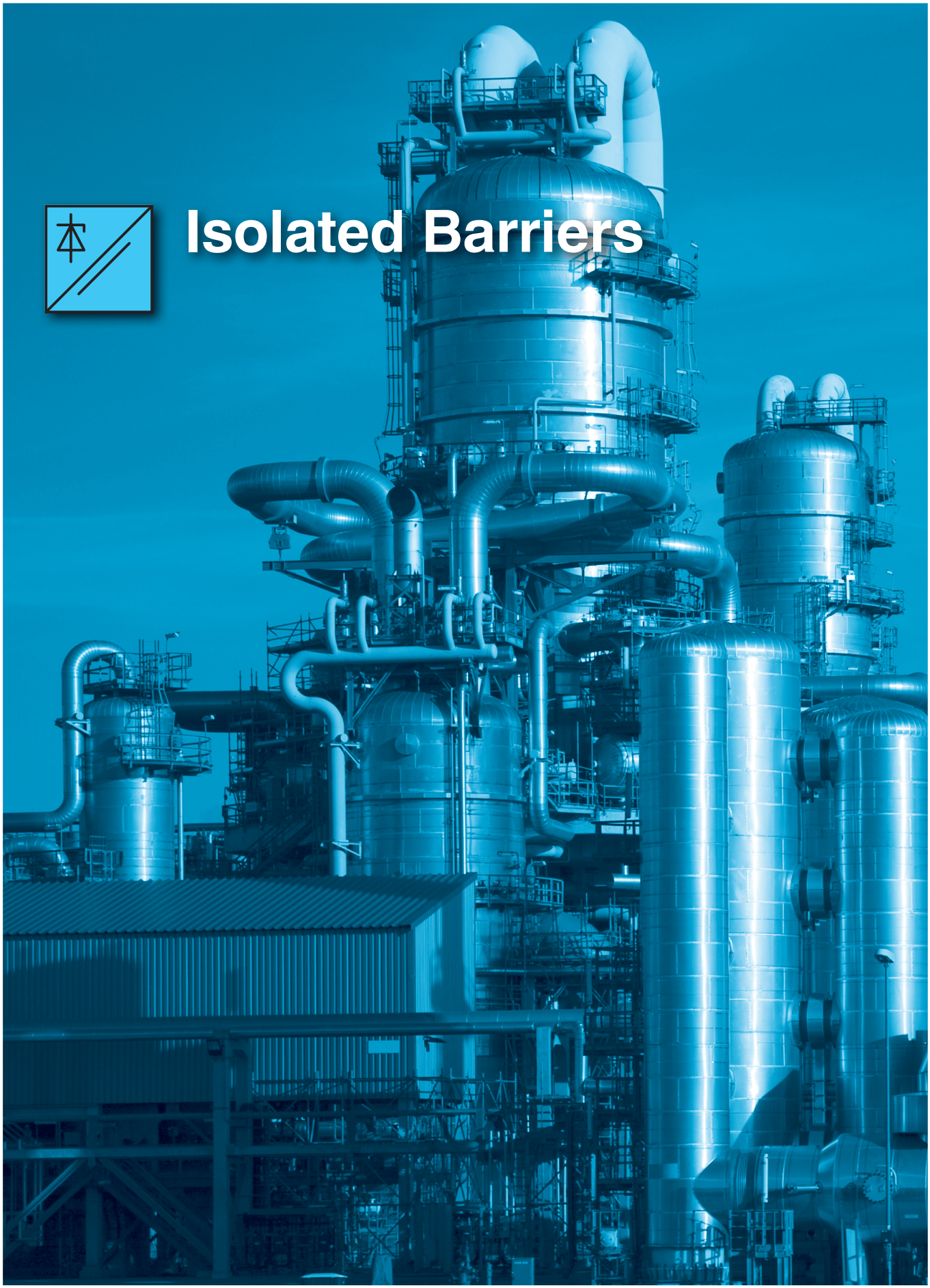

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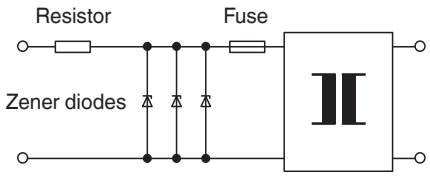
Isolated barriers for intrinsic safety applications are used in factory and process control for the galvanic isolation of control and instrumentation signals, such as NAMUR sensors, 4 mA to 20 mA and 0 V to 10 V signals. These devices are also used to convert specialized measurement signals into standard control signals. Isolated barriers have intrinsically safe control circuits in order to operate and communicate with field devices in hazardous areas. In all cases, the respective statutory regulations and directives governing the application or intended use shall be observed.

Operating principle

Isolated barriers are a combination of an intrinsic safety zener barrier and a galvanic isolation network. The energy limitation delivered to the field (voltage and current) is achieved through the zener barrier. In simple terms, a zener barrier contains a zener diode for voltage limitation and a resistor for current limitation. These components are protected with a fuse.

The galvanic isolation contained within the isolated barriers prevents noise, potential effects and transients from affecting the measurement signals. Although necessary for stand-alone, zener barriers, an isolated barrier does not require a connection to earth (ground).



K-System

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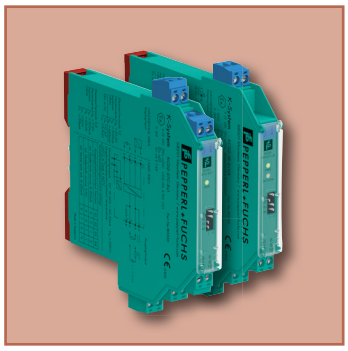
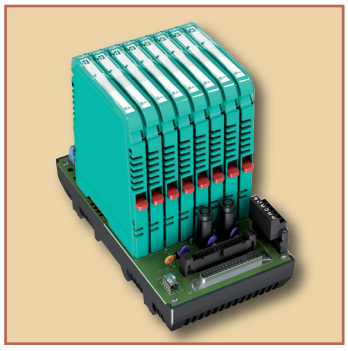


- DIN rail/Power Rail solutions
- 1-, 2- and 4-channel designs reduce DIN rail space
- SIL rated for safety instrumented systems
- Horizontal/vertical installation with no temperature degradation
- Removable terminals reduce the maintenance over the life cycle of the plant
- Integrated HART solutions for plant asset management
- 3-port galvanically isolated intrinsic safety barriers
- Line fault detection and local indication
- World-wide approvals

H-System

314



- Termination Board solutions feature custom system connectors
- High density modules reduce the number of cabinets and termination panels
- Plug-in I/O modules reduce maintenance over the life cycle of the plant
- SIL rated for safety instrumented systems
- Integrated HART solutions for plant asset management
- 3-port galvanically isolated intrinsic safety barriers
- Color-coded for visual identification
- World-wide approvals

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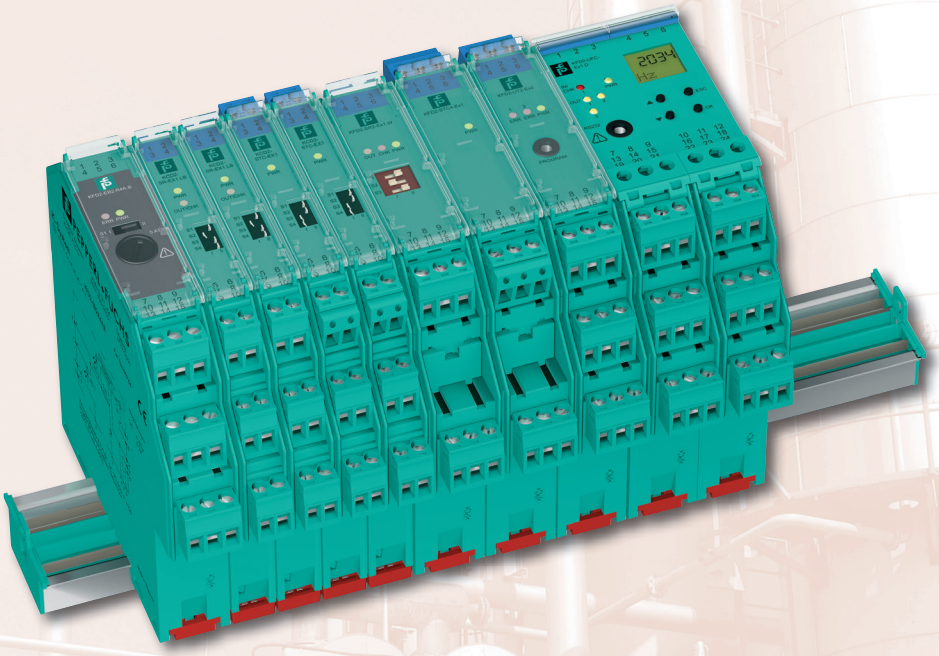
K-System



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Introduction

The K-System consists of wide range of isolated barriers suitable for mounting on 35 mm DIN rail. K-System is easy to specify, integrate and expand and has become synonymous with safety and reliability. Our extensive line of intrinsic safety isolators for hazardous location applications contains over 150 different models, each containing industry leading features and benefits.

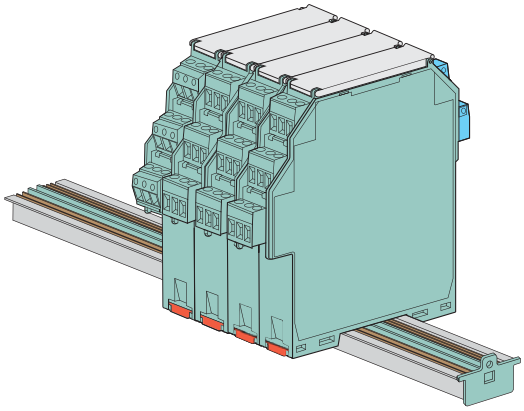

Figure 1 K-System on Power Rail

Housing types

Depending on the functionality and application, K-System has different housing widths. Whether it is the 12.5 mm KC modules or the well-proven 20 mm KF modules, the electrical and mechanical characteristics of the K-System are maintained. This collection of modules provides a wide range of interface barriers that can be combined on Power Rail.

KC module housing

Used for high signal integrity

- Compact housing, only 12.5 mm wide
- Single loop integrity
- Power loss only 0.8 W per device

Figure 2 12.5 mm housing (KC module)

KF module housings

Used for high channel density

- Compact 20 mm housing
- Highest packing density on the market
- As low as 5 mm per channel

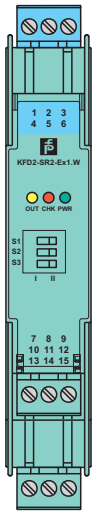

Figure 3 20 mm housing (KF module)

Used for applications with high functionality

- Logic controls determine and monitor speed, direction of rotation, slip, flow rates and time
- Analog controls monitor transmitter signals, strain gauges, temperature and load cells
- Configured using **PACT***ware*™ or by keypad
- Universal power supply

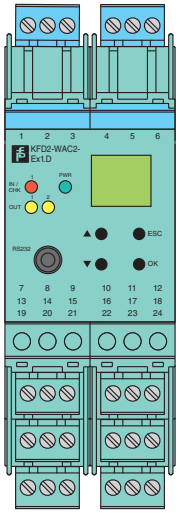

Figure 4 40 mm housing (KF module)

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Supply voltage

K-System isolated barriers are available with different supply voltages. The most widely used rating is 24 V DC; however, 115 V AC and 230 V AC are also available for applications when DC power is not available. The universal supply units carry the complete range from 20 V DC to 90 V DC and 48 V AC to 230 V AC on the same input terminals. The supported supply voltage for each barrier is identified on the side plate.

Mounting

The K-System is mounted on a 35 mm DIN rail acc. to EN 60715. To reduce wiring and installation costs, Power Rail is the optimum solution.

Low heat dissipation allows vertical or horizontal mounting.

Power Rail

The Power Rail is a plastic insert into a standard DIN rail and contains two leads that deliver power to the modules. Power is sent through the rail by a power feed module that delivers 24 V DC at 4 A. The module uses a 5 A fuse to protect the barriers. The Power Rail virtually eliminates the risk of wiring faults and facilitates easy expansion. Power Rail is available in two versions:

- UPR-03: 3-lead version supplies two leads for power and one lead for error signal
- UPR-05: 5-lead version supplies two leads for power, one lead for error signal and two leads for serial data exchange.

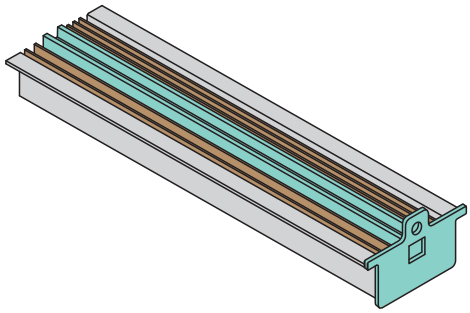

Figure 5 Universal Power Rail UPR-05

Mounting on Power Rail

As shown in the figure, the isolation modules are snapped onto the Universal Power Rail in a vertical downward movement.

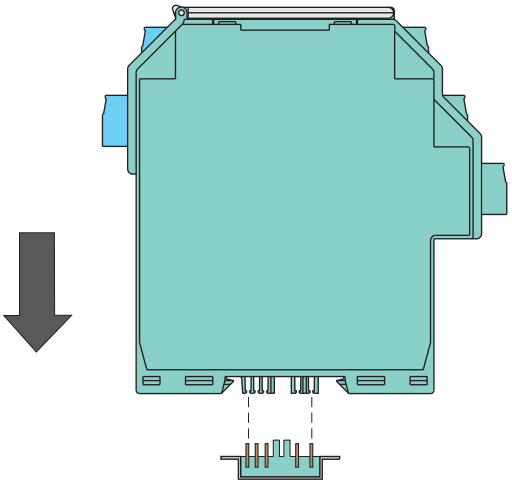

Figure 6 Proper K-System mounting

CORRECT: Device snapped on vertically.

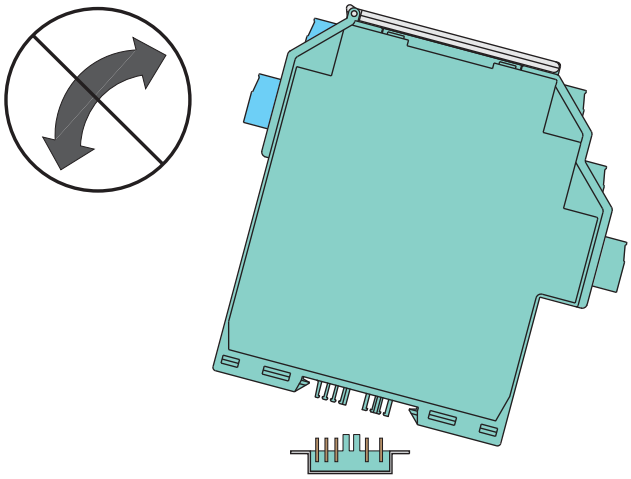

Figure 7 Improper K-System mounting

INCORRECT: Device snapped on from the side.

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Power connection to K-System

Conventional power supply without Power Rail

Conventional power supplies create complicated and expensive wiring systems. After all isolated barriers are connected, there is a significant amount of wiring and more wiring must be added for features such as lead breakage and short-circuit monitoring.

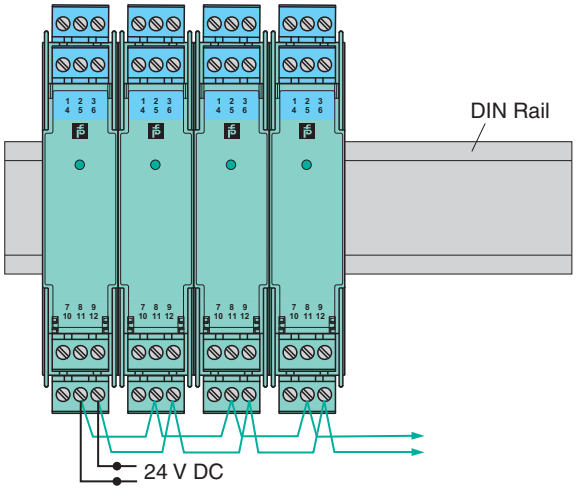

Figure 8 Conventional installation

Power supply with Power Rail

Supply with Power Feed Modules

The Pepperl+Fuchs Power Rail eliminates wiring hassles and reduces expense. The power feed module mounts on the Power Rail for easy and reliable distribution of power to all connected isolated modules. This method eliminates all of the parallel power wiring necessary on a conventional installation without Power Rail.

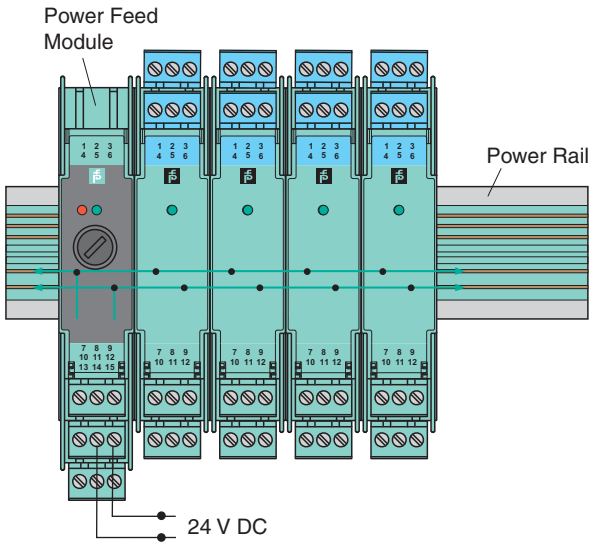

Figure 9 Power Rail installation

Redundant Supply with Power Feed Modules

Two power supplies or a redundant power supply with two power feed modules offers a high degree of safety and reliability.If a power supply is damaged or a fuse opens in a power feed module, the redundant supply continues to energize the isolator modules through their Power Rail connection.

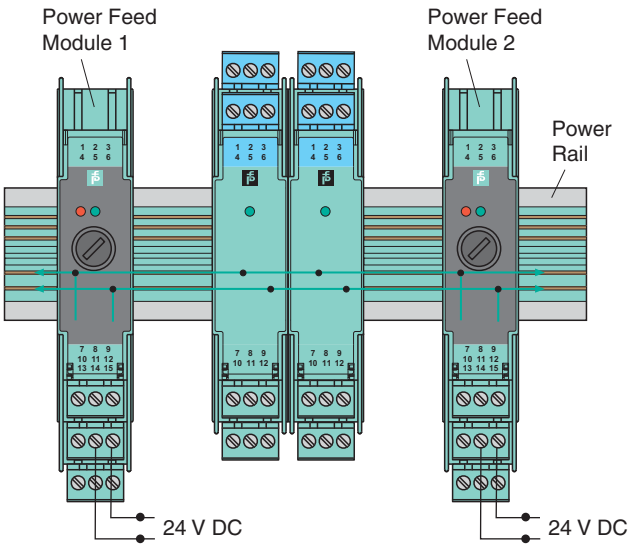

Figure 10 Redundant power connections

Direct Supply with Power Supplies

A complete power solution for a K-System installation is possible by using a 115/230 V AC to 24 V DC/4 A power supply with the KFA6-STR-1.24.4 or by using the KFA6-STR-1.24.500 that provides 24 V DC/500 mA. The power supplies snap-on the Power Rail to easily and efficiently distribute power to the isolated barriers.

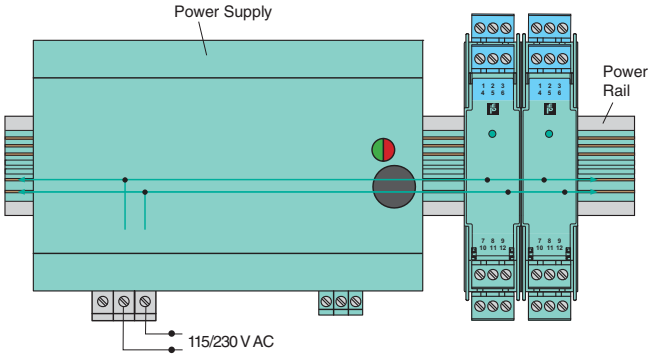

Figure 11 Integrated power supply (4 A)

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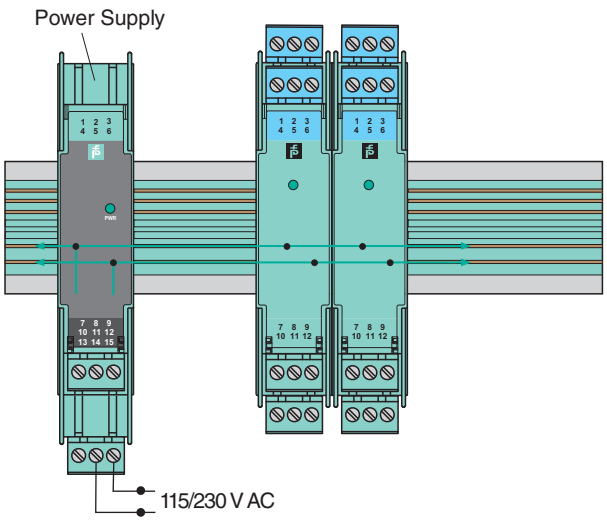

Figure 12 Integrated power supply (500 mA)

Collective error messaging

Collective error messaging enables lead breakage and short-circuit monitoring for isolator modules without additional wiring expenses. During a fault condition of the field circuit, an interrupt signal from an isolator module is transferred to the Power Rail. The power feed module evaluates the signal and transfers the interrupt signal to the control system via a relay contact.

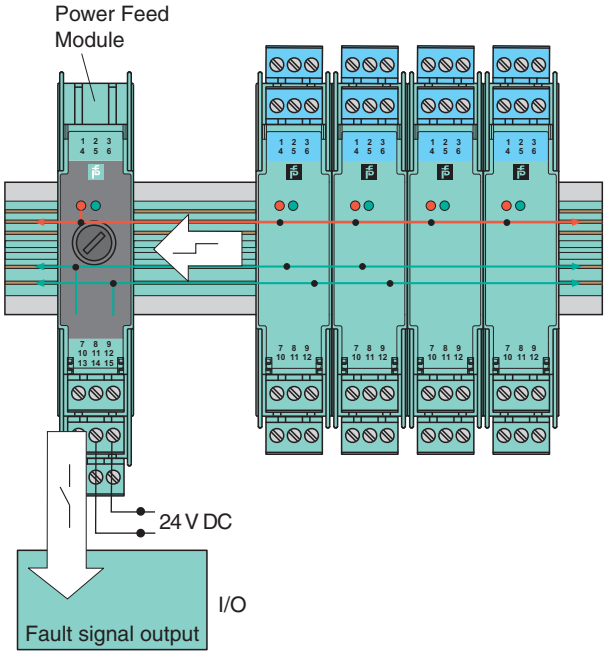

Figure 13 Collective error message via power feed module

Terminal blocks

Removable terminal blocks

The removable terminal blocks simplify control cabinet construction and allow the units to be replaced while they are energized. These screw-secured, cage clamp terminals allow space for the connection of leads with core cross-sections of up to 2.5 mm^2 (14 AWG). The connectors are coded with red pins so misconnection of a terminal block is eliminated. With the KF-CP coding pins (available separately), additional terminal block styles with test sockets or cage spring release can be easily coded and inserted into an isolated barrier

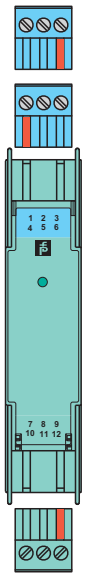

Figure 14 K-System removable terminal blocks

Terminal designation

Please reference appropriate model for terminal designation.

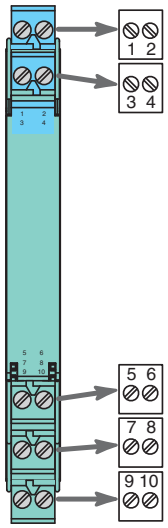

Figure 15 12.5 mm housing (KC module)

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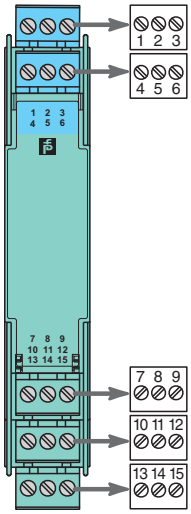

Figure 16 20 mm housing (KF module)

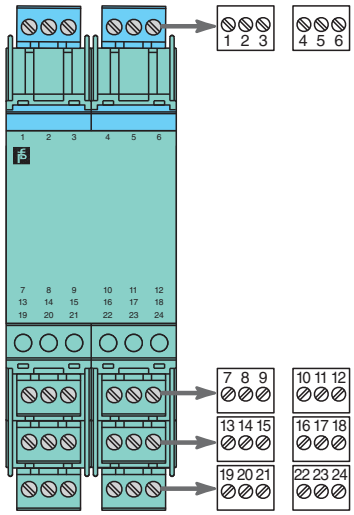

Figure 17 40 mm housing (KF module)

Color identification

The color identification of the devices has the following meaning:

- green indicates devices with DC power supply
- black indicates devices with AC power supply
- grey indicates devices with universal power supply of 20 V DC to 90 V DC or 48 V AC to 253 V AC

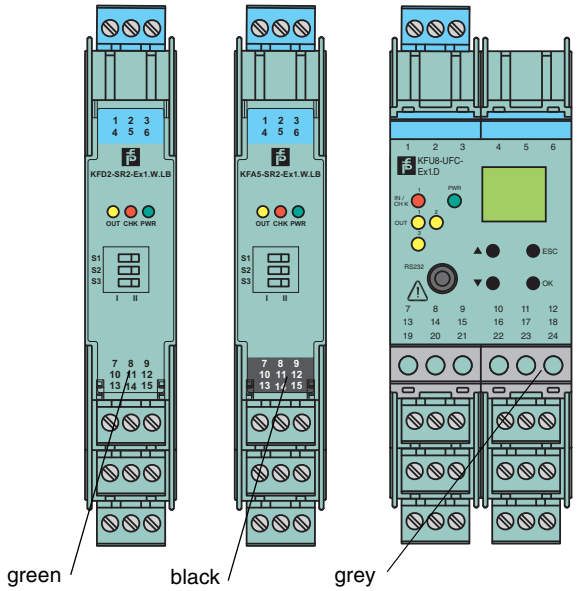

Figure 18 Color identification of devices

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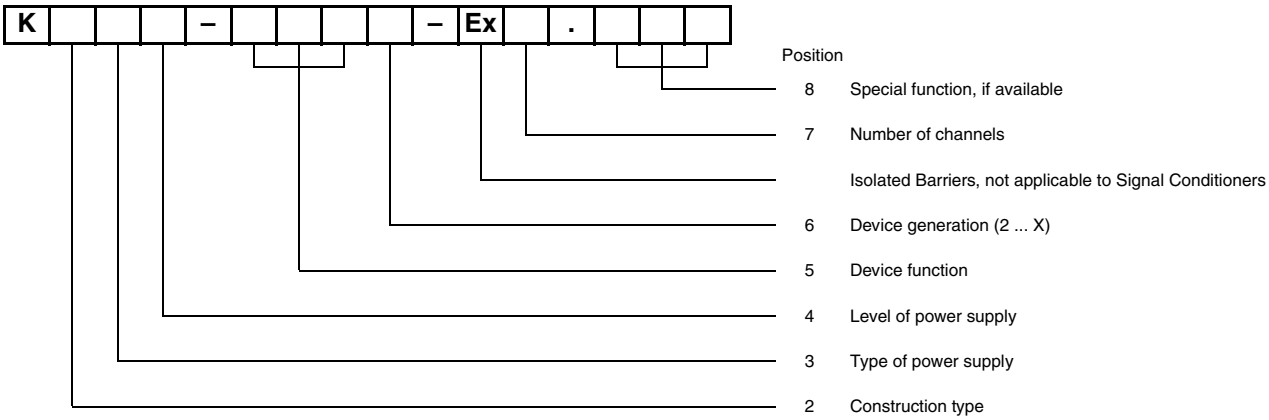
Model number description



Position 1	K	=	K-System
Position 2	C	=	Version with removable terminals, 12.5 mm width
	F	=	Version with removable terminals, 20 mm or 40 mm width
	H	=	Version without removable terminals, 20 mm or 40 mm width
Position 3	D	=	DC power supply
	A	=	AC power supply
	U	=	AC-/DC power supply
Position 4	0	=	without power supply
	2	=	24 V
	4	=	100 V
	5	=	115 V
	6	=	230 V
	8	=	20 V DC to 90 V DC, 48 V AC to 253 V AC
Position 5	CC	=	Converter for current/voltage
	CD	=	Current driver, active
	CR	=	Transmitter power supply device, current output
	CRG	=	Transmitter power supply device with limit value output
	CS	=	Current driver, passive
	DU	=	Switch amplifier, timer relay
	DWB	=	Rotational speed monitor, logic control unit
	EB	=	Power feed module
	ELD	=	Ground fault detection
	ER		Conductivity switch amplifier
	FF	=	RS 232 repeater
	GS	=	Trip amplifier for current/voltage
	GU	=	Universal trip amplifier
	GUT	=	Temperature converter with trip values
	HLC	=	HART Loop Converters
	HMM	=	HART Multiplexer Master
	HMS	=	HART Multiplexer Slave
	PT	=	Potentiometer converter
	RC	=	Converter for resistors
	RCI	=	Solenoid driver
	RO	=	Relay module
	RR	=	Repeater for resistance measuring sensor
	RSH	=	Relay module in safety application
	SCD	=	SMART current driver
	SCS	=	SMART current driver/repeater
	SD	=	Solenoid driver
	SH	=	Safety switch amplifier
	SL	=	Solenoid driver module with logic input
	SOT	=	Switch amplifier with passive, potential free transistor output
	SR	=	Switch amplifier with relay output
	SRA	=	Switch amplifier with relay output, 2:1 operation mode
	SRT	=	Switch amplifier with active transistor and relay output
	ST	=	Switch amplifier with active transistor output
	STC	=	SMART transmitter power supply with current output
	STR	=	Power supply
	STV	=	SMART transmitter power supply with voltage output
	TR	=	Converter for resistance measuring sensor
	TT	=	Converter for thermocouple/mV
	UFC	=	Universal frequency converter
	UFT	=	Frequency converter with direction and synchronization monitoring
	USC	=	Universal signal converter with trip values
	UT	=	Universal temperature converter
	VC	=	Converter for current/voltage
	VCR	=	Transmitter power supply, repeater for current/voltage
	VD	=	Solenoid driver
	VM	=	Solenoid driver
	VR	=	Voltage repeater
	WAC	=	Converter for strain gauges

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Safety information

The corresponding data sheets, the Declaration of Conformity, the EC-Type Examination Certificate and applicable certificates (see data sheet) are an integral part of this document.

Intended use

Laws and regulations applicable to the usage or planned purpose of usage must be observed. Devices are only approved for proper usage in accordance with intended use. Improper handling will result in voiding of any warrantee or manufacturer's responsibility.

These devices are used in C&I technology for the galvanic isolation of C&I signals, such as 20 mA and 10 V unit signals, and also for the adaptation and/or standardization of signals. Devices which have intrinsically safe control circuits are used to operate field devices within hazardous areas.

The devices are not suitable for the isolation of signals in power engineering, unless this is specifically referred to in the respective data sheet.

Protection of operating personnel and the system is not ensured if the product is not used in accordance with its intended use.

Intrinsic safety circuits that were operated with circuits of other types of protection may not be used as intrinsically safe circuits afterwards.

Installation and commissioning

Commissioning and installation must be carried out by specially trained and qualified personnel only.

Installation of the interface devices in the safe area

The devices are constructed to satisfy the IP20 protection classification and must be protected from adverse environmental conditions such as water spray or dirt exceeding the pollution degree 2.

The devices must be installed outside the hazardous area!

Depending on the level of protection, the intrinsically safe circuits of the devices (light blue identification on the device) can be located in the hazardous area. It is especially important to ensure that the intrinsically safe circuits are safely separated from all non-intrinsically safe circuits.

The installation of the intrinsically safe circuits is to be conducted in accordance with the relevant installation regulations.

The respective peak values of the field device and the associated device with regard to explosion protection should be considered when connecting intrinsically safe field devices with the intrinsically safe circuits of K-System devices (demonstration of intrinsic safety). EN 60079-14/ IEC 60079-14 or NEC and CEC electrical codes for US and Canada respectively must be observed (where appropriate). If available, also the product certification control drawing must be observed.

If more channels of one device are to be connected in parallel, it must be ensured that the parallel connection is made directly at the terminals. For the demonstration of intrinsic safety, the maximum values of the parallel connection are to be regarded.

The EC-Type Examination Certificates or standard certificates/approvals should be observed. It is especially important to observe the "special conditions" if these are included in the certificates.

Installation and commissioning of the interface devices within Zone 2/Div. 2 of the hazardous area

Only devices with the corresponding manufacturer's Declaration of Conformity or separate certificate of conformity can be installed in Zone 2/Div. 2.

The individual data sheets indicate whether these conditions are met.

For US and Canada installations, in Zone 2/Div. 2 follow the NEC and CEC wiring methods. The enclosure must be able to accept Zone 2/Div. 2 wiring methods. The referenced product certification control drawing must be observed.

For all other applications, the devices should be installed in a switch or junction box that:

- meets at least IP54 in accordance to EN 60529.
- meets to the requirements of resistance to light and resistance to impact according to EN 60079-0/ IEC 60079-0.
- meets to the requirements of thermal endurance according to EN 60079-15/IEC 60079-15.
- must not cause ignition danger by electrostatic charge during intended use, maintenance and cleaning.

Depending on the level of protection, the intrinsically safe circuits of the devices (light blue identification on the device) can be located in the hazardous area. It is especially important to ensure that the intrinsically safe circuits are safely separated from all non-intrinsically safe circuits.

The installation of the intrinsically safe circuits is to be conducted in accordance with the relevant installation regulations.

The respective peak values of the field device and the associated device with regard to explosion protection should be considered when connecting intrinsically safe field devices with the intrinsically safe circuits of K-System devices (demonstration of intrinsic safety). EN 60079-14/ IEC 60079-14 or NEC and CEC electrical codes for US and Canada respectively must be observed (where appropriate). If available, also the product certification control drawing must be observed.

If more channels of one device are to be connected in parallel, it must be ensured that the parallel connection is made directly at the terminals. For the demonstration of intrinsic safety, the maximum values of the parallel connection are to be regarded.

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The EC-Type Examination Certificates, standard certificates/approvals or the manufacturer's Declaration of Conformity should be observed. It is especially important to observe the "special conditions" if these are included in the certificates.

Repair and maintenance

The transfer characteristics of the devices remain stable over long periods of time. This eliminates the need for regular adjustment. Maintenance is not required.

Fault elimination

No changes can be made to devices that are operated in hazardous areas. Repairs on the device are not allowed.

Isolation coordinates for devices with Ex-certificate according to EN 50020 and EN 60079-11

The devices are assessed for pollution degree 2 and overvoltage category II according to EN 50178.

Isolation coordinates for installations for galvanic isolation according to EN 50178 and EN 61140

The devices of the K-System are electronic equipment for use in secluded electrical operating sites where only skilled personnel or electrically instructed personnel will have admission or access.

The devices are assessed for pollution degree 2 and overvoltage category II according to EN 50178.

Connect only power supplies to power feed modules, which provide protection against direct contact (e. g. SELV or PELV).

For additional details, see data sheets.

Technical data

Electrical data

Safe area signals and control circuit

- 0/4 mA to 20 mA signal level acc. to NE43
- Current output HART compatible
- Current input HART compatible
- Digital output: active or, passive electronic output 100 mA/30 V, short circuit protected
- Relay output 2 A, minimum load 1 mA/24 V
- Logic level 24 V acc. to IEC 60946
- Functional isolation or safe isolation acc. to EN 50178 and NAMUR NE23

For additional details, see data sheets.

Ex-signals and field circuit

- Transmitter power supply up to 17 V DC
- Current input HART compatible
- Pt100, in 2-, 3-, (4-)wire technology
- Resistor 0 Ω to 400 Ω with freely definable characteristic
- Potentiometer
- Thermocouples of all types, internal cold junction, external reference
- Current output HART compatible
- Digital input NAMUR EN 60947-5-6
- Digital output for Ex-i valves, short circuit protected

For additional details, see data sheets.

Mechanical data

Mounting

- Snap-on 35 mm standard DIN rail acc. to EN 60715. Can be mounted horizontally or vertically, side by side.
- Panel mount: The lugs on the base of the modules must be extended and used for mounting purposes with 3 mm screws.
- K-MS mounting base for screw attachment

Housing material

Polycarbonate (PC)

Dimensions

Housing drawings please refer to appendix.

Protection degree

IP20 acc. to EN 60529

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Connection

- KH*-modules:
  self-opening connection terminals for max. core diameter of 1 x 2.5 mm^2 (14 AWG)
- KF*-and KC*-modules:
  removable connector with integrated self opening device terminals for leads of up to a max. of 1 x 2.5 mm^2 (14 AWG)

Fire protection class

Housing: V2 according to UL 94 standard. (Unless stated otherwise all details relate to the reference conditions.)

Labeling

place for labeling on the front side, label:

- KC-modules (12.5 mm): 22 mm x 9 mm
- KF-modules (20 mm): 22 mm x 16.5mm
- KF-modules (40 mm): 18 mm x 8 mm

Ambient conditions

Ambient temperature

-20 °C to 60 °C (-4 °F to 140 °F)

Exceptions see data sheets.

Storage temperature

-40 °C to 90 °C (-40 °F to 194 °F)

Reference conditions for adjustment

20 °C (68 °F)

Relative humidity

max. 95 % without moisture condensation

Vibration resistance

acc. to EN 60068-2-6, 10 Hz to 150 Hz, 1 g, high crossover frequency

Shock resistance

acc. to EN 60068-2-27, 15 g, 11 ms, half-sine

Conformity with standards and directives

General

- Isolator modules with explosion protection, mostly with Ex ia IIC/Class I Div. 1, international approvals
- EMC acc. to NAMUR NE21 and EN 61326
- LEDs acc. to NAMUR NE44
- Software acc. to NAMUR NE53
- Switch-on pulse suppression
- Devices K*D2:
  - Supply voltage 20 V DC to 30 V DC via Power Rail or supply terminals
  - Fault signals via Power Rail
- Devices K*A and K*U:
  - Supply voltage 115 V/230 V AC ±10 %
- Safety devices acc. to VDE 0660 T.209, AK acc. to DIN 19250

Digital inputs/outputs in accordance with NAMUR

The standards references for this interface have changed many times:

German standard (old): **DIN 19234**: Electrical distance sensors – DC interface for distance sensors and switch amplifiers; 1990-06

European standard (old): **EN 50227**: Low voltage switch gear and control gear – control devices and switching elements – proximity switches, DC interface for proximity sensors and switch amplifiers (NAMUR), 1996-10

German version (old): **DIN EN 50227**: Low voltage switch gear – control devices and switching elements – proximity switches, DC interface for proximity sensors and switch amplifiers (NAMUR), 1997, German nomenclature VDE 0660, part 212

Current designation: DIN EN 60947-5-6: Low voltage switch gear – control devices and switching elements – proximity switches, DC interface for proximity sensors and switch amplifiers (NAMUR), 2000, German nomenclature: VDE 0660 part 212

Current IEC designation: IEC 60947-5-6: Low voltage switch gear and control gear – part 5-6: Control circuit devices and switching elements – DC interface for proximity sensors and switching amplifiers (NAMUR), 1999

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Switch Amplifiers

Model Number	Channels	Function: Timer	Function: Interval	Input (Field): NAMUR Sensor/ Dry Contact	Input (Field): Line Fault Detection	Output (Control System): Relay	Output (Control System): Transistor (Active/Passive)	Output (Control System): Error Message Output	Output (Control System): Active Signal Output	Supply: 24 V DC	Supply: 115 V AC/ 230 V AC	SIL	Zone 2/Division 2 Mounting	Page
KCD2-SR-Ex1.LB	1			■	■	2		■		■		2	■	127
KFD2-SR2-Ex1.W	1			■	■	1				■		2	■	128
KFA5-SR2-Ex1.W	1			■	■	1					■	2		129
KFA6-SR2-Ex1.W	1			■	■	1					■	2		130
KFD2-SR2-Ex1.W.LB	1			■	■	2		■		■		2	■	131
KFA5-SR2-Ex1.W.LB	1			■	■	2		■			■	2		132
KFA6-SR2-Ex1.W.LB	1			■	■	2		■			■	2		133
KCD2-SR-Ex2	2			■	■	2				■		2	■	134
KFD2-SR2-Ex2.W	2			■	■	2				■		2	■	135
KFA5-SR2-Ex2.W	2			■	■	2					■	2		136
KFA6-SR2-Ex2.W	2			■	■	2					■	2		137
KFA5-SR2-Ex2.W.IR	2		■	■	■	2					■			138
KFA6-SR2-Ex2.W.IR	2		■	■	■	2					■			139
KFD2-SR2-Ex2.2S	2			■	■	2x2				■		2	■	140
KFD2-SRA-Ex4	4			■	■	4				■				141
KFD2-SR-Ex1.4S.LK	1	■		■	■	4+1		■		■				142
KFD2-ST2-Ex1.LB	1			■	■		2	■		■		2	■	143
KFD2-ST2-Ex2	2			■	■		2			■		2	■	144
KFD2-SOT2-Ex1.LB	1			■	■		2	■		■		2	■	145
KFD2-SOT2-Ex1.LB.IO	1			■	■		2	■		■		2	■	146
KFD2-SOT2-Ex1.N	1			■	■		NAMUR			■		2	■	147
KFD2-SOT2-Ex2	2			■	■		2			■		2	■	148
KFA5-SOT2-Ex2	2			■	■		2				■	2		149
KFA6-SOT2-Ex2	2			■	■		2				■	2		150
KFD2-SOT2-Ex2.IO	2			■	■		2			■		2	■	151
KFD2-SH-Ex1	1			SN*	■	1		■		■		3	■	152
KFD2-SH-Ex1.T.OP	1			SN*	■		1	■	■	■		3	■	153
KHA6-SH-Ex1	1			SN*	■	1		■			■	3		154
KFD2-DU-Ex1.D	1	■		■	■	1	1			■			■	155
KFA5-DU-Ex1.D	1	■		■	■	1	1				■			156
KFA6-DU-Ex1.D	1	■		■	■	1	1				■			157

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Frequency Converters

Model Number	Functions			Input (Field)		Output (Control System)				Supply		SIL	Zone 2/Division 2 Mounting	Page
	Speed Monitor	Frequency Conversion	Special Functions	NAMUR Sensor/ Dry Contact	Line Fault Detection	Relay	Transistor (Passive)	Error Message Output	0/4 mA ... 20 mA	24 V DC	115 V AC/ 230 V AC			
KFD2-SR2-Ex2.W.SM	■		■	■	■	2				■		2	■	158
KFD2-DWB-Ex1.D	■			■	■	2		■		■		2	■	159
KFA5-DWB-Ex1.D	■			■	■	2		■			■	2		160
KFA6-DWB-Ex1.D	■			■	■	2		■			■	2		161
KFD2-UFC-Ex1.D	■	■	■	■	■	2	1	■	1	■		2	■	162
KFU8-UFC-Ex1.D	■	■	■	■	■	2	1	■	1	■	■	2		163
KFD2-UFT-Ex2.D	■	■	■	■	■	2	2	■	1	■			■	164
KFU8-UFT-Ex2.D	■	■	■	■	■	2	2	■	1	■	■			165

Conductivity Switch Amplifiers

Model Number	Channels	Function Measurement of Conductivity	Input (Field)		Output (Control System)		Supply		SIL	Zone 2/Division 2 Mounting	Page
			Line Fault Detection	Resistance	Relay	Error Message Output	24 V DC	115 V AC/ 230 V AC			
KFD2-ER-Ex1.W.LB	1	■	■	■	2	■	■				166
KFA5-ER-Ex1.W.LB	1	■	■	■	2	■		■			167
KFA6-ER-Ex1.W.LB	1	■	■	■	2	■		■			168

Ground Fault Detections and Interface Modules

Model Number	Description	Page
KFD2-ELD-Ex16	Ground Fault Detection, 16-channel, digital and analog inputs	169
KFD2-FF-Ex2.RS232	RS 232 Repeater, bi-directional	170

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Technical data

Supply	
Rated voltage	19 ... 30 V DC
Power consumption	≤ 500 mW
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 10 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I ≥ 6.5 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Output I	signal; relay
Output II	signal or error message; relay
Contact loading	253 V AC/2 A/cos Φ> 0.7; 126.5 V AC/4 A/cos Φ> 0.7; 30 V DC/2 A resistive load
Minimum switch current	2 mA/24 V DC
Energized/De-energized delay	≤ 20 ms/≤ 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 114 x 119 mm (0.5 x 4.5 x 4.7 in), housing type A2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0092
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22] ⟨Ex⟩ I (M1) [Ex ia] I
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4 X
FM approval	
Control drawing	16-533FM-12 (cFMus)
UL approval	
Control drawing	16-533FM-12 (cULus)
IECEx approval	IECEx BAS 06.0025
Approved for	[Ex ia] IIC, [Ex ia] I

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Relay contact output**
- **Fault relay contact output**
- **Line fault detection (LFD)**
- **Housing width 12.5 mm**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

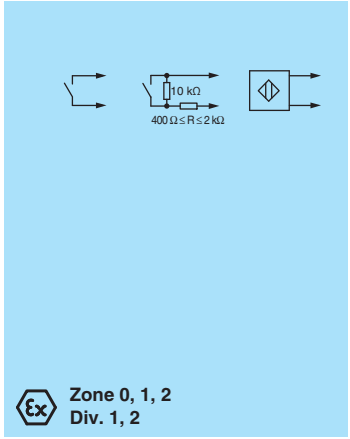
The proximity sensor or switch controls a form A normally open relay contact for the safe area load. The normal output state can be reversed using switch S1. Switch S2 allows output II to be switched between a signal output and an error message output. Switch S3 enables or disables line fault detection of the field circuit.

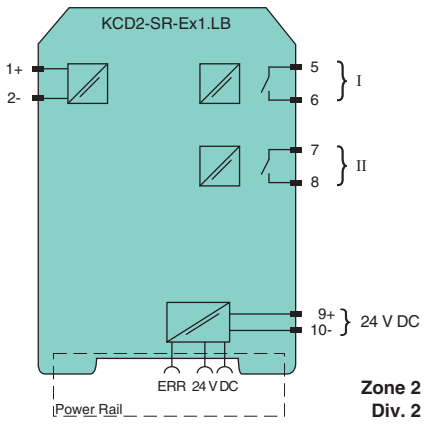
During an error condition, relays revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

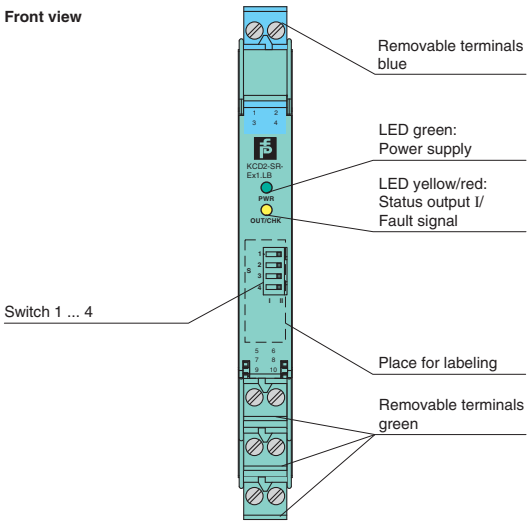
A unique collective error messaging feature is available when used with the Power Rail system.

Due to its compact housing design and low heat dissipation, this device is useful for detecting positions, end stops, and switching states in space-critical applications.

Diagrams







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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Relay contact output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

The proximity sensor or switch controls a form C changeover relay contact for the safe area load. The barrier output changes state when the input signal changes state. The normal output state can be reversed using switch S1. Switch S3 is used to enable or disable line fault detection of the field circuit.

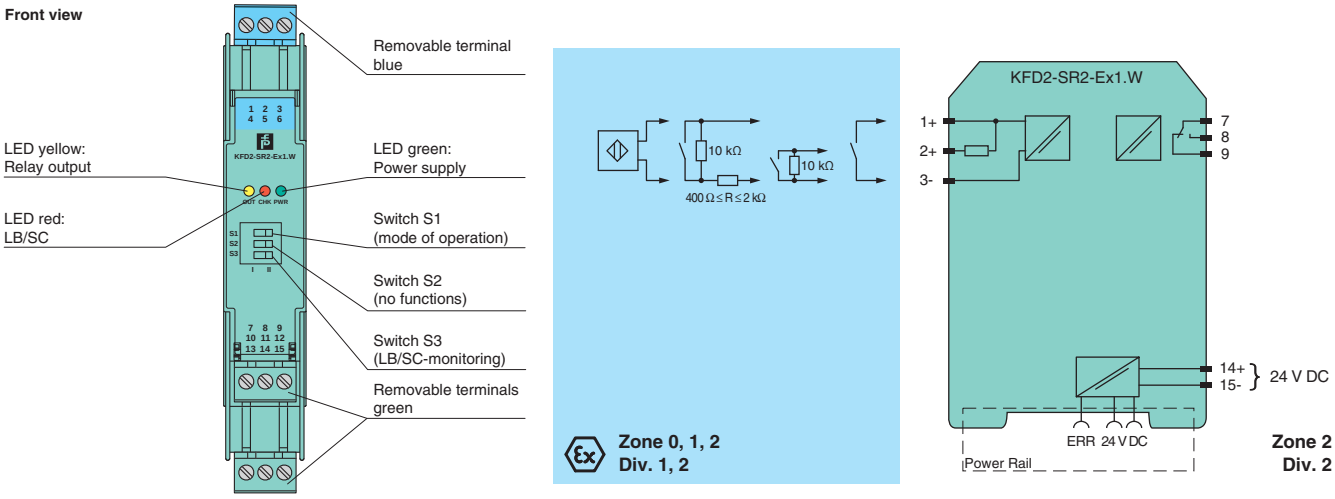
During an error condition, the relay reverts to its de-energized state and the LEDs indicate the fault according to NAMUR NE44.

A unique collective error messaging feature is available when used with the Power Rail system.

Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power consumption	< 0.9 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Output	signal; relay
Contact loading	253 V AC/2 A/cos Φ > 0.7; 126.5 V AC/4 A/cos Φ > 0.7; 40 V DC/2 A resistive load
Minimum switch current	2 mA/24 V DC
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	< 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2080
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection	⟨Ex⟩ II (3)G [Ex ic] IIC; [Ex nL] IIC
Statement of conformity	TÜV 99 ATEX 1493 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047

Diagrams



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Technical data

Supply	
Rated voltage	103.5 ... 126 V AC, 45 ... 65 Hz
Power consumption	1 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Output	signal; relay
Contact loading	253 V AC/2 A/cos Φ> 0.7; 126.5 V AC/4 A/cos Φ> 0.7; 40 V DC/2 A resistive load
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	< 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2081
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
FM approval	
Control drawing	116-0035
UL approval	
Control drawing	116-0145
CSA approval	
Control drawing	116-0047

Features

- **1-channel isolated barrier**
- **115 V AC supply**
- **Dry contact or NAMUR inputs**
- **Relay contact output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

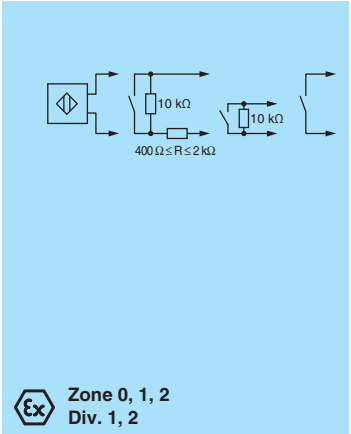
Function

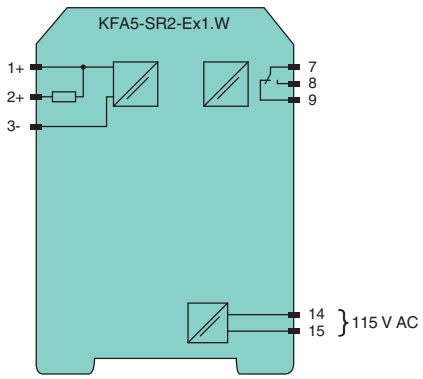
This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

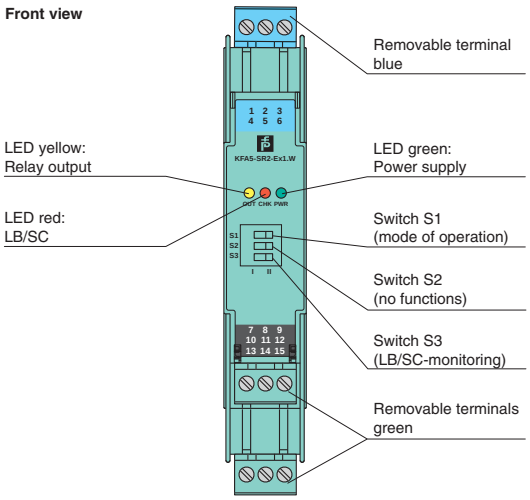
The proximity sensor or switch controls a form C changeover relay contact for the safe area load. The barrier output changes state when the input signal changes state. The normal output state can be reversed using switch S1. Switch S3 is used to enable or disable line fault detection of the field circuit.

During an error condition, the relay reverts to its de-energized state and the LEDs indicate the fault according to NAMUR NE44.

Diagrams







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Features

- **1-channel isolated barrier**
- **230 V AC supply**
- **Dry contact or NAMUR inputs**
- **Relay contact output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

The proximity sensor or switch controls a form C changeover relay contact for the safe area load. The barrier output changes state when the input signal changes state. The normal output state can be reversed using switch S1. Switch S3 is used to enable or disable line fault detection of the field circuit.

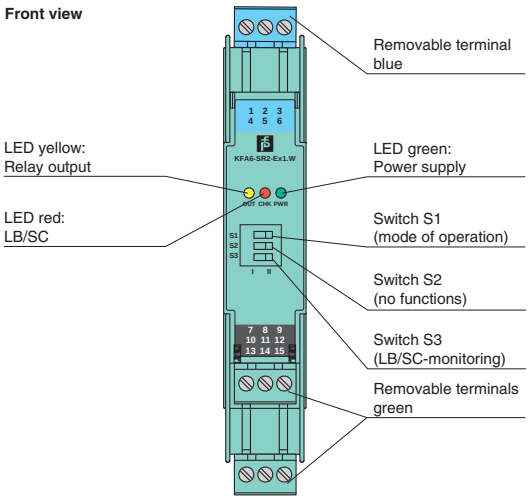
During an error condition, the relay reverts to its de-energized state and the LEDs indicate the fault according to NAMUR NE44.

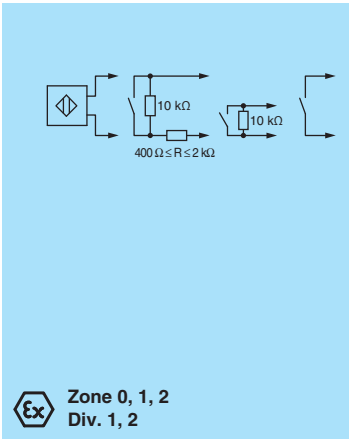
Technical data

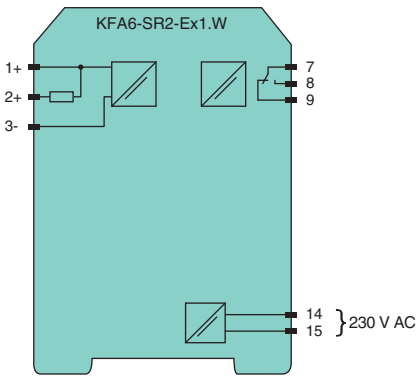
Supply	
Rated voltage	207 ... 253 V AC, 45 ... 65 Hz
Power consumption	≤ 1 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Output	signal; relay
Contact loading	253 V AC/2 A/cos Φ > 0.7; 126.5 V AC/4 A/cos Φ > 0.7; 40 V DC/2 A resistive load
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	< 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2081
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
FM approval	
Control drawing	116-0035
UL approval	
Control drawing	116-0145
CSA approval	
Control drawing	116-0047

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power consumption	< 1.3 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Output I	signal; relay
Output II	signal or error message; relay
Contact loading	253 V AC/2 A/cos Φ> 0.7; 126.5 V AC/4 A/cos Φ> 0.7; 40 V DC/2 A resistive load
Minimum switch current	2 mA/24 V DC
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2080
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection	⟨Ex⟩ II (3)G [Ex ic] IIC; [Ex nL] IIC
Statement of conformity	TÜV 99 ATEX 1493 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Relay contact output**
- **Fault relay contact output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

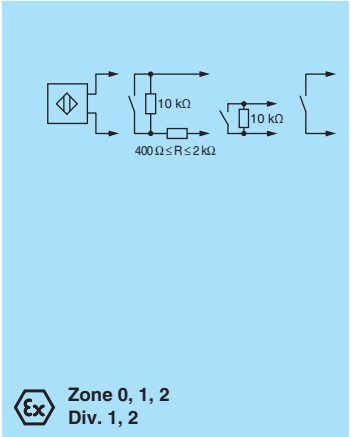
This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

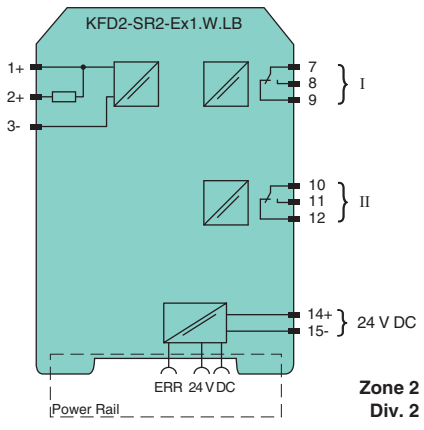
The proximity sensor or switch controls a form C changeover relay contact for the safe area load. The normal output state can be reversed using switch S1. Switch S2 allows output II to be switched between a signal output or an error message output. Switch S3 is used to enable or disable line fault detection of the field circuit.

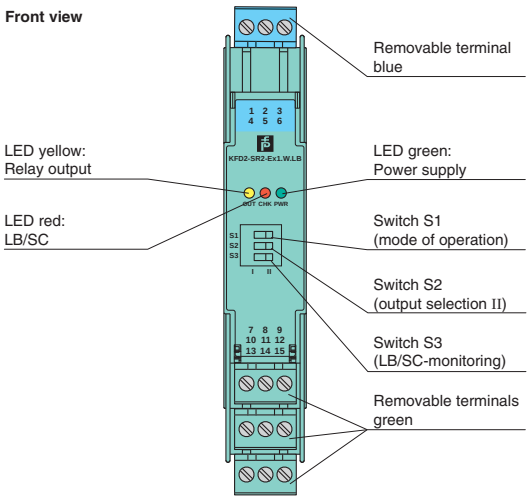
During an error condition, the relays revert to their de-energized state and the LEDs indicate the fault according to NAMUR NE44.

A unique collective error messaging feature is available when used with the Power Rail system.

Diagrams







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Features

- **1-channel isolated barrier**
- **115 V AC supply**
- **Dry contact or NAMUR inputs**
- **Relay contact output**
- **Fault relay contact output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

The proximity sensor or switch controls a form C changeover relay contact for the safe area load. The normal output state can be reversed using switch S1. Switch S2 allows output II to be switched between a signal output or an error message output. Switch S3 is used to enable or disable line fault detection of the field circuit.

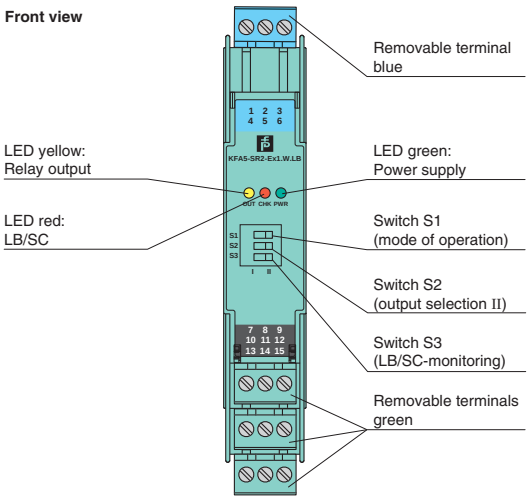
During an error condition, the relays revert to their de-energized state and the LEDs indicate the fault according to NAMUR NE44.

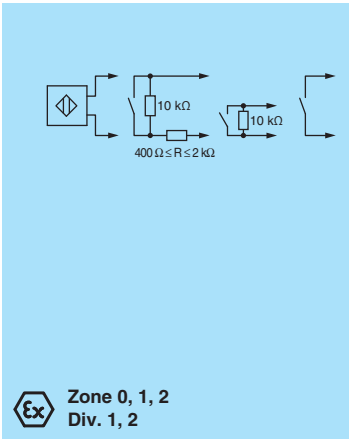
Technical data

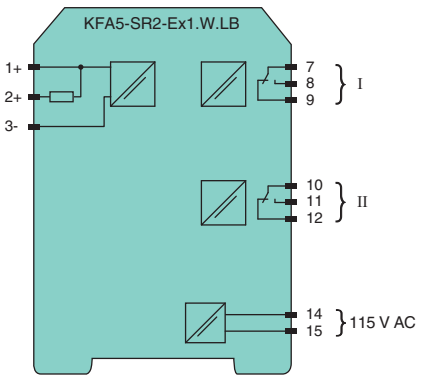
Supply	
Rated voltage	103.5 ... 126 V AC, 45 ... 65 Hz
Power consumption	≤ 1.3 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Output I	signal; relay
Output II	signal or error message; relay
Contact loading	253 V AC/2 A/cos Φ > 0.7; 126.5 V AC/4 A/cos Φ > 0.7; 40 V DC/2 A resistive load
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2081
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
FM approval	
Control drawing	116-0035
UL approval	
Control drawing	116-0145
CSA approval	
Control drawing	116-0047

Diagrams

Front view







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Technical data

Supply	
Rated voltage	207 ... 253 V AC, 45 ... 65 Hz
Power consumption	≤ 1.3 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Output I	signal; relay
Output II	signal or error message; relay
Contact loading	253 V AC/2 A/cos Φ> 0.7; 126.5 V AC/4 A/cos Φ> 0.7; 40 V DC/2 A resistive load
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2081
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
FM approval	
Control drawing	116-0035
UL approval	
Control drawing	116-0145
CSA approval	
Control drawing	116-0047

Features

- **1-channel isolated barrier**
- **230 V AC supply**
- **Dry contact or NAMUR inputs**
- **Relay contact output**
- **Fault relay contact output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

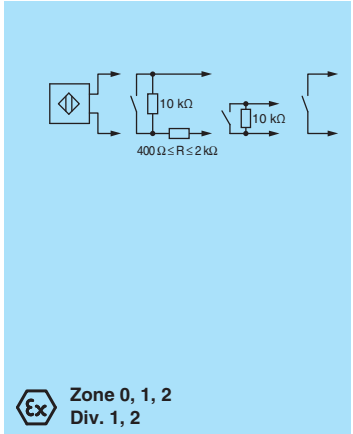
Function

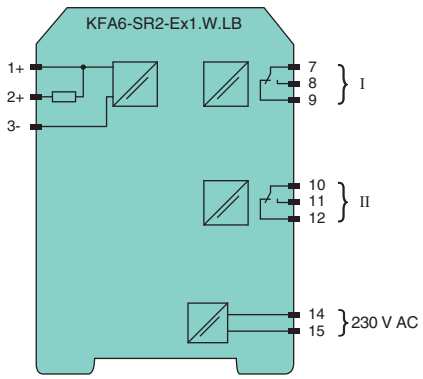
This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

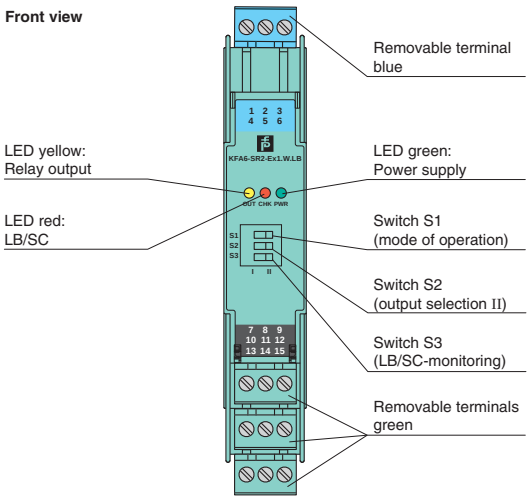
The proximity sensor or switch controls a form C changeover relay contact for the safe area load. The normal output state can be reversed using switch S1. Switch S2 allows output II to be switched between a signal output or an error message output. Switch S3 is used to enable or disable line fault detection of the field circuit.

During an error condition, the relays revert to their de-energized state and the LEDs indicate the fault according to NAMUR NE44.

Diagrams







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KCD2-SR-Ex2

Switch Amplifier

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Relay contact output**
- **Line fault detection (LFD)**
- **Housing width 12.5 mm**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

The proximity sensor or switch controls a form A normally open relay contact for the safe area load. The normal output state can be reversed using switches S1 and S2. Switch S3 is used to enable or disable line fault detection of the field circuit.

During an error condition, relays revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

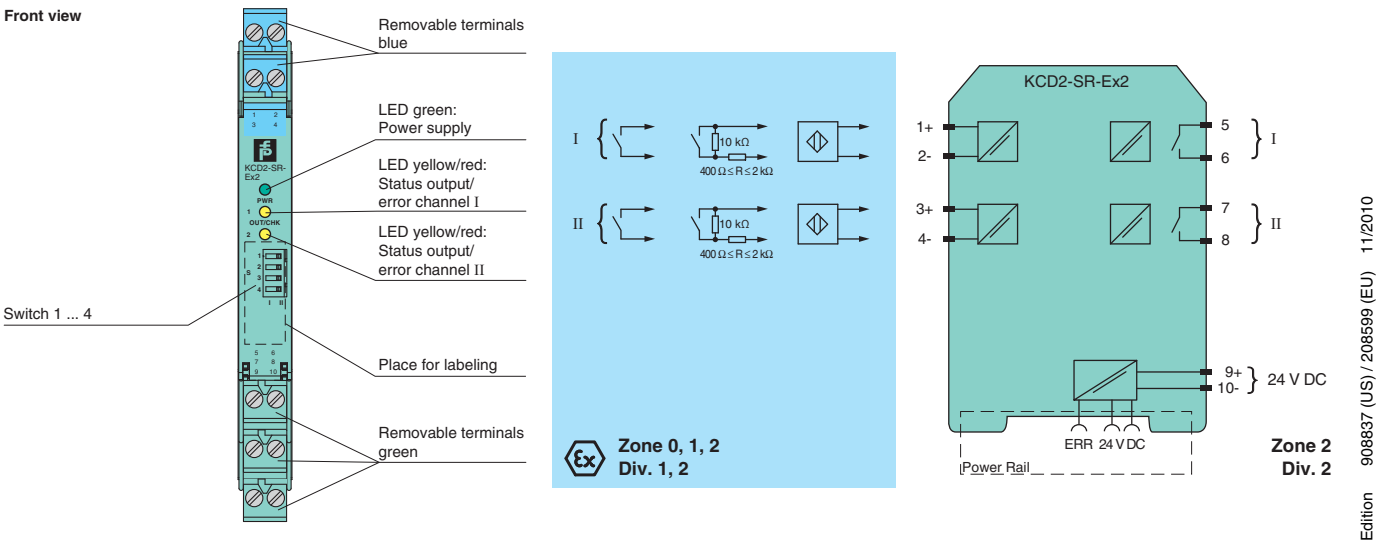
A unique collective error messaging feature is available when used with the Power Rail system.

Due to its compact housing design and low heat dissipation, this device is useful for detecting positions, end stops, and switching states in space-critical applications.

Technical data

Supply	
Rated voltage	19 ... 30 V DC
Power consumption	≤ 600 mW
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 10 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I ≥ 6.5 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Output I	signal; relay
Output II	signal; relay
Contact loading	253 V AC/2 A/cos Φ> 0.7; 126.5 V AC/4 A/cos Φ> 0.7; 30 V DC/2 A resistive load
Minimum switch current	2 mA/24 V DC
Energized/De-energized delay	≤ 20 ms/≤ 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 114 x 119 mm (0.5 x 4.5 x 4.7 in), housing type A2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0092
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22] ⟨Ex⟩ I (M1) [Ex ia] I
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4 X
FM approval	
Control drawing	16-533FM-12 (cFMus)
UL approval	
Control drawing	16-533FM-12 (cULus)
IECEx approval	IECEx BAS 06.0025
Approved for	[Ex ia] IIC, [Ex ia] I

Diagrams



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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power consumption	< 1.3 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Output I, II	signal; relay
Minimum switch current	2 mA/24 V DC
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2080
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection	⟨Ex⟩ II (3)G [Ex ic] IIC; [Ex nL] IIC
Statement of conformity	TÜV 99 ATEX 1493 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Relay contact output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

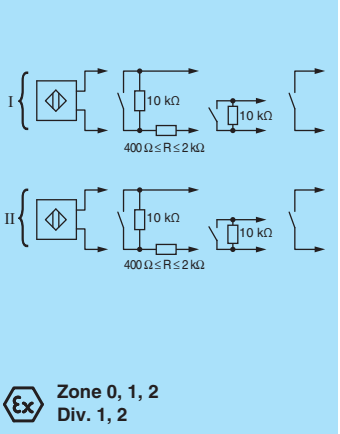
This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

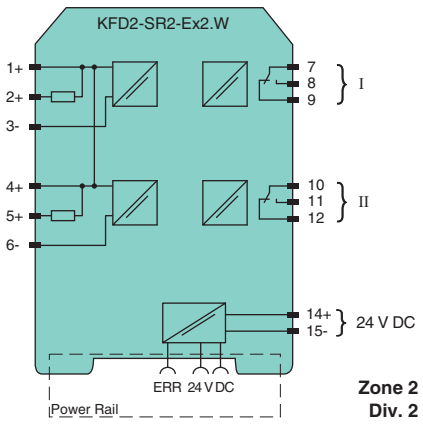
The proximity sensor or switch controls a form C changeover relay contact for the safe area load. The normal output state can be reversed using switches S1 and S2. Switch S3 is used to enable or disable line fault detection of the field circuit.

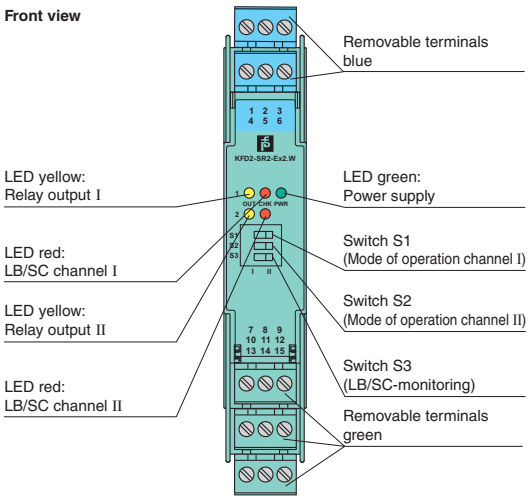
During an error condition, the relays revert to their de-energized state and the LEDs indicate the fault according to NAMUR NE44.

A unique collective error messaging feature is available when used with the Power Rail system.

Diagrams







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KFA5-SR2-Ex2.W

Switch Amplifier

Features

- **2-channel isolated barrier**
- **115 V AC supply**
- **Dry contact or NAMUR inputs**
- **Relay contact output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

The proximity sensor or switch controls a form C changeover relay contact for the safe area load. The normal output state can be reversed using switches S1 and S2. Switch S3 is used to enable or disable line fault detection of the field circuit.

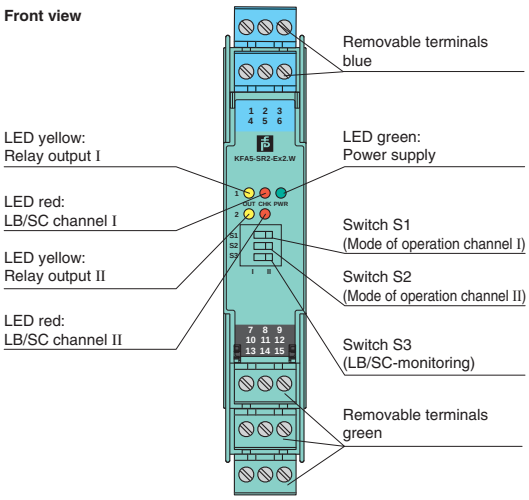
During an error condition, the relays revert to their de-energized state and the LEDs indicate the fault according to NAMUR NE44.

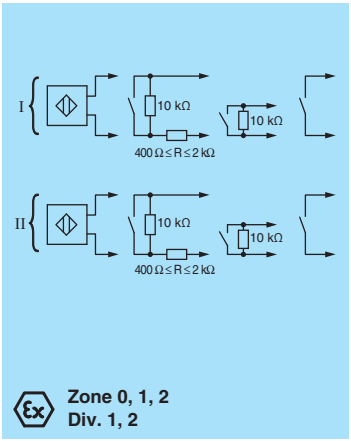
Technical data

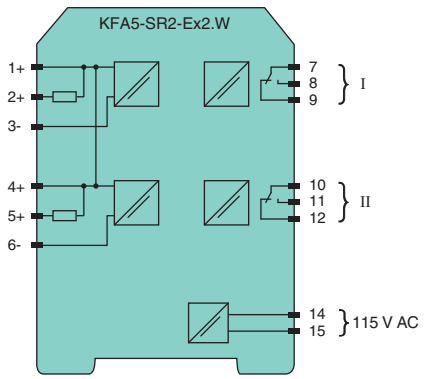
Supply	
Rated voltage	103.5 ... 126 V AC, 45 ... 65 Hz
Power consumption	≤ 1.3 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Output I, II	signal; relay
Contact loading	253 V AC/2 A/cos Φ > 0.7; 126.5 V AC/4 A/cos Φ > 0.7; 40 V DC/2 A resistive load
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2081
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
FM approval	
Control drawing	116-0035
UL approval	
Control drawing	116-0145
CSA approval	
Control drawing	116-0047

Diagrams

Front view







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Technical data

Supply	
Rated voltage	207 ... 253 V AC, 45 ... 65 Hz
Power consumption	≤ 1.3 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Output I, II	signal; relay
Contact loading	253 V AC/2 A/cos Φ> 0.7; 126.5 V AC/4 A/cos Φ> 0.7; 40 V DC/2 A resistive load
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2081
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
FM approval	
Control drawing	116-0035
UL approval	
Control drawing	116-0145
CSA approval	
Control drawing	116-0047

Features

- **2-channel isolated barrier**
- **230 V AC supply**
- **Dry contact or NAMUR inputs**
- **Relay contact output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

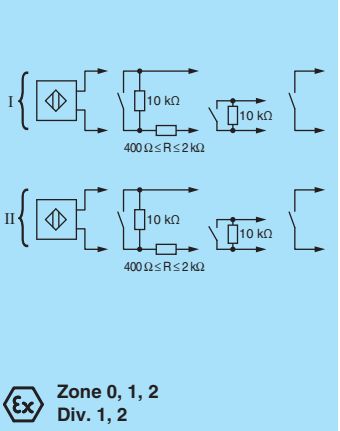
Function

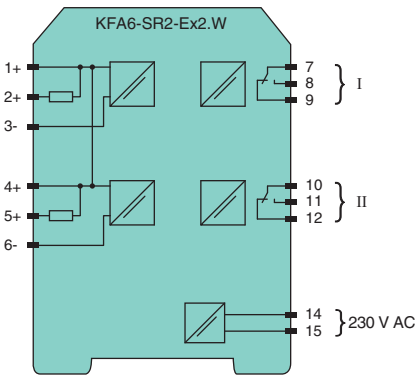
This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

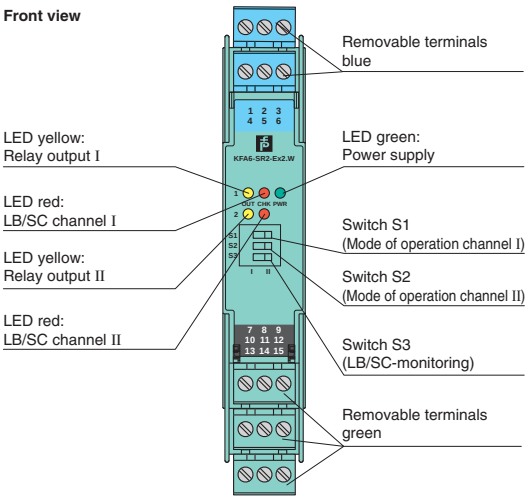
The proximity sensor or switch controls a form C changeover relay contact for the safe area load. The normal output state can be reversed using switches S1 and S2. Switch S3 is used to enable or disable line fault detection of the field circuit.

During an error condition, the relays revert to their de-energized state and the LEDs indicate the fault according to NAMUR NE44.

Diagrams







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Features

- **2-channel isolated barrier**
- **115 V AC supply**
- **Dry contact or NAMUR inputs**
- **Latching relay output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**

Function

This isolated barrier is used for intrinsic safety applications. It has a latching relay (bistable operation) for level control, pump up/pump down, or other switch/logic applications. The device is set by an active signal on input I and is reset by an active signal on input II. The mode of operation of inputs I and II can be programmed.

Switch S3 is used to enable or disable line fault detection of the field circuit. During an error condition or loss of power, the form C changeover relays revert to their de-energized state and the LEDs indicate the fault according to NAMUR NE44. When the wiring fault is corrected, the relay will revert to the state prior to the fault.

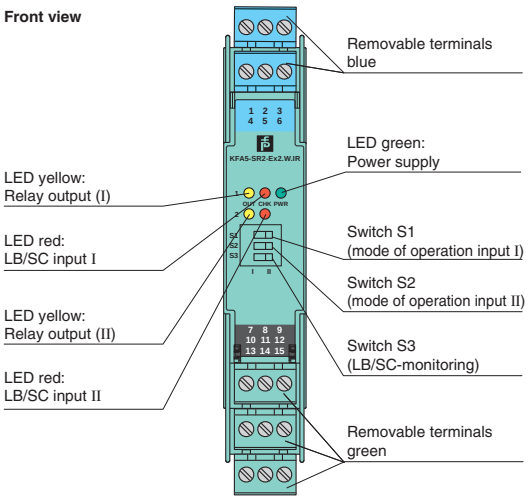
If the device is re-energized after power loss, the relays return to a factory-configured state.

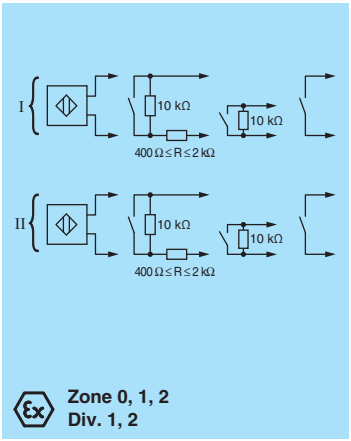
Technical data

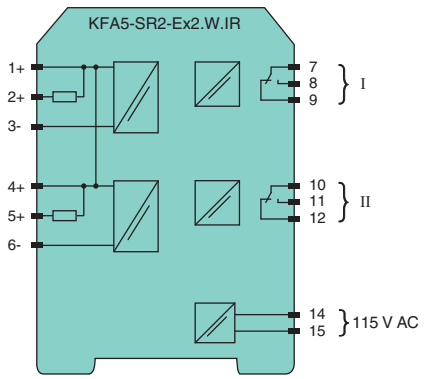
Supply	
Rated voltage	103.5 ... 126 V AC, 45 ... 65 Hz
Power consumption	≤ 1.5 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Pulse/Pause ratio	≥ 10 ms/≥ 10 ms
Output	
Output I, II	signal; relay
Contact loading	253 V AC/2 A/cos Φ> 0.7; 126.5 V AC/4 A/cos Φ> 0.7; 40 V DC/2 A resistive load
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2081
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
FM approval	
Control drawing	116-0035
UL approval	
Control drawing	116-0145
CSA approval	
Control drawing	116-0047

Diagrams

Front view







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Technical data

Supply	
Rated voltage	207 ... 253 V AC, 45 ... 65 Hz
Power consumption	≤ 1.5 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Pulse/Pause ratio	≥ 10 ms/≥ 10 ms
Output	
Output I, II	signal; relay
Contact loading	253 V AC/2 A/cos Φ> 0.7; 126.5 V AC/4 A/cos Φ> 0.7; 40 V DC/2 A resistive load
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2081
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
FM approval	
Control drawing	116-0035
UL approval	
Control drawing	116-0145
CSA approval	
Control drawing	116-0047

Features

- **2-channel isolated barrier**
- **230 V AC supply**
- **Dry contact or NAMUR inputs**
- **Latching relay output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**

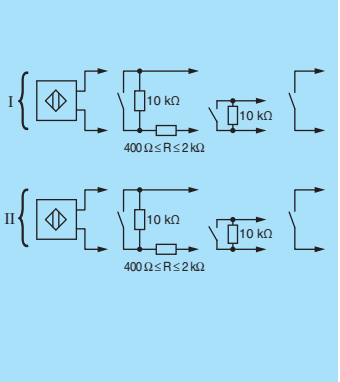
Function

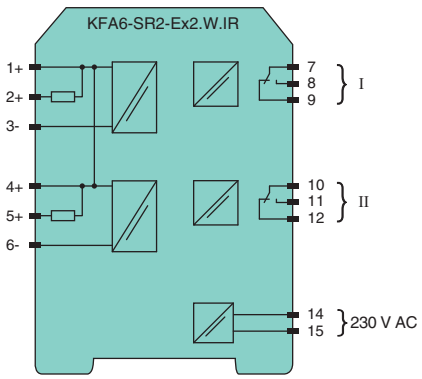
This isolated barrier is used for intrinsic safety applications. It has a latching relay (bistable operation) for level control, pump up/pump down, or other switch/logic applications. The device is set by an active signal on input I and is reset by an active signal on input II. The mode of operation of inputs I and II can be programmed.

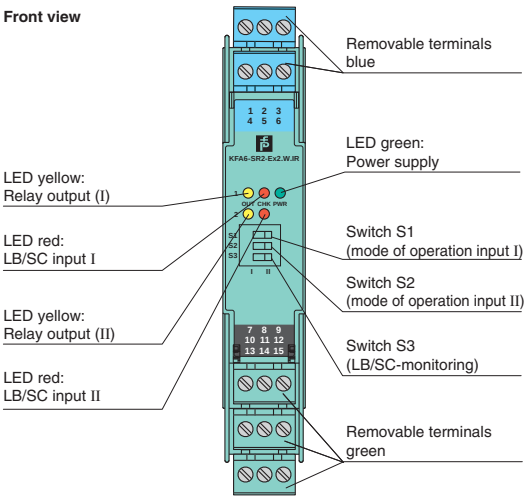
Switch S3 is used to enable or disable line fault detection of the field circuit. During an error condition or loss of power, the form C changeover relays revert to their de-energized state and the LEDs indicate the fault according to NAMUR NE44. When the wiring fault is corrected, the relay will revert to the state prior to the fault.

If the device is re-energized after power loss, the relays return to a factory-configured state.

Diagrams







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KFD2-SR2-Ex2.2S

Switch Amplifier

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **2 x 2 relay contact outputs with AND logic**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

Each sensor or switch controls two form A normally open relay contacts for the safe area load. The normal output state can be reversed using switches S1 and S2. Switch S3 is used to enable or disable line fault detection of the field circuit.

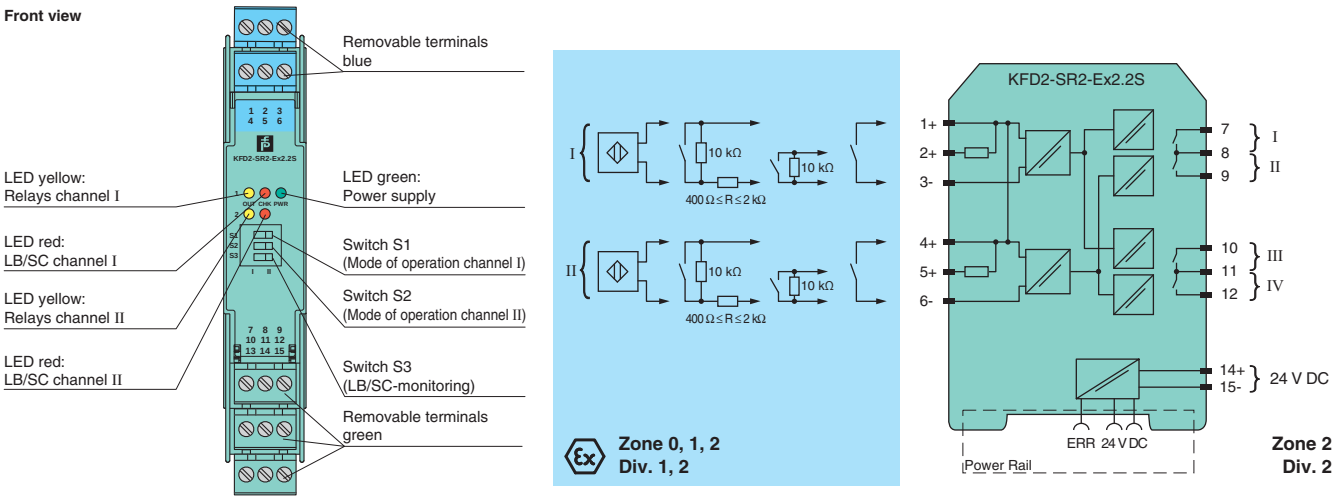
During an error condition, the relays revert to their de-energized state and the LEDs indicate the fault according to NAMUR NE44.

A unique collective error messaging feature is available when used with the Power Rail system.

Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power consumption	< 1.3 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Collective error message	Power Rail
Output I, II, III, IV	channel 1, 2; relay
Contact loading	50 V AC/1 A/cos Φ > 0.7; 40 V DC/1 A resistive load
Minimum switch current	1 mA/24 V DC
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	10^8 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2083
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1493 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047

Diagrams



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Technical data

Supply	
Rated voltage	19 ... 30 V DC
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Pulse/Pause ratio	≥ 35 ms/≥ 35 ms (non-AC operation) ≥ 70 ms/≥ 70 ms (AC operation)
Lead monitoring	breakage I ≤ 0.15 mA, short-circuit I > 6 mA
Output	
Collective error message	Power Rail
Output I up to IV	Signal I ... Signal IV; relay
Contact loading	253 V AC/2 A/cos Φ > 0.7; 40 V DC/2 A resistive load
Energized/De-energized delay	approx. 30 ms/approx. 30 ms
Mechanical life	5 x 10^6 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz (non-AC operation) ≤ 3 Hz (AC operation)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	ZELM 99 ATEX 0009
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC [circuit(s) in zone 0/1/2]
UL approval	
Control drawing	116-0145

Features

- **4-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **50 % less wiring, 2:1 technology**
- **Relay contact output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**

Function

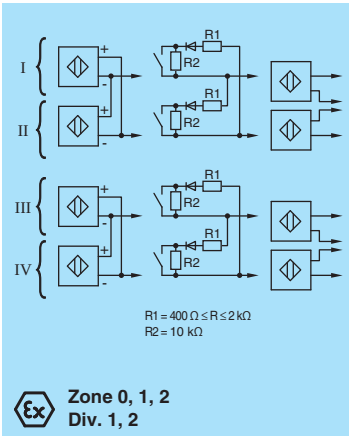
This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

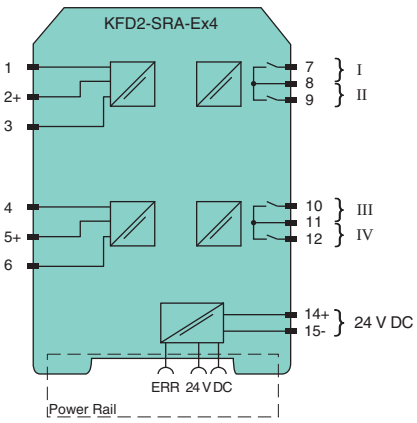
Each sensor or switch controls one form A normally open relay contact for the safe area load. A special 2:1 wire-saving technology is available on this isolator, reducing field wiring by 50 %.

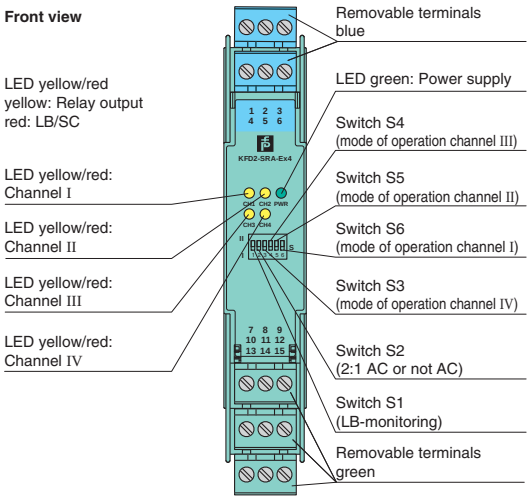
Switch S1 is used to enable or disable line fault detection of the field circuit. The 2:1 mode is selected with switch S2 while the remaining switches, S3 ... S6, are used for reversing the normal output state of the relays.

A unique collective error messaging feature is available when used with the Power Rail system.

Diagrams







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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Adjustable pulse extension**
- **4 relay contact outputs**
- **Fault relay contact output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**

Function

This isolated barrier is used for intrinsic safety applications. It extends the pulse duration of a digital signal (NAMUR sensors/mechanical contacts) from a hazardous area.

The proximity sensor or switch controls 4 form A normally open relay contact for the safe area load. The pulse duration on the output contacts can be adjusted from 50 ms to 1 s with a potentiometer. The pulse duration is designed to retrigger if another input pulse is detected.

A separate form A normally open relay contact is also available as a fault output. The normal output state can be reversed with switch S1a. Switch S1b enables or disables line fault detection of the field circuit.

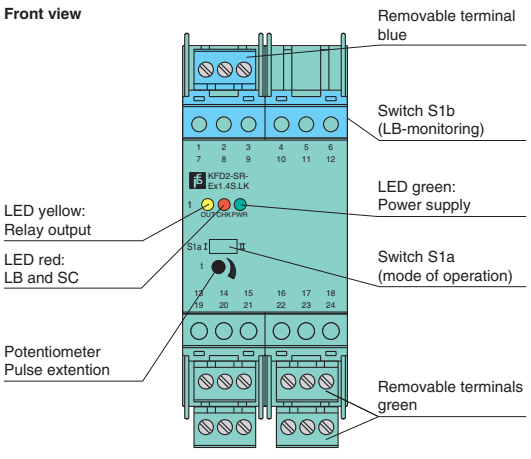
During an error condition, the relays revert to their de-energized state and the LEDs indicate the fault according to NAMUR NE44.

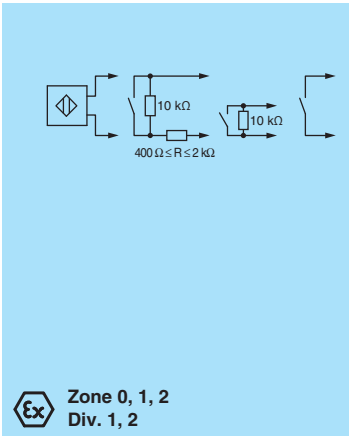
Technical data

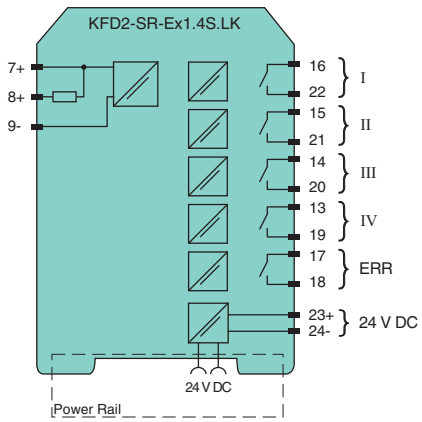
Supply	
Rated voltage	20 ... 35 V DC
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Pulse/Pause ratio	≥ 0.1 ms/≥ 0.1 ms
Lead monitoring	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Output	
Fault signal	relay
Output I up to IV	signal; relay
Contact loading	50 V AC/1 A/cos Φ > 0.7; 40 V DC/1 A resistive load
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	5 x 10^7 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	40 x 107 x 115 mm (1.6 x 4.2 x 4.5 in), housing type C1
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2082
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Lead monitoring	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Output	
Collective error message	Power Rail
Signal level	1-signal: (L+) - 3.5 V (100 mA, short-circuit proof) 0-signal: switched off (off-state current ≤ 10 µA)
Output I	signal; electronic output, active
Output II	signal or error message; electronic output, active
Transfer characteristics	
Switching frequency	≤ 5 kHz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2035
Group, category, type of protection	Ⓔx II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Active transistor output**
- **Active fault output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

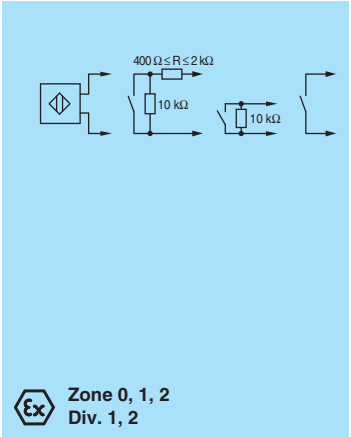
This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

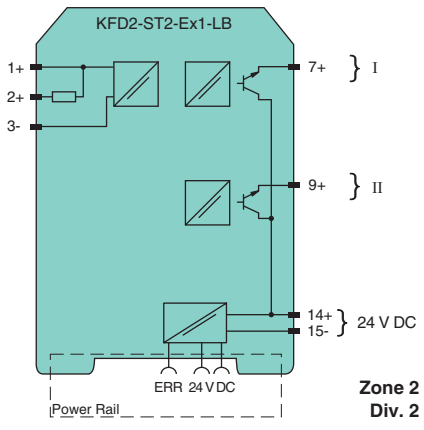
The proximity sensor or switch controls an active transistor output per channel for the safe area load. The normal output state is reversed using switch S1. Switch S2 allows output II to be switched between a signal output and an error message output. Switch S3 enables or disables line fault detection of the field circuit.

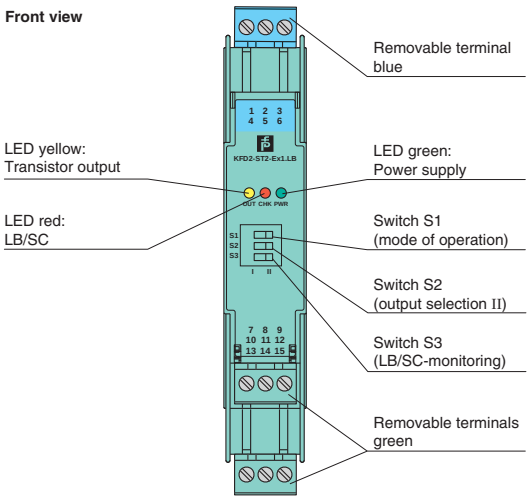
During an error condition, the transistors revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

A unique collective error messaging feature is available when used with the Power Rail system.

Diagrams







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Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Active transistor output**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

Each proximity sensor or switch controls an active transistor output per channel for the safe area load. The barrier output changes state when the input signal changes state.

The normal output state can be reversed using switch S1. Switch S2 allows output 2 to be switched between a signal output or an error message output. Switch S3 enables or disables line fault detection of the field circuit.

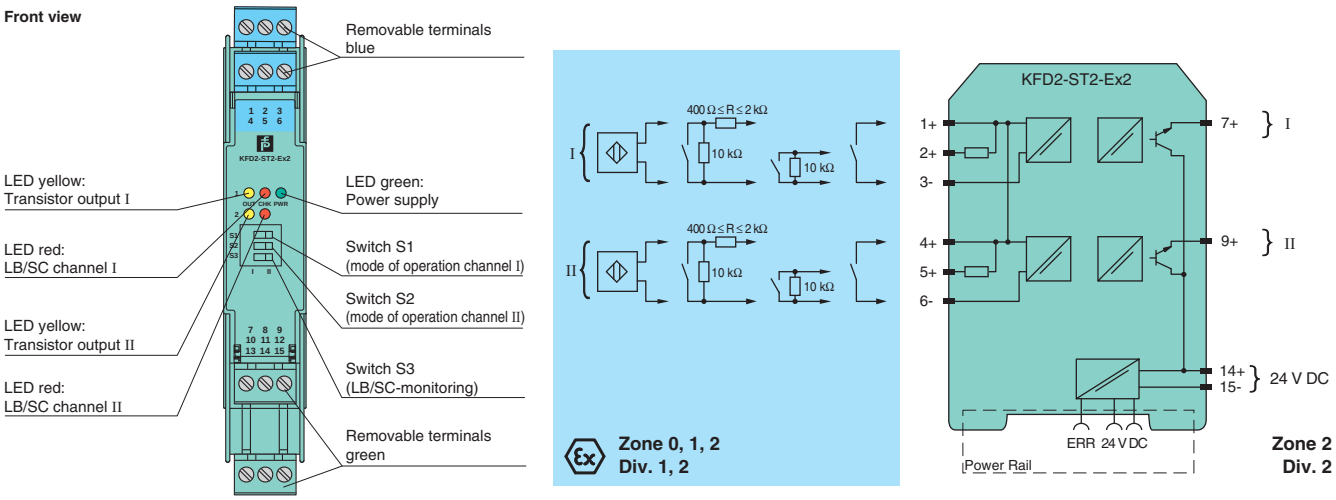
During an error condition, the transistors revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

A unique collective error messaging feature is available when used with the Power Rail system.

Technical data

Supply	
Rated voltage	20 ... 30 V DC
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Lead monitoring	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Output	
Collective error message	Power Rail
Signal level	1-signal: (L+) - 3.5 V (100 mA, short-circuit proof) 0-signal: switched off (off-state current ≤ 10 µA)
Output I, II	signal; electronic output, active
Transfer characteristics	
Switching frequency	≤ 5 kHz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2035
Group, category, type of protection	Ⓔx II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047

Diagrams



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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Lead monitoring	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Output	
Collective error message	Power Rail
Signal level	1-signal: switching voltage - 2.5 V max. at 10 mA switching current or 3 V max. at 100 mA switching current 0-signal: switched off (off-state current ≤ 10 µA)
Output I	signal, passive electronic output
Output II	signal or error message; passive transistor output
Switching voltage	≤ 40 V
Switching current	≤ 100 mA, short-circuit proof
Transfer characteristics	
Switching frequency	≤ 5 kHz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2035
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
EC-Type Examination Certificate	DMT 01 ATEX E 133
Group, category, type of protection	⟨Ex⟩ I (M1) [EEx ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Passive transistor output, non-polarized**
- **Passive fault output, non-polarized**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

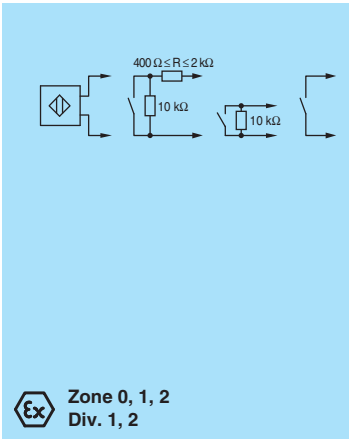
This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

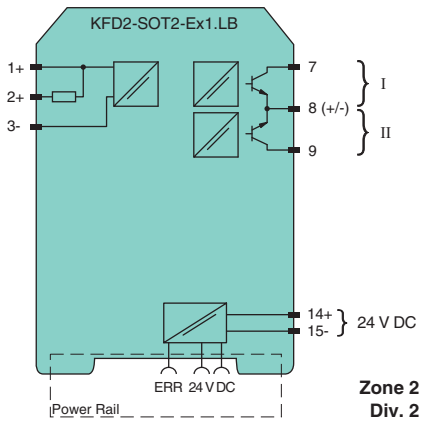
The proximity sensor or switch controls two passive transistors for the safe area load. The normal output state can be reversed using switch S1. Switch S2 allows output II to be switched between a signal output or an error message output. Switch S3 enables or disables line fault detection of the field circuit.

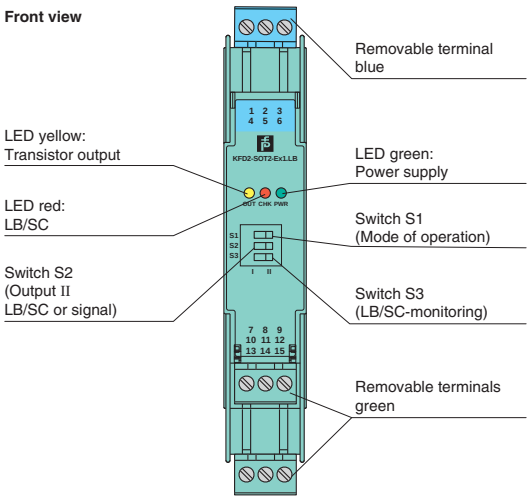
During an error condition, the transistors revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

A unique collective error messaging feature is available when used with the Power Rail system.

Diagrams







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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Isolated passive transistor output, non-polarized**
- **Isolated passive fault output, non-polarized**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

The proximity sensor or switch controls two passive transistors for the safe area load. Both transistor outputs are isolated from each other and isolated from the power supply. The normal output state can be reversed using switch S1. Switch S2 allows output II to be switched between a signal output and an error message output. Switch S3 enables or disables line fault detection of the field circuit.

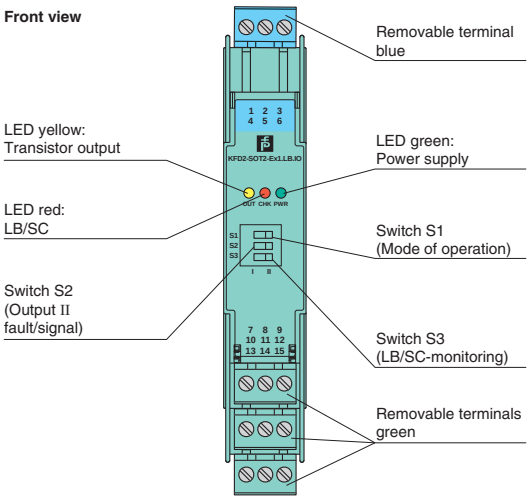
During an error condition, the transistors revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

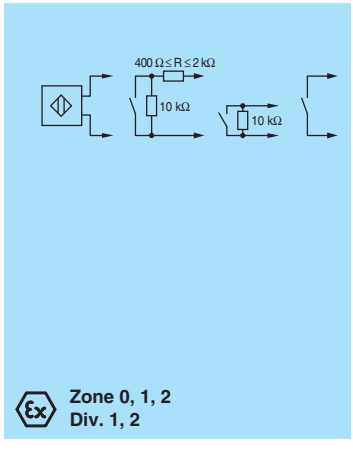
A unique collective error messaging feature is available when used with the Power Rail system.

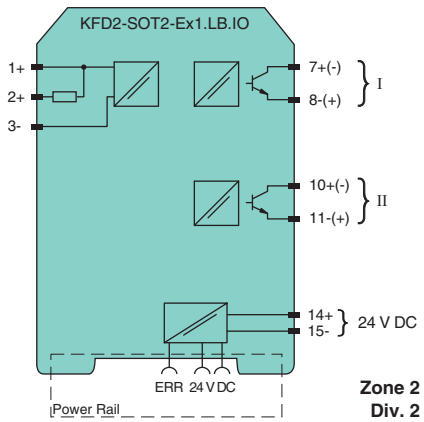
Technical data

Supply	
Rated voltage	20 ... 30 V DC
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Lead monitoring	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Output	
Collective error message	Power Rail
Signal level	1-signal: switching voltage - 2.5 V max. at 10 mA switching current or 3 V max. at 100 mA switching current 0-signal: switched off (off-state current ≤ 10 µA)
Output I	signal, passive electronic output
Output II	signal or error message; passive transistor output
Switching voltage	≤ 40 V
Switching current	≤ 100 mA, short-circuit proof
Transfer characteristics	
Switching frequency	≤ 5 kHz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2035
Group, category, type of protection	Ⓔx II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
EC-Type Examination Certificate	DMT 01 ATEX E 133
Group, category, type of protection	Ⓔx I (M1) [EEx ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047

Diagrams







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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Lead monitoring	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Output	
Rated voltage	typ. 8 V max. 20 V DC
Output	signal, passive electronic output
Impedance	1-signal: 1.6 kΩ ± 5 % 0-signal: 12 kΩ ± 5 %
Collective error message	Power Rail
Fault signal	< 10 µA
Transfer characteristics	
Switching frequency	≤ 5 kHz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2035
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 X
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **NAMUR rated output**
- **Line fault transparency**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

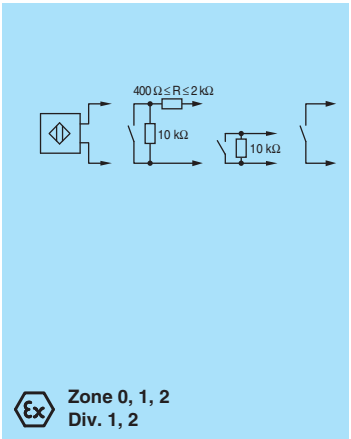
This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

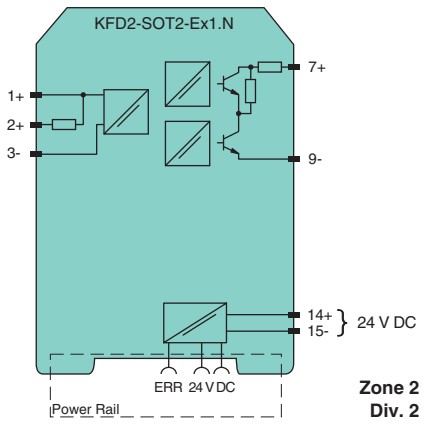
The switch output is designed according to NAMUR and transfers in addition to the switch signal the fault message in case of lead breakage or short circuit in the input circuit. During the error condition, the output changes to a high-impedance state. This can be evaluated by the downstream unit. Thus any additional wiring is omited for the channel-wise line fault detection in the control system.

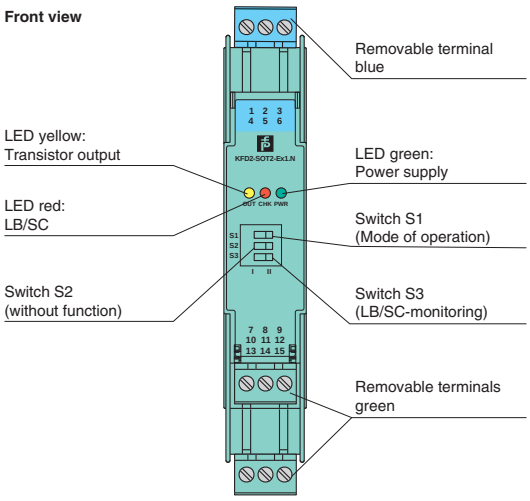
LEDs indicate the fault according to NAMUR NE44.

A unique collective error messaging feature is available when used with the Power Rail system.

Diagrams







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Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Passive transistor output, non-polarized**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

Each proximity sensor or switch controls a passive transistor output for the safe area load. The normal output state can be reversed using switch S1 for channel I and switch S2 for channel II. Switch S3 enables or disables line fault detection of the field circuit.

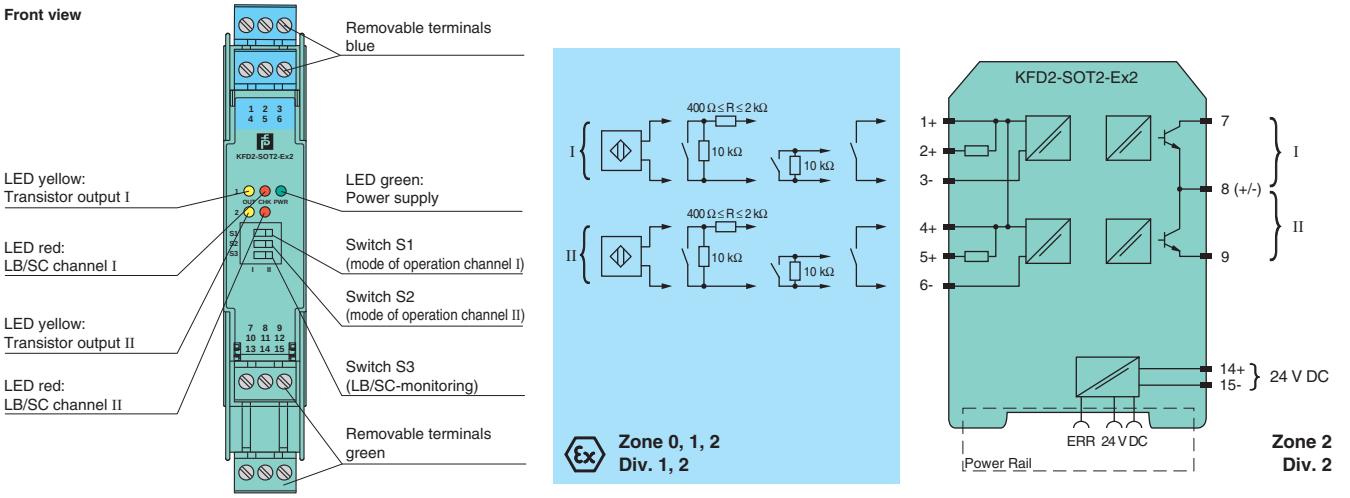
During an error condition, the transistors revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

A unique collective error messaging feature is available when used with the Power Rail system.

Technical data

Supply	
Rated voltage	20 ... 30 V DC
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Lead monitoring	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Output	
Collective error message	Power Rail
Signal level	1-signal: switching voltage - 2.5 V max. at 10 mA switching current or 3 V max. at 100 mA switching current 0-signal: switched off (off-state current ≤ 10 µA)
Output I, II	signal; electronic output, passive
Switching voltage	≤ 40 V
Switching current	≤ 100 mA, short-circuit proof
Transfer characteristics	
Switching frequency	≤ 5 kHz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2035
Group, category, type of protection	Ⓔx II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
EC-Type Examination Certificate	DMT 01 ATEX E 133
Group, category, type of protection	Ⓔx I (M1) [EEx ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047

Diagrams



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Technical data

Supply	
Rated voltage	103.5 ... 126.5 V AC
Power consumption	≤ 1.5 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Lead monitoring	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Output	
Signal level	1-signal: switching voltage - 2.5 V max. at 10 mA switching current or 3 V max. at 100 mA switching current 0-signal: switched off (off-state current ≤ 10 µA)
Output I, II	signal; electronic output, passive
Switching voltage	≤ 40 V
Switching current	≤ 100 mA, short-circuit proof
Transfer characteristics	
Switching frequency	≤ 5 kHz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 98 ATEX 2164
Group, category, type of protection	II (1) G [Ex ia] IIC II (1) D [Ex iaD]
FM approval	
Control drawing	116-0035
UL approval	
Control drawing	116-0145
CSA approval	
Control drawing	116-0047

Features

- **2-channel isolated barrier**
- **115 V AC supply**
- **Dry contact or NAMUR inputs**
- **Passive transistor output, non-polarized**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

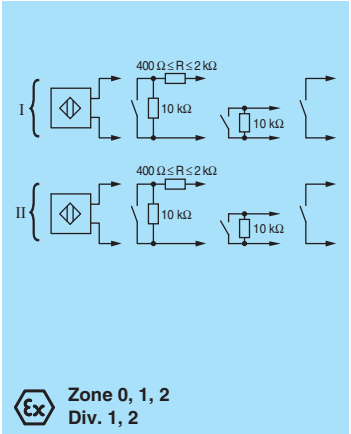
Function

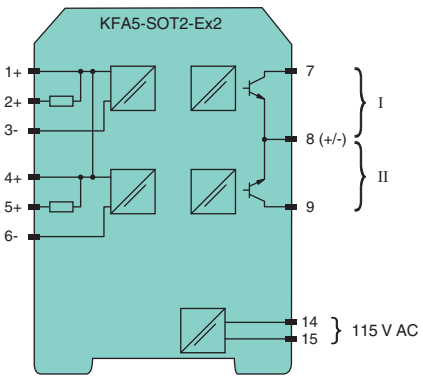
This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

Each proximity sensor or switch controls a passive transistor output for the safe area load. The normal output state can be reversed using switch S1 for channel I and switch S2 for channel II. Switch S3 enables or disables line fault detection of the field circuit.

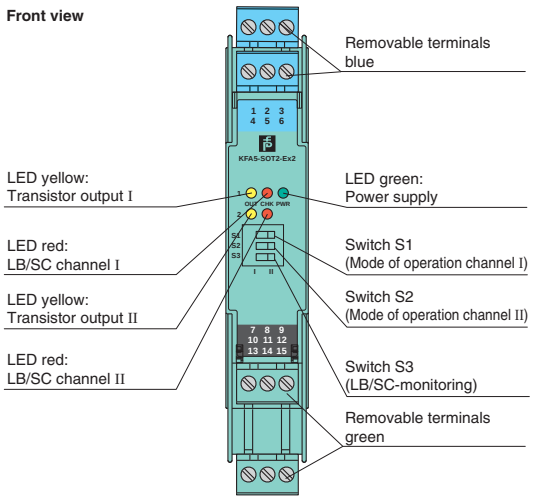
During an error condition, the transistors revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

Diagrams





Front view



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Features

- **2-channel isolated barrier**
- **230 V AC supply**
- **Dry contact or NAMUR inputs**
- **Passive transistor output, non-polarized**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

Each proximity sensor or switch controls a passive transistor output for the safe area load. The normal output state can be reversed using switch S1 for channel I and switch S2 for channel II. Switch S3 enables or disables line fault detection of the field circuit.

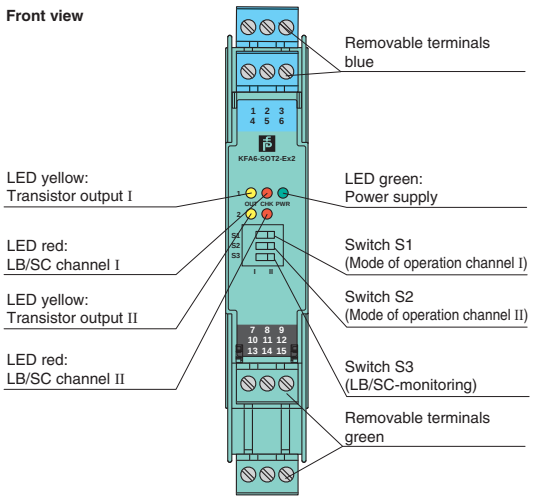
During an error condition, the transistors revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

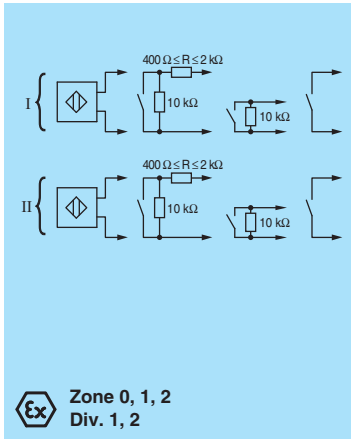
Technical data

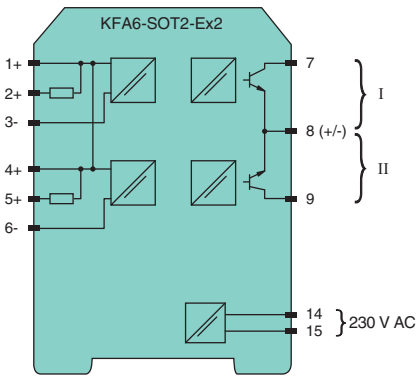
Supply	
Rated voltage	207 ... 253 V AC
Power consumption	≤ 1.5 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Lead monitoring	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Output	
Signal level	1-signal: switching voltage - 2.5 V max. at 10 mA switching current or 3 V max. at 100 mA switching current 0-signal: switched off (off-state current ≤ 10 µA)
Output I, II	signal; electronic output, passive
Switching voltage	≤ 40 V
Switching current	≤ 100 mA, short-circuit proof
Transfer characteristics	
Switching frequency	≤ 5 kHz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 98 ATEX 2164
Group, category, type of protection	⟨Ex⟩ II (1) G [Ex ia] IIC ⟨Ex⟩ II (1) D [Ex iaD]
FM approval	
Control drawing	116-0035
UL approval	
Control drawing	116-0145
CSA approval	
Control drawing	116-0047

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Lead monitoring	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Output	
Collective error message	Power Rail
Signal level	1-signal: switching voltage - 2.5 V max. at 10 mA switching current or 3 V max. at 100 mA switching current 0-signal: switched off (off-state current ≤ 10 µA)
Output I, II	signal; electronic output, passive
Switching voltage	≤ 40 V
Switching current	≤ 100 mA, short-circuit proof
Transfer characteristics	
Switching frequency	≤ 5 kHz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2035
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
EC-Type Examination Certificate	DMT 01 ATEX E 133
Group, category, type of protection	⟨Ex⟩ I (M1) [EEx ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Isolated passive transistor output, non-polarized**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

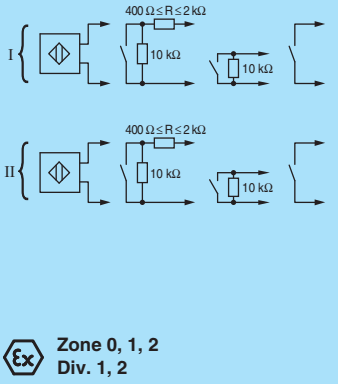
This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

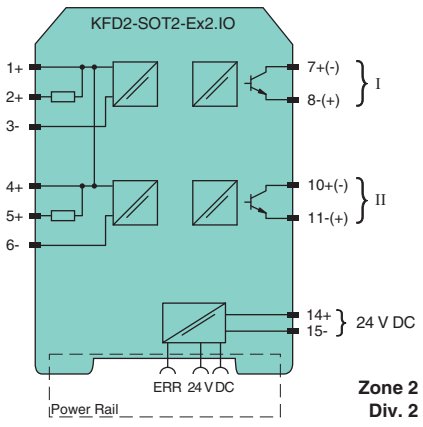
Each proximity sensor or switch controls a passive transistor output for the safe area load. Both transistor outputs are isolated from each other and isolated from the power supply. The normal output state can be reversed using switch S1 for channel I and switch S2 for channel II. Switch S3 enables or disables line fault detection of the field circuit.

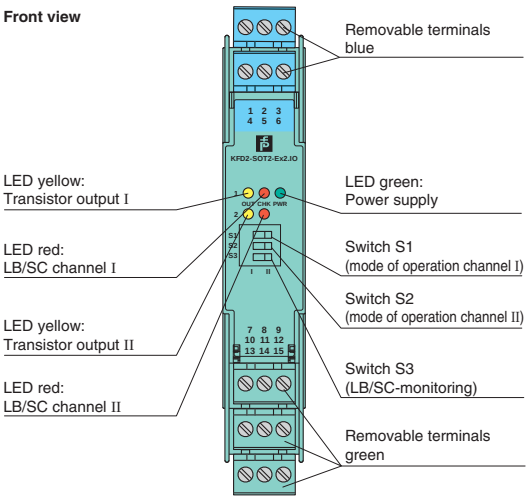
During an error condition, the transistors revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

A unique collective error messaging feature is available when used with the Power Rail system.

Diagrams







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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input for dry contacts or SN/S1N sensors**
- **Relay contact output**
- **Error message output**
- **For usage in accordance with ISO 13849-1**
- **Line fault detection (LFD)**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (SN/S1N proximity sensors and approved mechanical contacts) from a hazardous area to a safe area. It has additional protective circuitry to maintain a reliable safety function.

The proximity sensor or switch controls 1 safety output with 3 form A normally open relay contacts (one is in series to the 2 output relay contacts for the safety function), 1 standard output with 1 form A normally open relay contact, and 1 error message output with a passive transistor. Lead breakage (LB) and short circuit (SC) conditions are continuously monitored.

During an error condition, fault output energizes and outputs I and II de-energize.

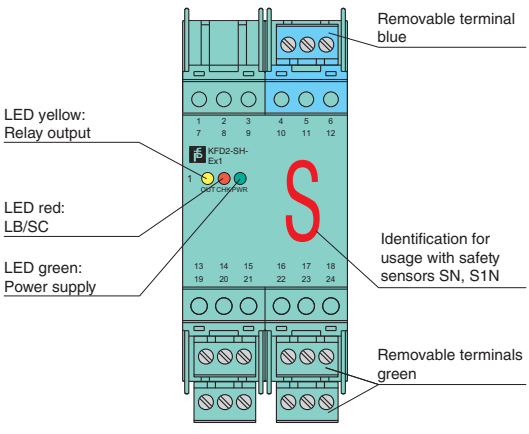
For safety applications, terminals 13 and 14 (output I) must be used.

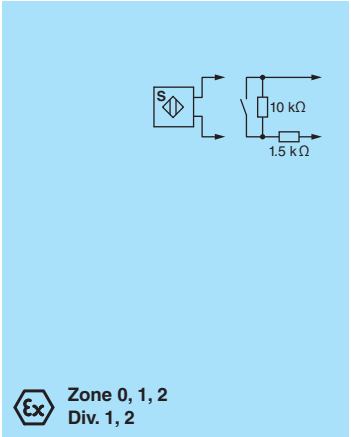
Technical data

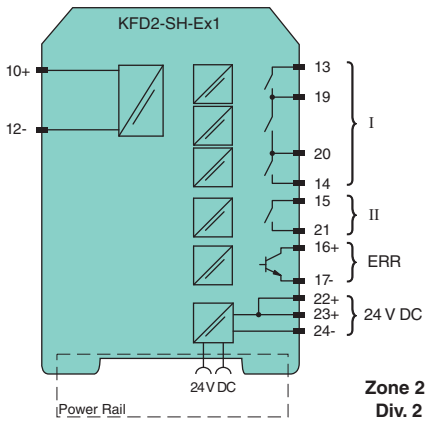
Supply	
Rated voltage	20 ... 35 V DC
Power consumption	≤ 2.3 W
Input	
Open circuit voltage/short-circuit current	approx. 8.4 V DC/approx. 11.7 mA
Lead resistance	≤ 50 Ω, in hazardous area cable capacitances and inductivities are to be taken into account
Switching point	
Relay de-energized	I < 2.1 mA and I > 5.9 mA
Relay energized	2.8 mA < I < 5.3 mA
Response delay	≤ 1 ms
Output	
Output I	signal, safety oriented; relay
Output I, II	
Contact loading	50 V AC/1 A/cos Φ > 0.7; 24 V DC/1 A resistive load
Mechanical life	50 x 10^6 switching cycles
Output II	signal, not safety oriented; relay
Output III	fault signal, not safety oriented; electronic output, passive
Rated voltage	10 ... 30 V DC
Signal level	1-signal: (L+) -2.5 V (7 mA, short-circuit proof)/ 0-signal: blocked output (leakage current ≤ 10 mA)
Transfer characteristics	
Switching frequency	5 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 280 g
Dimensions	40 x 107 x 115 mm (1.6 x 4.2 x 4.5 in), housing type C1
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2042
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1493 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4
FM approval	
Control drawing	116-0158

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power consumption	≤ 1.7 W
Input	
Open circuit voltage/short-circuit current	approx. 8.4 V DC/approx. 11.7 mA
Lead resistance	≤ 50 Ω, cable capacitances and inductances must be observed in hazardous areas
Switching point	
Relay de-energized	I < 2.1 mA and I > 5.9 mA, output switched off
Relay energized	2.8 mA < I < 5.3 mA, output switched on
Response delay	≤ 1 ms
Output	
Output I	safety oriented; electronic output, active
Rated voltage	24 V DC (≥ 20 V DC)
Current	> 15 mA (short-circuit current ≤ 25 mA)
Output II	not safety oriented; relay
Output II and III	
Contact loading	50 V AC/DC, 250 mA
Mechanical life	≤ 20 x 10^6 switching cycles
Output III	not safety oriented, fault signal; relay
Transfer characteristics	
Switching frequency	
Output I	≤ 50 Hz
Output II	≤ 5 Hz
Output III	≤ 5 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2041
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1493 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4
FM approval	
Control drawing	116-0158

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input for dry contacts or SN/S1N sensors**
- **Active signal output**
- **Relay contact output**
- **Error message output**
- **For usage in accordance with ISO 13849-1**
- **Line fault detection (LFD)**
- **Up to SIL3 acc. to IEC 61508**

Function

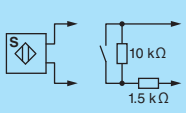
This isolated barrier is used for intrinsic safety applications. It transfers digital signals (SN/S1N proximity sensors and approved mechanical contacts) from a hazardous area to a safe area. It has an additional protective circuitry to maintain a reliable safety function.

The proximity sensor or switch controls a safety-related electronic output (output I) and a relay output (output II) with a form A normally open relay contact. Lead breakage (LB) and short circuit (SC) conditions are continuously monitored.

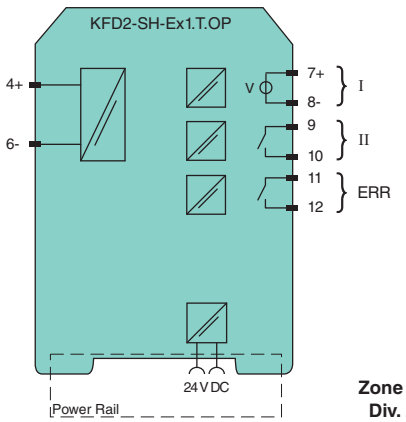
During an error condition, fault output energizes and outputs I and II de-energize.

For safety applications, terminals 7 and 8 (output I) must be used.

Diagrams

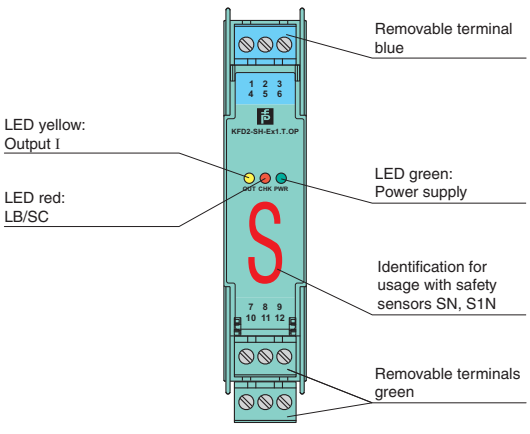


Zone 0, 1, 2
Div. 1, 2



Zone 2
Div. 2

Front view



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Features

- **1-channel isolated barrier**
- **115/230 V AC supply**
- **Input for dry contacts or SN/S1N sensors**
- **Relay contact output**
- **Error message output**
- **For usage in accordance with ISO 13849-1**
- **Line fault detection (LFD)**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (SN/S1N proximity sensors and approved mechanical contacts) from a hazardous area to a safe area. It has additional protective circuitry to maintain a reliable safety function.

The proximity sensor or switch controls 1 safety output with 3 form A normally open relay contacts (one is in series to the 2 output relay contacts for the safety function), 1 standard output with 1 form A normally open relay contact, and 1 error message output with a passive transistor. Lead breakage (LB) and short circuit (SC) conditions are continuously monitored.

During an error condition, fault output energizes and outputs I and II de-energize.

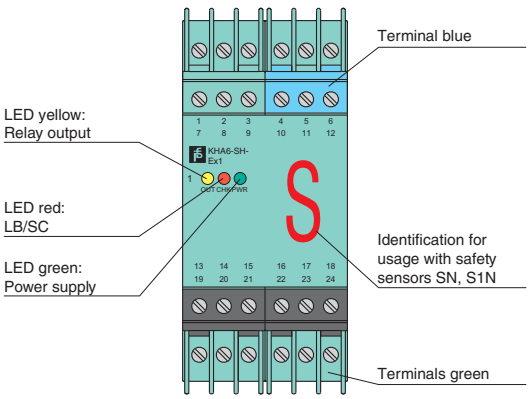
For safety applications, terminals 13 and 14 (output I) must be used.

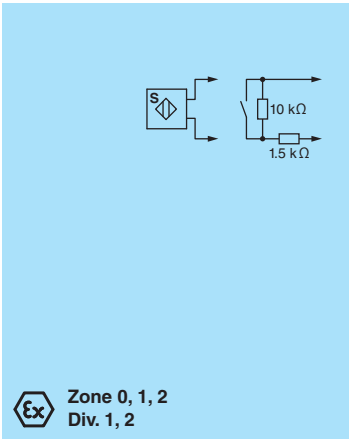
Technical data

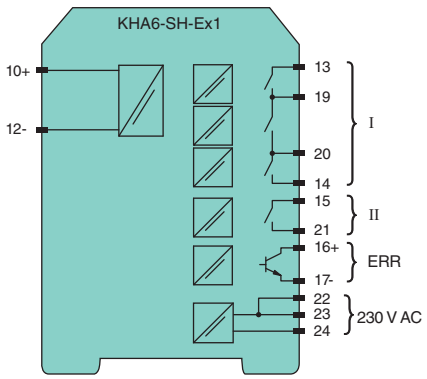
Supply	
Rated voltage	85 ... 253 V AC, 45 ... 65 Hz
Power consumption	≤ 2.3 W
Input	
Open circuit voltage/short-circuit current	approx. 8.4 V DC/approx. 11.7 mA
Lead resistance	≤ 50 Ω, in hazardous area cable capacitances and inductivities are to be taken into account
Switching point	
Relay de-energized	I < 2.1 mA and I > 5.9 mA
Relay energized	2.8 mA < I < 5.3 mA
Response delay	≤ 1 ms
Output	
Output I	signal, safety oriented; relay
Output I, II	
Contact loading	253 V AC/1 A/cos Φ≥ 0.7; 24 V AC/1 A resistive load
Mechanical life	50 x 10^6 switching cycles
Output II	signal, not safety oriented; relay
Output III	fault signal, not safety oriented; electronic output, passive
Rated voltage	10 ... 30 V DC
Signal level	1-signal: (L+) -2.5 V (7 mA, short-circuit proof)/ 0-signal: blocked output (leakage current ≤ 10 mA)
Transfer characteristics	
Switching frequency	5 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 280 g
Dimensions	40 x 93 x 115 mm (1.6 x 3.7 x 4.5 in), housing type E
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2043
Group, category, type of protection	Ⓔx II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power consumption	1.8 W
Input	
Input I	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	8.2 V/10 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Pulse duration	≥ 75 µs/1 ms see instruction manuals; the maximum input frequency has to be observed.
Input frequency	0 ... 80 Hz, pulse divider 0 ... 1 kHz
Lead monitoring	breakage I ≤ 0.15 mA; short-circuit I > 6.5 mA
Input II	reset
Active/Passive	I > 4 mA/I < 1.5 mA
Open circuit voltage/short-circuit current	18 V/5 mA
Pulse duration	≥ 10 ms
Output	
Output I	signal; relay
Contact loading	253 V AC/2 A/cos Φ≥ 0.7; 40 V DC/2 A
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Output II	signal; electronic unit, isolated
Contact loading	40 V/50 mA
Energized/De-energized delay	after rising input flank 3 ms; after falling input flank 2 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	TÜV 99 ATEX 1408
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 02 ATEX 1885 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4
FM approval	
Control drawing	16-538FM-12

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Relay and transistor output**
- **Adjustable output timer functions from 10 ms ... 60 min**
- **Input frequency up to 80 Hz; pulse divider up to 1 kHz**
- **Reset function**
- **Configurable by keypad**
- **Line fault detection (LFD)**

Function

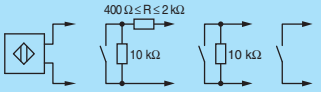
This isolated barrier is used for intrinsic safety applications. It is a highly configurable timer that accepts a digital signal (NAMUR sensor/mechanical contact) from a hazardous area and is commonly used in applications requiring on-delay, off-delay, one-shot, or pulse lengthening.

The output relay switch duration is easily adjusted, and a pulse divider function allows step-down ratios from 1:1 to 9999:1. A reset can be activated via dry contact switch and used to terminate a particular time function.

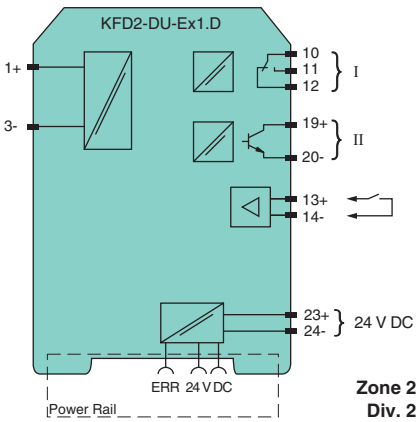
The unit is easily programmed by the use of a keypad located on the front of the unit. Line fault detection of the field circuit is indicated by a red LED and through the collective error output via Power Rail.

For additional information, refer to the manual and www.pepperl-fuchs.com.

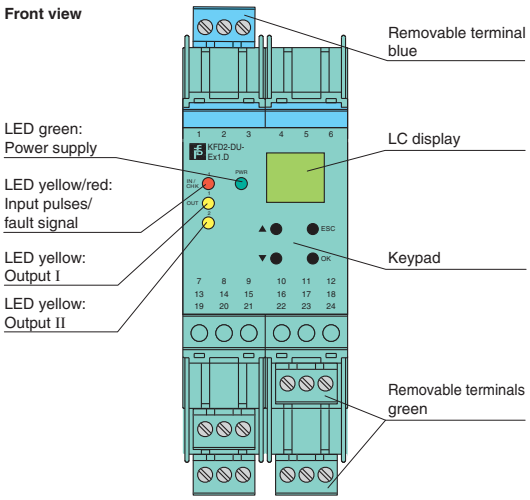
Diagrams



Zone 0, 1, 2
Div. 1, 2



Zone 2
Div. 2



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KFA5-DU-Ex1.D

Switch Amplifier, Timer Relay

Features

- **1-channel isolated barrier**
- **115 V AC supply**
- **Dry contact or NAMUR inputs**
- **Relay and transistor output**
- **Adjustable output timer functions from 10 ms ... 60 min**
- **Input frequency up to 80 Hz; pulse divider up to 1 kHz**
- **Reset function**
- **Configurable by keypad**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It is a highly configurable timer that accepts a digital signal (NAMUR sensor/mechanical contact) from a hazardous area and is commonly used in applications requiring on-delay, off-delay, one-shot, or pulse lengthening.

The output relay switch duration is easily adjusted, and a pulse divider function allows step-down ratios from 1:1 to 9999:1.

A reset can be activated via dry contact switch and used to terminate a particular time function.

The unit is easily programmed by the use of a keypad located on the front of the unit. Line fault detection of the field circuit is indicated by a red LED.

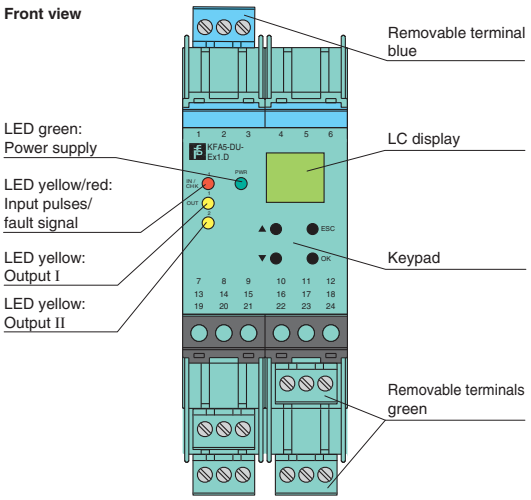
For additional information, refer to the manual and www.pepperl-fuchs.com.

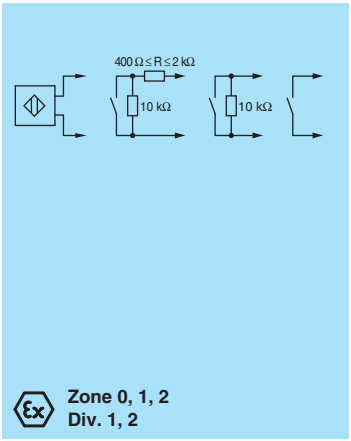
Technical data

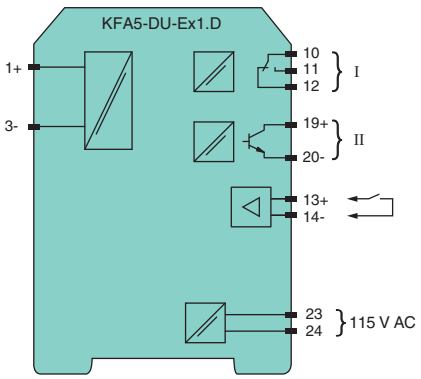
Supply	
Rated voltage	115 V AC ± 10 %
Power consumption	4 VA
Input	
Input I	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	8.2 V/10 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Pulse duration	≥ 75 µs/1 ms see instruction manuals; the maximum input frequency has to be observed.
Input frequency	0 ... 80 Hz, pulse divider 0 ... 1 kHz
Lead monitoring	breakage I ≤ 0.15 mA; short-circuit I > 6.5 mA
Input II	reset
Active/Passive	I > 3 mA/I < 1.5 mA
Open circuit voltage/short-circuit current	12 V/3.5 mA
Pulse duration	≥ 10 ms
Output	
Output I	signal; relay
Contact loading	253 V AC/2 A/cos Φ≥ 0.7; 40 V DC/2 A
Mechanical life	5 x 10^7 switching cycles
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Output II	signal; electronic unit, isolated
Contact loading	40 V/50 mA
Energized/De-energized delay	after rising input flank 3 ms; after falling input flank 2 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	TÜV 99 ATEX 1408
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C)
FM approval	
Control drawing	16-538FM-12

Diagrams

Front view







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Technical data

Supply	
Rated voltage	230 V AC ± 10 %
Power consumption	4 VA
Input	
Input I	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	8.2 V/10 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Pulse duration	≥ 75 µs/1 ms see instruction manuals; the maximum input frequency has to be observed.
Input frequency	0 ... 80 Hz, pulse divider 0 ... 1 kHz
Lead monitoring	breakage I ≤ 0.15 mA; short-circuit I > 6.5 mA
Input II	reset
Active/Passive	I > 3 mA/I < 1.5 mA
Open circuit voltage/short-circuit current	12 V/3.5 mA
Pulse duration	≥ 10 ms
Output	
Output I	signal; relay
Contact loading	253 V AC/2 A/cos Φ≥ 0.7; 40 V DC/2 A
Mechanical life	5 x 10^7 switching cycles
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Output II	signal; electronic unit, isolated
Contact loading	40 V/50 mA
Energized/De-energized delay	after rising input flank 3 ms; after falling input flank 2 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	TÜV 99 ATEX 1408
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C)
FM approval	
Control drawing	16-538FM-12

Features

- **1-channel isolated barrier**
- **230 V AC supply**
- **Dry contact or NAMUR inputs**
- **Relay and transistor output**
- **Adjustable output timer functions from 10 ms ... 60 min**
- **Input frequency up to 80 Hz; pulse divider up to 1 kHz**
- **Reset function**
- **Configurable by keypad**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It is a highly configurable timer that accepts a digital signal (NAMUR sensor/mechanical contact) from a hazardous area and is commonly used in applications requiring on-delay, off-delay, one-shot, or pulse lengthening.

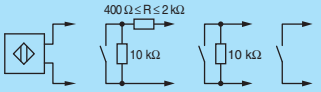
The output relay switch duration is easily adjusted, and a pulse divider function allows step-down ratios from 1:1 to 9999:1.

A reset can be activated via dry contact switch and used to terminate a particular time function.

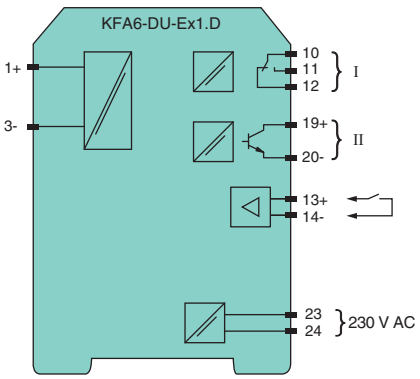
The unit is easily programmed by the use of a keypad located on the front of the unit. Line fault detection of the field circuit is indicated by a red LED.

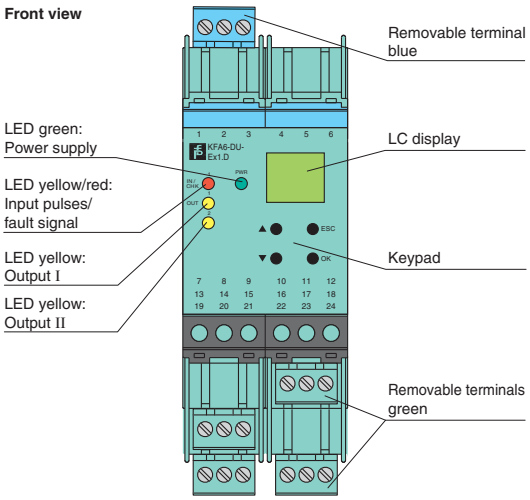
For additional information, refer to the manual and www.pepperl-fuchs.com.

Diagrams



⟨Ex⟩ **Zone 0, 1, 2**
Div. 1, 2





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KFD2-SR2-Ex2.W.SM

Standstill and Rotational Direction Monitor

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **PNP/push-pull, dry contacts or NAMUR inputs**
- **Selectable frequency trip values**
- **2 relay contact outputs**
- **Start-up override**
- **Selectable mode of operation**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It is a zero speed/standstill monitor that accepts input frequency pulses and triggers an output when the frequency drops below a selected value.

Two startup override values are available. This unit can also be used to determine rotation direction.

During an error condition, relays revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

The available diagnostic LEDs show rotation detection, limit trip indicator, power on, and hardware error indication.

The unit is easily programmed via switches mounted on the front of the unit.

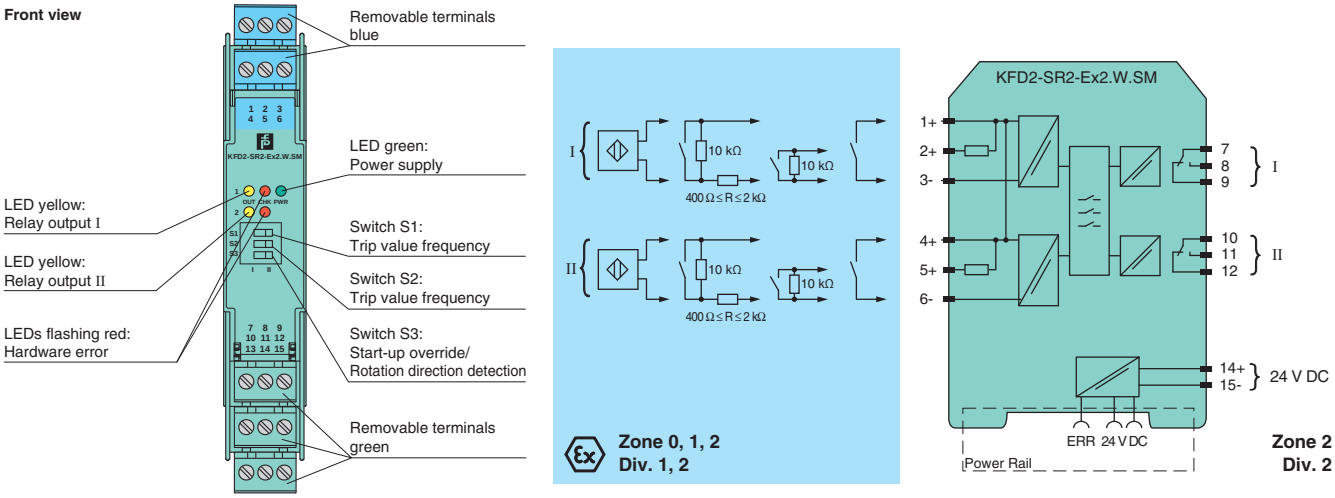
A unique collective error messaging feature is available when used with the Power Rail system.

For additional information, refer to www.pepperl-fuchs.com.

Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power consumption	≤ 1.5 W
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I > 6 mA
Control input	sensor power supply approx. 8.2 V, impedance 1.2 kΩ
Pulse duration	> 200 µs for standstill monitoring, > 250 µs for rotation direction detecion
Output	
Relay	2 changeover contacts
Contact loading	253 V AC/2 A/cos Φ > 0.7; 40 V DC/2 A resistive load
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Mechanical life	5 x 10^6 switching cycles
Trip value f_{max}	for standstill monitoring: 0.1 Hz; 0.5 Hz; 2 Hz; 10 Hz adjustable via DIP switch (S1 and S2)
Transfer characteristics	
Accuracy	± 5 %
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2080
Group, category, type of protection	Ⓔx II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection	Ⓔx II (3)G (EEx nL) IIC X [circuit(s) in zone 2]
Statement of conformity	TÜV 99 ATEX 1493 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA nC IIC T4
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047

Diagrams



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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power loss/power consumption	≤ 1.8 W/1.8 W
Input	
Input I	acc. to EN 60947-5-6 (NAMUR)
Pulse duration	> 50 µs
Input frequency	0.001 ... 5000 Hz
Lead monitoring	breakage I ≤ 0.15 mA; short-circuit I > 6.5 mA
Input II	startup override: 1 ... 1000 s, adjustable in steps of 1 s
Active/Passive	I > 4 mA (for min. 100 ms)/I < 1.5 mA
Open circuit voltage/short-circuit current	18 V/5 mA
Output	
Collective error message	Power Rail
Output I, II	signal; relay
Contact loading	250 V AC/2 A/cos Φ≥ 0.7; 40 V DC/2 A
Mechanical life	5 x 10^7 switching cycles
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Transfer characteristics	
Input I	
Measurement range	0.001 ... 5000 Hz
Output I, II	
Response delay	≤ 200 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	TÜV 99 ATEX 1408
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 02 ATEX 1885 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4
FM approval	
Control drawing	16-538FM-12

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Input frequency 1 mHz ... 5 kHz**
- **2 relay contact outputs**
- **Start-up override**
- **Configurable by keypad**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It monitors for an overspeed or underspeed condition of a digital signal (NAMUR sensor/mechanical contact) from a hazardous area by comparing the input frequency to the user programmed reference frequency.

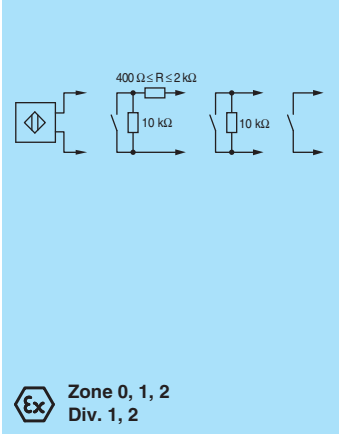
An overspeed or underspeed condition is signaled via the relay outputs. Line fault detection of the field circuit is indicated by a red LED, Power Rail and/or relay. The start-up override feature sets relay outputs to default conditions programmed by the user for up to 1,000 seconds.

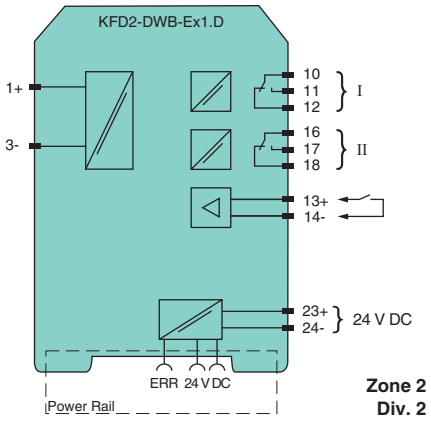
The unit is easily programmed by the use of a keypad located on the front of the unit.

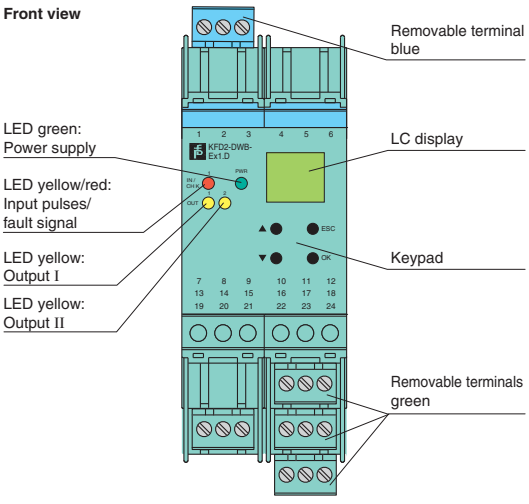
A unique collective error messaging feature is available when used with the Power Rail system.

For additional information, refer to the manual and www.pepperl-fuchs.com.

Diagrams







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KFA5-DWB-Ex1.D

Overspeed/Underspeed Monitor

Features

- **1-channel isolated barrier**
- **115 V AC supply**
- **Dry contact or NAMUR inputs**
- **Input frequency 1 mHz ... 5 kHz**
- **2 relay contact outputs**
- **Start-up override**
- **Configurable by keypad**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It monitors for an overspeed or underspeed condition of a discrete signal (NAMUR sensor/mechanical contact) from a hazardous area by comparing the input frequency to the user programmed reference frequency.

An overspeed or underspeed condition is signaled via the relay outputs. Line fault detection of the field circuit is indicated by a red LED and/or relay. The start-up override feature sets relay outputs to default conditions programmed by the user for up to 1,000 seconds.

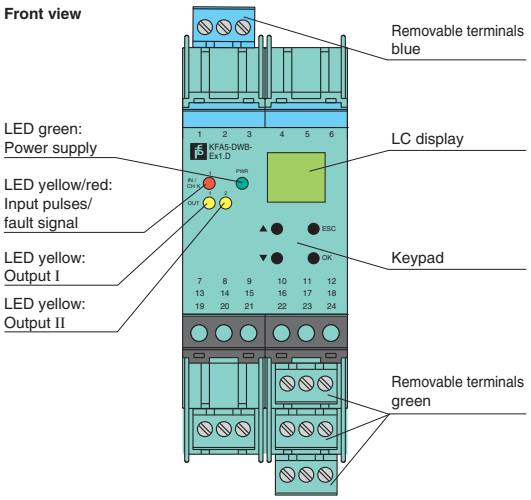
The unit is easily programmed by the use of a keypad located on the front of the unit.

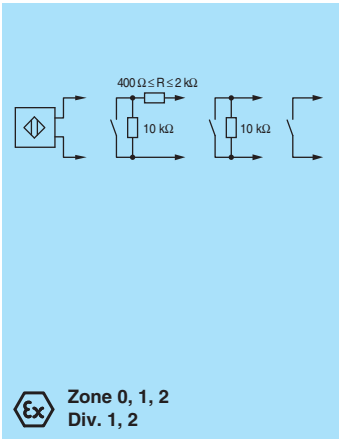
For additional information, refer to the manual and www.pepperl-fuchs.com.

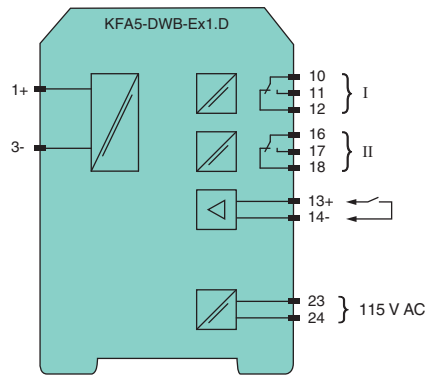
Technical data

Supply	
Rated voltage	115 V AC +/- 10 %
Power loss/power consumption	≤2 VA/2 VA
Input	
Input I	acc. to EN 60947-5-6 (NAMUR)
Pulse duration	> 50 µs
Input frequency	0.001 ... 5000 Hz
Lead monitoring	breakage I ≤0.15 mA; short-circuit I > 6.5 mA
Input II	startup override: 1 ... 1000 s, adjustable in steps of 1 s
Active/Passive	I > 4 mA (for min. 100 ms)/I < 1 mA
Open circuit voltage/short-circuit current	18 V/5 mA
Output	
Output I, II	signal; relay
Contact loading	250 V AC/2 A/cos Φ≥ 0.7; 40 V DC/2 A
Mechanical life	5 x 10^7 switching cycles
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Transfer characteristics	
Input I	
Measurement range	0.001 ... 5000 Hz
Output I, II	
Response delay	≤200 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	TÜV 99 ATEX 1408
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤60 °C)
FM approval	
Control drawing	16-538FM-12

Diagrams







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Technical data

Supply	
Rated voltage	230 V AC ± 10 %
Power loss/power consumption	≤2 VA/2 VA
Input	
Input I	acc. to EN 60947-5-6 (NAMUR)
Pulse duration	> 50 µs
Input frequency	0.001 ... 5000 Hz
Lead monitoring	breakage I ≤0.15 mA; short-circuit I > 6.5 mA
Input II	startup override: 1 ... 1000 s, adjustable in steps of 1 s
Active/Passive	I > 4 mA (for min. 100 ms)/I < 1 mA
Open circuit voltage/short-circuit current	18 V/5 mA
Output	
Output I, II	signal; relay
Contact loading	250 V AC/2 A/cos Φ≥ 0.7; 40 V DC/2 A
Mechanical life	5 x 10^7 switching cycles
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Transfer characteristics	
Input I	
Measurement range	0.001 ... 5000 Hz
Output I, II	
Response delay	≤200 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	TÜV 99 ATEX 1408
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤60 °C)
FM approval	
Control drawing	16-538FM-12

Features

- **1-channel isolated barrier**
- **230 V AC supply**
- **Dry contact or NAMUR inputs**
- **Input frequency 1 mHz ... 5 kHz**
- **2 relay contact outputs**
- **Start-up override**
- **Configurable by keypad**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

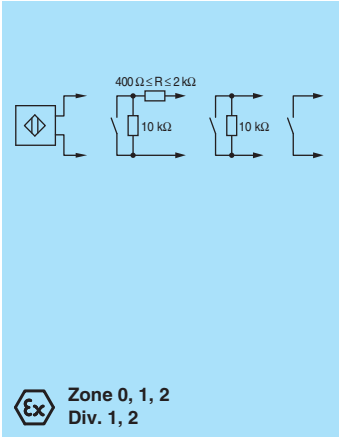
This isolated barrier is used for intrinsic safety applications. It monitors for an overspeed or underspeed condition of a discrete signal (NAMUR sensor/mechanical contact) from a hazardous area by comparing the input frequency to the user programmed reference frequency.

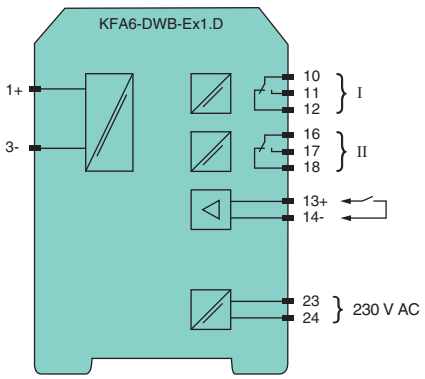
An overspeed or underspeed condition is signaled via the relay outputs. Line fault detection of the field circuit is indicated by a red LED and/or relay. The start-up override feature sets relay outputs to default conditions programmed by the user for up to 1,000 seconds.

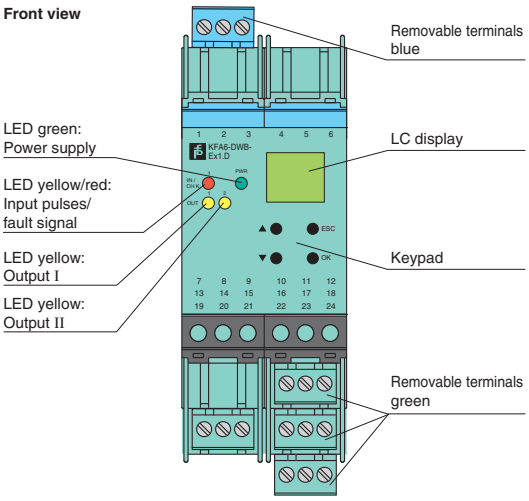
The unit is easily programmed by the use of a keypad located on the front of the unit.

For additional information, refer to the manual and www.pepperl-fuchs.com.

Diagrams







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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Input frequency 1 mHz ... 5 kHz**
- **Current output 0/4 mA ... 20 mA**
- **Relay and transistor output**
- **Start-up override**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It is a universal frequency converter that changes a digital input (NAMUR sensor/mechanical contact) into a proportional free adjustable 0/4 mA ... 20 mA analog output and functions as a switch amplifier and a trip alarm.

Also the functions of the switch outputs (2 relay outputs and 1 potential free transistor output) are easily adjustable [trip value display (min/max alarm), serially switched output, pulse divider output, error signal output].

The unit is easily programmed by the use of a keypad located on the front of the unit or with the **PACT***ware*™ configuration software.

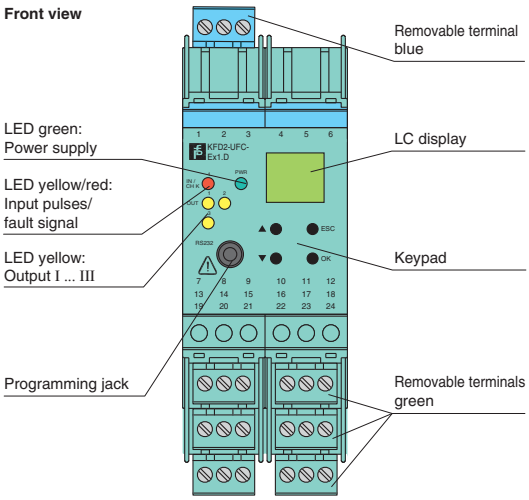
Line fault detection of the field circuit is indicated by a red LED and through the collective error output via Power Rail.

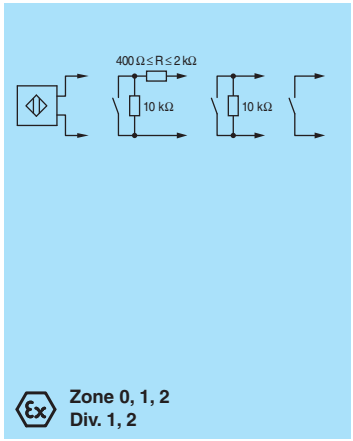
For additional information, refer to the manual and www.pepperl-fuchs.com.

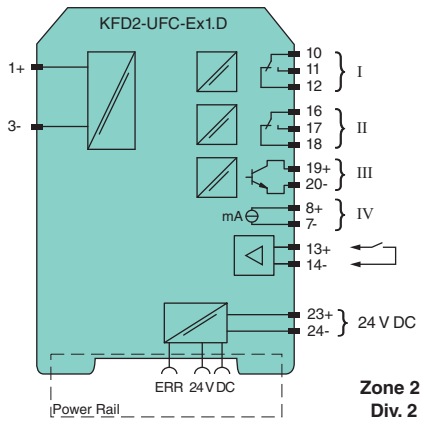
Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power loss/power consumption	≤2 W/2.2 W
Input	
Input I	acc. to EN 60947-5-6 (NAMUR)
Pulse duration	> 50 µs
Input frequency	0.001 ... 5000 Hz
Lead monitoring	breakage I ≤0.15 mA; short-circuit I > 6.5 mA
Input II	startup override: 1 ... 1000 s, adjustable in steps of 1 s
Active/Passive	I > 4 mA (for min. 100 ms)/I < 1.5 mA
Output	
Collective error message	Power Rail
Output I, II	signal; relay
Contact loading	250 V AC/2 A/cos Φ≥ 0.7; 40 V DC/2 A
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Output III	electronic output, passive
Contact loading	40 V DC
Output IV	analog
Current range	0 ... 20 mA or 4 ... 20 mA
Open loop voltage	≤24 V DC
Load	≤650 Ω
Fault signal	downscale I ≤ 3.6 mA, upscale ≥ 21.5 mA (acc. NAMUR NE43)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	TÜV 99 ATEX 1471
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤60 °C)
Statement of conformity	TÜV 02 ATEX 1885 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4
FM approval	
Control drawing	16-538FM-12

Diagrams







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Technical data

Supply	
Rated voltage	20 ... 90 V DC/48 ... 253 V AC 50 ... 60 Hz
Power loss/power consumption	≤2 W; 2.5 VA/2.2 W; 3 VA
Input	
Input I	acc. to EN 60947-5-6 (NAMUR)
Pulse duration	> 50 µs
Input frequency	0.001 ... 5000 Hz
Lead monitoring	breakage I ≤0.15 mA; short-circuit I > 6.5 mA
Input II	startup override: 1 ... 1000 s, adjustable in steps of 1 s
Active/Passive	I > 4 mA (for min. 100 ms)/I < 1.5 mA
Output	
Output I, II	signal; relay
Contact loading	250 V AC/2 A/cos Φ≥ 0.7; 40 V DC/2 A
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Output III	electronic output, passive
Contact loading	40 V DC
Output IV	analog
Current range	0 ... 20 mA or 4 ... 20 mA
Open loop voltage	≤24 V DC
Load	≤650 Ω
Fault signal	downscale I ≤ 3.6 mA, upscale ≥ 21.5 mA (acc. NAMUR NE43)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	TÜV 99 ATEX 1471
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤60 °C)
FM approval	
Control drawing	16-538FM-12

Features

- **1-channel isolated barrier**
- **AC/DC wide range supply**
- **Dry contact or NAMUR inputs**
- **Input frequency 1 mHz ... 5 kHz**
- **Current output 0/4 mA ... 20 mA**
- **Relay and transistor output**
- **Start-up override**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It is a universal frequency converter that changes a digital input (NAMUR sensor/mechanical contact) into a proportional free adjustable 0/4 mA ... 20 mA analog output and functions as a switch amplifier and a trip alarm.

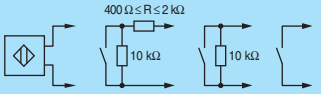
Also the functions of the switch outputs (2 relay outputs and 1 potential free transistor output) are easily adjustable [trip value display (min/max alarm), serially switched output, pulse divider output, error signal output].

The unit is easily programmed by the use of a keypad located on the front of the unit or with the **PACT***ware*™ configuration software.

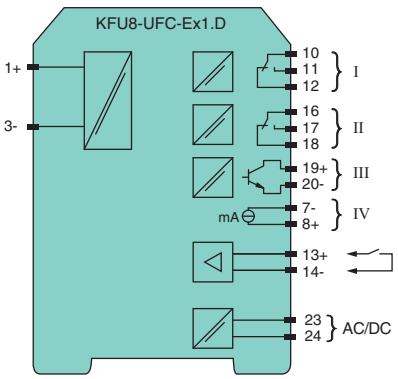
Line fault detection of the field circuit is indicated by a red LED.

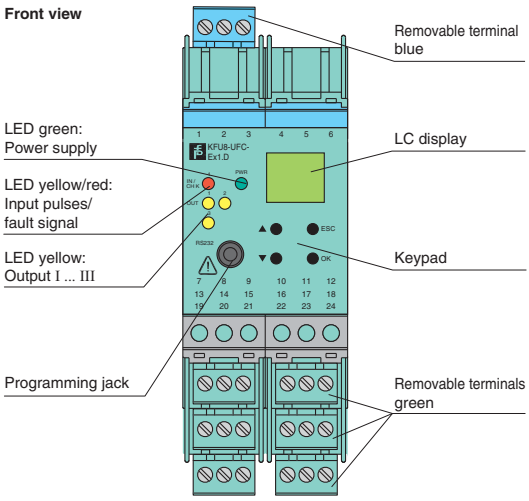
For additional information, refer to the manual and www.pepperl-fuchs.com.

Diagrams



Zone 0, 1, 2
Div. 1, 2





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KFD2-UFT-Ex2.D Frequency Converter with Direction and Synchronization Monitor

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Dry contact or NAMUR inputs**
- **Input frequency 1 mHz ... 1 kHz**
- **Current output 0/4 mA ... 20 mA**
- **Relay and transistor output**
- **Start-up override**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It analyzes 2 digital signals (NAMUR sensor/mechanical contact) from a hazardous area and functions as a rotation direction indicator, slip monitor, frequency monitor or synchronization monitor.

Each proximity sensor or switch controls a passive transistor output. The 2 relay outputs indicate if the input signal is above or below the trip value or the rotational direction.

The analog output can be programmed to be proportional to the input frequency or slip differential.

The unit is easily programmed by the use of a keypad located on the front of the unit or with the **PACT***ware*™ configuration software.

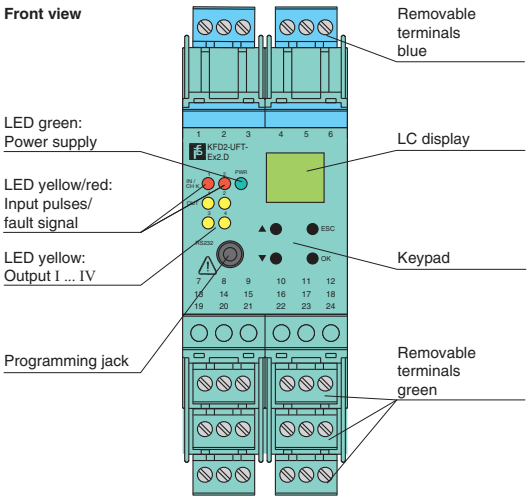
Line fault detection of the field current is indicated by a red LED and through the collective error output via Power Rail.

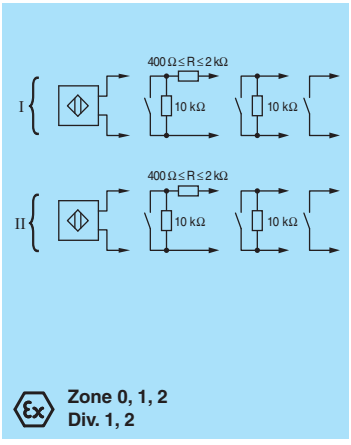
For additional information, refer to the manual and www.pepperl-fuchs.com.

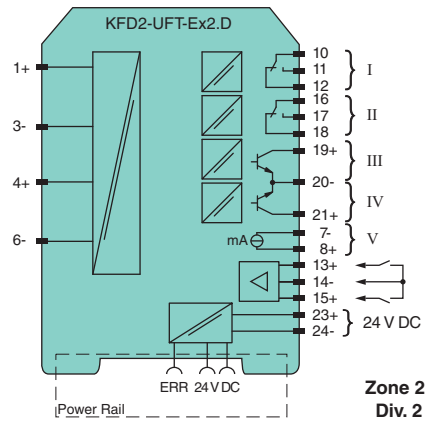
Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power consumption	2.5 W
Input	
Input I, II	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	8.2 V/10 mA
Lead monitoring	breakage I ≤ 0.15 mA; short-circuit I > 6.5 mA
Input III, IV	
Active/Passive	I > 4 mA (for min. 100 ms)/I < 1.5 mA
Open circuit voltage/short-circuit current	18 V/5 mA
Output	
Collective error message	Power Rail
Output I, II	signal; relay
Contact loading	250 V AC/2 A/cos Φ≥ 0.7; 40 V DC/2 A
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Output III and IV	signal; electronic output, passive
Contact loading	40 V DC
Output V	analog
Current range	0 ... 20 mA or 4 ... 20 mA
Open loop voltage	max. 24 V DC
Load	max. 650 Ω
Programming interface	
Interface	RS 232
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	TÜV 99 ATEX 1471
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 02 ATEX 1885 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4
FM approval	
Control drawing	16-538FM-12

Diagrams







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Technical data

Supply	
Rated voltage	20 ... 90 V DC/48 ... 253 V AC 50 ... 60 Hz
Power consumption	2.5 W/5 VA
Input	
Input I, II	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	8.2 V/10 mA
Lead monitoring	breakage I ≤ 0.15 mA; short-circuit I > 6.5 mA
Input III, IV	
Active/Passive	I > 4 mA (for min. 100 ms)/I < 1.5 mA
Open circuit voltage/short-circuit current	18 V/5 mA
Output	
Output I, II	signal; relay
Contact loading	250 V AC/2 A/cos Φ≥ 0.7; 40 V DC/2 A
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Output III and IV	signal; electronic output, passive
Contact loading	40 V DC
Output V	analog
Current range	0 ... 20 mA or 4 ... 20 mA
Open loop voltage	max. 24 V DC
Load	max. 650 Ω
Programming interface	
Interface	RS 232
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	TÜV 99 ATEX 1471
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C)
FM approval	
Control drawing	16-538FM-12

Features

- **2-channel isolated barrier**
- **AC/DC wide range supply**
- **Dry contact or NAMUR inputs**
- **Input frequency 1 mHz ... 1 kHz**
- **Current output 0/4 mA ... 20 mA**
- **Relay and transistor output**
- **Start-up override**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It analyzes 2 digital signals (NAMUR sensor/mechanical contact) from a hazardous area and functions as a rotation direction indicator, slip monitor, frequency monitor or synchronization monitor.

Each proximity sensor or switch controls a passive transistor output. The 2 relay outputs indicate if the input signal is above or below the trip value or the rotational direction.

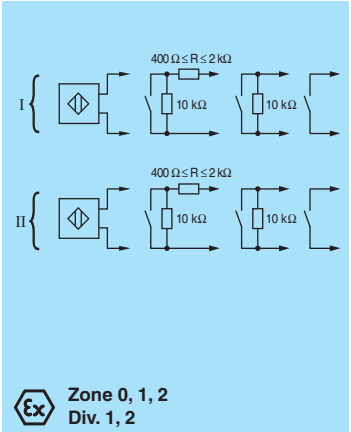
The analog output can be programmed to be proportional to the input frequency or slip differential.

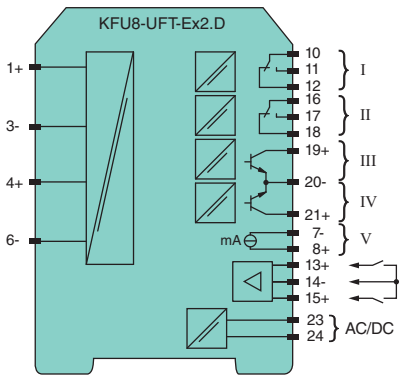
The unit is easily programmed by the use of a keypad located on the front of the unit or with the **PACT***ware*™ configuration software.

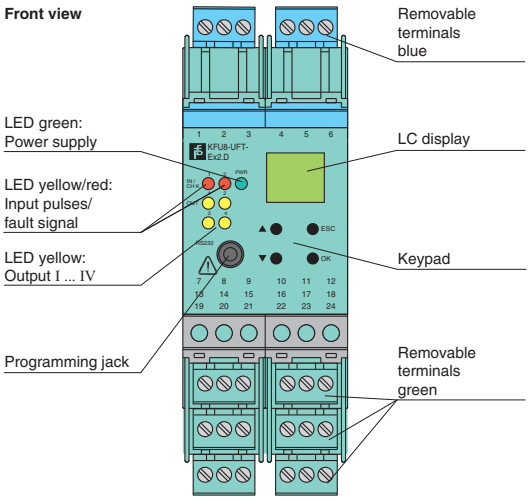
Line fault detection of the field current is indicated by a red LED.

For additional information, refer to the manual and www.pepperl-fuchs.com.

Diagrams







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KFD2-ER-Ex1.W.LB

Conductivity Switch Amplifier

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Level sensing input**
- **Adjustable range 1 kΩ ... 150 kΩ**
- **Latching relay output**
- **Adjustable time delay up to 10 s**
- **Minimum/maximum control**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It provides the AC measuring voltage for the level sensing electrodes.

Once the measured medium reaches the electrodes, the unit reacts by energizing a form C changeover relay contact.

The module is voltage and temperature stabilized and guarantees a defined switching characteristic.

It can be used for on/off control or minimum/maximum control. A signal delay feature is available and is adjustable between 0.5 s and 10 s.

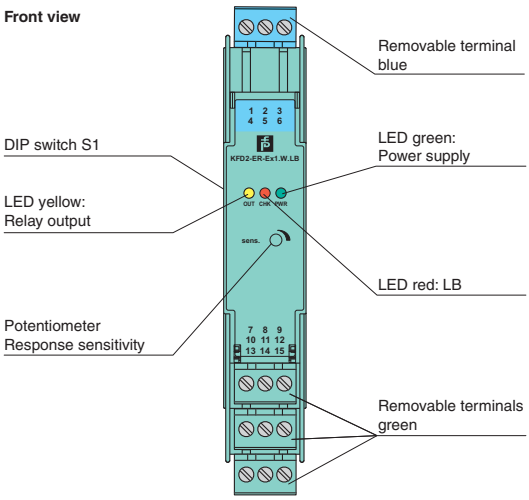
This module can also monitor the field circuit for lead breakage (LB). LB is indicated by a red LED. If LB monitoring is selected, output II serves as the fault signal output; otherwise, it will follow the function of output I.

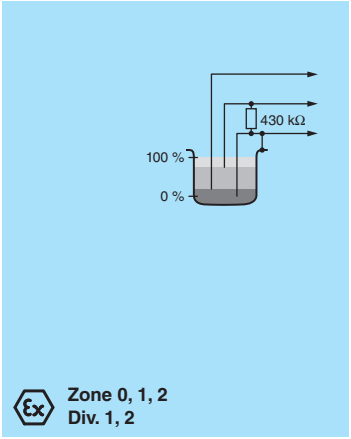
Technical data

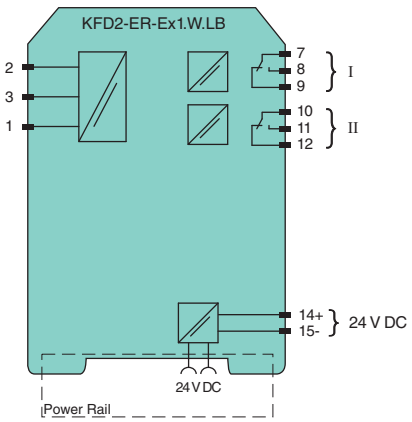
Supply	
Rated voltage	20 ... 30 V DC
Input	
Control input	min./max. control system: terminals 1, 2, 3 on/off control system: terminals 1, 3
Response sensitivity	1 ... 150 kΩ, adjustable via potentiometer
Output	
Switch power	max. 192 W, 2000 VA
Output	signal; relay
Time constant for signal damping	0.5 s, 2 s, 5 s, 10 s
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	DMT 00 ATEX E 033
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]

Diagrams

Front view







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Technical data

Supply	
Rated voltage	103.5 ... 126 V AC, 45 ... 65 Hz
Power consumption	< 1.2 W
Input	
Control input	min./max. control system: terminals 1, 2, 3 on/off control system: terminals 1, 3
Response sensitivity	1 ... 150 kΩ, adjustable via potentiometer
Output	
Switch power	max. 192 W, 2000 VA
Output	signal; relay
Time constant for signal damping	0.5 s, 2 s, 5 s, 10 s
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	DMT 00 ATEX E 032
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]

Features

- **1-channel isolated barrier**
- **115 V AC supply**
- **Level sensing input**
- **Adjustable range 1 kΩ ... 150 kΩ**
- **Latching relay output**
- **Adjustable time delay up to 10 s**
- **Minimum/maximum control**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It provides the AC measuring voltage for the level sensing electrodes.

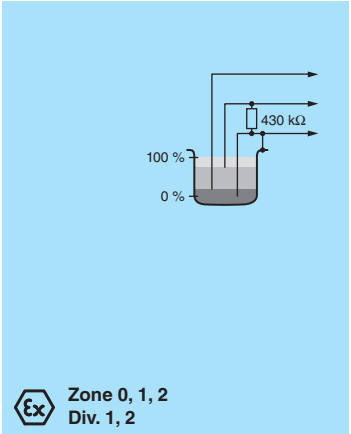
Once the measured medium reaches the electrodes, the unit reacts by energizing a form C changeover relay contact.

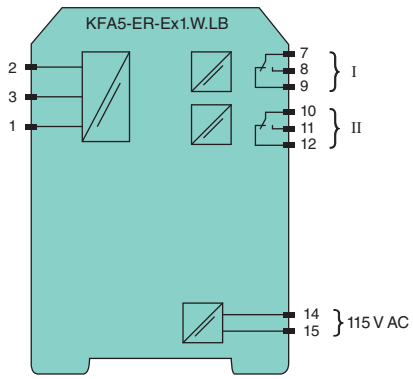
The module is voltage and temperature stabilized and guarantees a defined switching characteristic.

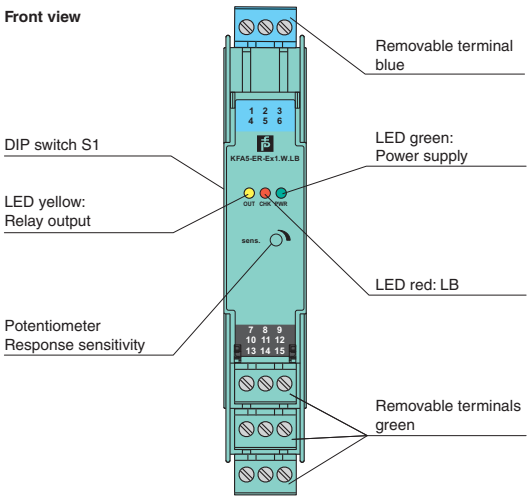
It can be used for on/off control or minimum/maximum control. A signal delay feature is available and is adjustable between 0.5 s and 10 s.

This module can also monitor the field circuit for lead breakage (LB). LB is indicated by a red LED. If LB monitoring is selected, output II serves as the fault signal output; otherwise, it will follow the function of output I.

Diagrams







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KFA6-ER-Ex1.W.LB

Conductivity Switch Amplifier

Features

- **1-channel isolated barrier**
- **230 V AC supply**
- **Level sensing input**
- **Adjustable range 1 kΩ ... 150 kΩ**
- **Latching relay output**
- **Adjustable time delay up to 10 s**
- **Minimum/maximum control**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It provides the AC measuring voltage for the level sensing electrodes.

Once the measured medium reaches the electrodes, the unit reacts by energizing a form C changeover relay contact.

The module is voltage and temperature stabilized and guarantees a defined switching characteristic.

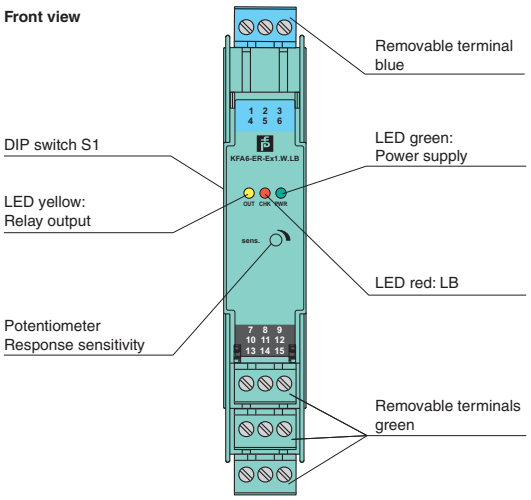
It can be used for on/off control or minimum/maximum control. A signal delay feature is available and is adjustable between 0.5 s and 10 s.

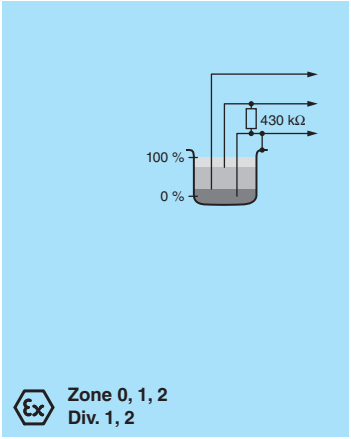
This module can also monitor the field circuit for lead breakage (LB). LB is indicated by a red LED. If LB monitoring is selected, output II serves as the fault signal output; otherwise, it will follow the function of output I.

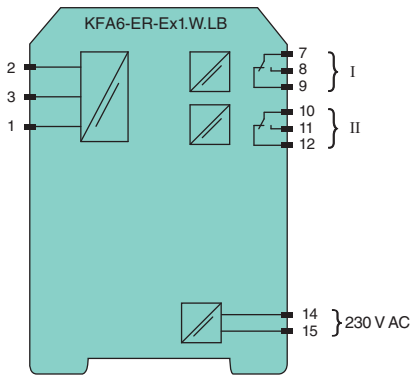
Technical data

Supply	
Rated voltage	207 ... 253 V AC, 45 ... 65 Hz
Power consumption	< 1.2 W
Input	
Control input	min./max. control system: terminals 1, 2, 3 on/off control system: terminals 1, 3
Response sensitivity	1 ... 150 kΩ, adjustable via potentiometer
Output	
Switch power	max. 192 W, 2000 VA
Output	signal; relay
Time constant for signal damping	0.5 s, 2 s, 5 s, 10 s
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	DMT 00 ATEX E 032
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]

Diagrams







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Input	
Ground connection	terminal 17
Rated values	5 V_{pp}, 0.1 mA; rectangular
Function	Test input: 24 V DC/5 mA; non-polarized
Output	
Output	signal; relay
Contact loading	253 V AC/2 A/cos Φ> 0.7; 40 V DC/2 A resistive load
Mechanical life	10^7 switching cycles
Transfer characteristics	
Response delay	≤ 50 s
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 260 g
Dimensions	60 x 119 x 115 mm (2.4 x 4.7 x 4.5 in), housing type D2
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	TÜV 00 ATEX 1585
Group, category, type of protection	⟨Ex⟩ II (1) G [Ex ia] IIC ⟨Ex⟩ II (1) D [Ex iaD]

Features

- **16-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Analog or digtial field device inputs**
- **Monitors leakage current**
- **Fault relay contact output**
- **LED status indication**
- **Test circuit for validation**
- **Parallel connection for easy integration**

Function

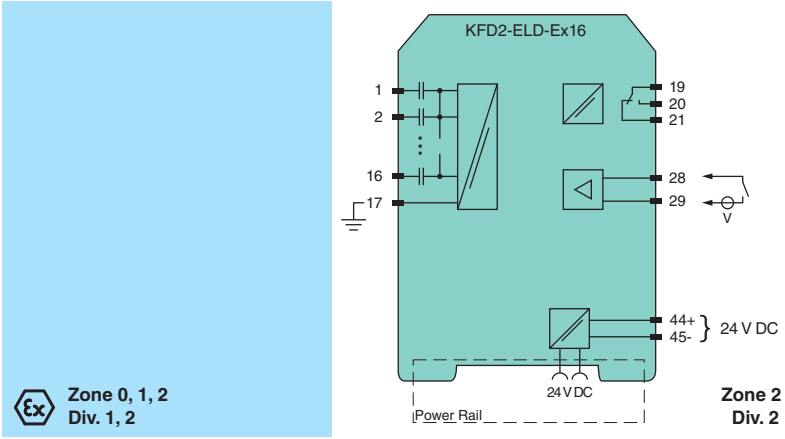
This isolated barrier is used for intrinsic safety applications. It detects ground faults on field lines.

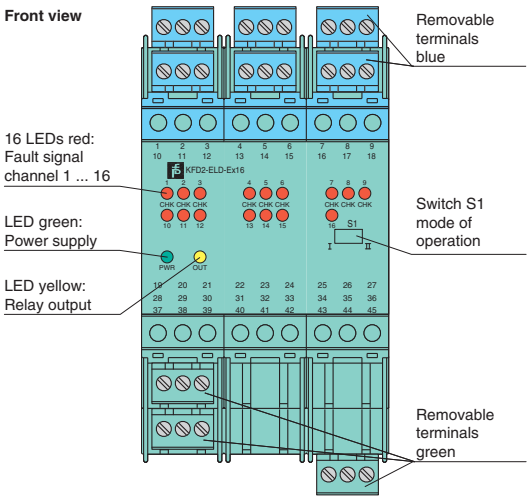
This 16-channel unit continuously monitors isolated intrinsically safe circuits and warns if their resistance to ground falls below 10 kΩ .

During an alarm condition, the appropriate channel LED is illuminated and the form C changeover relay contact is initiated (S1 = position II). The function of this relay can be reversed with the mode of operation switch (S1 = position II).

A self-test feature is also available on this device. When triggered manually by the user or remotely by the control system, the barrier reacts in the same manner as a real alarm condition.

Diagrams





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KFD2-FF-Ex2.RS232

RS 232 Repeater

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **RS 232 input/output**

Function

This isolated barrier is used for intrinsic safety applications. It is a repeater for the bi-directional transfer of RS 232 signals.

The input and output circuits are intrinsically safe and designed to transmit and receive RS 232 signals between the safe area and the hazardous area.

This barrier accepts input signals in the ±3 V ... ±15 V range providing a nominal ±10 V output that is independent of the input voltage.

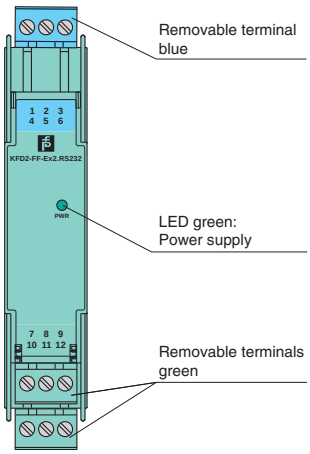
The maximum rate of data exchange is 20 kBits per second.

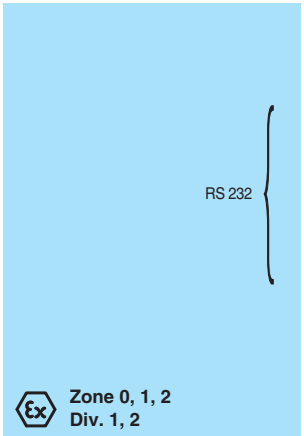
Technical data

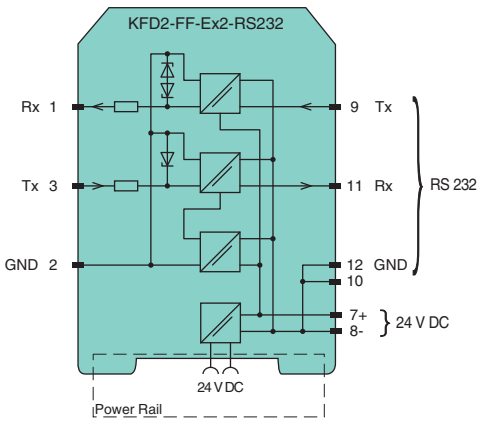
Supply	
Rated voltage	15 ... 35 V DC
Power consumption	approx. 1.5 W
Field circuit	
Interface	RS 232
Input	
Input signal	logic 0: +3 ... +15 V logic 1: -3 ... -15 V
Output	
Output signal	logic 0: +9 ... +12 V logic 1: -9 ... -12 V
Safe area	
Interface	RS 232
Input	
Input signal	logic 0: +3 ... +15 V logic 1: -3 ... -15 V
Output	
Output signal	logic 0: +9 ... +12 V logic 1: -9 ... -12 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 110 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 171 for entity parameters
EC-Type Examination Certificate	BAS 02 ATEX 0116
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC T4 (-40 °C ≤ T_{amb} ≤ 60 °C)
UL approval	
Control drawing	116-0173 (cULus)

Diagrams

Front view







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ATEX Entity Parameters

Model Number	Terminals	U_o (V)	I_o (mA)	P_o (mW)
KCD2-SR-Ex1.LB	1, 2	10.5	17.1	45
KCD2-SR-Ex2	1, 2; 3, 4	10.5	17.1	45
KFA5-DU-Ex1.D	1, 3	10.1	13.5	34
KFA5-DWB-Ex1.D	1, 3	10.1	13.5	34
KFA5-ER-Ex1.W.LB	1, 2, 3	10	2.5	6
KFA5-SOT2-Ex2	1, 2, 3; 4, 5, 6	10.5	13	34
KFA5-SR2-Ex1.W	1, 2, 3	10.6	19.1	51
KFA5-SR2-Ex1.W.LB	1, 2, 3	10.6	19.1	51
KFA5-SR2-Ex2.W	1, 2, 3; 4, 5, 6	10.6	19.1	51
KFA5-SR2-Ex2.W.IR	1, 2, 3; 4, 5, 6	10.6	19.1	51
KFA6-DU-Ex1.D	1, 3	10.1	13.5	34
KFA6-DWB-Ex1.D	1, 3	10.1	13.5	34
KFA6-ER-Ex1.W.LB	1, 2, 3	10	2.5	6
KFA6-SOT2-Ex2	1, 2, 3; 4, 5, 6	10.5	13	34
KFA6-SR2-Ex1.W	1, 2, 3	10.6	19.1	51
KFA6-SR2-Ex1.W.LB	1, 2, 3	10.6	19.1	51
KFA6-SR2-Ex2.W	1, 2, 3; 4, 5, 6	10.6	19.1	51
KFA6-SR2-Ex2.W.IR	1, 2, 3; 4, 5, 6	10.6	19.1	51
KFD2-DU-Ex1.D	1, 3	10.1	13.5	34
KFD2-DWB-Ex1.D	1, 3	10.1	13.5	34
KFD2-ELD-Ex16	1 ... 16	7.2	1.7	3
KFD2-ER-Ex1.W.LB	1, 2, 3	10	2.5	6
KFD2-FF-Ex2.RS232	1, 2	14.5	48	180
	2, 3	5.4	27	40
	1, 2, 3	19.9	75	200
KFD2-SH-Ex1	10, 12	9.56	16.8	41
KFD2-SH-Ex1.T.OP	4, 6	9.56	16.8	41
KFD2-SOT2-Ex1.LB	1, 2, 3	10.5	13	34
KFD2-SOT2-Ex1.LB.IO	1, 2, 3	10.5	13	34
KFD2-SOT2-Ex1.N	1, 2, 3	10.5	13	34
KFD2-SOT2-Ex2	1, 2, 3; 4, 5, 6	10.5	13	34
KFD2-SOT2-Ex2.IO	1, 2, 3; 4, 5, 6	10.5	13	34
KFD2-SR2-Ex1.W	1, 2, 3	10.5	13	34
KFD2-SR2-Ex1.W.LB	1, 2, 3	10.5	13	34
KFD2-SR2-Ex2.2S	1, 2, 3; 4, 5, 6	10.5	13	34
KFD2-SR2-Ex2.W	1, 2, 3; 4, 5, 6	10.5	13	34
KFD2-SR2-Ex2.W.SM	1, 2, 3; 4, 5, 6	10.5	13	34
KFD2-SRA-Ex4	1, 2, 3, 4, 5, 6	10	14	35
KFD2-SR-Ex1.4S.LK	7, 8, 9	12.7	20	62
KFD2-ST2-Ex1.LB	1, 2, 3	10.5	13	34
KFD2-ST2-Ex2	1, 2, 3; 4, 5, 6	10.5	13	34
KFD2-UFC-Ex1.D	1, 3	10.1	13.5	34
KFD2-UFT-Ex2.D	1, 3; 4, 6	10.1	13.5	34
KFU8-UFC-Ex1.D	1, 3	10.1	13.5	34
KFU8-UFT-Ex2.D	1, 3; 4, 6	10.1	13.5	34
KHA6-SH-Ex1	10, 12	9.56	16.8	41

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CSA Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)
KFA5-SOT2-Ex2	1, 3, 2, 3; 4, 6, 5, 6	10.5	13.0
KFA5-SR2-Ex1.W	1, 3; 2, 3	12.9	19.8
KFA5-SR2-Ex1.W.LB	1, 3; 2, 3	12.9	19.8
KFA5-SR2-Ex2.W	1, 3, 2, 3; 4, 6, 5, 6	12.9	19.8
KFA5-SR2-Ex2.W.IR	1, 3, 2, 3; 4, 6, 5, 6	12.9	19.8
KFA6-SOT2-Ex2	1, 3, 2, 3; 4, 6, 5, 6	12.9	19.8
KFA6-SR2-Ex1.W	1, 3; 2, 3	12.9	19.8
KFA6-SR2-Ex1.W.LB	1, 3; 2, 3	12.9	19.8
KFA6-SR2-Ex2.W	1, 3, 2, 3; 4, 6, 5, 6	12.9	19.8
KFA6-SR2-Ex2.W.IR	1, 3, 2, 3; 4, 6, 5, 6	12.9	19.8
KFD2-SOT2-Ex1.LB	1, 3; 2, 3	10.5	13.0
KFD2-SOT2-Ex1.LB.IO	1, 3; 2, 3	10.5	13.0
KFD2-SOT2-Ex1.N	1, 3; 2, 3	10.5	13.0
KFD2-SOT2-Ex2	1, 3, 2, 3; 4, 6, 5, 6	10.5	13.0
KFD2-SOT2-Ex2.IO	1, 3, 2, 3; 4, 6, 5, 6	10.5	13.0
KFD2-SR2-Ex1.W	1, 3; 2, 3	12.9	19.8
KFD2-SR2-Ex1.W.LB	1, 3; 2, 3	12.9	19.8
KFD2-SR2-Ex2.2S	1, 3, 2, 3; 4, 6, 5, 6	12.9	19.8
KFD2-SR2-Ex2.W	1, 3, 2, 3; 4, 6, 5, 6	12.9	19.8
KFD2-SR2-Ex2.W.SM	1, 3, 2, 3; 4, 6, 5, 6	12.9	19.8
KFD2-SR-Ex1.4S.LK	7, 9; 8, 9	12.9	19.8
KFD2-ST2-Ex1.LB	1, 3; 2, 3	10.5	13.0
KFD2-ST2-Ex2	1, 3, 2, 3; 4, 6, 5, 6	10.5	13.0

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FM Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
KCD2-SR-Ex1.LB	1, 2	10.5	17.1	–	–
KCD2-SR-Ex2	1, 2; 3, 4	10.5	17.1	–	–
KFA5-DU-Ex1.D	1, 3	10.1	13.5	–	–
KFA5-DWB-Ex1.D	1, 3	10.1	13.5	–	–
KFA5-SOT2-Ex2	1, 3; 2, 3; 4, 6; 5, 6	12.9	19.8	–	–
KFA5-SR2-Ex1.W	1, 3; 2, 3	12.9	19.8	–	–
KFA5-SR2-Ex1.W.LB	1, 3; 2, 3	12.9	19.8	–	–
KFA5-SR2-Ex2.W	1, 3; 2, 3; 4, 6; 5, 6	12.9	19.8	–	–
KFA5-SR2-Ex2.W.IR	1, 3; 2, 3; 4, 6; 5, 6	12.9	19.8	–	–
KFA6-DU-Ex1.D	1, 3	10.1	13.5	–	–
KFA6-DWB-Ex1.D	1, 3	10.1	13.5	–	–
KFA6-SOT2-Ex2	1, 3; 2, 3; 4, 6; 5, 6	12.9	19.8	–	–
KFA6-SR2-Ex1.W	1, 3; 2, 3	12.9	19.8	–	–
KFA6-SR2-Ex1.W.LB	1, 3; 2, 3	12.9	19.8	–	–
KFA6-SR2-Ex2.W	1, 3; 2, 3; 4, 6; 5, 6	12.9	19.8	–	–
KFA6-SR2-Ex2.W.IR	1, 3; 2, 3; 4, 6; 5, 6	12.9	19.8	–	–
KFD2-DU-Ex1.D	1, 3	10.1	13.5	–	–
KFD2-DWB-Ex1.D	1, 3	10.1	13.5	–	–
KFD2-SH-Ex1	10, 12	9.78	15.7	–	–
KFD2-SH-Ex1.T.OP	4, 6	9.78	17.2	–	–
KFD2-SOT2-Ex1.LB	1, 3; 2, 3	12.9	19.8	–	–
KFD2-SOT2-Ex1.LB.IO	1, 3; 2, 3	12.9	19.8	–	–
KFD2-SOT2-Ex1.N	1, 3; 2, 3	12.9	19.8	–	–
KFD2-SOT2-Ex2	1, 3; 2, 3; 4, 6; 5, 6	12.9	19.8	–	–
KFD2-SOT2-Ex2.IO	1, 3; 2, 3; 4, 6; 5, 6	12.9	19.8	–	–
KFD2-SR2-Ex1.W	1, 3; 2, 3	12.9	19.8	–	–
KFD2-SR2-Ex1.W.LB	1, 3; 2, 3	12.9	19.8	–	–
KFD2-SR2-Ex2.2S	1, 3; 2, 3; 4, 6; 5, 6	12.9	19.8	–	–
KFD2-SR2-Ex2.W	1, 3; 2, 3; 4, 6; 5, 6	12.9	19.8	–	–
KFD2-SR2-Ex2.W.SM	1, 3; 2, 3; 4, 6; 5, 6	12.9	19.8	–	–
KFD2-SR-Ex1.4S.LK	7, 9; 8, 9	12.9	19.8	–	–
KFD2-ST2-Ex1.LB	1, 3; 2, 3	12.9	19.8	–	–
KFD2-ST2-Ex2	1, 3; 2, 3; 4, 6; 5, 6	12.9	19.8	–	–
KFD2-UFC-Ex1.D	1, 3	10.1	13.5	–	–
KFD2-UFT-Ex2.D	1, 3; 4, 6 1, 4 to 3, 6	10.1 –	13.5 –	– 10.1	– 27
KFU8-UFC-Ex1.D	1, 3	10.1	13.5	–	–
KFU8-UFT-Ex2.D	1, 3; 4, 6 1, 4 to 3, 6	10.1 –	13.5 –	– 10.1	– 27

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UL Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
KCD2-SR-Ex1.LB	1, 2	10.5	17.1	–	–
KCD2-SR-Ex2	1, 2; 3, 4	10.5	17.1	–	–
KFA5-SOT2-Ex2	1, 3; 4, 6	10.6	19.5	–	–
KFA5-SR2-Ex1.W	1, 3; 4, 6	10.6	19.5	–	–
KFA5-SR2-Ex1.W.LB	1, 3; 4, 6	10.6	19.5	–	–
KFA5-SR2-Ex2.W	1, 3; 4, 6	10.6	19.5	–	–
KFA5-SR2-Ex2.W.IR	1, 3; 4, 6	10.6	19.5	–	–
KFA6-SOT2-Ex2	1, 3; 4, 6	10.6	19.5	–	–
KFA6-SR2-Ex1.W	1, 3; 4, 6	10.6	19.5	–	–
KFA6-SR2-Ex1.W.LB	1, 3; 4, 6	10.6	19.5	–	–
KFA6-SR2-Ex2.W	1, 3; 4, 6	10.6	19.5	–	–
KFA6-SR2-Ex2.W.IR	1, 3; 4, 6	10.6	19.5	–	–
KFD2-FF-Ex2.RS232	1, 2, 3	–	–	19.9	75
KFD2-SRA-Ex4	1, 3; 4, 6	10.6	19.5	–	–

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Solenoid Drivers

Model Number	Channels	Input (Control System)			Relay Output (Control System)	Output (Field)		Supply		SIL	Zone 2/Division 2 Mounting	Page
		Loop Powered	Logic Input	OR Function		Voltage (V)	Max. Current (mA)	24 V DC	Loop Powered			
KFD0-SD2-Ex1.1045	1	■				10	45		■	3		176
KFD0-SD2-Ex2.1045	2	■				10	45		■	3		177
KCD0-SD-Ex1.1245	1	■				12	45		■	3	■	178
KFD0-SD2-Ex2.1245	2	■				12	45		■	3		179
KFD0-SD2-Ex1.1065	1	■				9.8	65		■	3		180
KFD0-SD2-Ex1.1180	1	■				11	80		■	3		181
KFD0-SD2-Ex1.10100	1	■				10	100		■	3		182
KFD2-SL2-Ex1	1		■			11.7	45	■		2	■	183
KFD2-SL2-Ex1.B	1		■			11.7	45	■		2	■	184
KFD2-SL2-Ex1.LK	1		■		■	11.2	45	■		2	■	185
KFD2-SL2-Ex1.LK.1045	1		■		■	10	45	■		2	■	186
KFD2-SL2-Ex1.LK.1270	1		■		■	12.5	70	■		2		187
KFD2-SL2-Ex2	2		■			11.7	45	■		2	■	188
KFD2-SL2-Ex2.B	2		■			11.7	45	■		2	■	189
KFD2-RCI-Ex1	1		■			13.5	20.4	■		3	■	190
KFD2-VM-Ex1.35.L	1		■	■		15.3	17	■				191

Relay Outputs

Model Number	Channels	Input (Control System)		Output (Field)	Supply		SIL	Zone 2/Division 2 Mounting	Page
		Loop Powered	Logic Input	Relay	24 V DC	Loop Powered			
KFD0-RO-Ex2	2		■	2		■		■	192

Interface Modules

Model Number	Description	Page
KFD2-FF-Ex2.RS232	RS 232 Repeater, bi-directional	193

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Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current limit 45 mA at 10 V DC**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

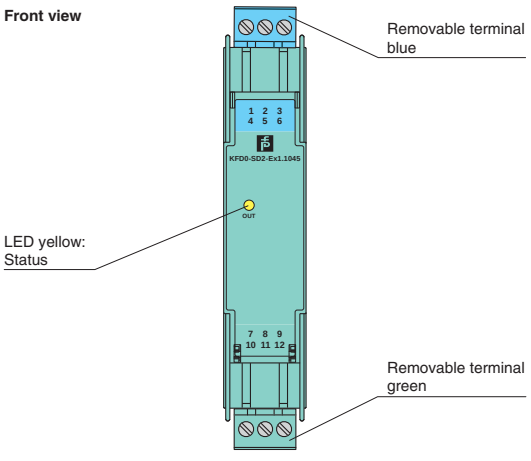
It is loop powered, so the available energy at the output is received from the input signal. The output signal has a resistive characteristic. As a result the output voltage and current are dependent on the load and the input voltage.

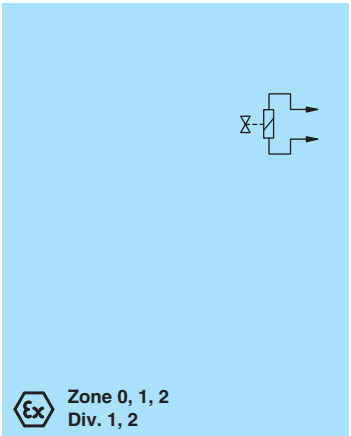
At full load, 10 V at 45 mA is available for the hazardous area application.

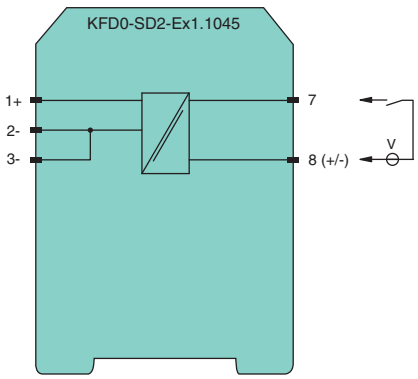
Technical data

Supply	
Rated voltage	loop powered
Power loss	< 1.05 W (≤ 30 V)
Input	
Rated voltage U_i	20 ... 35 V DC
Current	72 mA at 20 V input voltage, load = 220 Ω 50 mA at 35 V input voltage, load = 220 Ω
Output	
Internal resistor	≤ 282 Ω
Limit	current I_E: ≥ 45 mA voltage U_E: ≥ 10 V
Open loop voltage	≥ 22.7 V
Output rated operating current	45 mA
Output signal	these values are valid for the rated operational voltage 20 ... 35 V DC
Energized/De-energized delay	single operation: 300 µs/50 µs; periodical: 5 µs/50 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0252
Group, category, type of protection	Ex II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22] Ex I (M1) [Ex ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ex II 3G Ex nA II T4
FM approval	
Control drawing	266-031FM-12 (cFMus)
UL approval	
Control drawing	116-0316 (cULus)
IECEx approval	IECEx BAS 06.0058

Diagrams







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Technical data

Supply	
Rated voltage	loop powered
Power loss	< 1.05 W (≤ 30 V) per channel
Input	
Rated voltage U_i	20 ... 35 V DC
Current	72 mA at 20 V input voltage, load = 220 Ω 50 mA at 35 V input voltage, load = 220 Ω
Output	
Internal resistor	≤ 282 Ω
Limit	current I_E: ≥ 45 mA voltage U_E: ≥ 10 V
Open loop voltage	≥ 22.7 V
Output rated operating current	45 mA
Output signal	these values are valid for the rated operational voltage 20 ... 35 V DC
Energized/De-energized delay	single operation: 300 µs/50 µs; periodical: 5 µs/50 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0252
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22] ⟨Ex⟩ I (M1) [Ex ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	266-031FM-12 (cFMus)
UL approval	
Control drawing	116-0316 (cULus)
IECEx approval	IECEx BAS 06.0058

Features

- **2-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current limit 45 mA at 10 V DC**
- **Up to SIL3 acc. to IEC 61508**

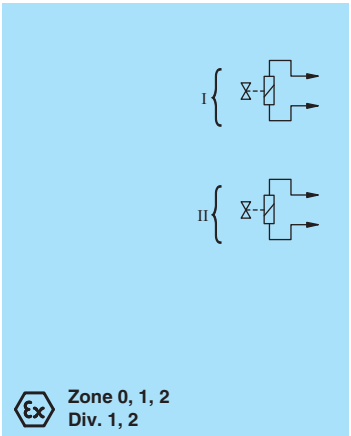
Function

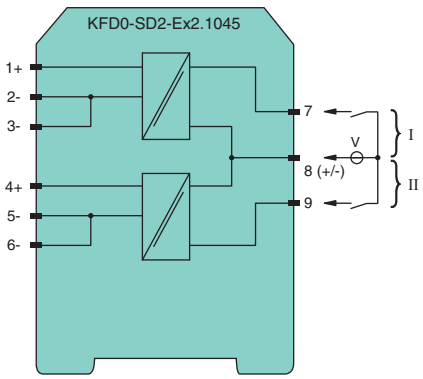
This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

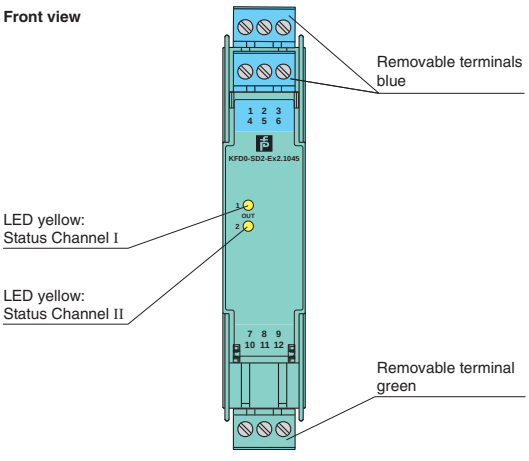
It is loop powered, so the available energy at the output is received from the input signal. The output signal has a resistive characteristic. As a result the output voltage and current are dependent on the load and the input voltage.

At full load, 10 V at 45 mA is available for the hazardous area application.

Diagrams







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Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current limit 45 mA at 12 V DC**
- **Housing width 12.5 mm**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

It is loop powered, so the available energy at the output is received from the input signal. The output signal has a resistive characteristic. As a result the output voltage and current are dependent on the load and the input voltage.

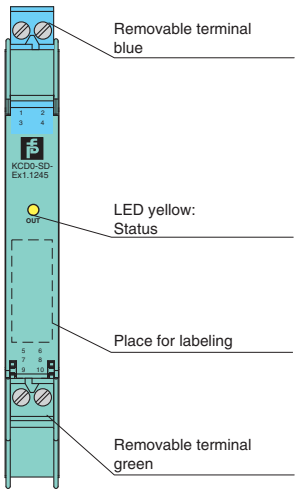
At full load, 12 V at 45 mA is available for the hazardous area application.

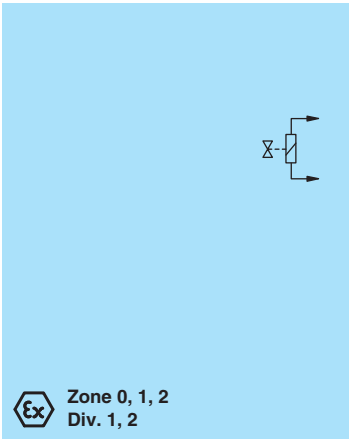
Technical data

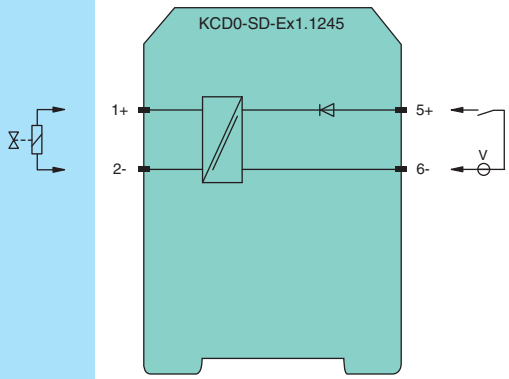
Supply	
Power loss	< 1 W
Input	
Rated voltage U_i	19 ... 30 V DC
Current	72 mA at 19 V input voltage and 265 Ω output load 50 mA at 30 V input voltage and 265 Ω output load
Output	
Internal resistor	≤ 238 Ω
Limit	current I_E: ≥ 45 mA voltage U_E: ≥ 12 V
Open loop voltage	≥ 22.7 V
Output rated operating current	45 mA
Output signal	These values are valid for the rated operational voltage 19 ... 30 V DC.
Energized/De-energized delay	single operation: 300 µs/50 µs; periodical: 5 µs/50 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 114 x 119 mm (0.5 x 4.5 x 4.7 in), housing type A2
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0170
Group, category, type of protection	Ⓔx II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22] Ⓔx I (M1) [Ex ia] I
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 X
FM approval	
Control drawing	16-533FM-12 (cFMus)
UL approval	
Control drawing	16-533UL-12 (cULus)
IECEx approval	IECEx BAS 06.0032
Approved for	[Ex ia] IIC, [Ex ia] I

Diagrams

Front view







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Technical data

Supply	
Rated voltage	loop powered
Power loss	< 1 W (≤ 30 V) per channel
Input	
Rated voltage U_i	20 ... 35 V DC
Current	72 mA at 20 V input voltage, load = 265 Ω 50 mA at 35 V input voltage, load = 265 Ω
Output	
Internal resistor	≤ 238 Ω
Limit	current I_E: ≥ 45 mA voltage U_E: ≥ 12 V
Open loop voltage	≥ 22.7 V
Output rated operating current	45 mA
Output signal	these values are valid for the rated operational voltage 20 ... 35 V DC
Energized/De-energized delay	single operation: 300 µs/50 µs; periodical: 5 µs/50 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0252
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22] ⟨Ex⟩ I (M1) [Ex ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	266-031FM-12 (cFMus)
UL approval	
Control drawing	116-0316 (cULus)
IECEx approval	IECEx BAS 06.0058

Features

- **2-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current limit 45 mA at 12 V DC**
- **Up to SIL3 acc. to IEC 61508**

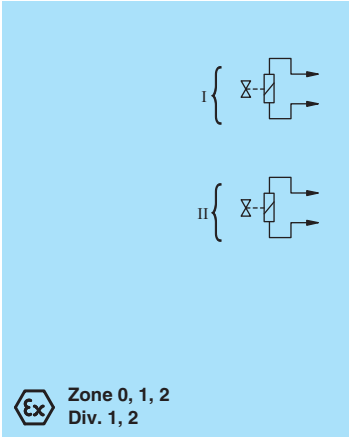
Function

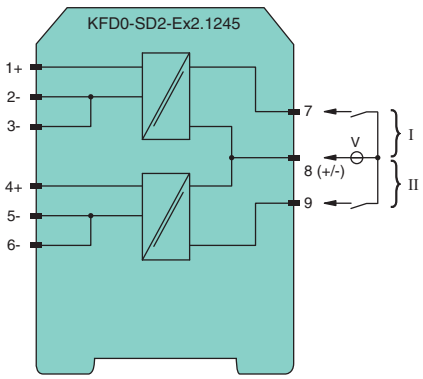
This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

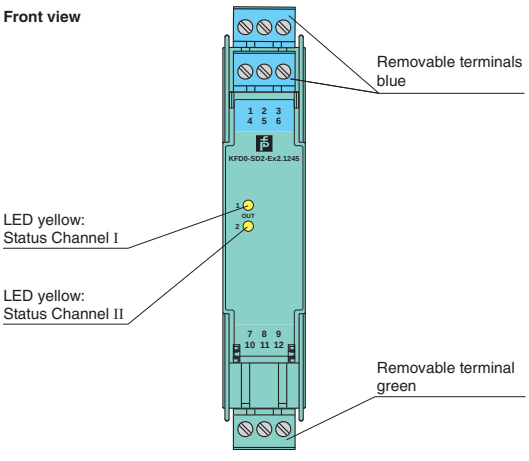
It is loop powered, so the available energy at the output is received from the input signal. The output signal has a resistive characteristic. As a result the output voltage and current are dependent on the load and the input voltage.

At full load, 12 V at 45 mA is available for the hazardous area application.

Diagrams







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Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current limit 65 mA at 9.8 V DC**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

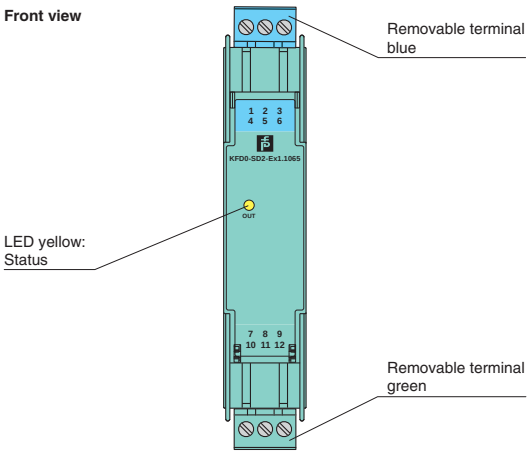
It is loop powered, so the available energy at the output is received from the input signal. The output signal has a resistive characteristic. As a result the output voltage and current are dependent on the load and the input voltage.

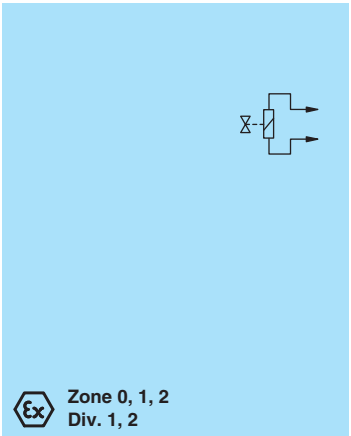
At full load, 9.8 V at 65 mA is available for the hazardous area application.

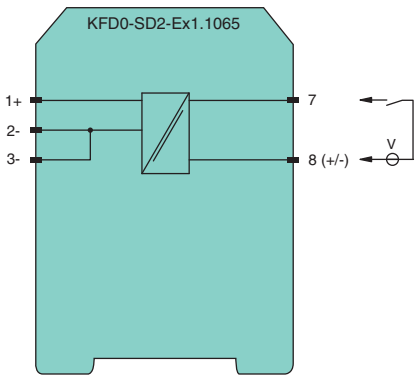
Technical data

Supply	
Rated voltage	loop powered
Power loss	< 1 W (≤30 V)
Input	
Rated voltage U_i	20 ... 35 V DC
Current	72 mA at 20 V input voltage, load = 150 Ω 50 mA at 35 V input voltage, load = 150 Ω
Output	
Internal resistor	≤90 Ω
Limit	current I_E: ≥ 65 mA voltage U_E: ≥ 9.8 V
Open loop voltage	≥ 15.4 V
Output rated operating current	65 mA
Output signal	these values are valid for the rated operational voltage 20 ... 35 V DC
Energized/De-energized delay	single operation: 300 µs/50 µs; periodical: 5 µs/50 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0252
Group, category, type of protection	Ex II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22] Ex I (M1) [Ex ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ex II 3G Ex nA II T4
FM approval	
Control drawing	266-031FM-12 (cFMus)
UL approval	
Control drawing	116-0316 (cULus)
IECEx approval	IECEx BAS 06.0058

Diagrams







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Technical data

Supply	
Rated voltage	loop powered
Power loss	< 1 W (≤ 30 V)
Input	
Rated voltage U_i	20 ... 35 V DC
Current	140 mA at 20 V input voltage, load = 140 Ω 100 mA at 35 V input voltage, load = 140 Ω
Output	
Internal resistor	≤ 150 Ω
Limit	current I_E: ≥ 80 mA voltage U_E: ≥ 11 V
Open loop voltage	≥ 22.7 V
Output rated operating current	80 mA
Output signal	these values are valid for the rated operational voltage 20 ... 35 V DC
Energized/De-energized delay	single operation: 300 µs/50 µs; periodical: 5 µs/50 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0252
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIB, [Ex ia D] [circuit(s) in zone 0/1/2/20/21/22] ⟨Ex⟩ I (M1) [Ex ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	266-031FM-12 (cFMus)
UL approval	
Control drawing	116-0316 (cULus)
IECEx approval	IECEx BAS 06.0058

Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current limit 80 mA at 11 V DC**
- **Up to SIL3 acc. to IEC 61508**

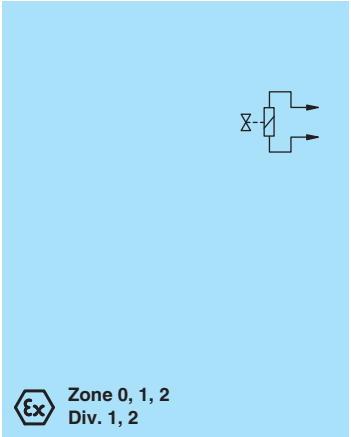
Function

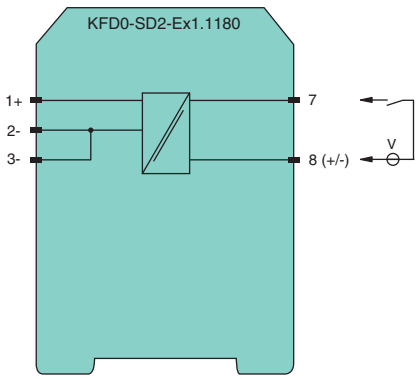
This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

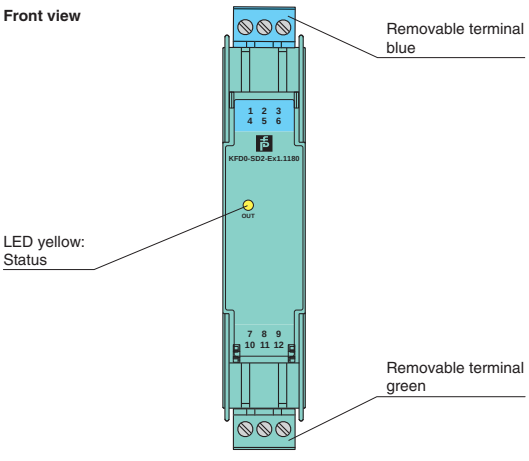
It is loop powered, so the available energy at the output is received from the input signal. The output signal has a resistive characteristic. As a result the output voltage and current are dependent on the load and the input voltage.

At full load, 11 V at 80 mA is available for the hazardous area application.

Diagrams







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Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current limit 100 mA at 10 V DC**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

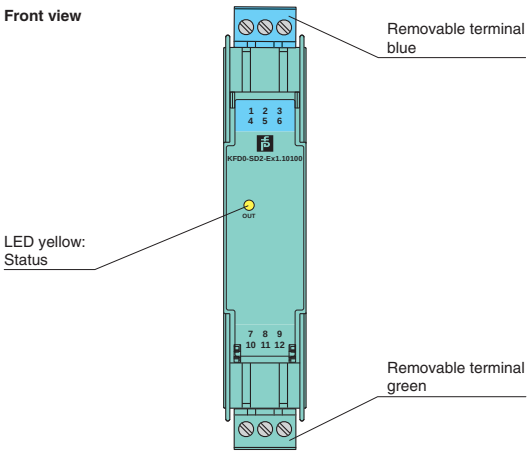
It is loop powered, so the available energy at the output is received from the input signal. The output signal has a resistive characteristic. As a result the output voltage and current are dependent on the load and the input voltage.

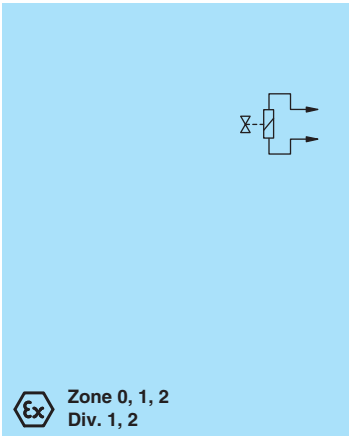
At full load, 10 V at 100 mA is available for the hazardous area application.

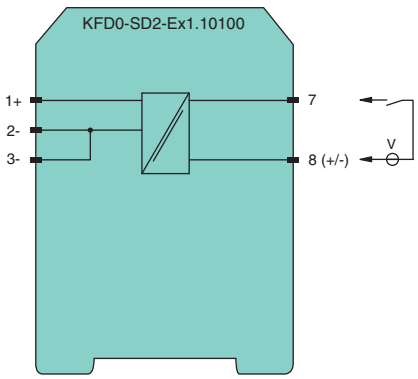
Technical data

Supply	
Rated voltage	loop powered
Power loss	< 1.2 W ($U_i \leq 30$ V)
Input	
Rated voltage U_i	20 ... 35 V DC
Current	150 mA at 20 V input voltage, load = 100 Ω 100 mA at 35 V input voltage, load = 100 Ω
Output	
Internal resistor	≤ 68 Ω
Limit	current I_E: ≥ 100 mA voltage U_E: ≥ 10 V
Open loop voltage	≥ 16.2 V
Output rated operating current	100 mA
Output signal	these values are valid for the rated operational voltage 20 ... 35 V DC
Energized/De-energized delay	single operation: 300 µs/50 µs; periodical: 5 µs/50 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0252
Group, category, type of protection	Ⓔx II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22] Ⓔx I (M1) [Ex ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4
FM approval	
Control drawing	266-031FM-12 (cFMus)
UL approval	
Control drawing	116-0316 (cULus)
IECEx approval	IECEx BAS 06.0058

Diagrams







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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power consumption	≤ 1.7 W at 45 mA output current
Input	
Input current	approx. 3 mA at 24 V DC
Signal level	1-signal: 16 ... 30 V DC 0-signal: 0 ... 5 V DC
Output	
Internal resistor	272 Ω
Limit	current I_E: 45 mA voltage U_E: 11.7 V
Open loop voltage	≥ 24 V
Output rated operating current	45 mA
Output signal	these values are valid for rated operational voltages from 20 ... 30 V DC
Energized/De-energized delay	≤ 20 ms/≤ 20 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	ZELM 00 ATEX 0024
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22]
Statement of conformity	TÜV 02 ATEX 1820 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	16-548FM-12
IECEx approval	IECEx TUN 04.0001
Approved for	[Ex ia] IIC, [Ex iaD]

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Output 45 mA at 11.7 V DC**
- **Logic input, non-polarized**
- **Lead monitoring**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms.

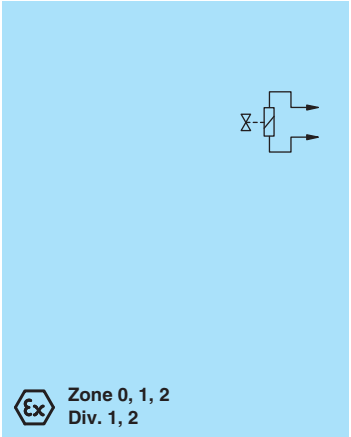
It is controlled by means of a logic circuit. Voltage signals in a range of 16 V DC ... 30 V DC are accepted as 1-signal. The 0-signal must be within a range of 0 V DC ... 5 V DC. The current consumption of the logic inputs is about 3 mA each.

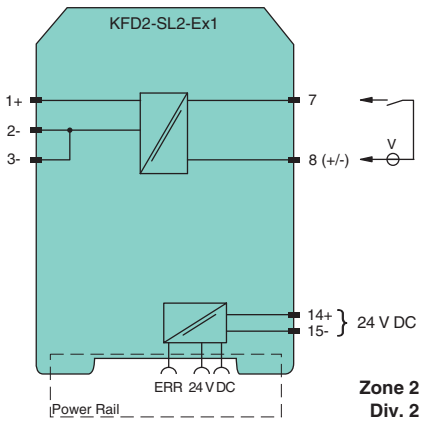
At full load, 11.7 V at 45 mA is available for the hazardous area load.

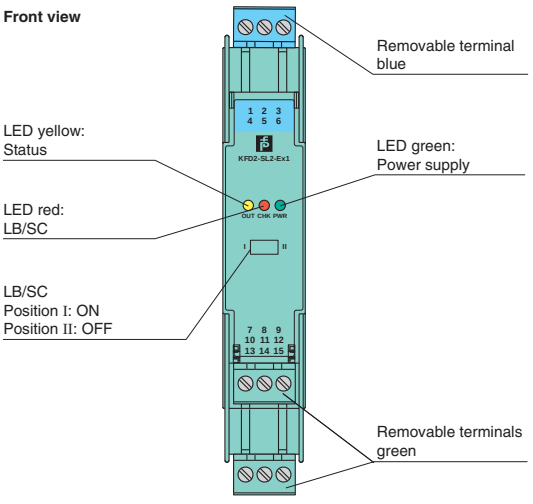
Line fault detection of the field circuit is indicated by a red LED. The error signal switches on if the field impedance is > 10 kΩ for lead breakage or < 50 Ω for short circuits.

A unique collective error messaging feature is available when used with the Power Rail system.

Diagrams







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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Output 45 mA at 11.7 V DC**
- **Logic input, non-polarized**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms.

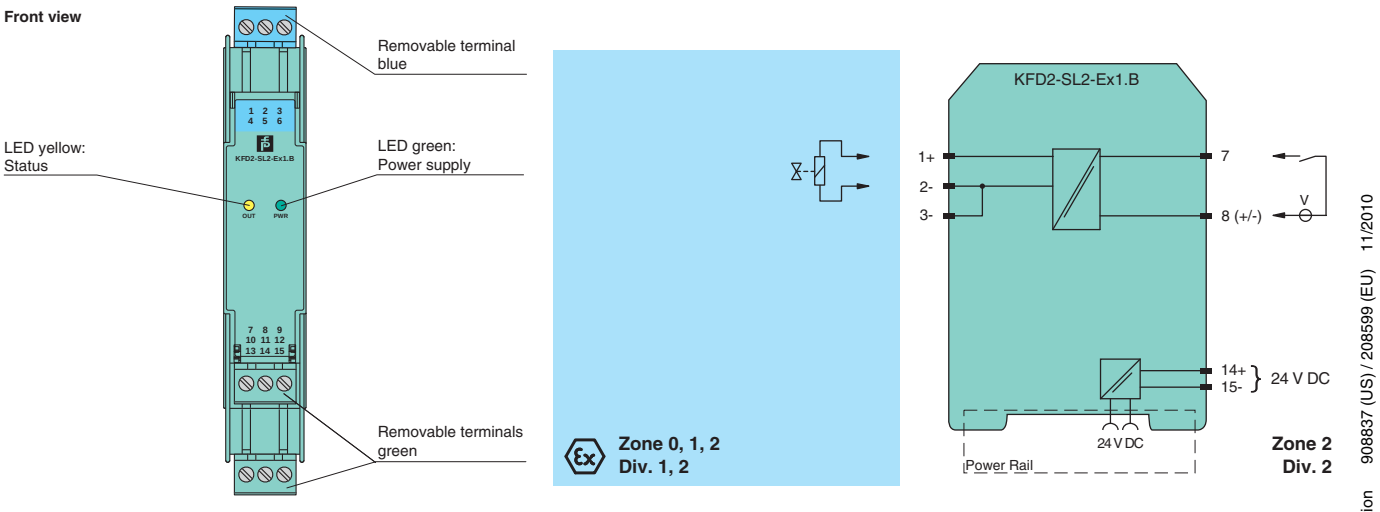
It is controlled by means of a logic circuit. Voltage signals in a range of 16 V DC ... 30 V DC are accepted as 1-signal. The 0-signal must be within a range of 0 V DC ... 5 V DC. The current consumption of the logic inputs is about 3 mA each.

At full load, 11.7 V at 45 mA is available for the hazardous area load.

Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power consumption	≤ 1.7 W at 45 mA output current
Input	
Input current	approx. 3 mA at 24 V DC
Signal level	1-signal: 16 ... 30 V DC 0-signal: 0 ... 5 V DC
Output	
Internal resistor	272 Ω
Limit	current I_E: 45 mA voltage U_E: 11.7 V
Open loop voltage	≥ 24 V
Output rated operating current	45 mA
Output signal	these values are valid for rated operational voltages from 20 ... 30 V DC
Energized/De-energized delay	≤ 20 ms/≤ 20 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	ZELM 00 ATEX 0024
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22]
Statement of conformity	TÜV 02 ATEX 1820 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	16-548FM-12
IECEx approval	IECEx TUN 04.0001
Approved for	[Ex ia] IIC, [Ex iaD]

Diagrams



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Technical data

Supply	
Rated voltage	19 ... 30 V DC
Power consumption	≤ 1.9 W at 45 mA output current
Input	
Input current	approx. 3 mA
Signal level	1-signal: 16 ... 30 V DC 0-signal: 0 ... 5 V DC
Output	
Output I	
Internal resistor	270 Ω
Limit	current I_E: 45 mA voltage U_E: 11.2 V
Open loop voltage	≥ 23.5 V
Output rated operating current	45 mA
Output signal	These values are valid for the rated operational voltage 19 ... 30 V DC.
Output II	
Contact loading	terminals 10, 11, 12, 253 V AC/2 A/cos Φ> 0.7; 40 V DC/2 A resistive load
Lead monitoring	relay; signal at short-circuit R_B < 50 Ω, lead breakage R_B > 10 kΩ
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	ZELM 99 ATEX 0015
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC, [Ex iaD] [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 02 ATEX 1820 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Output 45 mA at 11.2 V DC**
- **Logic input, non-polarized**
- **Fault relay contact output**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms.

It is controlled by means of a logic circuit. Voltage signals in a range of 16 V DC ... 30 V DC are accepted as 1-signal. The 0-signal must be within a range of 0 V DC ... 5 V DC. The current consumption of the logic inputs is about 3 mA each.

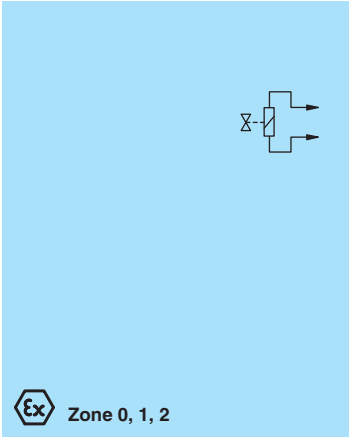
At full load, 11.2 V at 45 mA is available for the hazardous area load.

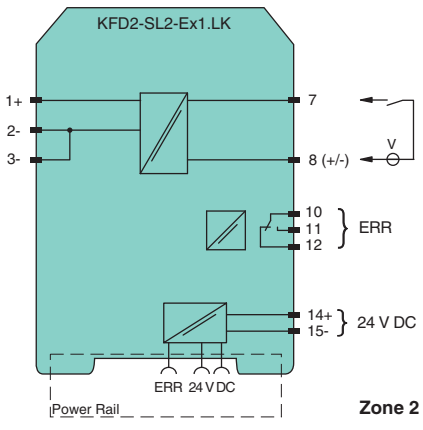
Line fault detection of the field circuit is indicated by a red LED, and initiation of a form C changeover relay contact.

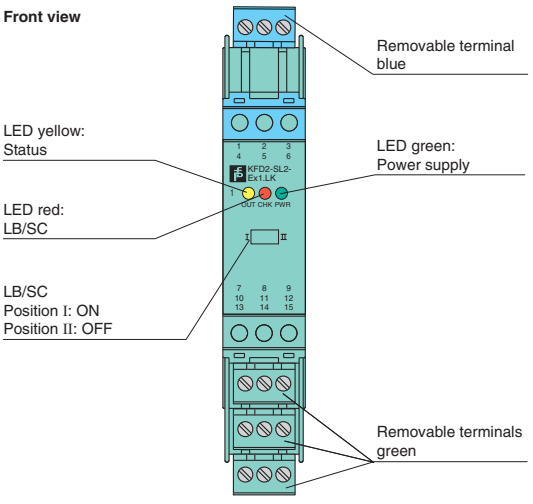
During an error condition, the relay reverts to its de-energized state. The error signal switches on if the field impedance is > 10 kΩ for lead breakage or < 50 Ω for short circuits.

A unique collective error messaging feature is available when used with the Power Rail system.

Diagrams







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KFD2-SL2-Ex1.LK.1045

Solenoid Driver

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Output 45 mA at 10 V DC**
- **Logic input, non-polarized**
- **Fault relay contact output**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms.

It is controlled by means of a logic circuit. Voltage signals in a range of 16 V DC ... 30 V DC are accepted as 1-signal. The 0-signal must be within a range of 0 V DC ... 5 V DC. The current consumption of the logic inputs is about 3 mA each.

At full load, 10 V at 45 mA is available for the hazardous area load.

Line fault detection of the field circuit is indicated by a red LED, and initiation of a form C changeover relay contact.

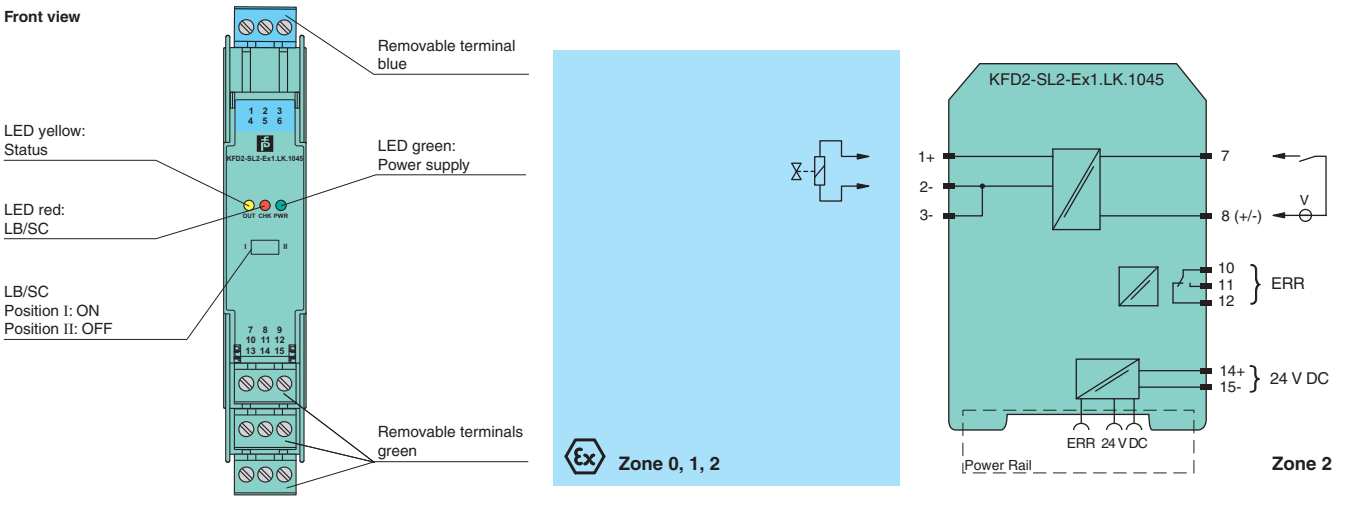
During an error condition, the relay reverts to its de-energized state. The error signal switches on if the field impedance is > 10 kΩ for lead breakage or < 50 Ω for short circuits.

A unique collective error messaging feature is available when used with the Power Rail system.

Technical data

Supply	
Rated voltage	19 ... 30 V DC
Power consumption	≤ 1.9 W at 45 mA output current
Input	
Input current	approx. 3 mA
Signal level	1-signal: 16 ... 30 V DC 0-signal: 0 ... 5 V DC
Output	
Output I	
Internal resistor	300 Ω
Limit	current I_E: 45 mA voltage U_E: 10 V
Open loop voltage	≥ 23.5 V
Output rated operating current	45 mA
Output signal	These values are valid for the rated operational voltage 19 ... 30 V DC.
Output II	
Contact loading	terminals 10, 11, 12, 253 V AC/2 A/cos Φ> 0.7; 40 V DC/2 A resistive load
Lead monitoring	relay; signal at short-circuit R_B < 50 Ω, lead breakage R_B > 10 kΩ
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	ZELM 99 ATEX 0015
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC, [Ex iaD] [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 02 ATEX 1820 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4

Diagrams



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Technical data

Supply	
Rated voltage	19 ... 30 V DC
Power consumption	≤ 1.9 W at 45 mA output current
Input	
Input current	approx. 3 mA
Signal level	1-signal: 16 ... 30 V DC 0-signal: 0 ... 5 V DC
Output	
Output I	
Internal resistor	92 Ω
Limit	current I_E: 70 mA voltage U_E: 12.5 V
Open loop voltage	≥ 19.2 V
Output rated operating current	70 mA
Output signal	These values are valid for the rated operational voltage 19 ... 30 V DC.
Output II	
Contact loading	terminals 10, 11, 12, 253 V AC/2 A/cos Φ> 0.7; 40 V DC/2 A resistive load
Lead monitoring	relay; signal at short-circuit R_B < 50 Ω, lead breakage R_B > 10 kΩ
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	ZELM 99 ATEX 0015
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIB, [Ex ia D] [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 02 ATEX 1820 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Output 70 mA at 12.5 V DC**
- **Logic input, non-polarized**
- **Fault relay contact output**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms.

It is controlled by means of a logic circuit. Voltage signals in a range of 16 V DC ... 30 V DC are accepted as 1-signal. The 0-signal must be within a range of 0 V DC ... 5 V DC. The current consumption of the logic inputs is about 3 mA each.

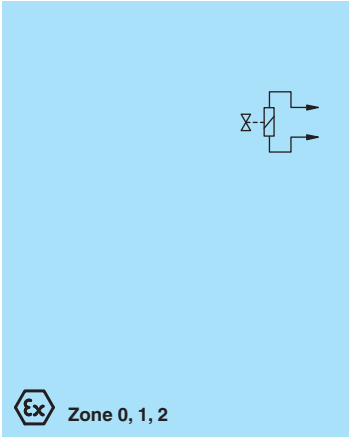
At full load, 12.5 V at 70 mA is available for the hazardous area load.

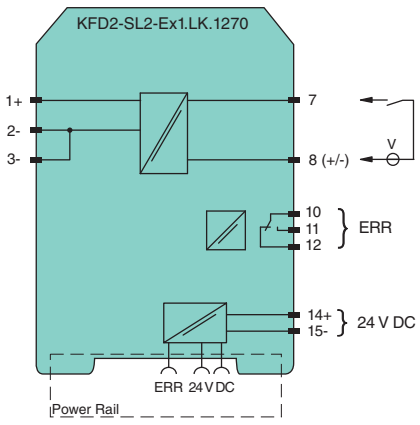
Line fault detection of the field circuit is indicated by a red LED, and initiation of a form C changeover relay contact.

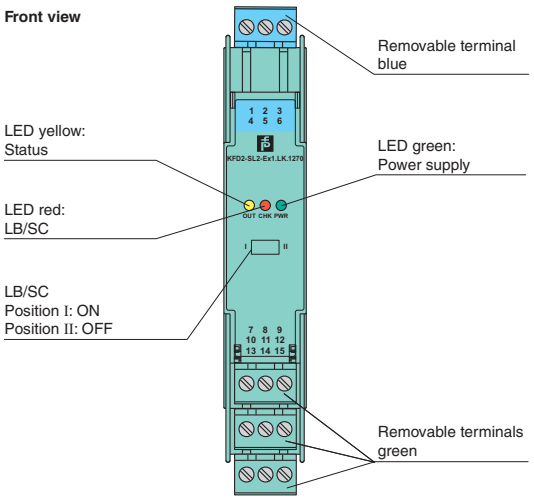
During an error condition, the relay reverts to its de-energized state. The error signal switches on if the field impedance is > 10 kΩ for lead breakage or < 50 Ω for short circuits.

A unique collective error messaging feature is available when used with the Power Rail system.

Diagrams







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Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Output 45 mA at 11.7 V DC**
- **Logic input, non-polarized**
- **Lead monitoring**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms.

It is controlled by means of a logic circuit. Voltage signals in a range of 16 V DC ... 30 V DC are accepted as 1-signal. The 0-signal must be within a range of 0 V DC ... 5 V DC. The current consumption of the logic inputs is about 3 mA each.

At full load, 11.7 V at 45 mA is available for the hazardous area load.

Line fault detection of the field circuit is indicated by a red LED. The error signal switches on if the field impedance is > 10 kΩ for lead breakage or < 50 Ω for short circuits.

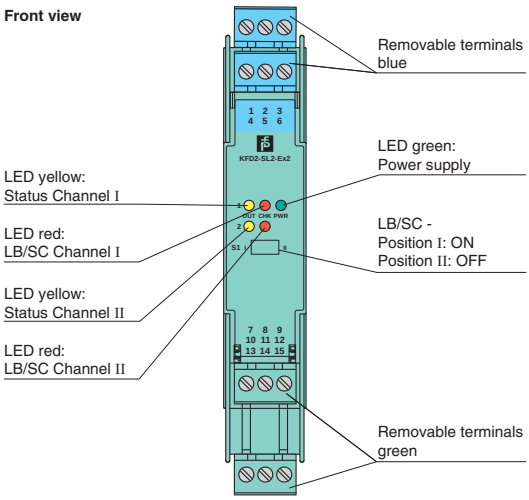
A unique collective error messaging feature is available when used with the Power Rail system.

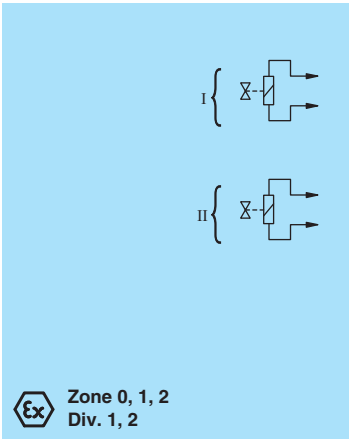
Technical data

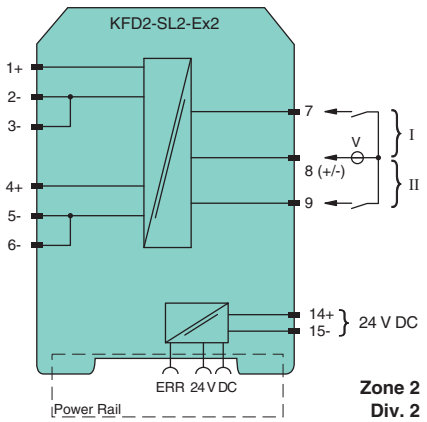
Supply	
Rated voltage	20 ... 30 V DC
Power consumption	≤ 3.3 W at 45 mA output current
Input	
Input current	approx. 3 mA at 24 V DC
Signal level	1-signal: 16 ... 30 V DC 0-signal: 0 ... 5 V DC
Output	
Internal resistor	272 Ω
Limit	Current I_E: 45 mA voltage U_E: 11.7 V
Open loop voltage	≥ 24 V
Output rated operating current	45 mA
Output signal	these values are valid for rated operational voltages from 20 ... 30 V DC
Energized/De-energized delay	≤ 20 ms/≤ 20 ms
Ambient conditions	
Ambient temperature	-20 ... 50 °C (-4 ... 122 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	ZELM 00 ATEX 0024
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22]
Statement of conformity	TÜV 02 ATEX 1820 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	16-548FM-12
IECEx approval	IECEx TUN 04.0001
Approved for	[Ex ia] IIC, [Ex iaD]

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power consumption	≤3.3 W at 45 mA output current
Input	
Input current	approx. 3 mA at 24 V DC
Signal level	1-signal: 16 ... 30 V DC 0-signal: 0 ... 5 V DC
Output	
Internal resistor	272 Ω
Limit	current I_E: 45 mA voltage U_E: 11.7 V
Open loop voltage	≥ 24 V
Output rated operating current	45 mA
Output signal	these values are valid for rated operational voltages from 20 ... 30 V DC
Energized/De-energized delay	≤20 ms/≤20 ms
Ambient conditions	
Ambient temperature	-20 ... 50 °C (-4 ... 122 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	ZELM 00 ATEX 0024
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22]
Statement of conformity	TÜV 02 ATEX 1820 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	16-548FM-12
IECEx approval	IECEx TUN 04.0001
Approved for	[Ex ia] IIC, [Ex iaD]

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Output 45 mA at 11.7 V DC**
- **Logic input, non-polarized**
- **Up to SIL2 acc. to IEC 61508**

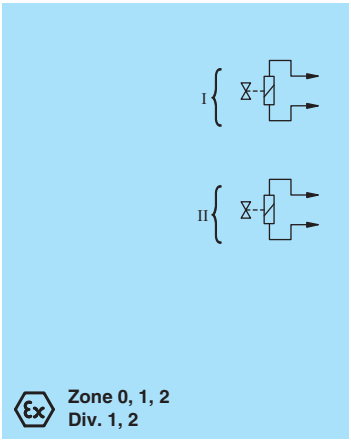
Function

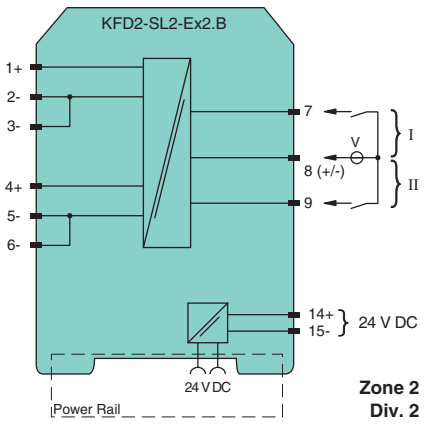
This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms.

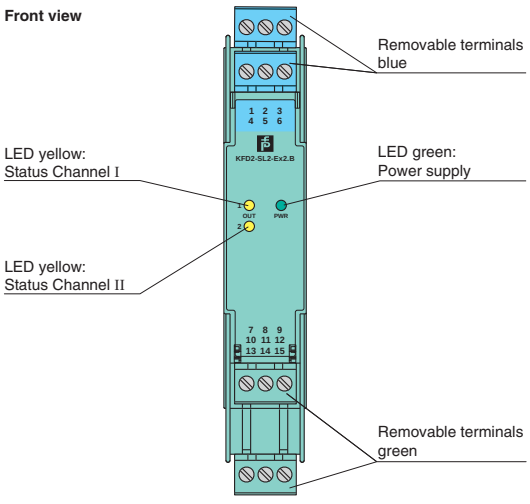
It is controlled by means of a logic circuit. Voltage signals in a range of 16 V DC ... 30 V DC are accepted as 1-signal. The 0-signal must be within a range of 0 V DC ... 5 V DC. The current consumption of the logic inputs is about 3 mA each.

At full load, 11.7 V at 45 mA is available for the hazardous area load.

Diagrams







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KFD2-RCI-Ex1

Solenoid Driver

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Output 20.4 mA at 13.5 V DC**
- **19 V DC ... 30 V DC input**
- **Line fault detection (LFD)**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. The device can be used in shut down applications with HART positioners.

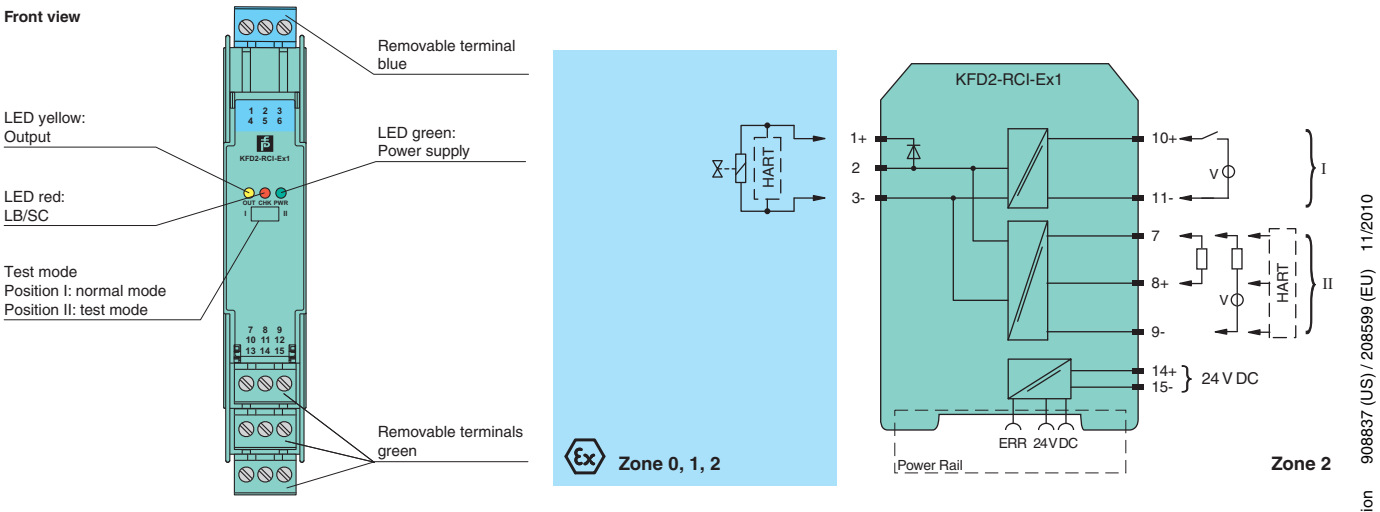
Via the logic input the positioner is energized or de-energized (shut down). Independent of the status, a second input enables HART communication with the positioner. With this the asset management system can request for example diagnostic information or can initiate a partial stroke test. The HART communication also works with de-energized positioner.

A unique collective error messaging feature is available when used with the Power Rail system.

Technical data

Supply	
Rated voltage	19 ... 30 V DC
Power consumption	< 0.8 W
Input	
Input current	40 mA at 19 ... 30 V DC
Signal level	1-signal: 19 ... 30 V DC 0-signal: 0 ... 5 V DC
Power consumption	< 1.2 W
Operating mode	loop powered
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	CESI 09 ATEX 037
Group, category, type of protection	Ⓔx II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22]
Statement of conformity	PF 09 CERT 1438 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4
IECEx approval	IECEx CES 09.0008

Diagrams



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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power loss	typ. 1.2 W
Power consumption	< 1.5 W
Input	
Signal level	1-signal: 15 ... 30 V DC; input current: approx. 2.3 mA at 24 V DC 0-signal: 0 ... 5 V DC or open input
Response delay	5 ... 30 ms (typical 10 ms)
Output	
Internal resistor	≤ 410 Ω
Limit	Current I_E: ≥ 17 mA; typ. 18 mA voltage U_E: ≥ 15.3 V; typ. 16 V
Open loop voltage	≥ 22.3 V
Output rated operating current	17 mA
Output signal	these values are valid for rated operational voltages from 20 ... 30 V DC
Transfer characteristics	
Switching frequency	15 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	PTB 00 ATEX 2132
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Output 15.3 V DC at 17 mA**
- **3 logic inputs with AND/OR logic**
- **Service port for isolator function test**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids and other similar loads.

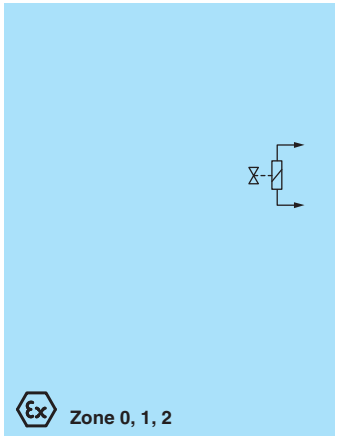
It is controlled by two "OR" and one "AND" configured logic input.

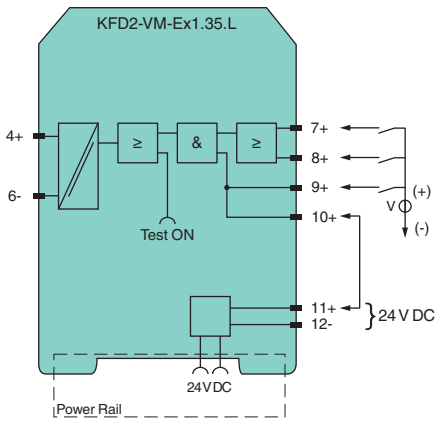
At full load, 15.3 V at 17 mA is available for the hazardous area load. The output signal has a resistive characteristic.

An override/test jack feature is available on the front plate of the device.

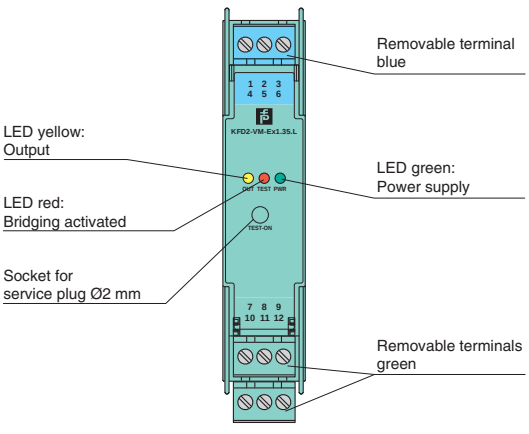
By engaging the service plug, the logic inputs are bypassed and the output is energized. The operation of this test feature is indicated by a red LED.

Diagrams





Front view



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KFD0-RO-Ex2

Relay Module

Features

- **2-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Relay contact output to hazardous area**
- **Logic input 15 V DC ... 30 V DC, non-polarized**

Function

This isolated barrier is used for intrinsic safety applications. It switches circuits inside the hazardous area.

Typical circuits used with this isolator include remote resets, fire alarm tests or remote calibration of strain gauges.

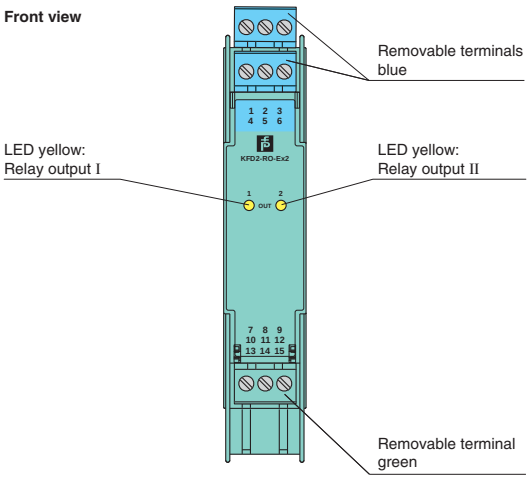
Both outputs are galvanically isolated to the inputs. The inputs are not polarized and share a common reference potential.

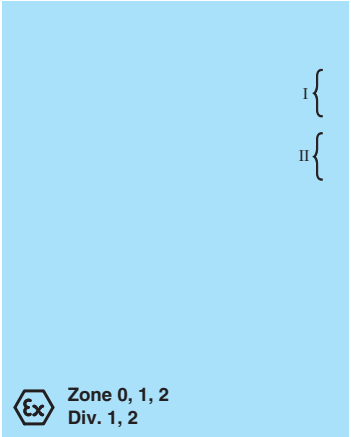
A fuse and an electronic current-limiting circuit protect the inputs of the relay module.

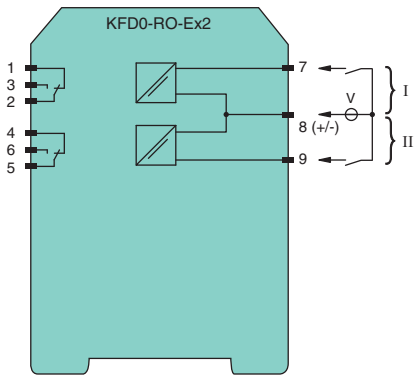
Technical data

Supply	
Power loss	0.8 W
Input	
Rated voltage U_i	15 ... 30 V DC
Rated current I_i	≤21 mA per channel
Output	
Contact loading	230 V AC/2 A/cos Φ> 0.7; 40 V DC/2 A resistive load
Energized/De-energized delay	approx. 10 ms/approx. 5 ms
Mechanical life	5 x 10^6 switching cycles
Transfer characteristics	
Switching frequency	< 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 65 °C (-4 ... 149 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	DMT 00 ATEX E 016
Group, category, type of protection	Ⓔx II (1)GD [Ex ia] IIC, [Ex iaD]
Statement of conformity	TÜV 00 ATEX 1621 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA nC IIC T4
CSA approval	
Control drawing	116-0156

Diagrams







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Technical data

Supply	
Rated voltage	15 ... 35 V DC
Power consumption	approx. 1.5 W
Field circuit	
Interface	RS 232
Input	
Input signal	logic 0: +3 ... +15 V logic 1: -3 ... -15 V
Output	
Output signal	logic 0: +9 ... +12 V logic 1: -9 ... -12 V
Safe area	
Interface	RS 232
Input	
Input signal	logic 0: +3 ... +15 V logic 1: -3 ... -15 V
Output	
Output signal	logic 0: +9 ... +12 V logic 1: -9 ... -12 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 110 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 194 for entity parameters
EC-Type Examination Certificate	BAS 02 ATEX 0116
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC T4 (-40 °C ≤ T_{amb} ≤ 60 °C)
UL approval	
Control drawing	116-0173 (cULus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **RS 232 input/output**

Function

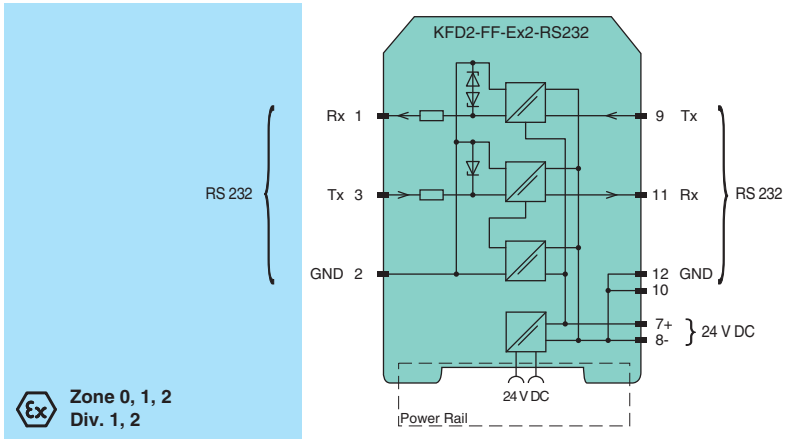
This isolated barrier is used for intrinsic safety applications. It is a repeater for the bi-directional transfer of RS 232 signals.

The input and output circuits are intrinsically safe and designed to transmit and receive RS 232 signals between the safe area and the hazardous area.

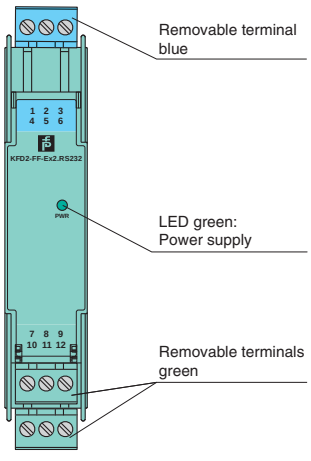
This barrier accepts input signals in the ±3 V ... ±15 V range providing a nominal ±10 V output that is independent of the input voltage.

The maximum rate of data exchange is 20 kBits per second.

Diagrams



Front view



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ATEX Entity Parameters

Model Number	Terminals	U_o (V)	I_o (mA)	P_o (mW)
KCD0-SD-Ex1.1245	1, 2	25.2	110	693
KFD0-SD2-Ex1.10100	1, 2	17	271	1152
KFD0-SD2-Ex1.1045	1, 2	25.2	93	590
KFD0-SD2-Ex1.1065	1, 2	17.22	220	947
KFD0-SD2-Ex1.1180	1, 2	25.2	184	1159
KFD0-SD2-Ex2.1045	1, 2; 4, 5	25.2	93	590
KFD0-SD2-Ex2.1245	1, 2; 4, 5	25.2	110	693
KFD2-FF-Ex2.RS232	1, 2	14.5	48	180
	2, 3	5.4	27	40
	1, 2, 3	19.9	75	200
KFD2-SL2-Ex1	1, 2, 3	28	110	770
KFD2-SL2-Ex1.B	1, 2, 3	28	110	770
KFD2-SL2-Ex1.LK	1, 2, 3	28	110	770
KFD2-SL2-Ex1.LK.1045	1, 2, 3	26	93	607
KFD2-SL2-Ex1.LK.1270	1, 2, 3	22.1	248	1380
KFD2-SL2-Ex2	1, 2, 3; 4, 5, 6	28	110	770
KFD2-SL2-Ex2.B	1, 2, 3; 4, 5, 6	28	110	770
KFD2-RCI-Ex1	1, 2, 3	25.4	93.6	595
KFD2-VM-Ex1.35.L	4, 6	25,2	67.2	423.5

Model Number	Terminals	U_i (V)	I_i (mA)
KFD0-RO-Ex2	1, 2, 3; 4, 5, 6	60	2000

CSA Entity Parameters

Model Number	Terminals	V_{max} (V)	Resistances (Ω)	V_{oc} (V)	I_{sc} (mA)
KFD0-RO-Ex2	1, 2, 3; 4, 5, 6	0	0	–	–

FM Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
KCD0-SD-Ex1.1245	1, 2	25.2	110	–	–
KFD0-SD2-Ex1.10100	1, 2	17	271	–	–
KFD0-SD2-Ex1.1045	1, 2	25.2	93	–	–
KFD0-SD2-Ex1.1065	1, 2	17.22	220	–	–
KFD0-SD2-Ex1.1180	1, 2	25.2	184	–	–
KFD0-SD2-Ex2.1045	1, 2; 4, 5	25.2	93	–	–
KFD0-SD2-Ex2.1245	1, 2; 4, 5	25.2	110	–	–
KFD2-SL2-Ex1	1, 2, 3	28	110	–	–
KFD2-SL2-Ex1.B	1, 2, 3	28	110	–	–
KFD2-SL2-Ex2	1, 2, 3; 4, 5, 6	28	110	–	–
KFD2-SL2-Ex2.B	1, 2, 3; 4, 5, 6	28	110	–	–

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UL Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
KCD0-SD-Ex1.1245	1, 2	25.2	110	–	–
KFD2-FF-Ex2.RS232	1, 2, 3	–	–	19.9	75
KFD0-SD2-Ex1.1045	1, 2, 3	25.2	93	–	–
KFD0-SD2-Ex1.1065	1, 2, 3	17.22	220	–	–
KFD0-SD2-Ex1.10100	1, 2, 3	17.0	271	–	–
KFD0-SD2-Ex1.1180	1, 2, 3	25.2	184	–	–
KFD0-SD2-Ex2.1045	1, 2, 3; 4, 5, 6	25.2	93	–	–
KFD0-SD2-Ex2.1245	1, 2, 3; 4, 5, 6	25.2	110	–	–

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Transmitter Power Supplies

Model Number	Channels	Input (Field)			Output (Control System)				Specials						Page
		2-wire Transmitter	3-wire Transmitter	Current Source	0/4 mA ... 20 mA (Source)	0/4 mA ... 20 mA (Sink)	1 V ... 5 V	2 V ... 10 V	SMART	Higher Field Voltage	Signal Splitting (1 Input – 2 Outputs)	Supply 24 V DC	SIL	Zone 2/Division 2 Mounting	
KCD2-STC-Ex1	1	■		■	■	■	1		■			■	2	■	201
KFD2-STC4-Ex1	1	■	■	■	1				■			■	2	■	202
KFD2-STC4-Ex1-Y122583	1	■	■	■		1			■			■	2	■	203
KFD2-STC4-Ex1.H	1	■	■	■	1				■	■		■	2		204
KFD2-STV4-Ex1-1	1	■	■	■			1		■			■	2		205
KFD2-STV4-Ex1-2	1	■	■	■				1	■			■	2		206
KFD2-STC4-Ex1.2O	1	■	■	■	2				■		■	■	3	■	207
KFD2-STC4-Ex1.2O-Y122582	1	■	■	■		2			■		■	■	3	■	208
KFD2-STC4-Ex1.2O.H	1	■	■	■	2				■	■	■	■	3		209
KFD2-STV4-Ex1.2O-1	1	■	■	■			2		■		■	■	3	■	210
KFD2-STV4-Ex1.2O-2	1	■	■	■				2	■		■	■	3		211
KFD2-STC4-Ex2	2	■			2				■			■	2		212
KFD2-STC4-Ex2-Y203646	2	■				2			■			■	2		213
KFD2-STV4-Ex2-1	2	■					2		■			■	2		214
KFD2-STV4-Ex2-2	2	■						2	■			■	2		215
KFD2-STC3-Ex1	1	■			1				40 kHz			■			216
KFD2-STV3-Ex1-1	1	■					1		40 kHz			■			217
KFD2-STV3-Ex1-2	1	■						1	40 kHz			■			218
DN421	1	■							■			■			219

Transmitter Power Supplies with Trip Values

Model Number	Channels	Input (Field)			Output (Control System)			Supply		SIL	Zone 2/Division 2 Mounting	Page
		2-wire Transmitter	3-wire Transmitter	Current Source	0/4 mA ... 20 mA (Source)	Relay	SMART	24 V DC	115 V AC/ 230 V AC			
KFD2-CRG2-Ex1.D	1	■	■	■	1	2		■		2	■	220
KFU8-CRG2-Ex1.D	1	■	■	■	1	2		■	■	2		221

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Transmitter Power Supplies with HART Communication (HART Loop Converter)

Model Number	Channels	Input (Field)		Output (Control System)		Supply 24 V DC	SIL	Zone 2/Division 2 Mounting	Page
		Signal	Transmitter Supply	0/4 mA ... 20 mA (Active/Passive)	Relay				
KFD2-HLC-Ex1.D	1	HART	■	3		■		■	222
KFD2-HLC-Ex1.D.2W	1	HART	■	3	2	■		■	223
KFD2-HLC-Ex1.D.4S	1	HART	■	3	4	■		■	224

Current Repeaters

Model Number	Channels	Input (Field)				Output (Control System)				Supply Loop Powered	SIL	Zone 2/Division 2 Mounting	Page
		0 mA ... 40 mA	1 mA ... 20 mA	4 mA ... 20 mA	Fire Alarm	0 mA ... 40 mA	1 mA ... 20 mA	4 mA ... 20 mA	SMART				
KFD0-SCS-Ex1.55	1			■				1	■	■	2	■	225
KFD0-CS-Ex1.50P	1			■	■			1		■	2	■	226
KFD0-CS-Ex1.51P	1	■			■	1				■	2	■	227
KFD0-CS-Ex1.52	1			■				1		■		■	228
KFD0-CS-Ex1.54	1		■		■		1		■	■		■	229
KFD0-CS-Ex2.50P	2			■	■			2		■	2	■	230
KFD0-CS-Ex2.51P	2	■			■	2				■	2	■	231
KFD0-CS-Ex2.52	2			■				2		■		■	232
KFD0-CS-Ex2.54	2		■		■		2		■	■		■	233

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Voltage Repeaters

Model Number	Channels	Transmission Range							Supply 24 V DC	SIL	Zone 2/Division 2 Mounting	Page
		-50 mV ... 50 mV	-500 mV ... 500 mV	-10 V ... 10 V	-20 V ... 0 V	0 V ... 9 V	0 V ... 12 V	Cutoff Frequency				
KFD2-VR2-Ex1.50M	1	■						350 Hz	■		■	234
KFD2-VR2-Ex1.500M	1		■					350 Hz	■			235
KFD2-VR-Ex1.12	1					■		1.2 kHz	■			236
KFD2-VR-Ex1.18	1						■	4 kHz	■			237
KFD2-VR-Ex1.19	1			■				4 kHz	■			238
KFD2-VR-Ex1.19-Y109129	1			■				50 kHz	■			239
KFD2-VR4-Ex1.26	1				■			20 kHz	■		■	240

Current and Voltage Converters

Model Number	Channels	Input (Field)				Output (Control System)			Supply		SIL	Zone 2/Division 2 Mounting	Page
		-100 mV ... 100 mV	0/2 V ... 10 V	0/4 mA ... 20 mA	Strain Gauge	0/4 mA ... 20 mA	0 mA ... ±20 mA	Relay	24 V DC	Loop Powered			
KFD0-CC-Ex1	1		■	■		1				■		■	241
KFD2-WAC2-Ex1.D	1	■			■		1	2	■				242

Temperature Converters and Repeaters

Model Number	Channels	Input (Field)				Output (Control System)			Supply		SIL	Zone 2/Division 2 Mounting	Page
		RTD	TC	Potentiometer	V	4 mA ... 20 mA	0/1 V ... 5 V	Resistance	24 V DC	Loop Powered			
KFD2-UT2-Ex1	1	■	■	■	■	1			■		2	■	243
KFD2-UT2-Ex1-1	1	■	■	■	■		1		■		2	■	244
KFD2-UT2-Ex2	2	■	■	■	■	2			■		2	■	245
KFD2-UT2-Ex2-1	2	■	■	■	■		2		■		2	■	246
KFD0-TR-Ex1	1	■				1				■		■	247
KFD0-TT-Ex1	1		■			1				■		■	248
KCD2-RR-Ex1	1	■						1	■			■	249

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Temperature Converters with Trip Values

Model Number	Channels	Input (Field)					Output (Control System)		Supply		SIL	Zone 2/Division 2 Mounting	Page
		RTD	TC	Potentiometer	V	mA	4 mA ... 20 mA	Relay	24 V DC	115 V AC/ 230 V AC			
KFD2-GU-Ex1	1	■	■		■	■		2	■				250
KFD2-GUT-Ex1.D	1	■	■	■	■		1	2	■		2	■	251
KFU8-GUT-Ex1.D	1	■	■	■	■		1	2	■	■	2		252

Potentiometers and Resistor Converters

Model Number	Channels	Input (Field)				Output (Control System)			Supply		SIL	Zone 2/Division 2 Mounting	Page
		2-wire	3-wire	4-wire	5-wire	0/4 mA ... 20 mA	0/1 V ... 5/10 V	Resistance	24 V DC	Loop Powered			
KFD2-UT2-Ex1	1	■	■	■		1			■		2	■	243
KFD2-UT2-Ex1-1	1	■	■	■			1		■		2	■	244
KFD2-UT2-Ex2	2	■	■	■*		2			■		2	■	245
KFD2-UT2-Ex2-1	2	■	■	■*			2		■		2	■	246
KCD2-RR-Ex1	1	■	■	■				1	■			■	249
KFD2-PT2-Ex1	1		■	■	■		1		■			■	253
KFD2-PT2-Ex1-1	1		■	■	■		1		■			■	254
KFD2-PT2-Ex1-4	1		■	■	■	1			■			■	255
KFD2-PT2-Ex1-5	1		■	■	■	1			■			■	256
KFD0-RC-Ex1	1		■	■	■	1				■		■	257

* 4-wire on channel I only

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Technical data

Supply	
Rated voltage	19 ... 30 V DC
Power consumption	≤ 1.1 W
Input	
Input signal	4 ... 20 mA limited to approx. 30 mA
Voltage drop U_d	approx. 5 V on terminals 3+, 4-
Available voltage	≥ 15 V at 20 mA terminals 1+, 2-
Output	
Load	0 ... 300 Ω (source mode)
Output signal	4 ... 20 mA or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt) 4 ... 20 mA (sink mode), operating voltage 15.5 ... 26 V
Ripple	20 mV_{rms}
Transfer characteristics	
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 3 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0 ... 3 kHz (-3 dB)
Rise time	10 to 90 % ≤ 20 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 114 x 124 mm (0.5 x 4.5 x 4.9 in), housing type A2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	CESI 06 ATEX 021
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC, [Ex ia D] [circuit(s) in zone 0/1/2/20/21/22]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 X
FM approval	
Control drawing	16-533FM-12 (cFMus)
UL approval	
Control drawing	16-533FM-12 (cULus)
IECEx approval	IECEx CES 06.0001
Approved for	[Ex ia] IIC

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire SMART transmitters and 2-wire SMART current sources**
- **Output 4 mA ... 20 mA or 1 V ... 5 V**
- **Sink or source mode**
- **Housing width 12.5 mm**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire SMART transmitters in a hazardous area, and can also be used with 2-wire SMART current sources.

It transfers the analog input signal to the safe area as an isolated current value.

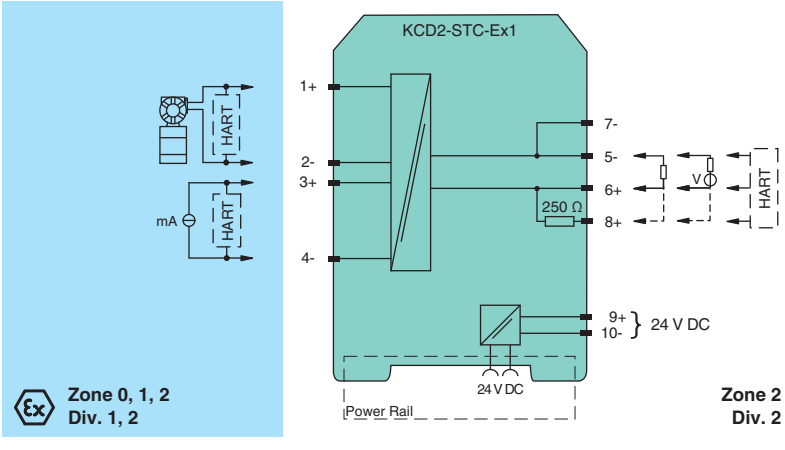
Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

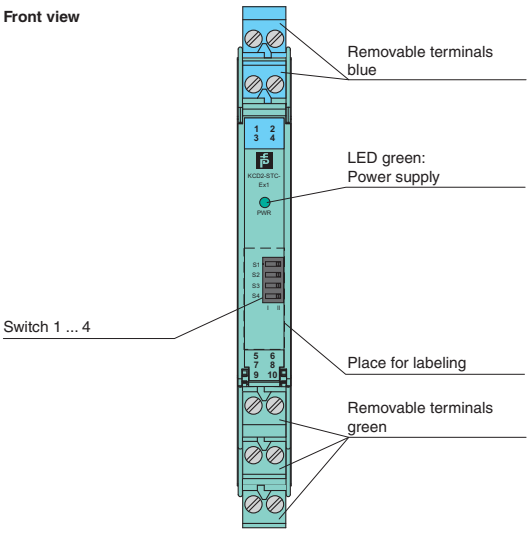
Selectable output of current source, sink mode, or voltage output is available via DIP switches.

If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 6 and 8 can be used.

Test sockets for the connection of HART communicators are integrated into the terminals of the device.

Diagrams





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KFD2-STC4-Ex1

SMART Transmitter Power Supply

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire and 3-wire SMART transmitters and 2-wire SMART current sources**
- **Output 0/4 mA ... 20 mA**
- **Terminals with test points**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire and 3-wire SMART transmitters in a hazardous area, and can also be used with 2-wire SMART current sources.

It transfers the analog input signal to the safe area as an isolated current value.

Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8 and 9 can be used.

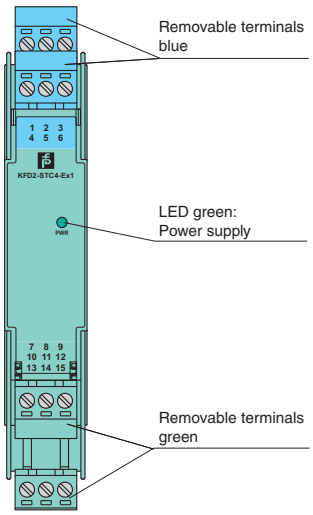
Test sockets for the connection of HART communicators are integrated into the terminals of the device.

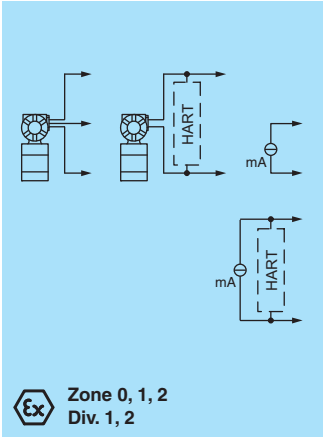
Technical data

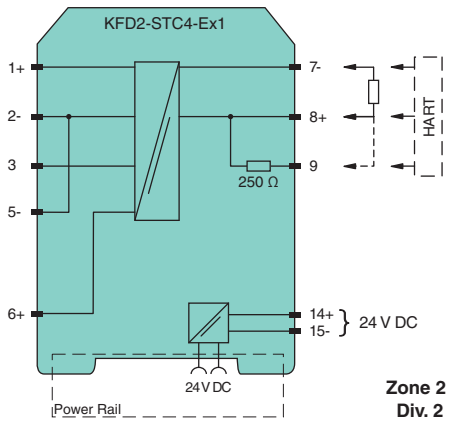
Supply	
Rated voltage	20 ... 35 V DC
Power consumption	1.9 W
Input	
Input signal	0/4 ... 20 mA
Input resistance	≤ 64 Ω terminals 2-, 3; ≤ 500 Ω terminals 1+, 3 (250 Ω load)
Available voltage	≥ 16 V at 20 mA terminals 1+, 3
Output	
Load	0 ... 800 Ω
Output signal	0/4 ... 20 mA (overload > 25 mA)
Ripple	≤ 50 μA_{rms}
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/4 ... 20 mA ≤ 10 µA incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	0.25 µA/K
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 7.5 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 200 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7060
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
EC-Type Examination Certificate	DMT 01 ATEX E 133
Group, category, type of protection	⟨Ex⟩ I (M1) [EEx ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Power consumption	1.9 W
Input	
Input signal	0/4 ... 20 mA
Input resistance	≤ 64 Ω terminals 2-, 3; ≤ 500 Ω terminals 1+, 3 (250 Ω load)
Available voltage	≥ 16 V at 20 mA terminals 1+, 3
Output	
Output signal	0/4 ... 20 mA (overload > 25 mA)
Ripple	≤ 50 μA_{rms}
External supply (loop)	11 ... 30 V DC
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/4 ... 20 mA ≤ 10 µA incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	0.25 µA/K
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 7.5 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 200 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7060
Group, category, type of protection	⟨Ex⟩ II (1)GD, [Ex ia] IIC, [Ex iaD] (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire and 3-wire SMART transmitters and 2-wire SMART current sources**
- **0/4 mA ... 20 mA current sink output**
- **Terminals with test points**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire and 3-wire SMART transmitters in a hazardous area, and can also be used with 2-wire SMART current sources.

It transfers the analog input signal to the safe area as an isolated current value.

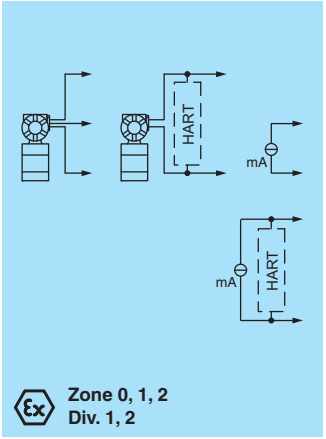
Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

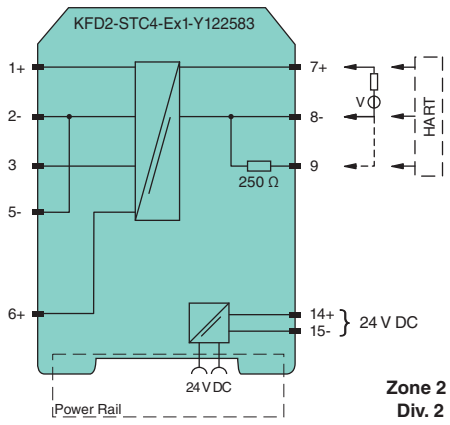
It is designed to provide a sink mode output on the safe area terminals.

If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8 and 9 can be used.

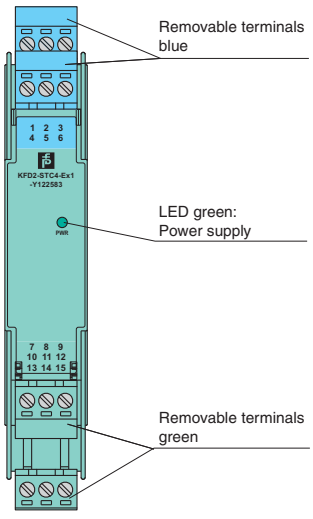
Test sockets for the connection of HART communicators are integrated into the terminals of the device.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire and 3-wire SMART transmitters and 2-wire SMART current sources**
- **Output 0/4 mA ... 20 mA**
- **Terminals with test points**
- **High field voltage 17.6 V DC**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire and 3-wire SMART transmitters with higher output voltage in a hazardous area, and can also be used with 2-wire SMART current sources.

It transfers the analog input signal to the safe area as an isolated current value.

Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8 and 9 can be used.

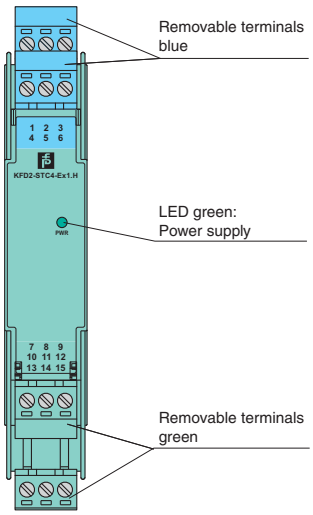
Test sockets for the connection of HART communicators are integrated into the terminals of the device.

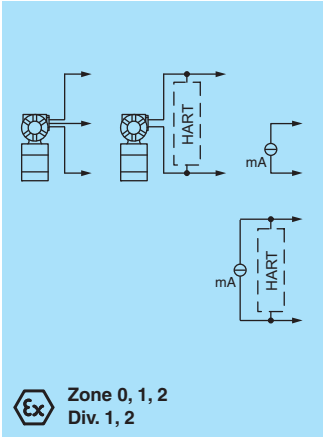
Technical data

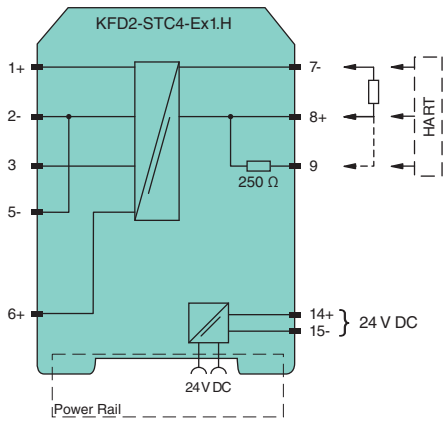
Supply	
Rated voltage	20 ... 35 V DC
Power consumption	1.9 W
Input	
Input signal	0/4 ... 20 mA
Input resistance	≤ 64 Ω terminals 2-, 3; ≤ 500 Ω terminals 1+, 3 (250 Ω load)
Available voltage	≥ 17.6 V at 20 mA terminals 1+, 3
Output	
Load	0 ... 800 Ω
Output signal	0/4 ... 20 mA (overload > 25 mA)
Ripple	≤ 50 μA_{rms}
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/4 ... 20 mA ≤ 10 µA incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	0.25 µA/K
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 7.5 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 200 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7060
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
EC-Type Examination Certificate	DMT 01 ATEX E 133
Group, category, type of protection	⟨Ex⟩ I (M1) [EEx ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Power consumption	1.9 W
Input	
Input signal	0/4 ... 20 mA
Input resistance	≤ 64 Ω terminals 2-, 3; ≤ 500 Ω terminals 1+, 3 (250 Ω load)
Available voltage	≥ 16 V at 20 mA terminals 1+, 3
Output	
Load	output resistance: 250 Ω
Output signal	0/1 ... 5 V
Ripple	≤ 12.5 mV
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/1 ... 5 V ≤ 5 mV incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	≤ 20 ppm/K
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 7.5 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
De-energized delay	20 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 200 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7060
Group, category, type of protection	⟨Ex⟩ II (1)GD, [Ex ia] IIC, [Ex iaD] (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire and 3-wire SMART transmitters and 2-wire SMART current sources**
- **Output 0/1 V ... 5 V**
- **Terminals with test points**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire and 3-wire SMART transmitters in a hazardous area, and can also be used with 2-wire SMART current sources.

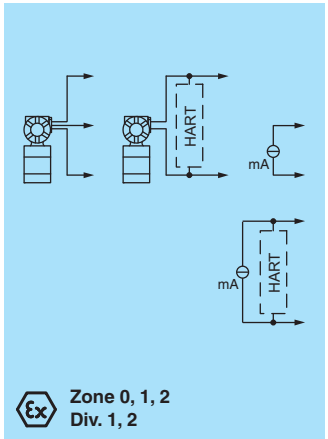
It transfers the analog input signal to the safe area as an isolated voltage value.

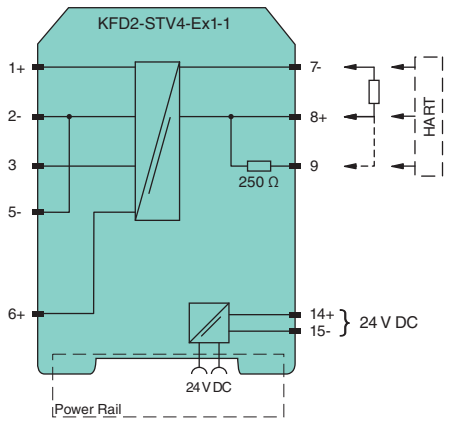
Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8 and 9 can be used.

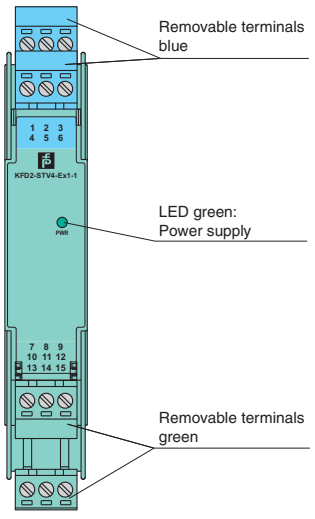
Test sockets for the connection of HART communicators are integrated into the terminals of the device.

Diagrams





Front view



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KFD2-STV4-Ex1-2

SMART Transmitter Power Supply

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire and 3-wire SMART transmitters and 2-wire SMART current sources**
- **Output 0/2 V ... 10 V**
- **Terminals with test points**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire and 3-wire SMART transmitters in a hazardous area, and can also be used with 2-wire SMART current sources.

It transfers the analog input signal to the safe area as an isolated voltage value.

Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8 and 9 can be used.

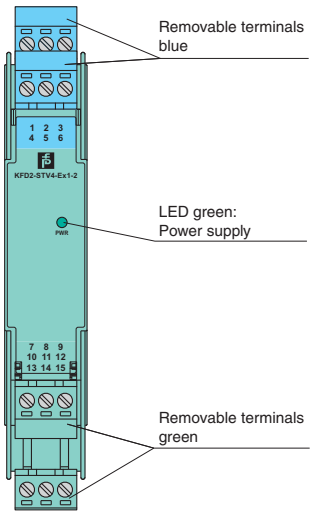
Test sockets for the connection of HART communicators are integrated into the terminals of the device.

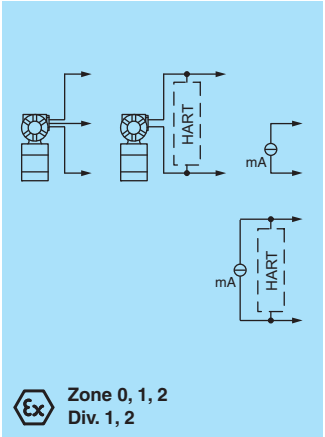
Technical data

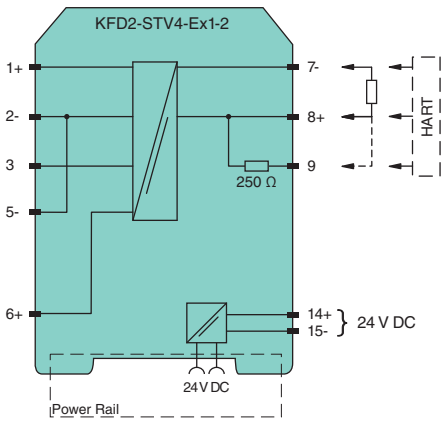
Supply	
Rated voltage	20 ... 35 V DC
Power consumption	1.9 W
Input	
Input signal	0/4 ... 20 mA
Input resistance	≤ 64 Ω terminals 2-, 3; ≤ 500 Ω terminals 1+, 3 (250 Ω load)
Available voltage	≥ 16 V at 20 mA terminals 1+, 3
Output	
Load	output resistance: 500 Ω
Output signal	0/2 ... 10 V
Ripple	≤ 25 mV
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/2 ... 10 V ≤ 10 mV incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	≤ 20 ppm/K
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 7.5 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
De-energized delay	20 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 200 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7060
Group, category, type of protection	Ⓔx II (1)GD, [Ex ia] IIC, [Ex iaD] (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Power consumption	2.5 W
Input	
Input signal	0/4 ... 20 mA
Input resistance	≤ 76 Ω terminals 2-, 3; ≤ 500 Ω terminals 1+, 3 (250 Ω load)
Available voltage	≥ 16 V at 20 mA terminals 1+, 3
Output	
Load	0 ... 550 Ω
Output signal	0/4 ... 20 mA (overload > 25 mA)
Ripple	≤ 50 μA_{rms}
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/4 ... 20 mA ≤ 10 µA incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	0.25 µA/K
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 7.5 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 200 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7060
Group, category, type of protection	⟨Ex⟩ II (1)GD, [Ex ia] IIC, [Ex iaD] (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire and 3-wire SMART transmitters and 2-wire SMART current sources**
- **Dual output 0/4 mA ... 20 mA**
- **Terminals with test points**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire and 3-wire SMART transmitters in a hazardous area, and can also be used with 2-wire SMART current sources.

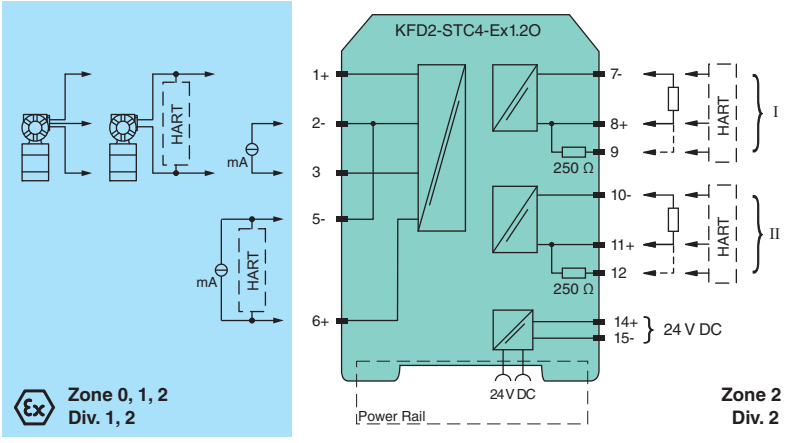
It transfers the analog input signal to the safe area as two isolated current values.

Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

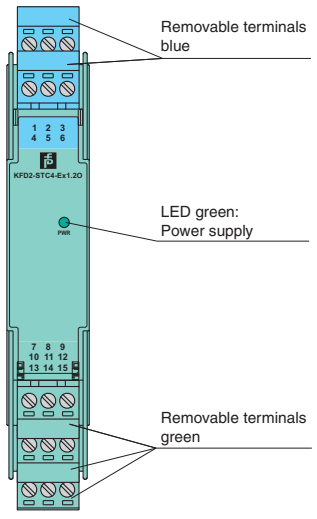
If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8, 9 and 11, 12 can be used.

Test sockets for the connection of HART communicators are integrated into the terminals of the device.

Diagrams



Front view



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KFD2-STC4-Ex1.2O-Y122582

SMART Transmitter Power Supply

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire and 3-wire SMART transmitters and 2-wire SMART current sources**
- **Dual output 0/4 mA ... 20 mA, current sink**
- **Terminals with test points**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire and 3-wire SMART transmitters in a hazardous area, and can also be used with 2-wire SMART current sources.

It transfers the analog input signal to the safe area as two isolated current values.

Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

It is designed to provide a sink mode output on the safe area terminals.

If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8, 9 and 11, 12 can be used.

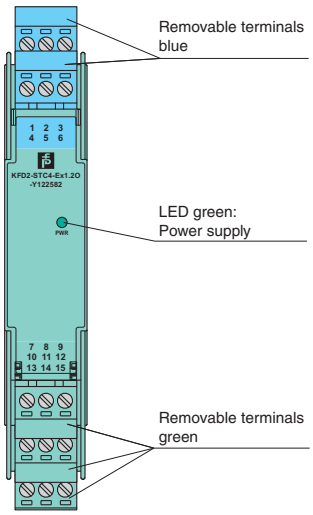
Test sockets for the connection of HART communicators are integrated into the terminals of the device.

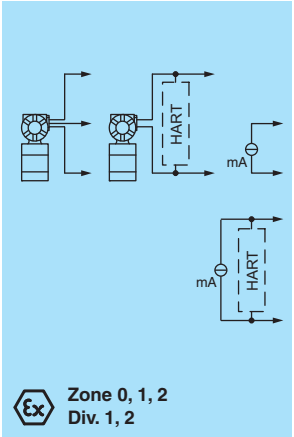
Technical data

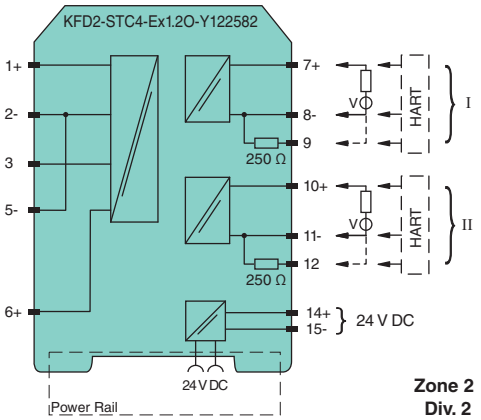
Supply	
Rated voltage	20 ... 35 V DC
Power consumption	2.5 W
Input	
Input signal	0/4 ... 20 mA
Input resistance	≤ 76 Ω terminals 2-, 3; ≤ 500 Ω terminals 1+, 3 (250 Ω load)
Available voltage	≥ 16 V at 20 mA terminals 1+, 3
Output	
Output signal	0/4 ... 20 mA (overload > 25 mA)
Ripple	≤ 50 μA_{rms}
External supply (loop)	11 ... 30 V DC
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/4 ... 20 mA ≤ 10 µA incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	0.25 µA/K
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 7.5 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 200 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7060
Group, category, type of protection	⟨Ex⟩ II (1)GD, [Ex ia] IIC, [Ex iaD] (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Power consumption	2.5 W
Input	
Input signal	0/4 ... 20 mA
Input resistance	≤ 76 Ω terminals 2-, 3; ≤ 500 Ω terminals 1+, 3 (250 Ω load)
Available voltage	≥ 17.6 V at 20 mA terminals 1+, 3
Output	
Load	0 ... 550 Ω
Output signal	0/4 ... 20 mA (overload > 25 mA)
Ripple	≤ 50 μA_{rms}
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/4 ... 20 mA ≤ 10 µA incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	0.25 µA/K
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 7.5 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 200 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7060
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
EC-Type Examination Certificate	DMT 01 ATEX E 133
Group, category, type of protection	⟨Ex⟩ I (M1) [EEx ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire and 3-wire SMART transmitters and 2-wire SMART current sources**
- **Dual output 0/4 mA ... 20 mA**
- **Terminals with test points**
- **High field voltage 17.6 V DC**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire and 3-wire SMART transmitters with higher output voltage in a hazardous area, and can also be used with 2-wire SMART current sources.

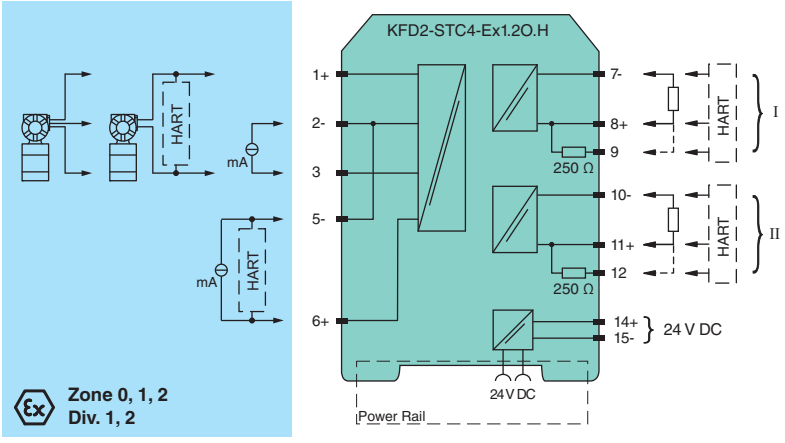
It transfers the analog input signal to the safe area as two isolated current values.

Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

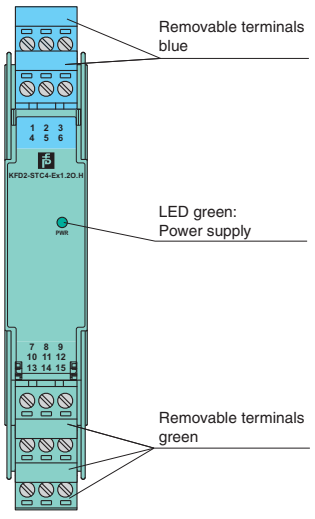
If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8, 9 and 11, 12 can be used.

Test sockets for the connection of HART communicators are integrated into the terminals of the device.

Diagrams



Front view



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KFD2-STV4-Ex1.2O-1

SMART Transmitter Power Supply

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire and 3-wire SMART transmitters and 2-wire SMART current sources**
- **Dual output 0/1 V ... 5 V**
- **Terminals with test points**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire and 3-wire SMART transmitters in a hazardous area, and can also be used with 2-wire SMART current sources.

It transfers the analog input signal to the safe area as two isolated voltage values.

Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8, 9 and 11, 12 can be used.

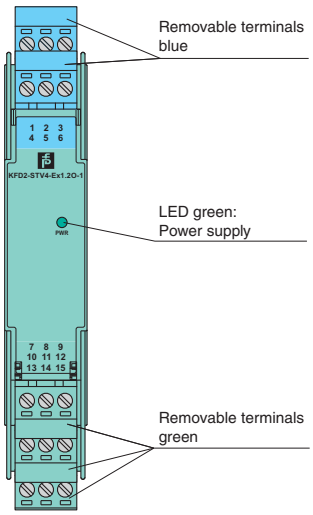
Test sockets for the connection of HART communicators are integrated into the terminals of the device.

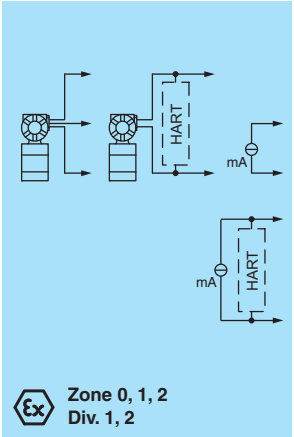
Technical data

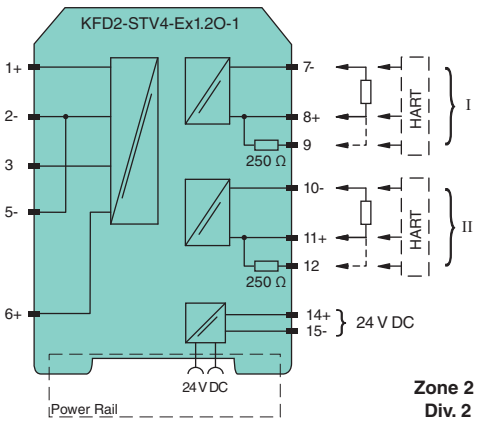
Supply	
Rated voltage	20 ... 35 V DC
Power consumption	2.5 W
Input	
Input signal	0/4 ... 20 mA
Input resistance	≤ 76 Ω terminals 2-, 3; ≤ 500 Ω terminals 1+, 3 (250 Ω load)
Available voltage	≥ 16 V at 20 mA terminals 1+, 3
Output	
Load	output resistance: 250 Ω
Output signal	0/1 ... 5 V
Ripple	≤ 12.5 mV
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/1 ... 5 V ≤ 5 mV incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	≤ 20 ppm/K
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 7.5 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
De-energized delay	20 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7060
Group, category, type of protection	Ⓔx II (1)GD, [Ex ia] IIC, [Ex iaD] (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Power consumption	2.5 W
Input	
Input signal	0/4 ... 20 mA
Input resistance	≤ 76 Ω terminals 2-, 3; ≤ 500 Ω terminals 1+, 3 (250 Ω load)
Available voltage	≥ 16 V at 20 mA terminals 1+, 3
Output	
Load	output resistance: 500 Ω
Output signal	0/2 ... 10 V
Ripple	≤ 25 mV
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/2 ... 10 V ≤ 10 mV incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	≤ 20 ppm/K
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 7.5 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
De-energized delay	20 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 200 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7060
Group, category, type of protection	Ⓔx II (1)GD, [Ex ia] IIC, [Ex iaD] (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire and 3-wire SMART transmitters and 2-wire SMART current sources**
- **Dual output 0/2 V ... 10 V**
- **Terminals with test points**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire and 3-wire SMART transmitters in a hazardous area, and can also be used with 2-wire SMART current sources.

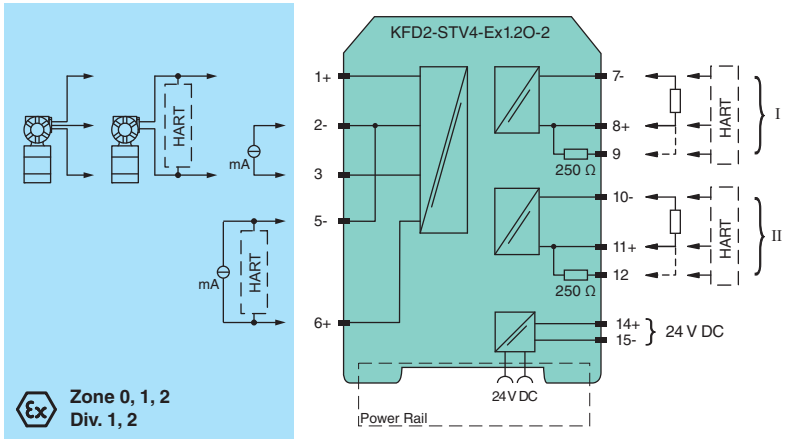
It transfers the analog input signal to the safe area as two isolated voltage values.

Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

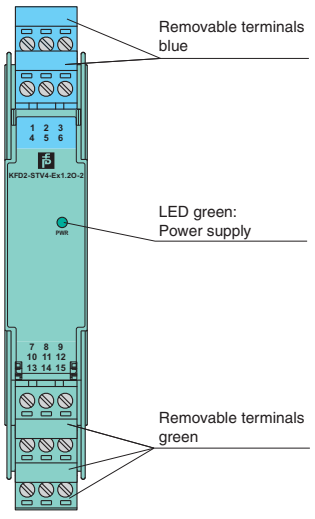
If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8, 9 and 11, 12 can be used.

Test sockets for the connection of HART communicators are integrated into the terminals of the device.

Diagrams



Front view



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KFD2-STC4-Ex2

SMART Transmitter Power Supply

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire SMART transmitters**
- **Output 0/4 mA ... 20 mA**
- **Terminals with test points**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire SMART transmitters in a hazardous area.

It transfers the analog input signal to the safe area as an isolated current value.

Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8, 9 and 11, 12 can be used.

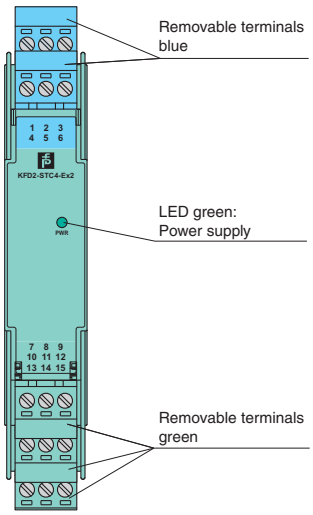
Test sockets for the connection of HART communicators are integrated into the terminals of the device.

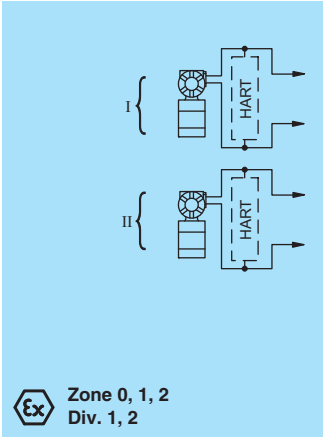
Technical data

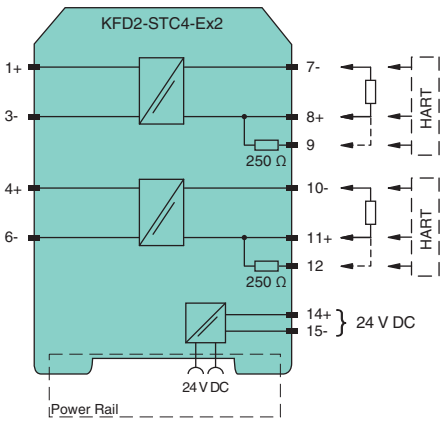
Supply	
Rated voltage	20 ... 35 V DC
Power consumption	≤ 2.8 W
Input	
Input signal	0/4 ... 20 mA
Available voltage	≥ 16 V at 20 mA, terminals 1+, 3
Output	
Load	0 ... 550 Ω
Output signal	0/4 ... 20 mA (overload > 25 mA)
Ripple	≤ 50 μA_{rms}
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/4 ... 20 mA ≤ 10 µA incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	0.25 µA/K
Frequency range	hazardous area into the safe area: bandwidth with 1 V_{pp} signal 0 ... 7.5 kHz (-3 dB) safe area to hazardous area: bandwidth with 1 V_{pp} signal 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
De-energized delay	20 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7025
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Power consumption	≤ 2.8 W
Input	
Input signal	0/4 ... 20 mA
Available voltage	≥ 16 V at 20 mA, terminals 1+, 3
Output	
Output signal	0/4 ... 20 mA (overload > 25 mA)
Ripple	≤ 50 μA_{rms}
External supply (loop)	11 ... 30 V DC
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/4 ... 20 mA ≤ 10 µA incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	0.25 µA/K
Frequency range	hazardous area into the safe area: bandwidth with 1 V_{pp} signal 0 ... 7.5 kHz (-3 dB) safe area to hazardous area: bandwidth with 1 V_{pp} signal 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
De-energized delay	20 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 200 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7025
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
UL approval	
Control drawing	116-0173 (cULus)

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire SMART transmitters**
- **0/4 mA ... 20 mA current sink output**
- **Terminals with test points**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire SMART transmitters in a hazardous area.

It transfers the analog input signal to the safe area as an isolated current value.

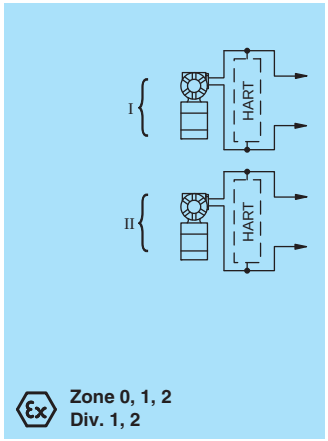
Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

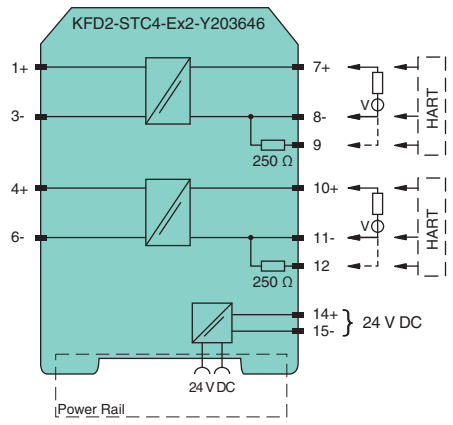
It is designed to provide a sink mode output on the safe area terminals.

If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8, 9 and 11, 12 can be used.

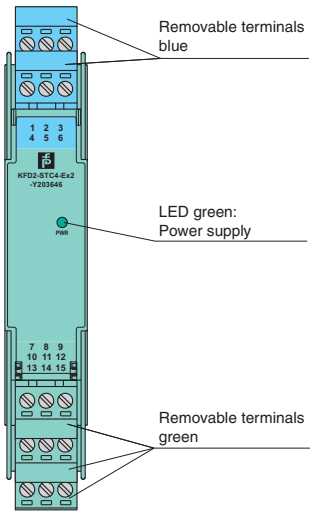
Test sockets for the connection of HART communicators are integrated into the terminals of the device.

Diagrams





Front view



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KFD2-STV4-Ex2-1

SMART Transmitter Power Supply

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire SMART transmitters**
- **Output 0/1 V ... 5 V**
- **Terminals with test points**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire SMART transmitters in a hazardous area.

It transfers the analog input signal to the safe area as an isolated voltage value.

Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8, 9 and 11, 12 can be used.

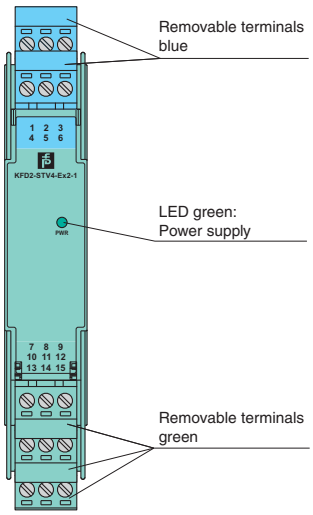
Test sockets for the connection of HART communicators are integrated into the terminals of the device.

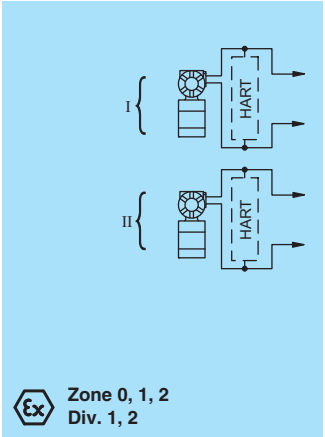
Technical data

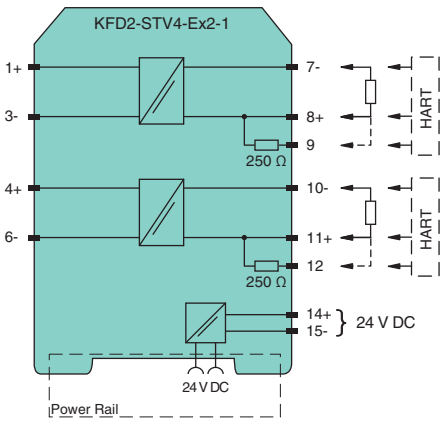
Supply	
Rated voltage	20 ... 35 V DC
Power consumption	≤ 2.8 W
Input	
Input signal	0/4 ... 20 mA
Available voltage	≥ 16 V at 20 mA, terminals 1+, 3
Output	
Load	output resistance: 250 Ω
Output signal	0/1 ... 5 V
Ripple	≤ 12.5 mV
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/1 ... 5 V ≤ 5 mV incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	≤ 20 ppm/K
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 7.5 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
De-energized delay	20 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7025
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Power consumption	≤ 2.8 W
Input	
Input signal	0/4 ... 20 mA
Available voltage	≥ 16 V at 20 mA, terminals 1+, 3
Output	
Load	output resistance: 500 Ω
Output signal	0/2 ... 10 V
Ripple	≤ 25 mV
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/2 ... 10 V ≤ 10 mV incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	≤ 20 ppm/K
Frequency range	hazardous area into the safe area: bandwidth with 1 V_{pp} signal 0 ... 7.5 kHz (-3 dB) safe area to hazardous area: bandwidth with 1 V_{pp} signal 0.3 ... 7.5 kHz (-3 dB)
Rise time	20 µs
Start-up time	200 µs
De-energized delay	20 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 99 ATEX 7025
Group, category, type of protection	Ⓔx II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire SMART transmitters**
- **Output 0/2 V ... 10 V**
- **Terminals with test points**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire SMART transmitters in a hazardous area.

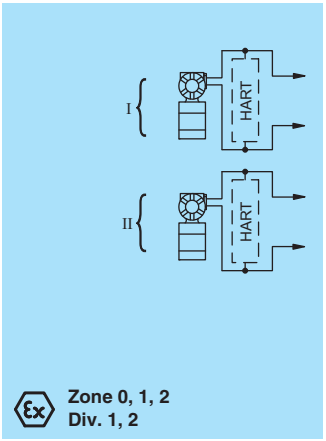
It transfers the analog input signal to the safe area as an isolated voltage value.

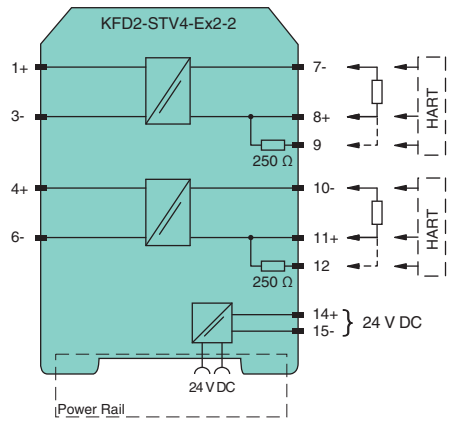
Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8, 9 and 11, 12 can be used.

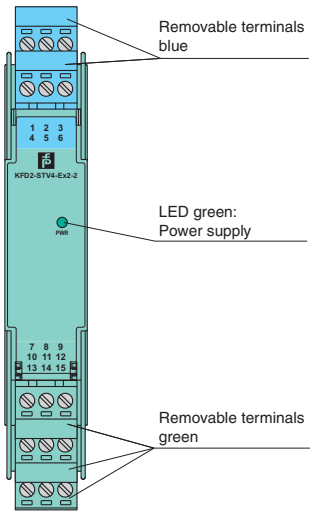
Test sockets for the connection of HART communicators are integrated into the terminals of the device.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **2-wire SMART transmitter**
- **Output 4 mA ... 20 mA**
- **SMART capable up to 40 kHz (-1dB)**
- **Suitable for Honeywell DE protocol**
- **Terminals with test points**

Function

This isolated barrier is used for intrinsic safety applications. It provides a 2-wire SMART transmitter with power in a hazardous area and transfers the analog signal to the safe area as an isolated current source.

Digital signals up to 40 kHz may be superimposed on the analog values in the hazardous or safe area and are transferred bi-directionally.

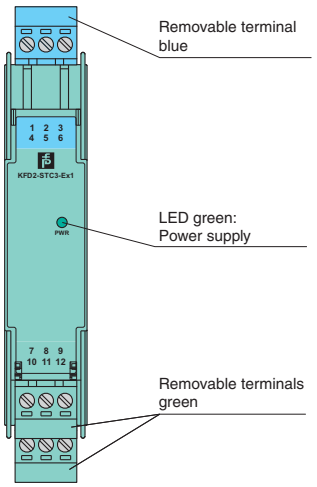
Sockets for the connection of a HART communicator are integrated into the terminals of the device.

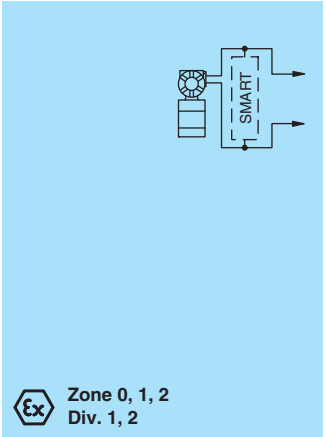
Technical data

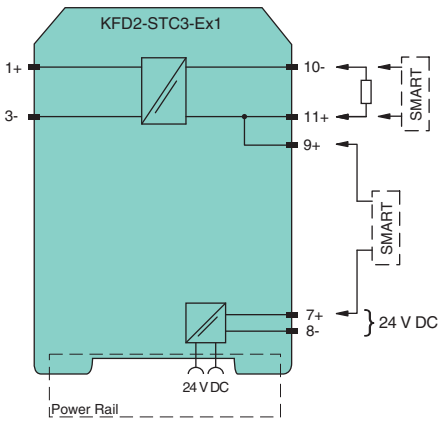
Supply	
Rated voltage	20 ... 35 V DC
Power consumption	≤ 2 W
Input	
Input signal	4 ... 20 mA
Available voltage	approx. 17 V at 4 ... 20 mA
Output	
Output signal	4 ... 20 mA, max. load 1000 Ω, for HART ≥ 230 Ω, Honeywell DE 230 ... 280 Ω (transmitter and communicator dependent)
Ripple	≤ 0.05 % of output signal range
Transfer characteristics	
Deviation	≤ 0.05 % of output signal range (current output), ≤ 10 µA at 20 °C (68 °F)
Influence of ambient temperature	≤ 20 ppm/K
Frequency range	hazardous area to safe area: bandwidth with 1 mA_{pp} signal 0 ... 40 kHz (-1 dB); 0 ... 50 kHz (-6 dB) safe area to hazardous area: bandwidth with 250 mV_{pp} signal 2 Hz ... 40 kHz (-1 dB); 1 Hz ... 50 kHz (-6 dB)
Rise time	10 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 115 x 115 mm (0.8 x 4.5 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 01 ATEX 7369
Group, category, type of protection	Ⓔx II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	BASEEFA 09 ATEX 0218X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)
IECEx approval	IECEx BAS 06.0088 IECEx BAS 09.0102X
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I Ex nA II T4

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Power consumption	≤ 2 W
Input	
Input signal	4 ... 20 mA
Available voltage	approx. 17 V at 4 ... 20 mA
Output	
Output signal	1 ... 5 V, internal resistance approx. 275 Ω
Ripple	≤ 0.05 % of output signal range
Transfer characteristics	
Deviation	≤ 0.03 % of output signal range (voltage output)
Influence of ambient temperature	≤ 20 ppm/K
Frequency range	hazardous area to safe area: bandwidth with 1 mA_{pp} signal 0 ... 40 kHz (-1 dB); 0 ... 50 kHz (-6 dB) safe area to hazardous area: bandwidth with 250 mV_{pp} signal 2 Hz ... 40 kHz (-1 dB); 1 Hz ... 50 kHz (-6 dB)
Rise time	10 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 115 x 115 mm (0.8 x 4.5 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 01 ATEX 7369
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	BASEEFA 09 ATEX 0218X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)
IECEx approval	IECEx BAS 06.0088 IECEx BAS 09.0102X
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I Ex nA II T4

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **2-wire SMART transmitter**
- **Output 1 V ... 5 V**
- **SMART capable up to 40 kHz (-1dB)**
- **Suitable for Honeywell DE protocol**
- **Terminals with test points**

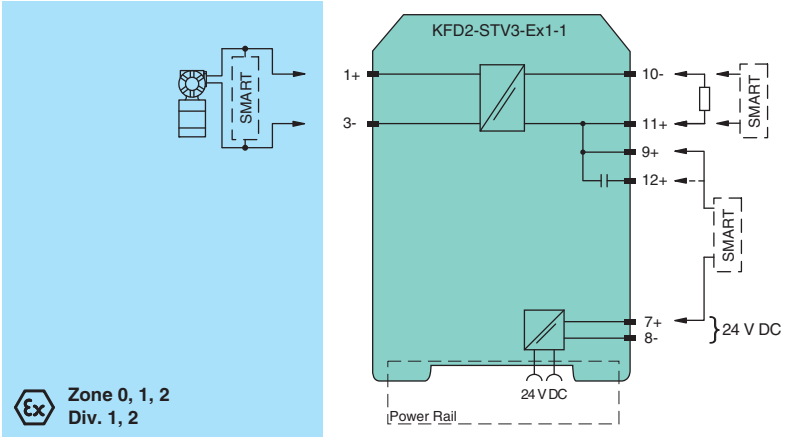
Function

This isolated barrier is used for intrinsic safety applications. It provides a 2-wire SMART transmitter with power in a hazardous area and transfers the analog signal to the safe area as an isolated voltage source.

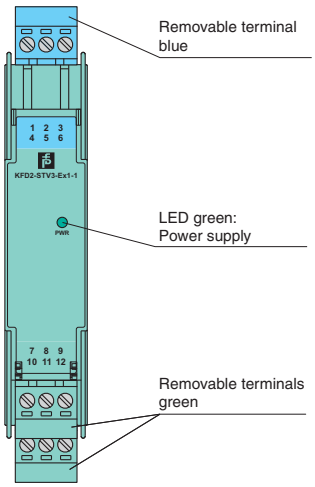
Digital signals up to 40 kHz may be superimposed on the analog values in the hazardous or safe area and are transferred bi-directionally.

Sockets for the connection of a HART communicator are integrated into the terminals of the device.

Diagrams



Front view



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KFD2-STV3-Ex1-2

SMART Transmitter Power Supply

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **2-wire SMART transmitter**
- **Output 2 V ... 10 V**
- **SMART capable up to 40 kHz (-1dB)**
- **Suitable for Honeywell DE protocol**
- **Terminals with test points**

Function

This isolated barrier is used for intrinsic safety applications. It provides a 2-wire SMART transmitter with power in a hazardous area and transfers the analog signal to the safe area as an isolated voltage source.

Digital signals up to 40 kHz may be superimposed on the analog values in the hazardous or safe area and are transferred bi-directionally.

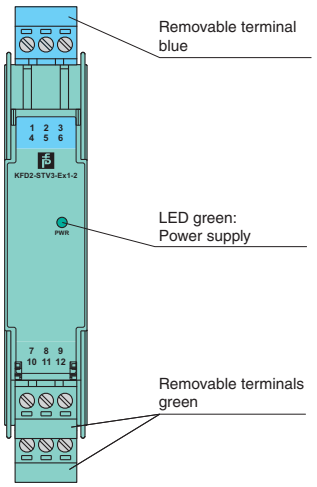
Sockets for the connection of a HART communicator are integrated into the terminals of the device.

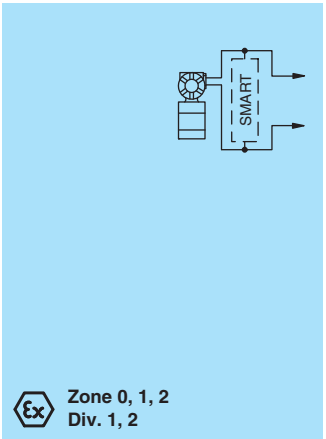
Technical data

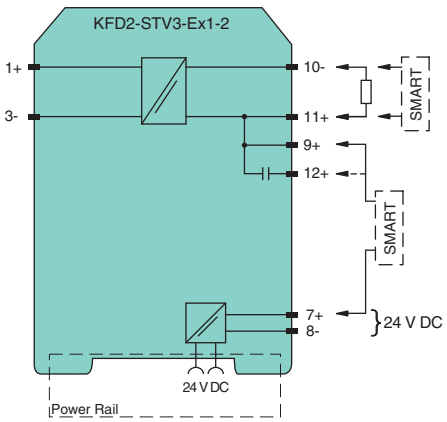
Supply	
Rated voltage	20 ... 35 V DC
Power consumption	≤ 2 W
Input	
Input signal	4 ... 20 mA
Available voltage	approx. 17 V at 4 ... 20 mA
Output	
Output signal	2 ... 10 V, internal resistance approx. 525 Ω Some Honeywell DE devices may not tolerate these levels.
Ripple	≤ 0.05 % of output signal range
Transfer characteristics	
Deviation	≤ 0.03 % of output signal range (voltage output)
Influence of ambient temperature	≤ 20 ppm/K
Frequency range	hazardous area to safe area: bandwidth with 1 mA_{pp} signal 0 ... 7 kHz (-1 dB); 0 ... 50 kHz (-6 dB) safe area to hazardous area: bandwidth with 250 mV_{pp} signal 2 Hz ... 40 kHz (-1 dB); 1 Hz ... 50 kHz (-6 dB)
Rise time	10 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 115 x 115 mm (0.8 x 4.5 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 01 ATEX 7369
Group, category, type of protection	Ⓔx II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	BASEEFA 09 ATEX 0218X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)
IECEx approval	IECEx BAS 06.0088 IECEx BAS 09.0102X
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I Ex nA II T4

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 30 V DC or 20 ... 26.4 V AC
Power consumption	2.2 W/3.1 VA
Input	
Input signal	4 ... 20 mA terminals 2+, 3-
Available voltage	≥ 16 V at 20 mA terminals 1+, 2-
Output	
Load	0 ... 750 Ω
Output signal	4 ... 20 mA (overload > 25 mA)
Ripple	≤ 100 μA_{rms}
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/4 ... 20 mA ≤ 20 µA incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature	2 µA/K
Frequency range	0.8 ... 15 kHz (-3 dB)
Rise time	22 ms
Start-up time	200 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 175 g
Dimensions	22.5 x 99 x 114.5 mm (0.89 x 3.89 x 4.5 in)
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	TÜV 05 ATEX 2758
Group, category, type of protection	Ⓔx II (2)GD [EEx ib] IIC (-20 °C ≤ T_{amb} ≤ 60 °C)

Features

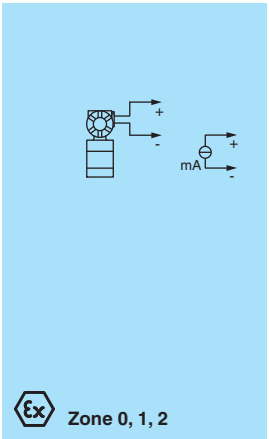
- **1-channel isolated barrier**
- **24 V AC/DC supply**
- **2-wire SMART transmitter**
- **Output 4 mA ... 20 mA**
- **Low Ex i values**
- **Suitable for Hartmann and Braun transmitter**

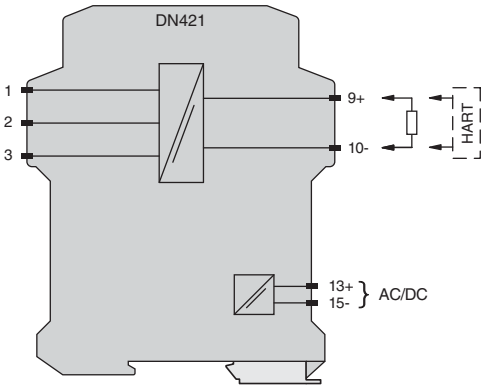
Function

This isolated barrier is used for intrinsic safety applications. It provides a 2-wire SMART transmitter with power in a hazardous area and transfers the signal to the safe area. It is designed to provide higher output voltage to the transmitter in the hazardous area.

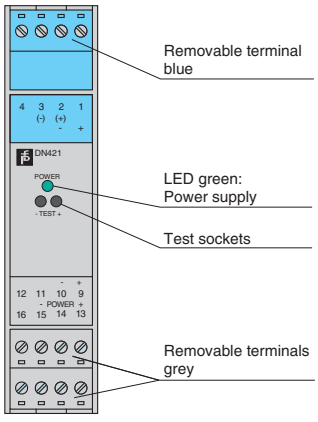
Digital signals may be superimposed on the analog values in the hazardous or safe area and are transferred bi-directionally.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input 2-wire and 3-wire transmitters and 2-wire current sources**
- **Output 0/4 mA ... 20 mA**
- **2 relay contact outputs**
- **Programmable high/low alarm**
- **Linearization function (max 20 points)**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire and 3-wire transmitters in a hazardous area, and can also be used with active current sources.

Two relays and an active 0/4 mA ... 20 mA current source are available as outputs. The relay contacts and the current output can be integrated in security-relevant circuits. The current output is easily scaled.

On the display the measured value can be indicated in various physical units.

The unit is easily programmed by the use of a keypad located on the front of the unit or with the **PACT***ware*™ configuration software.

The input has a line fault detection.

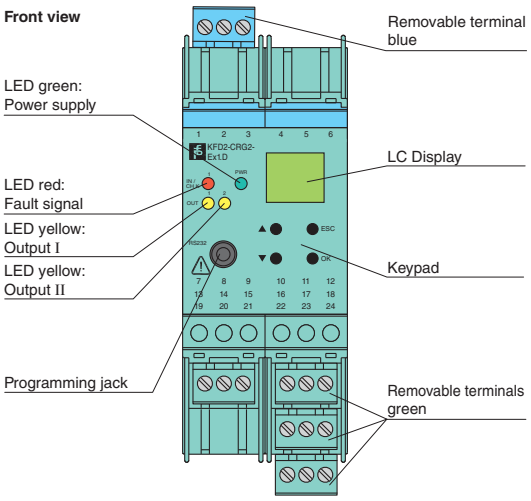
A unique collective error messaging feature is available when used with the Power Rail system.

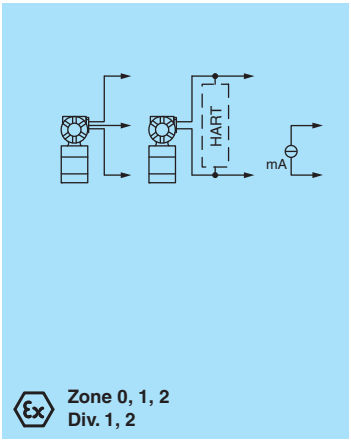
For additional information, refer to the manual and www.pepperl-fuchs.com.

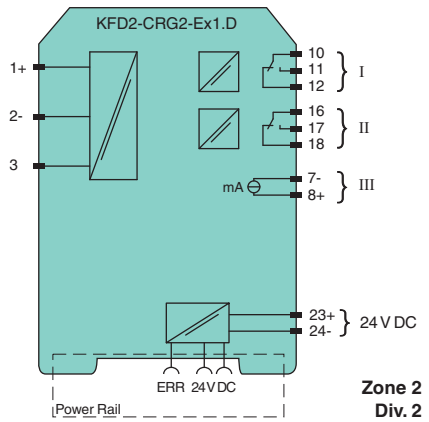
Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power consumption	2.5 W
Input	
Input I	
Input signal	0/4 ... 20 mA
Available voltage	≥ 15 V at 20 mA
Open circuit voltage/short-circuit current	24 V/33 mA
Input resistance	45 Ω (terminals 2, 3)
Lead monitoring	breakage I < 0.2 mA; short-circuit I > 22 mA acc. to NAMUR NE43
Output	
Output signal	0 ... 20 mA or 4 ... 20 mA
Output I, II	signal; relay
Contact loading	250 V AC/2 A/cos Φ≥ 0.7; 40 DC/2 A
Mechanical life	5 x 10^7 switching cycles
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Output III	Signal, analog
Current range	0 ... 20 mA or 4 ... 20 mA
Open loop voltage	≤ 24 V DC
Load	≤ 650 Ω
Fault signal	downscale I ≤ 3.6 mA, upscale I ≥ 21 mA (acc. NAMUR NE43)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	TÜV 01 ATEX 1701
Group, category, type of protection	⟨Ex⟩ II (1) G [Ex ia] IIC ⟨Ex⟩ II (1) D [Ex iaD]
FM approval	
Control drawing	16-554FM-12 (cFMus)

Diagrams







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Technical data

Supply	
Rated voltage	20 ... 90 V DC or 48 ... 253 V AC
Power consumption	2.2 W/4 VA
Input	
Input I	
Input signal	0/4 ... 20 mA
Available voltage	> 15 V at 20 mA
Open circuit voltage/short-circuit current	24 V/33 mA
Input resistance	45 Ω (terminals 2, 3)
Lead monitoring	breakage I < 0.2 mA; short-circuit I > 22 mA acc. to NAMUR NE43
Output	
Output signal	0 ... 20 mA or 4 ... 20 mA
Output I, II	signal; relay
Contact loading	250 V AC/2 A/cos Φ≥ 0.7; 40 DC/2 A
Mechanical life	5 x 10^7 switching cycles
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Output III	Signal, analog
Current range	0 ... 20 mA or 4 ... 20 mA
Open loop voltage	≤24 V DC
Load	≤650 Ω
Fault signal	downscale I ≤3.6 mA, upscale I ≥ 21.5 mA (acc. NAMUR NE43)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	TÜV 01 ATEX 1701
Group, category, type of protection	⟨Ex⟩ II (1) G [Ex ia] IIC ⟨Ex⟩ II (1) D [Ex iaD]
FM approval	
Control drawing	16-554FM-12 (cFMus)

Features

- **1-channel isolated barrier**
- **AC/DC wide range supply**
- **Input 2-wire and 3-wire transmitters and 2-wire current sources**
- **Output 0/4 mA ... 20 mA**
- **2 relay contact outputs**
- **Programmable high/low alarm**
- **Linearization function (max 20 points)**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire and 3-wire transmitters in a hazardous area, and can also be used with active current sources.

Two relays and an active 0/4 mA ... 20 mA current source are available as outputs. The relay contacts and the current output can be integrated in security-relevant circuits. The current output is easily scaled.

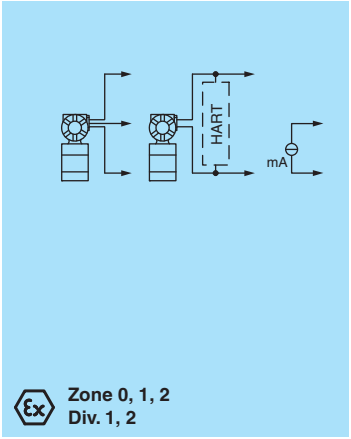
On the display the measured value can be indicated in various physical units.

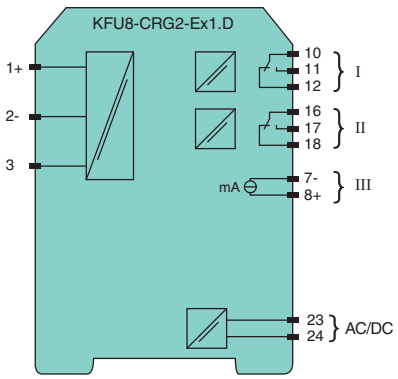
The unit is easily programmed by the use of a keypad located on the front of the unit or with the **PACT***ware*™ configuration software.

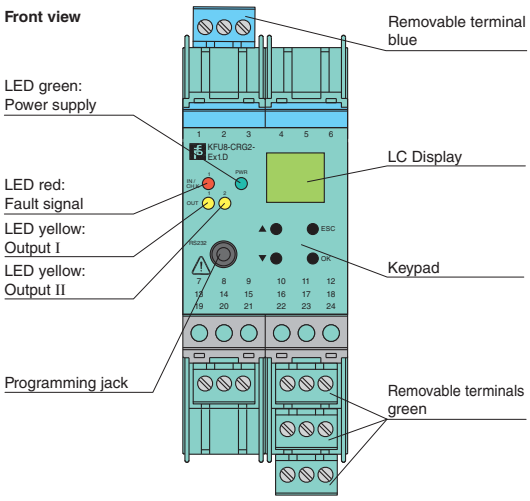
The input has a line fault detection.

For additional information, refer to the manual and www.pepperl-fuchs.com.

Diagrams







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KFD2-HLC-Ex1.D

HART Loop Converter

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input HART with transmitter supply**
- **3 analog outputs 4 mA ... 20 mA**
- **Sink and source mode output**
- **Configurable by keypad**

Function

This isolated barrier is used for intrinsic safety applications. It is a HART loop converter that provides power to transmitters or can be connected to existing HART loops in parallel.

It is able to evaluate up to four HART variables (PV, SV, TV, QV). Of those four HART variables, the data contained in any three of them can be converted to three different 4 mA ... 20 mA current signals. These loop signals can be connected to display devices or analog inputs on the process control system/control system.

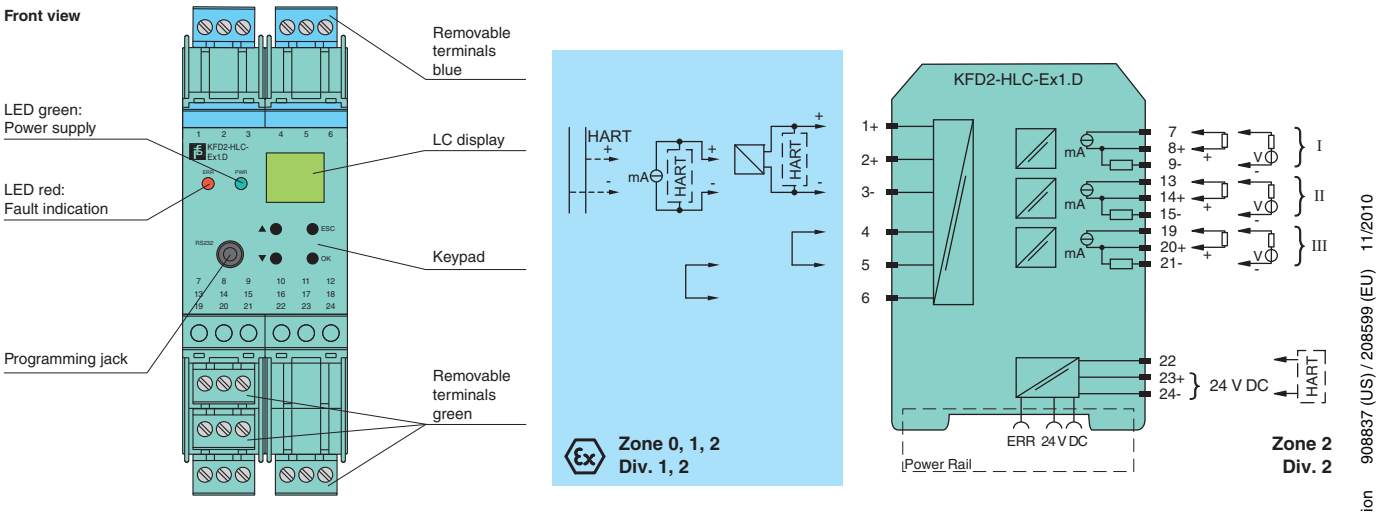
The unit is easily programmed by the use of a keypad located on the front of the unit.

For additional information, refer to the manual and www.pepperl-fuchs.com.

Technical data

Supply	
Rated voltage	19 ... 30 V DC
Rated current	approx. 120 mA at 24 V DC
Power loss	2.3 W
Power consumption	2.9 W
Input	
Input signal	HART communication, transmitter supply
Open circuit voltage/short-circuit current	typ. 24 V/28 mA
Input resistance	250 Ω, 5 % (terminals 2, 3 and with jumper on 5, 6)
Available voltage	≥ 15.5 V at 20 mA, short-circuit proof
Output	
Output signal	analog
Current range	4 ... 20 mA, source or sink mode
Load	≤650 Ω, source mode
Voltage range	5 ... 30 V, sink mode from external supply
Collective error message	Power Rail and LED red
Fault signal	downscale I ≤ 2 mA, upscale I ≥ 21.5 mA (acc. NAMUR NE43) or hold measurement value
Other outputs	HART communicator on terminals 22, 24
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BASEEFA 07 ATEX 0174
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC, [Ex iaD]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 X

Diagrams



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Technical data

Supply	
Rated voltage	19 ... 30 V DC
Rated current	approx. 130 mA at 24 V DC
Power loss	2.5 W
Power consumption	3.1 W
Input	
Input signal	HART communication, transmitter supply
Open circuit voltage/short-circuit current	typ. 24 V/28 mA
Input resistance	250 Ω, 5 % (terminals 2, 3 and with jumper on 5, 6)
Available voltage	≥ 15.5 V at 20 mA, short-circuit proof
Output	
Collective error message	Power Rail and LED red
Output I, II	
Output signal	relay and LED yellow
Mechanical life	10^7 switching cycles
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Output III, IV, V	
Output signal	analog
Current range	4 ... 20 mA, source or sink mode
Load	≤650 Ω, source mode
Voltage range	5 ... 30 V, sink mode from external supply
Fault signal	downscale I ≤ 2 mA, upscale I ≥ 21.5 mA (acc. NAMUR NE43) or hold measurement value
Other outputs	HART communicator on terminals 22, 24
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BASEEFA 07 ATEX 0174
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC, [Ex iaD]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC II T4 X

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input HART with transmitter supply**
- **2 relay outputs (changeover contacts)**
- **3 analog outputs 4 mA ... 20 mA**
- **Sink and source mode output**
- **Configurable by keypad**

Function

This isolated barrier is used for intrinsic safety applications. It is a HART loop converter that provides power to transmitters or can be connected to existing HART loops in parallel.

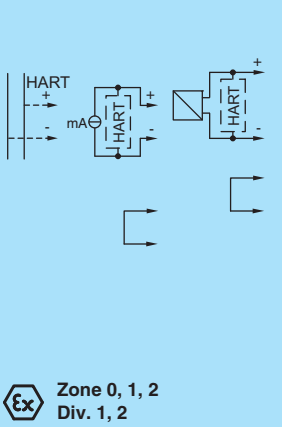
It is able to evaluate up to four HART variables (PV, SV, TV, QV). Of those four HART variables, the data contained in any three of them can be converted to three different 4 mA ... 20 mA current signals. These loop signals can be connected to display devices or analog inputs on the process control system/control system.

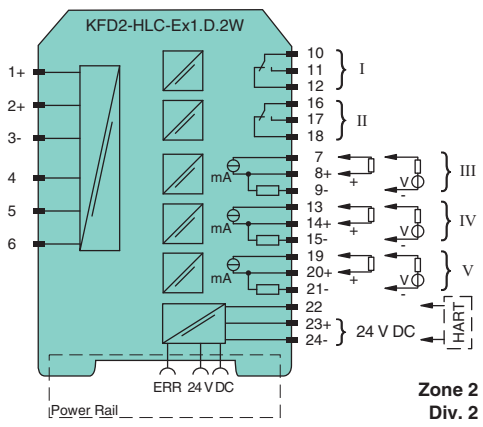
In addition to the current outputs, two form C changeover relay contacts are available and can be programmed to operate at trip values from the HART variables.

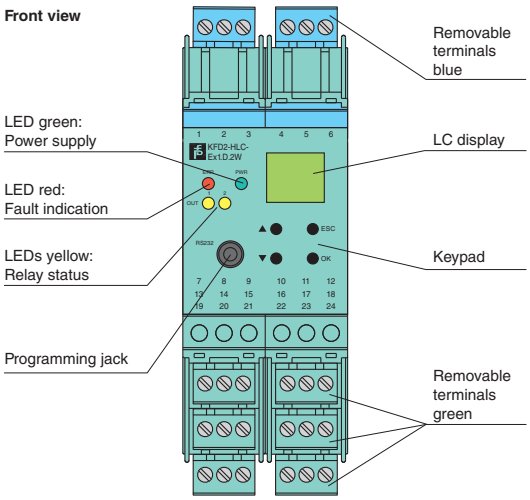
The unit is easily programmed by the use of a keypad located on the front of the unit.

For additional information, refer to the manual and www.pepperl-fuchs.com.

Diagrams







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KFD2-HLC-Ex1.D.4S

HART Loop Converter

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Input HART with transmitter supply**
- **4 relay outputs (NO)**
- **3 analog outputs 4 mA ... 20 mA**
- **Sink and source mode output**
- **Configurable by keypad**

Function

This isolated barrier is used for intrinsic safety applications. It is a HART loop converter that provides power to transmitters or can be connected to existing HART loops in parallel.

It is able to evaluate up to four HART variables (PV, SV, TV, QV). Of those four HART variables, the data contained in any three of them can be converted to three different 4 mA ... 20 mA current signals. These loop signals can be connected to display devices or analog inputs on the process control system/control system.

In addition to the current outputs, four form A normally open relay contacts are available and can be programmed to operate at trip values from the HART variables.

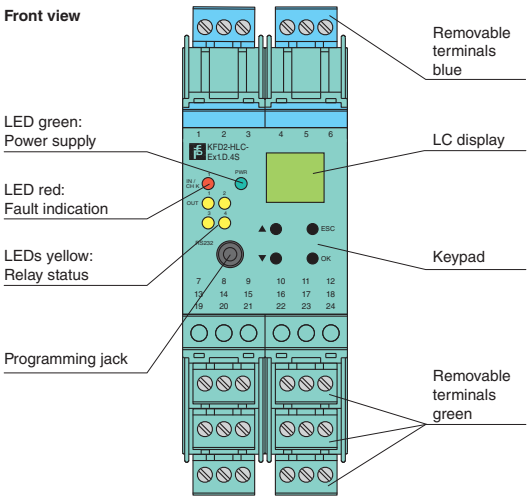
The unit is easily programmed by the use of a keypad located on the front of the unit.

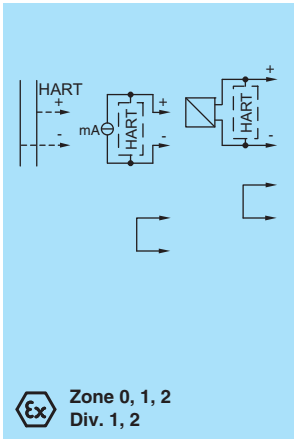
For additional information, refer to the manual and www.pepperl-fuchs.com.

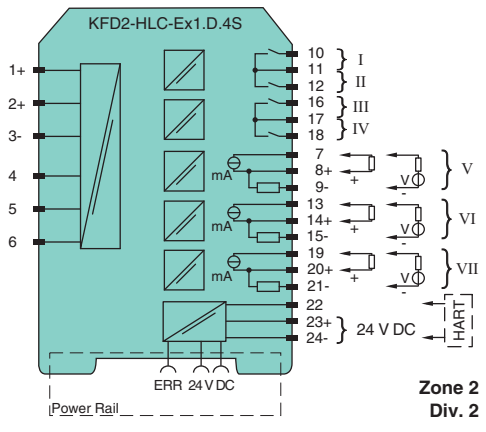
Technical data

Supply	
Rated voltage	19 ... 30 V
Rated current	approx. 140 mA at 24 V DC
Power loss	2.7 W
Power consumption	3.3 W
Input	
Input signal	HART communication, transmitter supply
Open circuit voltage/short-circuit current	typ. 24 V/28 mA
Input resistance	250 Ω, 5 % (terminals 2, 3 and with jumper on 5, 6)
Available voltage	≥ 15.5 V at 20 mA, short-circuit proof
Output	
Collective error message	Power Rail and LED red
Output I, II, III, IV	
Output signal	relay and LED yellow
Mechanical life	10^7 switching cycles
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Output V, VI, VII	
Output signal	analog
Current range	4 ... 20 mA, source or sink mode
Load	≤ 650 Ω, source mode
Voltage range	5 ... 30 V, sink mode from external supply
Fault signal	downscale I ≤ 2 mA, upscale I ≥ 21.5 mA (acc. NAMUR NE43) or hold measurement value
Other outputs	HART communicator on terminals 22, 24
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BASEEFA 07 ATEX 0174
Group, category, type of protection	Ⓔx II (1)GD [Ex ia] IIC, [Ex iaD]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA nC II T4 X

Diagrams







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Technical data

Supply	
Rated voltage	loop powered
Power loss	0.2 W
Field circuit	
Connection	terminals 1+, 2/3-
Available voltage	≥ 16 V for supply voltage > 21 V
Current	4 ... 20 mA (linear transmission 1 ... 22 mA)
Load	≤ 800 Ω (at 20 mA)
Supply circuit	
Voltage	max. 30 V DC
Current	4 ... 20 mA (quiescent current < 0.5 mA)
Power loss	150 mW at 20 mA and U_E < 24 V
Transfer characteristics	
Deviation	
After calibration	≤ ± 80 µA linearity, load and voltage dependence at 20 °C (68 °F)
Influence of ambient temperature	< 0.5 µA/K
Damping	approx. 3 dB
Rise time	≤ 20 µs at 0 Ω, ≤ 600 µs with 800 Ω load
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 120 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	PTB 02 ATEX 2064
Group, category, type of protection	⟨Ex⟩ II (2)G [EEx ib] IIC
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G EEx nA II T4 X
FM approval	device with FM approval on request

Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 4 mA ... 20 mA**
- **HART I/P or transmitter power supply**
- **Low voltage drop**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

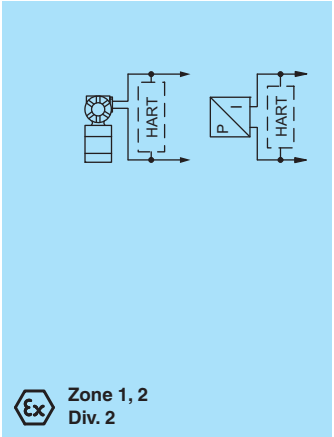
This isolated barrier is used for intrinsic safety applications. It is loop powered and isolates a 4 mA ... 20 mA signal for transmitters and positioners and is HART compatible.

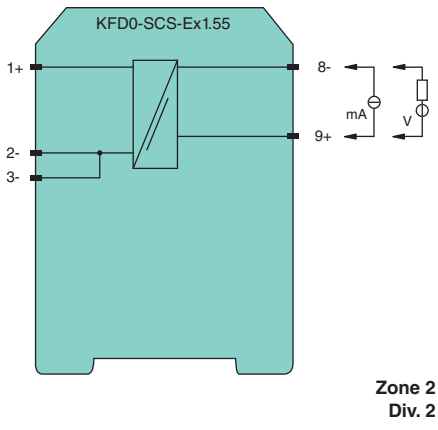
With a noticeably lower power loss compared to active isolator modules, the barriers 5 V drop makes it suitable for transmitter applications with unstable power sources between 20 V DC ... 30 V DC.

Line fault detection of the field circuit is possible if the control loop in the safe area is monitored for overscale or underscale conditions of the 4 mA ... 20 mA range.

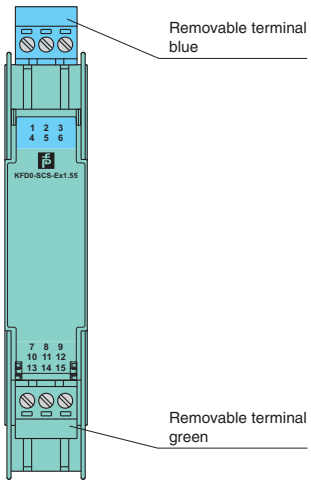
The module can also be used for controlling solenoid valves and discrete outputs, such as LEDs. In this case, terminals 8- and 9+ are driven with a 24 V signal.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 4 mA ... 20 mA**
- **I/P or transmitter power supply**
- **Accuracy 0.1 %**
- **Reverse polarity protection**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers DC signals from fire alarms, smoke alarms, and temperature sensors in hazardous areas. It can also be used to control I/P converters, power solenoids, LEDs, and audible alarms.

Reverse polarity protection prevents damage to the isolator caused by faulty wiring.

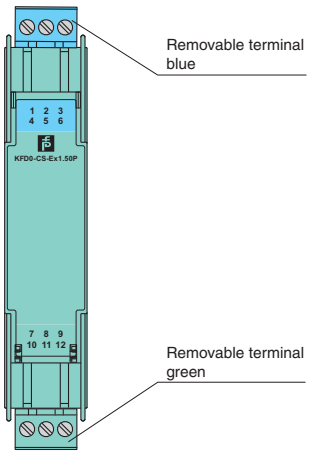
Since this isolator is loop powered, use the technical data to verify that proper voltage is available to the field devices.

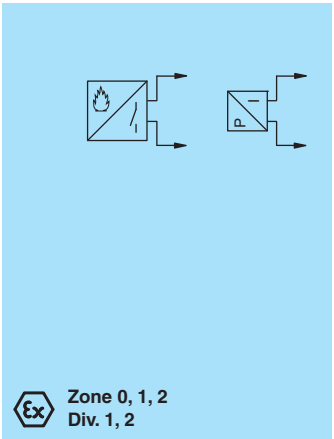
Technical data

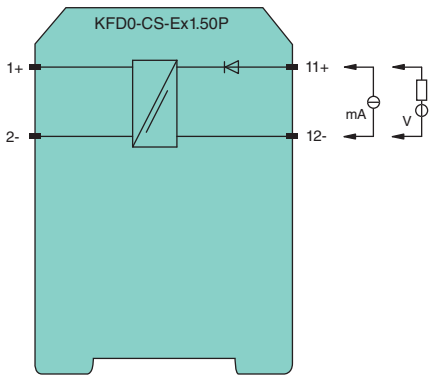
Supply	
Rated voltage	loop powered
Safe circuit	
Voltage	5 ... 35 V DC
Current	4 ... 20 mA
Power loss	at 20 mA and U_{in} < 24.3 V: < 250 mW per channel at 20 mA and U_{in} > 24.3 V: < 500 mW per channel
Field circuit	
Voltage	for 5V < U_e < 24.3V: ≥ 0.9 x U_e - (0.37 x current in mA) - 1.0 for U_{in} > 24.3 V: ≥ 21 V - (0.36 x current in mA)
Short-circuit current	at U_{in} > 24.3 V : ≤ 65 mA
Transfer current	≤ 40 mA
Transfer characteristics	
Deviation	
After calibration	≤ ± 20 µA; incl. calibration, linearity, hysteresis and load fluctuations at the output up to a load of 1 kΩ at 20 °C (68 °F)
Rise time	≤ 5 ms at 4 ... 20 mA step and U_{in} < 24 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 98 ATEX 7343
Group, category, type of protection	Ⓔx II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Diagrams

Front view







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Technical data

Supply	
Rated voltage	loop powered
Inputs/Outputs (not intrinsically safe)	
Voltage	4 ... 35 V DC
Current	0 ... 40 mA
Power loss	at 40 mA and U_{in} < 22 V: 700 mW per channel at 40 mA and U_{in} > 22 V: 1.2 W per channel
Inputs/Outputs (Intrinsically safe)	
Output voltage	for 4 V < U_{in} < 24 V: ≥ U_{in} - (0.37 x current in mA) - 1.0 for U_{in} > 24 V: ≥ 21 V - (0.36 x current in mA)
Short-circuit current	at U_{in} > 24 V: ≤ 65 mA
Transfer current	≤ 40 mA
Transfer characteristics	
Deviation	
After calibration	≤ ± 200 µA; incl. calibration, linearity, hysteresis and load fluctuations at the output up to a load of 1 kΩ and current ≤ 20 mA at 20 °C (68 °F)
Influence of ambient temperature	≤ ± 2 µA/K at U_{in} ≤ 20 V; ≤ ± 5 µA/K at U_{in} > 20 V
Rise time	≤ 5 ms at 4 ... 20 mA step and U_{in} < 24 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 98 ATEX 7343
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 0 mA ... 40 mA**
- **I/P or transmitter power supply**
- **Accuracy 1 %**
- **Reverse polarity protection**
- **Up to SIL2 acc. to IEC 61508**

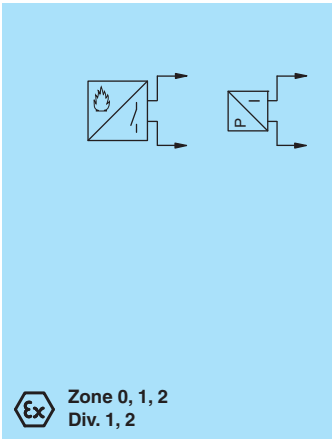
Function

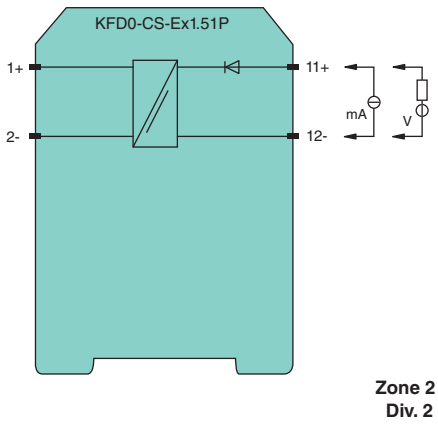
This isolated barrier is used for intrinsic safety applications. It transfers DC signals from fire alarms, smoke alarms, and temperature sensors in hazardous areas. It can also be used to control I/P converters, power solenoids, LEDs, and audible alarms.

Reverse polarity protection prevents damage to the isolator caused by faulty wiring.

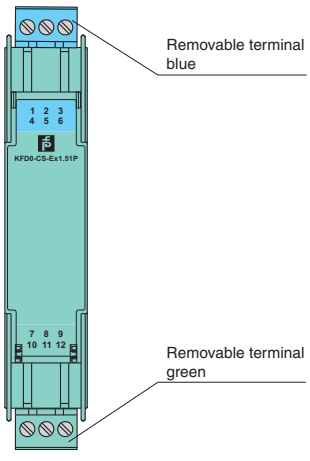
Since this isolator is loop powered, use the technical data to verify that proper voltage is available to the field devices.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 4 mA ... 20 mA**
- **Accuracy 0.1 %**
- **Entity parameter I_o/I_{sc} = 0 mA**

Function

This isolated barrier is used for intrinsic safety applications. It is loop-powered and repeats a 4 mA ... 20 mA signal from a current source inside a hazardous area to the safe area (It does not provide power for transmitters inside the hazardous area.).

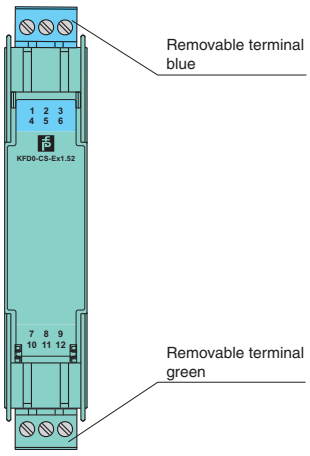
The 25.2 V, 0 mA entity parameters make it easy to design intrinsically safe systems.

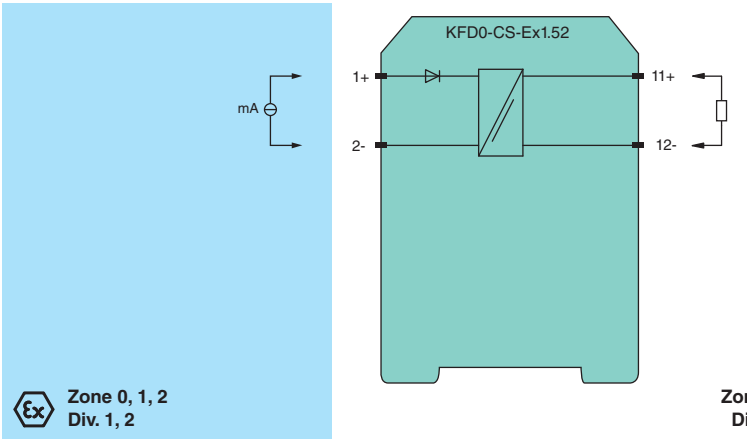
Technical data

Supply	
Rated voltage	loop powered
Power loss	0.2 W
Input	
Transmission range	current range 4 ... 20 mA voltage range 4 ... 24 V DC
Output	
Current	4 ... 20 mA
Voltage	4 ... 24 V DC for 4 V < U_e < 24 V: 0.9 x U_e - (0.11 x current in mA) - 2
Transfer characteristics	
Deviation	
After calibration	± 20 µA incl. calibration, linearity, hysteresis and load fluctuations at 20 °C (68 °F), U_{in} ≤ 20 V +20 µA/-50 µA incl. calibration, linearity, hysteresis and load fluctuations at 20 °C (68 °F), 20 V < U_{in} < 24 V
Influence of ambient temperature	± 1 µA/K (0 ... 50 °C (32 ... 122 °F)), U_{in} ≤ 12 V ± 2 µA/K (0 ... 60 °C (32 ... 140 °F)), U_{in} ≤ 18 V ± 5 µA/K (-20 ... 60 °C (-4 ... 140 °F)), U_{in} ≤ 24 V
Rise time	≤ 10 ms at 4 ... 20 mA and 250 Ω load
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BASEEFA 03 ATEX 0141
Group, category, type of protection	[EEx ia] IIC (T_{amb} = 60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Diagrams

Front view





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Technical data

Supply	
Rated voltage	loop powered
Power loss	0.2 W
Input	
Short-circuit current	≤ 65 mA
Transmission range	voltage: 4 ... 26 V DC/0 ... 6 V_{pp} AC current: 1 ... 20 mA
Output	
Current	0 ... 20 mA
Voltage	0 ... 26 V for 4 V ≤ < U_e ≤ 26 V: ≥ U_e - (0.38 x current in mA) - 0.5
Transfer characteristics	
Deviation	
After calibration	≤ 3.5 mA current loss at 20 mA load current
Influence of ambient temperature	± 20 µA/K
Rise time	≤ 50 µs (load current ≥ 1 mA)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 00 ATEX 7087
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC, [Ex iaD]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132
IECEx approval	IECEx BAS 08.0079

Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **SMART fire alarm input**
- **Current input 1 mA ... 20 mA**

Function

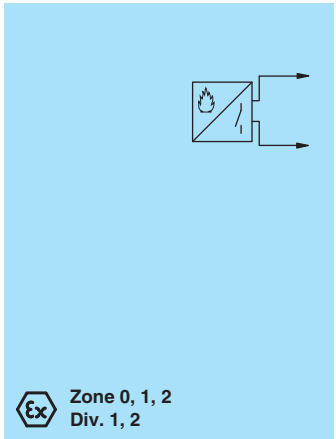
This isolated barrier is used for intrinsic safety applications. It provides control and signal transfer for SMART compatible fire and smoke alarm transmitters inside hazardous areas.

Digital signals may be superimposed (AC up to 6 V) on the analog values in the hazardous or safe area and are transferred bidirectionally.

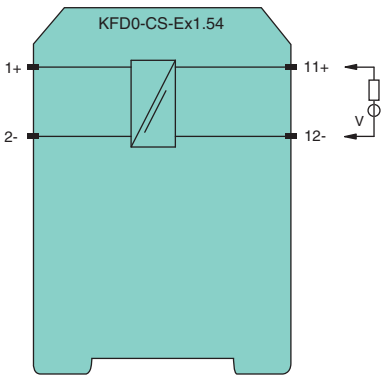
The fall time of the digital signal must be smaller than 50 µs, the current in the hazardous area must be bigger than 1 mA.

Since this isolator is loop-powered, use the technical data to verify that proper voltage is available to the field devices.

Diagrams

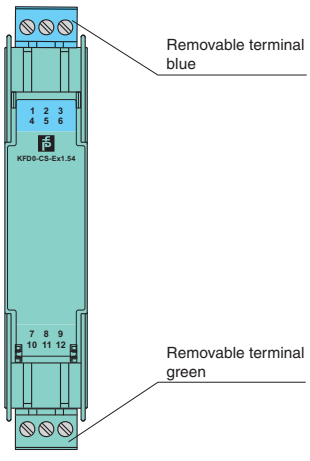


⟨Ex⟩ **Zone 0, 1, 2**
Div. 1, 2



Zone 2
Div. 2

Front view



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Features

- **2-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 4 mA ... 20 mA**
- **I/P or transmitter power supply**
- **Accuracy 0.1 %**
- **Reverse polarity protection**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers DC signals from fire alarms, smoke alarms, and temperature sensors in hazardous areas. It can also be used to control I/P converters, power solenoids, LEDs, and audible alarms.

Reverse polarity protection prevents damage to the isolator caused by faulty wiring.

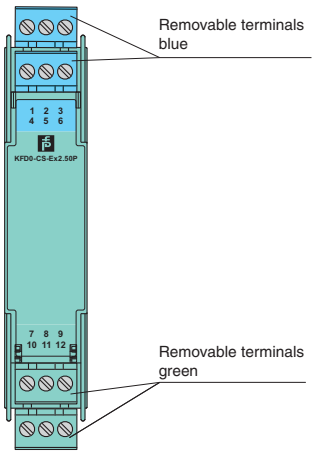
Since this isolator is loop powered, use the technical data to verify that proper voltage is available to the field devices.

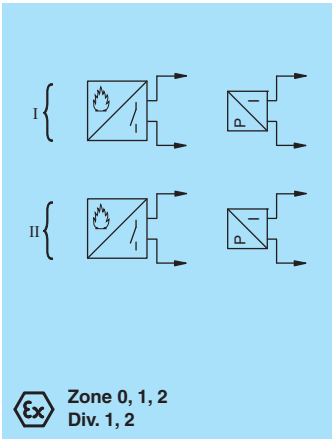
Technical data

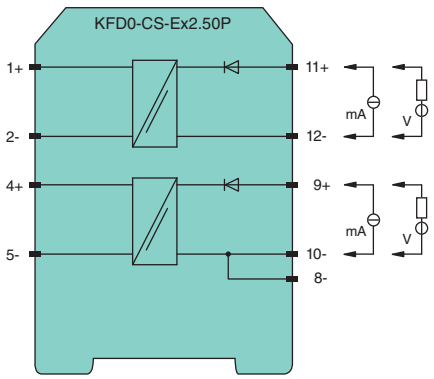
Supply	
Rated voltage	loop powered
Safe circuit	
Voltage	5 ... 35 V DC
Current	4 ... 20 mA
Power loss	at 20 mA and U_{in} < 24.3 V: < 250 mW per channel at 20 mA and U_{in} > 24.3 V: < 500 mW per channel
Field circuit	
Voltage	for 5V < U_e < 24.3V: ≥ 0.9 x U_e - (0.37 x current in mA) - 1.0 for U_{in} > 24.3 V: ≥ 21 V - (0.36 x current in mA)
Short-circuit current	at U_{in} > 24.3 V : ≤ 65 mA
Transfer current	≤ 40 mA
Transfer characteristics	
Deviation	
After calibration	≤ ± 20 µA; incl. calibration, linearity, hysteresis and load fluctuations at the output up to a load of 1 kΩ at 20 °C (68 °F)
Rise time	≤ 5 ms at 4 ... 20 mA step and U_{in} < 24 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 98 ATEX 7343
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Diagrams

Front view







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Technical data

Supply	
Rated voltage	loop powered
Inputs/Outputs (not intrinsically safe)	
Voltage	4 ... 35 V DC
Current	0 ... 40 mA
Power loss	at 40 mA and U_{in} < 22 V: 700 mW per channel at 40 mA and U_{in} > 22 V: 1.2 W per channel
Inputs/Outputs (Intrinsically safe)	
Output voltage	for 4 V < U_{in} < 24 V: ≥ U_{in} - (0.37 x current in mA) - 1.0 for U_{in} > 24 V: ≥ 21 V - (0.36 x current in mA)
Short-circuit current	at U_{in} > 24 V: ≤ 65 mA
Transfer current	≤ 40 mA
Transfer characteristics	
Deviation	
After calibration	≤ ± 200 µA; incl. calibration, linearity, hysteresis and load fluctuations at the output up to a load of 1 kΩ and current ≤ 20 mA at 20 °C (68 °F)
Influence of ambient temperature	≤ ± 2 µA/K at U_{in} ≤ 20 V; ≤ ± 5 µA/K at U_{in} > 20 V
Rise time	≤ 5 ms at 4 ... 20 mA step and U_{in} < 24 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 98 ATEX 7343
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Features

- **2-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 0 mA ... 40 mA**
- **I/P or transmitter power supply**
- **Accuracy 1 %**
- **Reverse polarity protection**
- **Up to SIL2 acc. to IEC 61508**

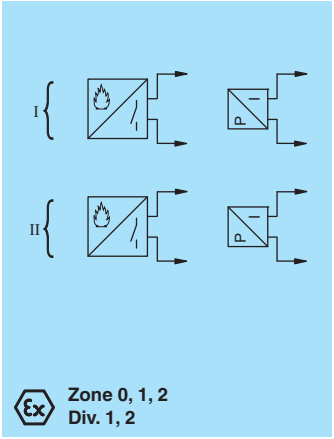
Function

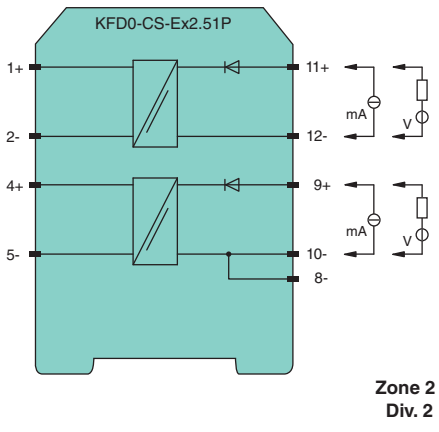
This isolated barrier is used for intrinsic safety applications. It transfers DC signals from fire alarms, smoke alarms, and temperature sensors in hazardous areas. It can also be used to control I/P converters, power solenoids, LEDs, and audible alarms.

Reverse polarity protection prevents damage to the isolator caused by faulty wiring.

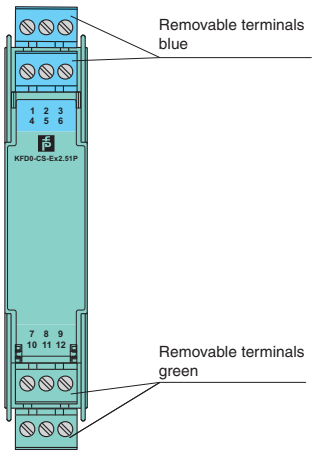
Since this isolator is loop powered, use the technical data to verify that proper voltage is available to the field devices.

Diagrams





Front view



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KFD0-CS-Ex2.52

Repeater

Features

- **2-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 4 mA ... 20 mA**
- **Accuracy 0.1 %**
- **Entity parameter I_o/I_{sc} = 0 mA**

Function

This isolated barrier is used for intrinsic safety applications. It is loop-powered and repeats a 4 mA ... 20 mA signal from a current source inside a hazardous area to the safe area (It does not provide power for transmitters inside the hazardous area.).

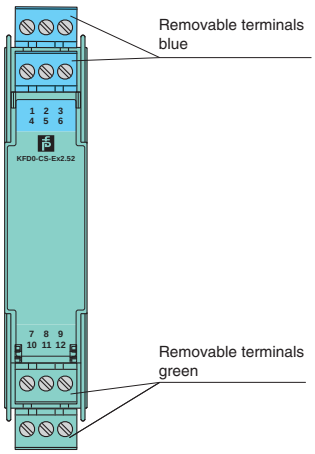
The 25.2 V, 0 mA entity parameters make it easy to design intrinsically safe systems.

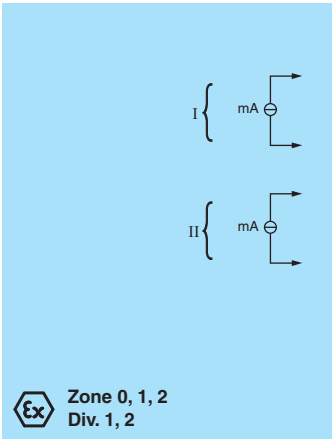
Technical data

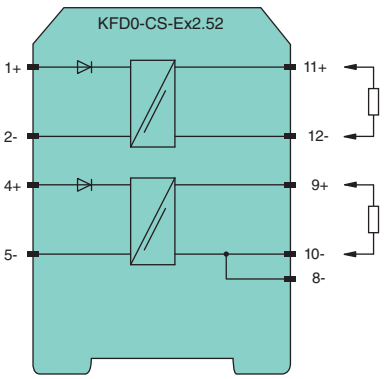
Supply	
Rated voltage	loop powered
Power loss	0.4 W
Input	
Transmission range	current range 4 ... 20 mA voltage range 4 ... 24 V DC
Output	
Current	4 ... 20 mA
Voltage	4 ... 24 V DC for 4 V < U_e < 24 V: 0.9 x U_e - (0.11 x current in mA) - 2
Transfer characteristics	
Deviation	
After calibration	± 20 µA incl. calibration, linearity, hysteresis and load fluctuations at 20 °C (68 °F), U_{in} ≤ 20 V +20 µA/-50 µA incl. calibration, linearity, hysteresis and load fluctuations at 20 °C (68 °F), 20 V < U_{in} < 24 V
Influence of ambient temperature	± 1 µA/K (0 ... 50 °C (32 ... 122 °F)), U_{in} ≤ 12 V ± 2 µA/K (0 ... 60 °C (32 ... 140 °F)), U_{in} ≤ 18 V ± 5 µA/K (-20 ... 60 °C (-4 ... 140 °F)), U_{in} ≤ 24 V
Rise time	≤ 10 ms at 4 ... 20 mA and 250 Ω load
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BASEEFA 03 ATEX 0141
Group, category, type of protection	[EEx ia] IIC (T_{amb} = 60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Diagrams

Front view







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Technical data

Supply	
Rated voltage	loop powered
Power loss	0.2 W
Input	
Short-circuit current	≤65 mA
Transmission range	voltage: 4 ... 26 V DC/0 ... 6 V_{pp} AC current: 1 ... 20 mA
Output	
Current	0 ... 20 mA
Voltage	0 ... 26 V for 4 V ≤ < U_e ≤ 26 V: ≥ U_e - (0.38 x current in mA) - 0.5
Transfer characteristics	
Deviation	
After calibration	≤3.5 mA current loss at 20 mA load current
Influence of ambient temperature	± 20 µA/K
Rise time	≤50 µs (load current ≥ 1 mA)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 00 ATEX 7087
Group, category, type of protection	Ⓔx II (1)GD [Ex ia] IIC, [Ex iaD]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132
IECEx approval	IECEx BAS 08.0079

Features

- **2-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **SMART fire alarm input**
- **Current input 1 mA ... 20 mA**

Function

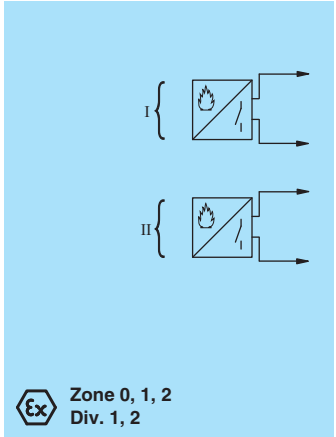
This isolated barrier is used for intrinsic safety applications. It provides control and signal transfer for SMART compatible fire and smoke alarm transmitters inside hazardous areas.

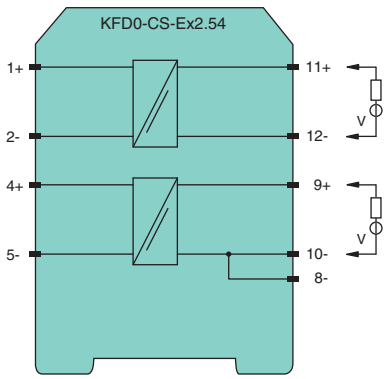
Digital signals may be superimposed (AC up to 6 V) on the analog values in the hazardous or safe area and are transferred bidirectionally.

The fall time of the digital signal must be smaller than 50 µs, the current in the hazardous area must be bigger than 1 mA.

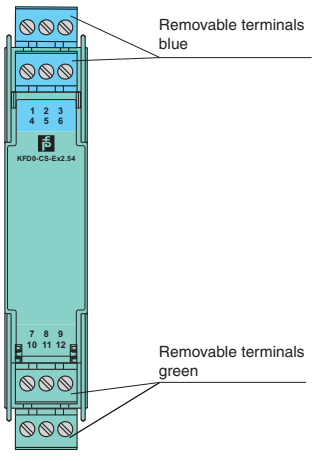
Since this isolator is loop-powered, use the technical data to verify that proper voltage is available to the field devices.

Diagrams





Front view



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KFD2-VR2-Ex1.50M

Voltage Repeater

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Voltage input 0 mV ... ± 50 mV**
- **Voltage output 0 mV ... ± 50 mV**
- **Selectable up/downscale burnout detection on Power Rail**

Function

This isolated barrier is used for intrinsic safety applications. It transfers low voltage signals from thermocouples, load cells, strain gauges, operational amplifiers, and inductive oscillation sensors located in hazardous areas to safe areas.

The input voltage of the terminals 4 and 5 is transferred to the terminals 7 and 8.

The input, output, and power supply are galvanically isolated from each other. Upscale or downscale lead breakage monitoring is selectable via switches located on the front panel of the device.

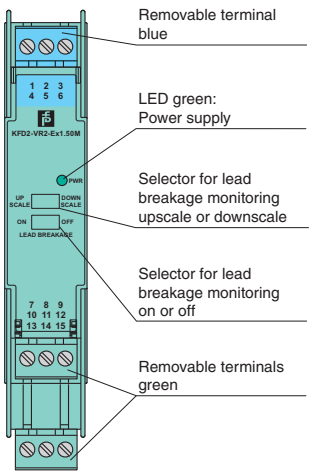
Note: This unit requires three minutes after power-up to reach the accuracy cited in the technical data.

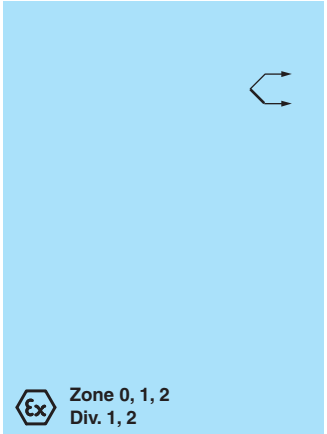
Technical data

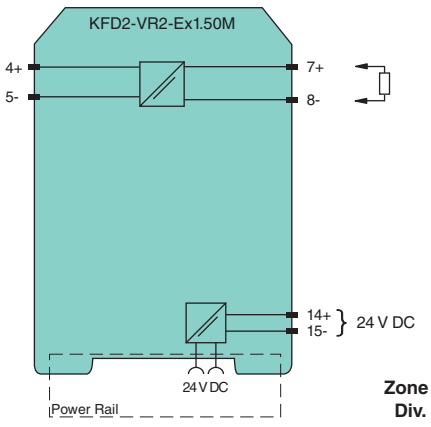
Supply	
Rated voltage	19 ... 30 V DC
Power loss/power consumption	0.3 W max.
Input	
Input resistance	≥ 20 MΩ
Transmission range	0 ... ± 50 mV
Offset voltage/current	≤ 5 µV/≤ 5 nA
Lead monitoring	100 nA
Output	
Load	Accuracy figures for infinite load impedance. Additional 0.03 % of span for a load resistance of 10 kΩ
Voltage	0 ... ± 50 mV
Fault signal	sensor breakage: > +100 mV (upscale), < -100 mV (downscale)
Transfer characteristics	
Deviation	
After calibration	at 20 °C (68 °F): ± 3 µV up to ± 10 mV/± 0.03 % of the span up to +50 mV/± 0.05 % of the span up to -50 mV
Influence of ambient temperature	± 1 µV/K (typical ± 0.25 µV/K)
Absolute	< 0.25 K at 30 V voltage supply
Bandwidth	DC to 350 Hz (-3 dB)
Rise time	≤ 1 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 125 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0040
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	BASEEFA 09 ATEX 0219X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus) or 116-0334 (cULus)
IECEx approval	IECEx BAS 06.0011, IECEx BAS 09.0103X
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I Ex nA II T4

Diagrams

Front view







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Technical data

Supply	
Rated voltage	19 ... 30 V DC
Power loss/power consumption	0.3 W max.
Input	
Input resistance	≥ 20 MΩ
Transmission range	0 ... ± 500 mV
Offset voltage/current	≤ 5 µV/≤ 5 nA
Lead monitoring	100 nA
Output	
Load	Accuracy figures for infinite load impedance. Additional 0.03 % of span for a load resistance of 10 kΩ
Voltage	0 ... ± 500 mV
Fault signal	sensor breakage: > +500 mV (upscale), < -500 mV (downscale)
Transfer characteristics	
Deviation	
After calibration	at 20 °C (68 °F): ± 30 µV up to ± 100mV/± 0.03 % of the span up to +500 mV/± 0.03 % of the span up to -500 mV
Influence of ambient temperature	± 10 µV/K (typical ± 5 µV/K)
Absolute	< 0.25 K at 30 V voltage supply
Bandwidth	DC to 350 Hz (-3 dB)
Rise time	≤ 1 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 125 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0040
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	BASEEFA 09 ATEX 0219X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0334 (cULus)
IECEx approval	IECEx BAS 06.0011, IECEx BAS 09.0103X
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I Ex nA II T4

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Voltage input 0 mV ... ± 500 mV**
- **Voltage output 0 mV ... ± 500 mV**
- **Selectable up/downscale burnout detection on Power Rail**

Function

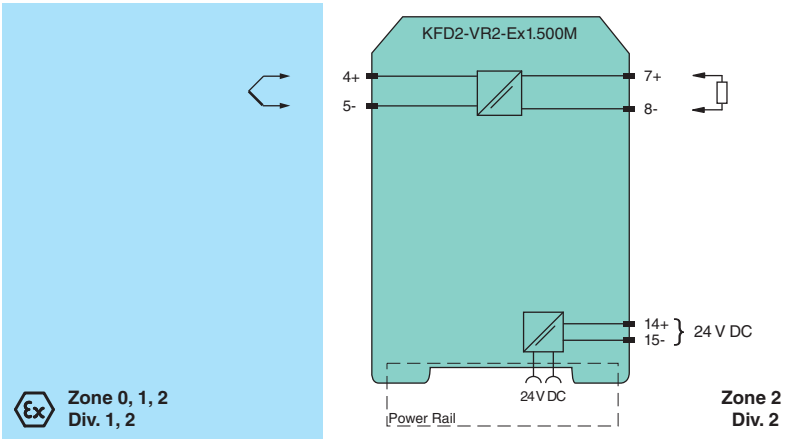
This isolated barrier is used for intrinsic safety applications. It transfers low voltage signals from thermocouples, load cells, strain gauges, operational amplifiers, and inductive oscillation sensors located in hazardous areas to safe areas.

The input voltage of the terminals 4 and 5 is transferred to the terminals 7 and 8.

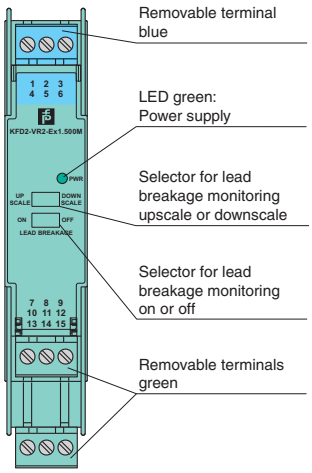
The input, output, and power supply are galvanically isolated from each other. Upscale or downscale lead breakage monitoring is selectable via switches located on the front panel of the device.

Note: This unit requires three minutes after power-up to reach the accuracy cited in the technical data.

Diagrams



Front view



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KFD2-VR-Ex1.12

Voltage Repeater

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Voltage input 0 V ... 9 V**
- **Voltage output 0 V ... 9 V**

Function

This isolated barrier is used for intrinsic safety applications. It transfers voltage signals from hazardous areas to safe areas.

The input voltage of the terminals 4 and 5 is transferred to the terminals 7 and 8. The terminals 4 and 8 have the same polarity.

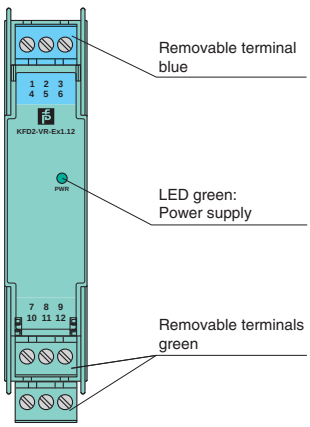
It repeats 0 V ... 9 V signals from strain gauges, transducers, and inductive motion sensors with signal frequencies up to 1.2 kHz.

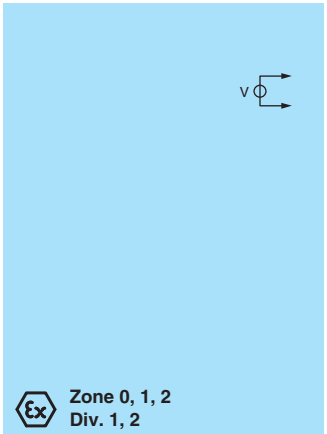
Technical data

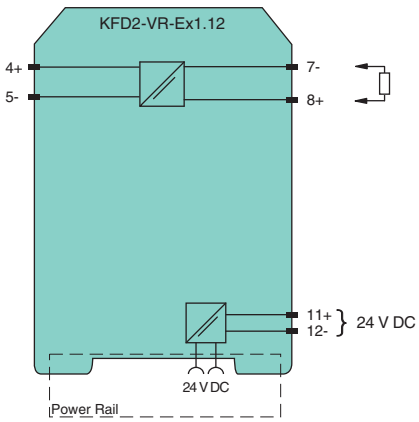
Supply	
Rated voltage	20 ... 35 V DC
Input	
Input resistance	≥ 10 MΩ
Transmission range	0 ... 9 V
Offset voltage/current	< 2 mV/< 7 nA
Output	
Voltage	0 ... 9 V
Output resistance	≤ 20 Ω
Transfer characteristics	
Deviation	
After calibration	± 5 mV at 20 °C (68 °F)
Influence of ambient temperature	≤ 0.005 % of range per K
Bandwidth	1.2 kHz (-3 dB)
Rise time	≤ 0.4 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	DMT 01 ATEX E 133
Group, category, type of protection	⟨Ex⟩ I (M1) [EEx ia] I

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Input	
Input resistance	≥ 10 MΩ
Transmission range	0 ... 12 V
Offset voltage/current	< 2 mV/< 7 mA
Output	
Voltage	0 ... 12 V
Output resistance	≤ 600 Ω
Transfer characteristics	
Deviation	
After calibration	± 5 mV at 20 °C (68 °F)
Influence of ambient temperature	≤ 0.005 % of range per K
Bandwidth	1.2 kHz (-3 dB)
Rise time	≤ 0.4 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 01 ATEX 7262
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	BASEEFA 10 ATEX 0079X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132
IECEx approval	IECEx BAS 10.0040X
Approved for	Ex nA II T4

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Voltage input 0 V ... 12 V**
- **Voltage output 0 V ... 12 V**

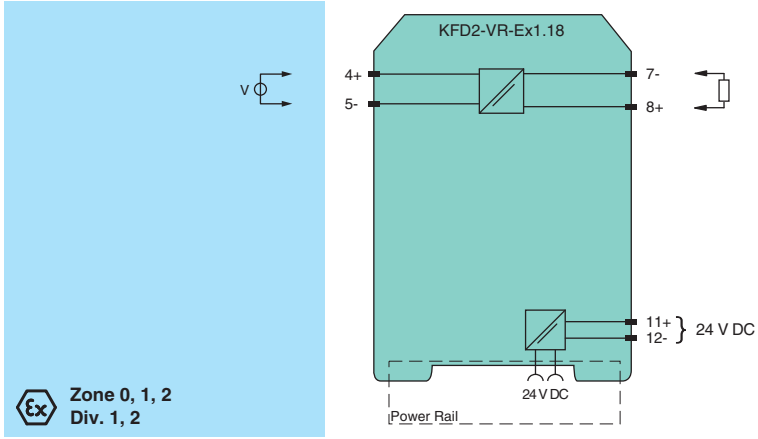
Function

This isolated barrier is used for intrinsic safety applications. It transfers voltage signals from hazardous areas to safe areas.

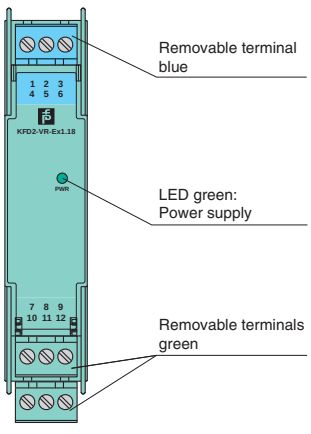
The input voltage of the terminals 4 and 5 is transferred to the terminals 7 and 8. The terminals 4 and 8 have the same polarity.

It repeats 0 V ... 12 V signals from strain gauges, transducers, and inductive motion sensors with signal frequencies up to 1.2 kHz.

Diagrams



Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Voltage input -10 V ... 10 V**
- **Voltage output -10 V ... 10 V**

Function

This isolated barrier is used for intrinsic safety applications. It transfers voltage signals from hazardous areas to safe areas.

The input voltage of the terminals 4 and 5 is transferred to the terminals 7 and 8. The terminals 4 and 8 have the same polarity.

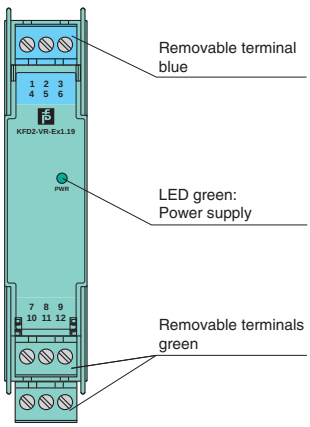
It repeats voltage signals from magnetic pickups, transducers, and flow meters between -10 V ... 10 V with signal frequencies up to 1.2 kHz.

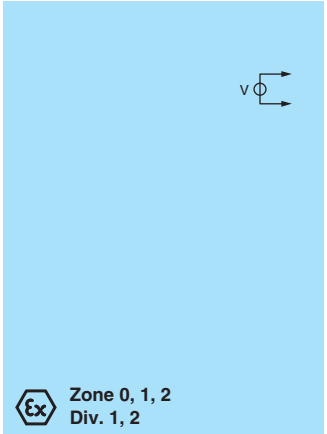
Technical data

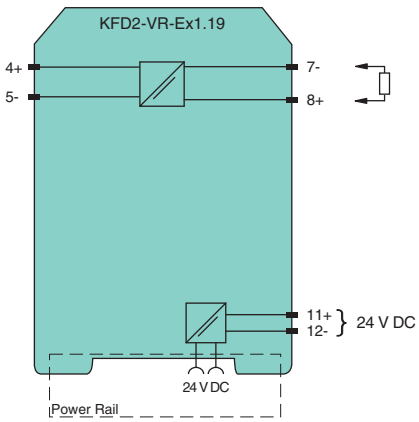
Supply	
Rated voltage	20 ... 35 V DC
Input	
Input resistance	≥ 10 MΩ
Transmission range	0 ... ± 10 V
Offset voltage/current	< 2 mV/< 7 mA
Output	
Voltage	-10 ... 10 V
Output resistance	≤ 600 Ω
Transfer characteristics	
Deviation	
After calibration	± 5 mV at 20 °C (68 °F)
Influence of ambient temperature	< 0.005 % of range per K
Bandwidth	1.2 kHz (-3 dB)
Rise time	< 0.4 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 01 ATEX 7262
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	BASEEFA 10 ATEX 0079X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132
IECEx approval	IECEx BAS 10.0040X
Approved for	Ex nA II T4

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Input	
Input resistance	≥ 10 MΩ
Offset voltage/current	< 10 mV/< 1 µA
Output	
Voltage	-10 ... 10 V
Output resistance	≤ 20 Ω
Transfer characteristics	
Deviation	
After calibration	± 30 mV at 20 °C (68 °F)
Influence of ambient temperature	< 0.01 % of span per K
Bandwidth	≤ 50 kHz (-3 dB)
Rise time	≤ 10 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 110 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 01 ATEX 7262
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	BASEEFA 10 ATEX 0079X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132
IECEx approval	IECEx BAS 10.0040X
Approved for	Ex nA II T4

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Voltage input -10 V ... 10 V**
- **Transmission frequency up to 50 kHz**
- **Voltage output -10 V ... 10 V**

Function

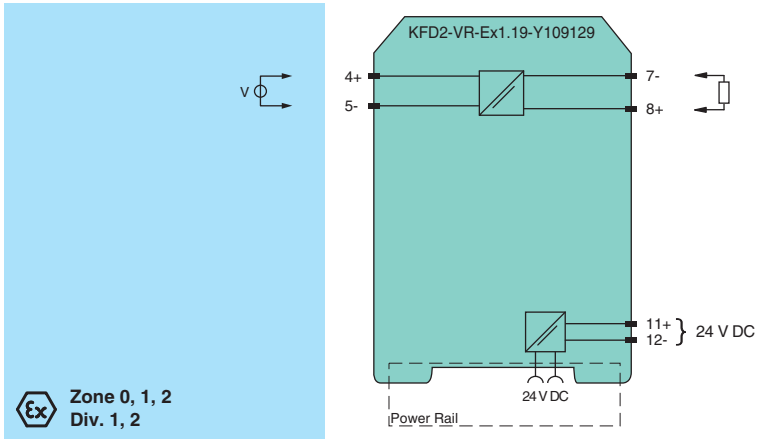
This isolated barrier is used for intrinsic safety applications. It transfers voltage signals from hazardous areas to safe areas.

The input voltage of the terminals 4 and 5 is transferred to the terminals 7 and 8. The terminals 4 and 8 have the same polarity.

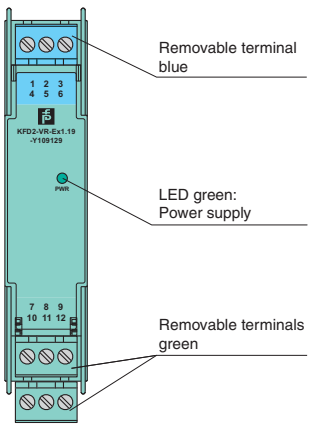
It repeats voltage signals from magnetic pickups, transducers, and flow meters between -10 V ... 10 V.

This barrier is designed for frequencies up to 50 kHz.

Diagrams



Front view



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KFD2-VR4-Ex1.26

Voltage Repeater

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Voltage input 0 V ... -20 V**
- **Vibration sensor inputs**
- **Voltage/current field supply**
- **Voltage output 0 V ... -20 V**

Function

This isolated barrier is used for intrinsic safety applications. It provides a floating output to power a vibration sensor (i. e., Bently Nevada) or accelerometers in a hazardous area and transfers the voltage signal from that sensor to the safe area.

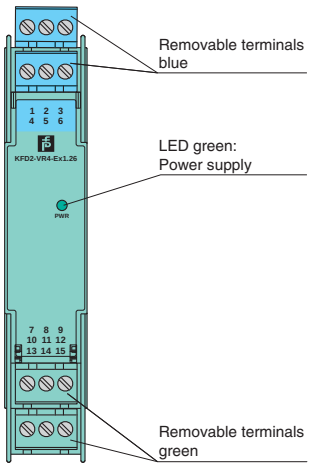
Designed to provide a voltage or current supply to the vibration sensor. Depending on connection the barrier provides 3.6 mA, 5.3 mA, or 8.9 mA supply current for 2-wire sensors, or 18 V at 20 mA for 3-wire sensors.

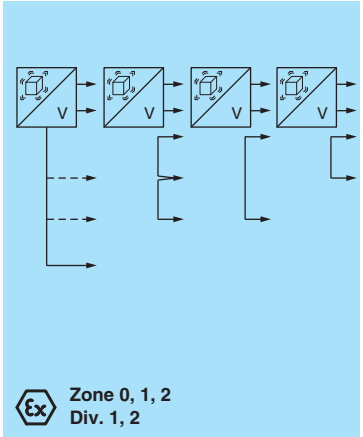
Technical data

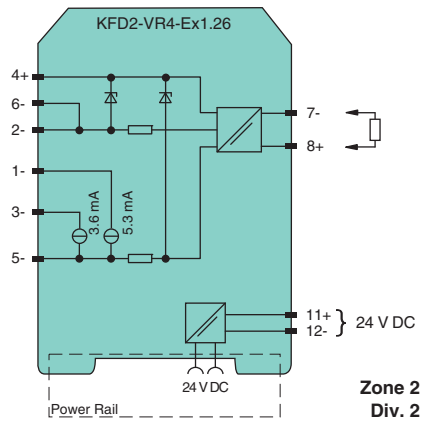
Supply	
Rated voltage	20 ... 35 V DC
Power consumption	< 1.6 W
Input	
Input resistance	10 kΩ terminals 4 (common), 6-/2-
Output rated operating current	terminals 4 (common), 5-: > 10 mA at -21 V or > 20 mA at -18 V terminals 4 (common), 1-: 5.3 mA ±0.53 mA at -10 V terminals 4 (common), 3-: 3.6 mA ±0.7 mA at -10 V
Transmission range	0 ... -20 V
Output	
Load	≥ 2 kΩ
Voltage	0 ... -20 V
Output resistance	approx. 10 Ω Since this is much less than the end-to-end resistance of a zener barrier, it may be necessary to specify a monitor intended for use without a barrier. Please follow the advice of the monitor manufacturer.
Transfer characteristics	
Bandwidth	-0.1 dB at 10 kHz; -1 dB at 20 kHz
Time delay relative to input	7.2 ± 0.3 µs
Ripple	in 200 kHz bandwidth < 20 mV_{rms} in 20 kHz bandwidth < 3 mV_{rms}
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 125 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 02 ATEX 7206
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC
EC-Type Examination Certificate	DMT 01 ATEX E 133
Group, category, type of protection	⟨Ex⟩ I (M1) [EEx ia] I
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	12 ... 35 V DC loop powered
Power loss	0.4 W
Input	
Current range	0 ... 20 mA, load ≤ 50 Ω
Voltage range	0 ... 10 V, load ≥ 100 kΩ
Output	
Load	(U -12 V)/0.02 A
Current output	4 ... 20 mA, limited to ≤ 35 mA
Fault signal	downscaling ≤ 3 mA
Transfer characteristics	
Deviation	
After calibration	0.1 % of full-scale value
Temperature effect	span: 0.050 % of span/K; zero point: 0.060 % of span/K
Linearization	≤ 0.04 % of full-scale value
Influence of supply voltage	6.5 ppm/V
Rise time	250 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	ZELM 00 ATEX 0034
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC
Statement of conformity	TÜV 01 ATEX 1777X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
CSA approval	
Control drawing	116-0132

Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current or voltage input**
- **Output: 4 ... 20 mA**
- **Potentiometer or DIP switch selectable ranges**
- **Line fault detection (LFD)**

Function

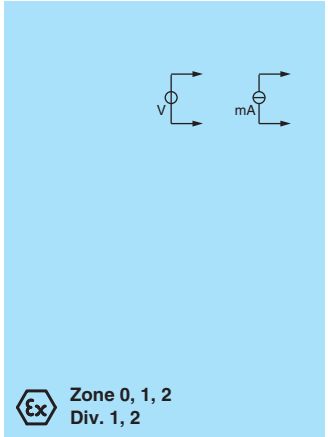
This isolated barrier is used for intrinsic safety applications. It converts a 2-wire voltage or current in the hazardous area to a 4 mA ... 20 mA signal in the safe area.

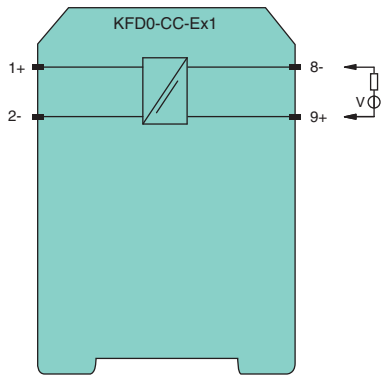
The device can be used to double signals in 20 mA measurement circuits due to the limited current signal input load of 50 Ω.

DIP switches and potentiometers make field calibration easy.

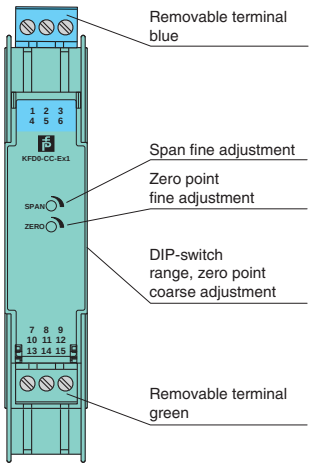
Since this isolator is loop-powered, use the technical data to verify that the proper voltage is available to the field devices.

Diagrams





Front view



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KFD2-WAC2-Ex1.D

Strain Gauge Converter

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Strain gauge input**
- **Output 0 mA ... ± 20 mA or 0 V ... ± 10 V**
- **Relay contact output**
- **Programmable high/low alarm**
- **RS 485 interface**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It is used with strain gauges, load cells and resistance measuring bridges.

Designed to provide 5 V excitation voltage, this barrier's high quality A/D converter allows it to be used with those devices requiring 10 V.

The unit is easily programmed by the use of a keypad located on the front of the unit or with the **PACT***ware*™ configuration software. The actual measurement for tare, zero point, and final value can be entered in this manner.

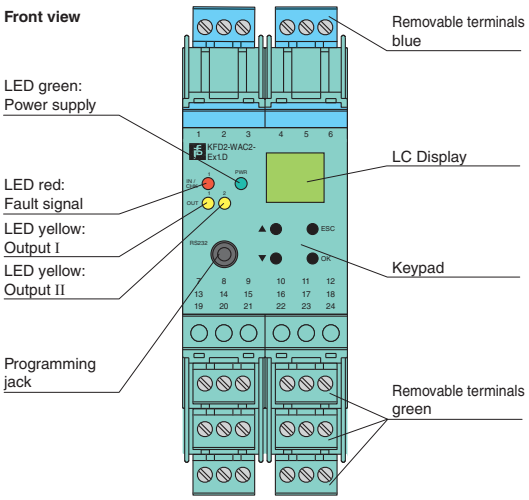
A unique collective error messaging feature is available when used with the Power Rail system.

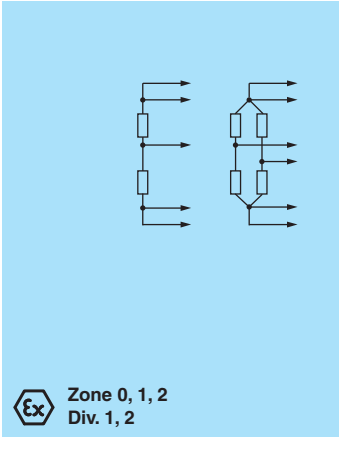
For additional information, refer to the manual and www.pepperl-fuchs.com.

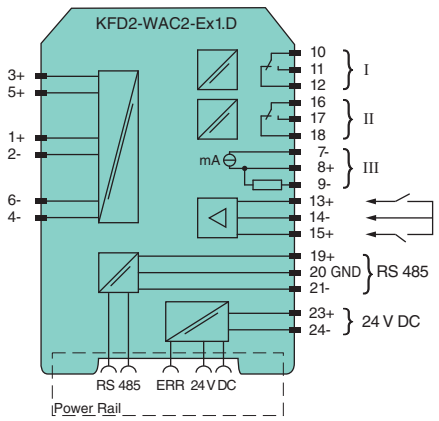
Technical data

Supply	
Rated voltage	20 ... 35 V DC
Power consumption	≤ 3 W
Interface	
Type	RS 485
Programming interface	RS 232 programming jack
Field circuit	
Lead resistance	≤ 25 Ω per lead
Sensor supply	1 ... 5 V
Short-circuit current	50 mA
Load	≥ 116 Ω up to 5V, ≥ 85 Ω up to 4V
Input	
Programmable Tare	0 ... 500 % of span
Input I	signal; analog
Input signal	-100 ... 100 mV
Input resistance	> 1 MΩ for voltage measurement
Input II, III	tare adjustment, calibration and zero
Active/Passive	I > 4 mA/I < 1.5 mA
Output	
Output I, II	relay output
Mechanical life	2 x 10^7 switching cycles
Output III	analog output
Current range	-20 ... 20 mA
Load	≤ 550 Ω
Line fault detection	downscale -21.5 mA (-10.75 V) or 2 mA (1 V), upscale 21.5 mA (10.75 V)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 250 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	TÜV 04 ATEX 2531
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC, [Ex iaD], [circuit(s) in zone 0/1/2]
FM approval	
Control drawing	116-0302 (cFMus)
IECEx approval	IECEx TUN 06.0005
Approved for	[Ex ia Ga] IIC, [Ex ia] I, [Ex iaD]

Diagrams







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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power loss/power consumption	≤ 0.95 W/0.95 W
Input	
RTD	type Pt10, Pt50, Pt100, Pt500, Pt1000 (EN 60751: 1995) type Pt10GOST, Pt50GOST, Pt100GOST, Pt500GOST, Pt1000GOST (6651-94) type Cu10, Cu50, Cu100 (P50353-92) type Ni100 (DIN 43760)
Measuring current	approx. 200 µA with RTD
Types of measuring	2-, 3-, 4-wire connection
Thermocouples	type B, E, J, K, N, R, S, T (IEC 584-1: 1995) type L (DIN 43710: 1985) type TXK, TXKH, TXA (P8.585-2001)
Cold junction compensation	external and internal
Measuring circuit monitoring	sensor burnout
Voltage	selectable within the range -100 ... 100 mV
Output	
Output	analog current output
Current range	0 ... 20 mA or 4 ... 20 mA
Fault signal	downscale 0 or 2 mA, upscale 21.5 mA (acc. NAMUR NE43)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 130 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	CESI 04 ATEX 143
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 02 ATEX 1797 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0316
CSA approval	
Control drawing	366-024CS-12 (cCSAus)
IECEx approval	IECEx TUN 07.0003
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **TC, RTD, potentiometer or voltage input**
- **Current output 0/4 mA ... 20 mA**
- **Sink or source mode**
- **Line fault (LFD) and sensor burnout detection**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It is designed to connect RTDs, thermocouples, or potentiometers in the hazardous area, and provide a proportional 0/4 mA ... 20 mA signal to the safe area.

The barrier offers 3-port isolation between input, output, and power supply.

A removable terminal block K-CJC-** is available for thermocouples when internal cold junction compensation is desired.

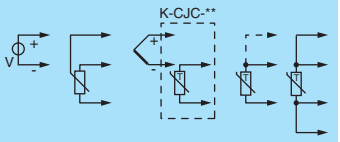
A fault is indicated by a red flashing LED per NAMUR NE44 and user-configured fault outputs.

The unit is easily programmed with the **PACT***ware*™ configuration software.

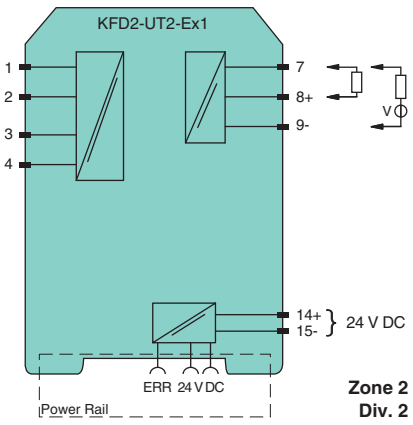
A collective error messaging feature is available when used with the Power Rail system.

For additional information, refer to the manual and www.pepperl-fuchs.com.

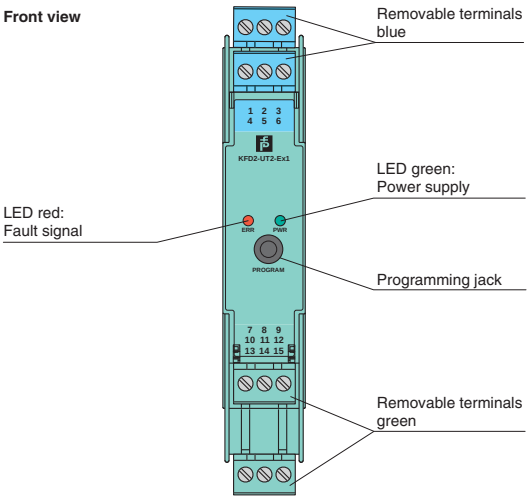
Diagrams



Zone 0, 1, 2
Div. 1, 2



Zone 2
Div. 2



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KFD2-UT2-Ex1-1

Universal Temperature Converter

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **TC, RTD, potentiometer or voltage input**
- **Voltage output 0/1 V ... 5 V**
- **Line fault (LFD) and sensor burnout detection**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It is designed to connect RTDs, thermocouples, or potentiometers in the hazardous area, and provide a proportional 0/1 V ... 5 V signal to the safe area.

The barrier offers 3-port isolation between input, output, and power supply.

A removable terminal block K-CJC-** is available for thermocouples when internal cold junction compensation is desired.

A fault is indicated by a red flashing LED per NAMUR NE44 and user-configured fault outputs.

The unit is easily programmed with the **PACT***ware*™ configuration software.

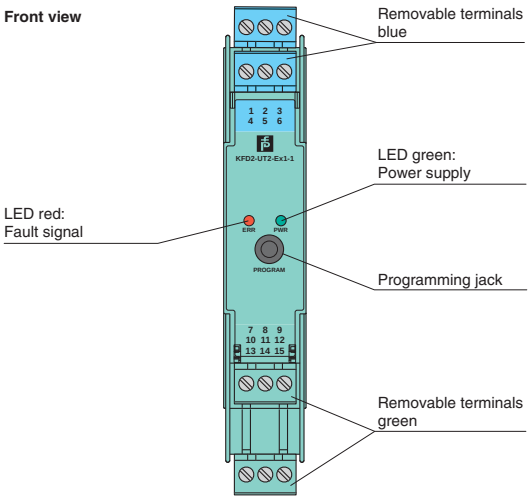
A collective error messaging feature is available when used with the Power Rail system.

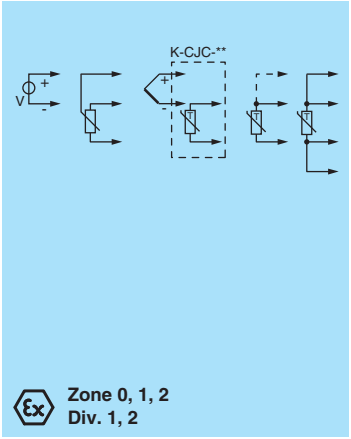
For additional information, refer to the manual and www.pepperl-fuchs.com.

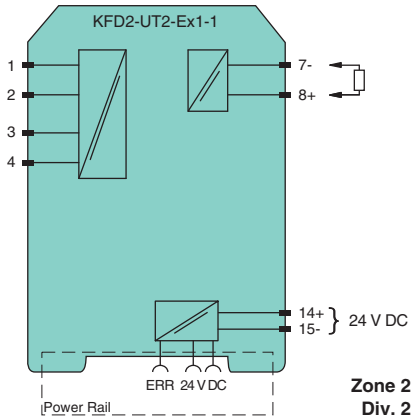
Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power loss/power consumption	≤ 0.64 W/0.64 W
Input	
RTD	type Pt10, Pt50, Pt100, Pt500, Pt1000 (EN 60751: 1995) type Pt10GOST, Pt50GOST, Pt100GOST, Pt500GOST, Pt1000GOST (6651-94) type Cu10, Cu50, Cu100 (P50353-92) type Ni100 (DIN 43760)
Measuring current	approx. 200 µA with RTD
Types of measuring	2-, 3-, 4-wire connection
Thermocouples	type B, E, J, K, N, R, S, T (IEC 584-1: 1995) type L (DIN 43710: 1985) type TXK, TXKH, TXA (P8.585-2001)
Cold junction compensation	external and internal
Measuring circuit monitoring	sensor burnout
Voltage	selectable within the range -100 ... 100 mV
Output	
Voltage output	0 ... 5 V or 1 ... 5 V; output resistance: ≤ 5 Ω; load: ≥ 10 kΩ
Fault signal	downscale 0 V or 0.5 V, upscale 5.375 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 130 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	CESI 04 ATEX 143
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 02 ATEX 1797 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0316
CSA approval	
Control drawing	366-024CS-12 (cCSAus)
IECEx approval	IECEx TUN 07.0003
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I

Diagrams







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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power loss/power consumption	≤ 1.5 W/1.5 W
Input	
RTD	type Pt10, Pt50, Pt100, Pt500, Pt1000 (EN 60751: 1995) type Pt10GOST, Pt50GOST, Pt100GOST, Pt500GOST, Pt1000GOST (6651-94) type Cu10, Cu50, Cu100 (P50353-92) type Ni100 (DIN 43760)
Measuring current	approx. 200 µA with RTD
Types of measuring	2-, 3-wire connection
Thermocouples	type B, E, J, K, N, R, S, T (IEC 584-1: 1995) type L (DIN 43710: 1985) type TXK, TXKH, TXA (P8.585-2001)
Cold junction compensation	external and internal
Measuring circuit monitoring	sensor burnout
Voltage	selectable within the range -100 ... 100 mV
Output	
Output I, II	Analog current output
Current range	0 ... 20 mA or 4 ... 20 mA
Fault signal	downscale 0 or 2 mA, upscale 21.5 mA (acc. NAMUR NE43)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 130 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	CESI 04 ATEX 143
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 02 ATEX 1797 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0316
CSA approval	
Control drawing	366-024CS-12 (cCSAus)
IECEx approval	IECEx TUN 07.0003
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **TC, RTD, potentiometer or voltage input**
- **Current output 0/4 mA ... 20 mA**
- **Sink or source mode**
- **Line fault (LFD) and sensor burnout detection**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It is designed to connect RTDs, thermocouples, or potentiometers in the hazardous area, and provide a proportional 0/4 mA ... 20 mA signal to the safe area.

The barrier offers 3-port isolation between input, output, and power supply.

A removable terminal block K-CJC-** is available for thermocouples when internal cold junction compensation is desired.

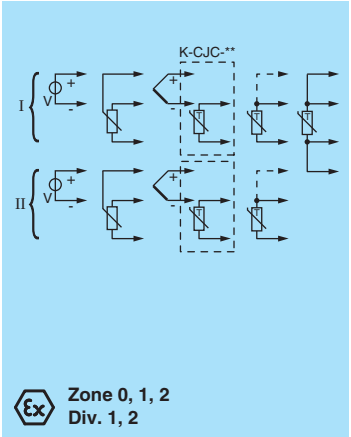
A fault is indicated by a red flashing LED per NAMUR NE44 and user-configured fault outputs.

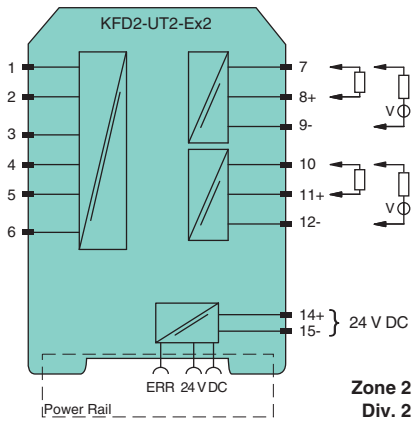
The unit is easily programmed with the **PACT***ware*™ configuration software.

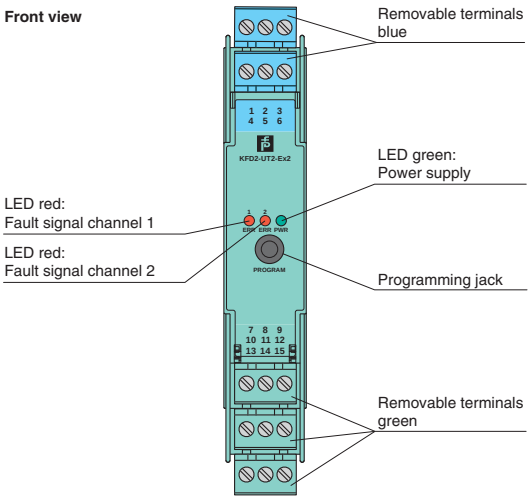
A collective error messaging feature is available when used with the Power Rail system.

For additional information, refer to the manual and www.pepperl-fuchs.com.

Diagrams







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KFD2-UT2-Ex2-1

Universal Temperature Converter

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **TC, RTD, potentiometer or voltage input**
- **Voltage output 0/1 V ... 5 V**
- **Line fault (LFD) and sensor burnout detection**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It is designed to connect RTDs, thermocouples, or potentiometers in the hazardous area, and provide a proportional 0/1 V ... 5 V signal to the safe area.

The barrier offers 3-port isolation between input, output, and power supply.

A removable terminal block K-CJC-** is available for thermocouples when internal cold junction compensation is desired.

A fault is indicated by a red flashing LED per NAMUR NE44 and user-configured fault outputs.

The unit is easily programmed with the **PACT***ware*™ configuration software.

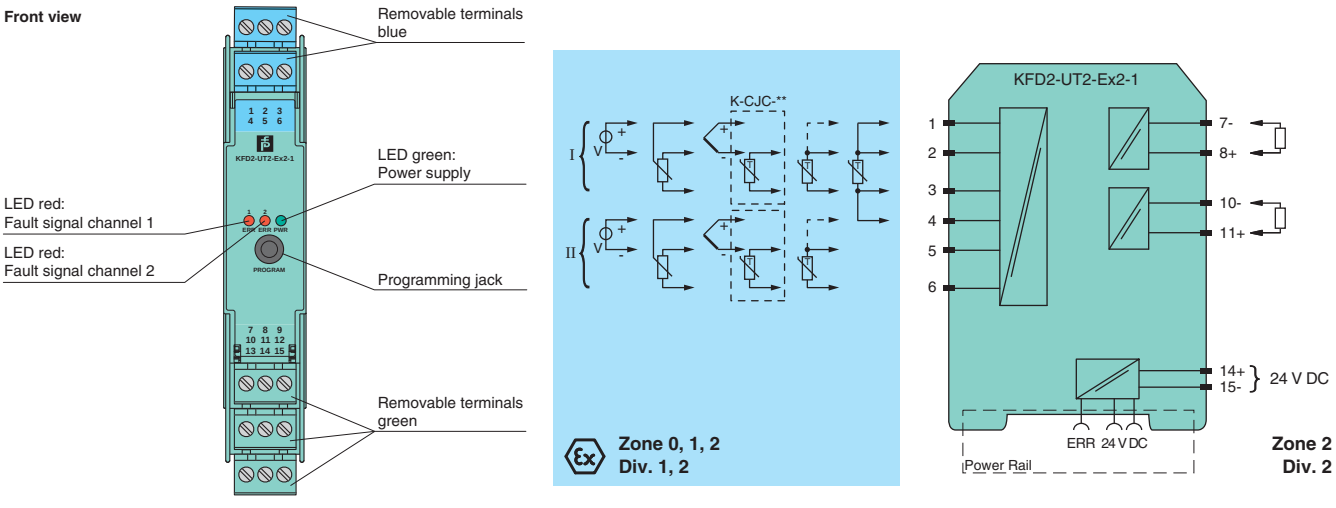
A collective error messaging feature is available when used with the Power Rail system.

For additional information, refer to the manual and www.pepperl-fuchs.com.

Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power loss/power consumption	≤ 0.8 W/0.8 W
Input	
RTD	type Pt10, Pt50, Pt100, Pt500, Pt1000 (EN 60751: 1995) type Pt10GOST, Pt50GOST, Pt100GOST, Pt500GOST, Pt1000GOST (6651-94) type Cu10, Cu50, Cu100 (P50353-92) type Ni100 (DIN 43760)
Measuring current	approx. 200 µA with RTD
Types of measuring	2-, 3-wire connection
Thermocouples	type B, E, J, K, N, R, S, T (IEC 584-1: 1995) type L (DIN 43710: 1985) type TXK, TXKH, TXA (P8.585-2001)
Cold junction compensation	external and internal
Measuring circuit monitoring	sensor burnout
Voltage	selectable within the range -100 ... 100 mV
Output	
Voltage output	0 ... 5 V or 1 ... 5 V; output resistance: ≤ 5 Ω; load: ≥ 10 kΩ
Fault signal	downscale 0 V or 0.5 V, upscale 5.375 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 130 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	CESI 04 ATEX 143
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 02 ATEX 1797 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0316
CSA approval	
Control drawing	366-024CS-12 (cCSAus)
IECEx approval	IECEx TUN 07.0003
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I

Diagrams



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Technical data

Supply	
Rated voltage	12 ... 35 V DC loop powered
Input	
Lead resistance	≤ 100 Ω per lead
Measuring current	approx. 1 mA
Output	
Load	(U -12 V)/0.02 A
Current output	4 ... 20 mA, limited to ≤ 35 mA
Fault signal	upscaling ≥ 22 mA (limited to 35 mA)
Transfer characteristics	
Measurement range f_n	span without linearization 25 ... 800 °C (77 ... 1472 °F)/ with linearization 25 ... 375 °C (77 ... 707 °F), both adjustable zero point without linearization -200 ... 400 °C (-328 ... 752 °F)/ with linearization -30 ... 375 °C (-22 ... 707 °F), both adjustable
Deviation	
After calibration	0.1 % of full-scale value incl. linearity and hysteresis
Influence of ambient temperature	span and zero point 0.015 %/K or ± 10 mΩ/K
Influence of supply voltage	6.5 ppm/V
Rise time	250 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	ZELM 00 ATEX 0036
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC
Statement of conformity	TÜV 01 ATEX 1777X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
CSA approval	
Control drawing	116-0132

Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **2- or 3-wire Pt100 RTD input**
- **Output 4 mA ... 20 mA, temperature linearization selectable**
- **DIP switch selectable ranges**
- **Sensor breakage detection**

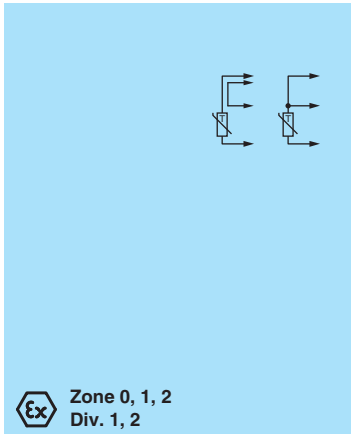
Function

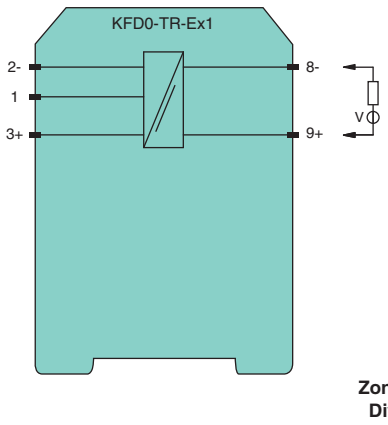
This isolated barrier is used for intrinsic safety applications. It is a loop-powered isolator that converts the resistance from a 3-wire RTD in the hazardous area to a 4 mA ... 20 mA signal in the safe area.

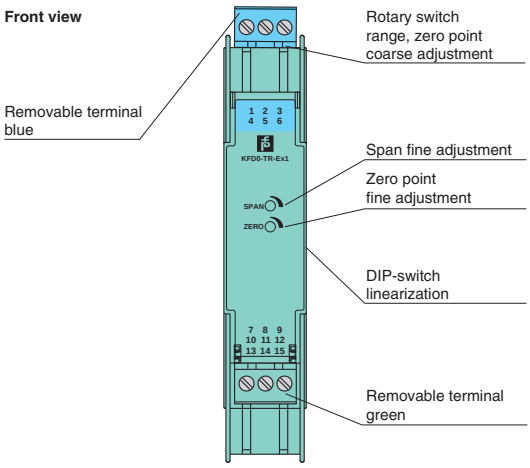
A selectable analog linearization ensures a temperature linear 4 mA ... 20 mA output between 25 °C ... 375 °C.

It also features conveniently located DIP switches, rotary switches and potentiometers to make field calibration easy.

Diagrams







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Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Thermocouple input**
- **Output 4 mA ... 20 mA**
- **Internal cold junction compensation**
- **Sensor breakage detection**
- **DIP switch selectable ranges**

Function

This isolated barrier is used for intrinsic safety applications. It is a loop-powered isolator that converts thermocouple inputs in the hazardous area to a 4 mA ... 20 mA signal in the safe area.

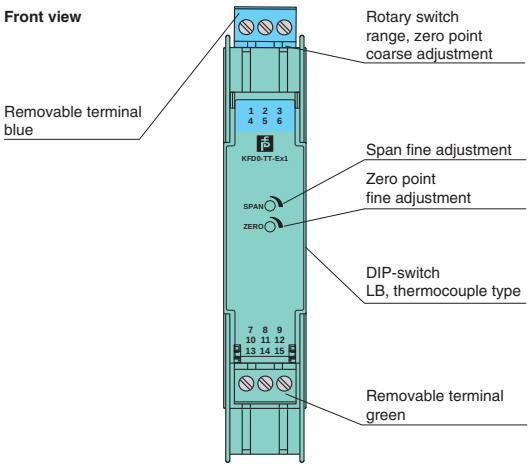
The internal cold junction compensation can be bypassed by using terminals 1 and 3.

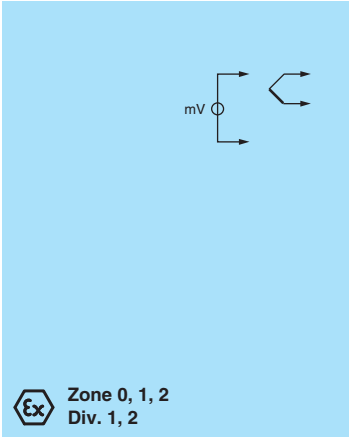
The output current is linear to input voltage, not proportional to temperature. Zero, span, and burnout detection are field-configurable.

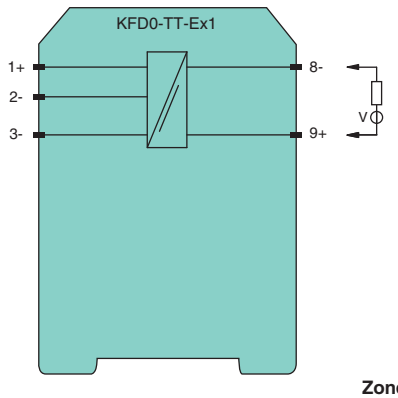
Technical data

Supply	
Rated voltage	12 ... 35 V DC loop powered
Input	
Lead resistance	≤ 100 Ω per lead
Current	lead monitoring ON: ≤ 15 nA; OFF: ≤ 1 nA
Output	
Load	(U -12 V)/0.02 A
Current output	4 ... 20 mA, limited to ≤ 35 mA
Fault signal	downscaling ≤ 3 mA, upscaling ≥ 22 mA
Transfer characteristics	
Measurement range f_n	span 4 ... 100 mV, zero point -12 ... 60 mV, both adjustable
Deviation	
After calibration	0.1 % of full-scale value ± 1 K for the cold junction
Temperature effect	temperature deviation 0.015 % of the span/K or 1.5 µV/K cold junction ± 2 K (calibrated at T_{amb} = 20 °C (68 °F))
Influence of supply voltage	6.5 ppm/V
Characteristic curve	the output voltage is linearly proportionate to the input voltage (not to temperature)
Rise time	250 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	ZELM 00 ATEX 0035
Group, category, type of protection	Ex II (1)GD [EEx ia] IIC
Statement of conformity	TÜV 01 ATEX 1777X
Group, category, type of protection, temperature classification	Ex II 3G Ex nA II T4
CSA approval	
Control drawing	116-0132

Diagrams







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Technical data

Supply	
Rated voltage	19 ... 30 V DC
Power consumption	0.35 W (24 V and 1 mA sense current)
Input	
Line fault detection	yes, at Pt100
Lead resistance	≤ 10 % of resistance value
Transmission range	0 ... 10 mA
Available voltage	9 V
Lead monitoring	50 nA
Output	
Current	0 ... 10 mA
Available voltage	0 ... 7 V
Fault signal	< 10 Ω or > 400 Ω, depending on lead disconnected (measuring current ≤ 1mA)
Transfer characteristics	
Deviation	$I_m \geq 1$ mA: ± 0.1 % of R_m or ± 0.1 Ω (the larger value is applicable) $I_m < 1$ mA: accuracy reduces in proportion to I_m. e. g. $I_m = 0.1$ mA: ± 1 % of R_m or 1 Ω (the larger value is applicable).
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 114 x 124 mm (0.5 x 4.5 x 4.9 in), housing type A2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BASEEFA 10 ATEX 0061
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	BASEEFA 10 ATEX 0062X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	pending
UL approval	
Control drawing	116-0332 (cULus)
IECEx approval	IECEx BAS 10.0024 IECEx BAS 10.0025X
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I Ex nA II T4

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Resistance and RTD input (Pt100, Pt500, Pt1000)**
- **Resistance output**
- **Accuracy 0.1 %**
- **Line fault detection (LFD) for Pt100**

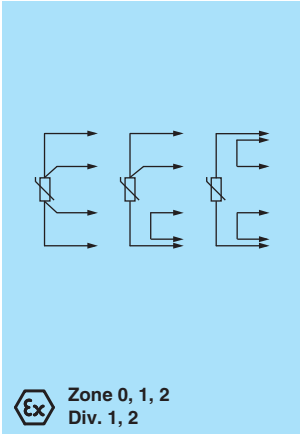
Function

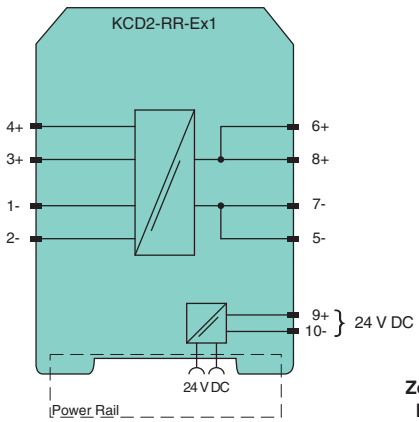
This isolated barrier is used for intrinsic safety applications. It transfers RTD resistance values from hazardous areas to safe areas.

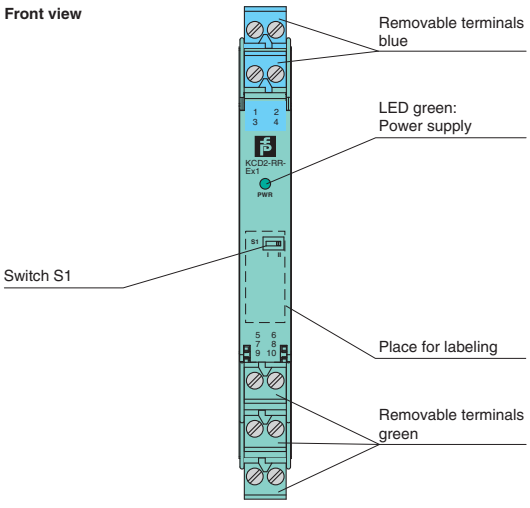
A 2-, 3-, or 4-wire mode is available depending on the required accuracy.

The monitor registers the same load as if it were connected directly to the resistance in a hazardous area.

Diagrams







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KFD2-GU-Ex1

Temperature Trip Value

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Thermocouple, RTD, voltage or current input**
- **2 relay contact outputs**
- **Programmable high/low alarm**
- **Sensor breakage detection**

Function

This isolated barrier is used for intrinsic safety applications. It accepts a variety of inputs including RTDs or thermocouples and provides a relay trip whenever it reaches a user-programmed set point.

A removable terminal block K-CJC-** is available for thermocouples when internal cold junction compensation is desired.

A fault is indicated by a red flashing LED per NAMUR NE44 and user-configured fault outputs.

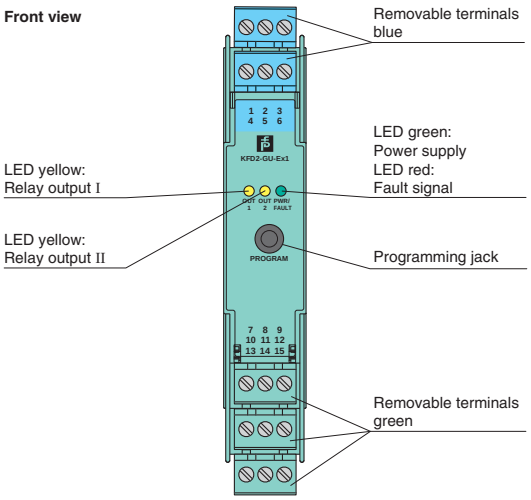
The unit is easily programmed with the **PACT***ware*™ configuration software.

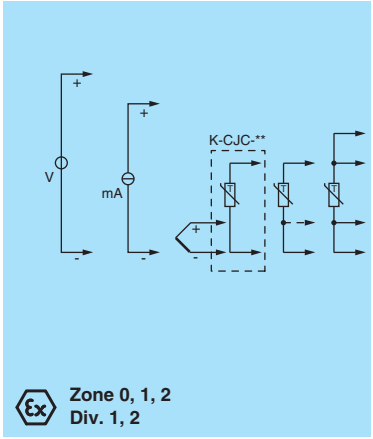
For additional information, refer to the manual and www.pepperl-fuchs.com.

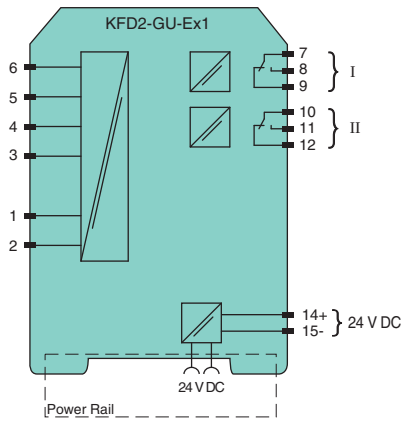
Technical data

Supply	
Rated voltage	19 ... 35 V DC
Power consumption	0.8 W
Input	
Thermocouples	type B, E, J, K, N, R, S, T (IEC 584-1: 1995) type L (DIN 43710: 1985)
Load	20 Ω for 20 mA; 200 kΩ for 10 V
Output	
Output I, II	
Contact loading	253 V AC/2 A/500 VA/cos Φ min. 0.7; 40 V DC/2 A resistive load
Mechanical life	2 x 10^7 switching cycles
Transfer characteristics	
Deviation	
Voltage input	± 0.02 % of 10 V measuring range
Resistance input	± 0.025 % of measuring range (4-wire connection)
Current input	± 0.02 % of 20 mA measuring range
Pt100	± 0.01 % of abs. temperature value of switching point in K + 0.2 K (4-wire connection)
Thermocouple	± 0.05 % of abs. temperature value of switching point in K + 1.1 K (1.2 K for thermocouple types R and S) this includes ± 0.8 K error of the cold junction compensation (+0.9 K for thermocouple types R and S).
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 98 ATEX 7152
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 99 ATEX 1493 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4
UL approval	
Control drawing	116-0173 (cULus)
IECEx approval	IECEx BAS 06.0022

Diagrams







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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power loss/power consumption	≤ 2 W/2.2 W
Input	
RTD	Pt100, Pt500, Pt1000, Ni100, Ni1000
Types of measuring	2-, 3-, 4-wire technology
Lead resistance	≤ 50 Ω
Measuring circuit monitoring	sensor burnout, sensor short-circuit
Thermocouples	type B, E, J, K, L, N, R, S, T
Cold junction compensation	external and internal
Measuring circuit monitoring	sensor burnout
Voltage	0 ... 10 V, 2 ... 10 V, 0 ... 1 V, -100 ... 100 mV
Potentiometer	0.8 ... 20 kΩ
Types of measuring	2-, 3-, 5-wire technology
Input resistance	≥ 250 kΩ (0 ... 10 V) ≥ 1 MΩ (0 ... 1 V, -100 ... 100 mV)
Measuring current	approx. 400 µA with resistance measuring sensor
Output	
Output I, II	relay
Contact loading	250 V AC/2 A/cos Φ≥ 0.7; 40 DC/2 A
Mechanical life	5 x 10^7 switching cycles
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Output III	Analog current output
Current range	0 ... 20 mA or 4 ... 20 mA
Open loop voltage	≤ 24 V DC
Load	≤ 650 Ω
Fault signal	downscale I ≤ 3.6 mA, upscale I ≥ 21 mA (acc. NAMUR NE43)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	TÜV 03 ATEX 2140
Group, category, type of protection	⟨Ex⟩ II (1) G [Ex ia] IIC ⟨Ex⟩ II (1) D [Ex iaD]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4 X

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **TC, RTD, potentiometer or voltage input**
- **Redundant TC input**
- **Current output 0/4 mA ... 20 mA**
- **2 relay contact outputs**
- **Line fault (LFD) and sensor burnout detection**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It is designed for a wide range of measurement applications. It converts the signal of an RTD, thermocouple, potentiometer, or voltage source to a proportional output current. It also provides a relay trip value.

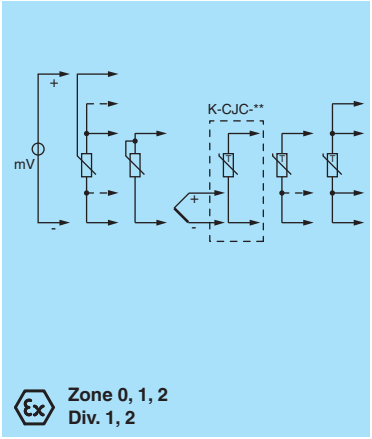
A removable terminal block K-CJC-** is available for thermocouples when internal cold junction compensation is desired.

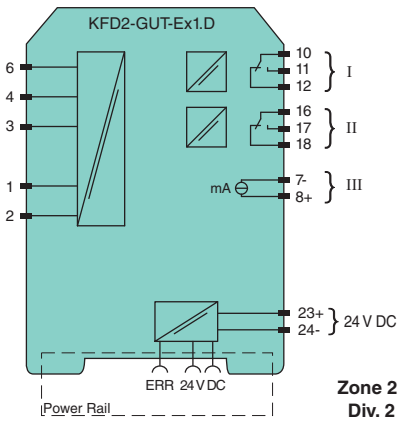
The unit is easily programmed by the use of a keypad located on the front of the unit or with the **PACT***ware*™ configuration software.

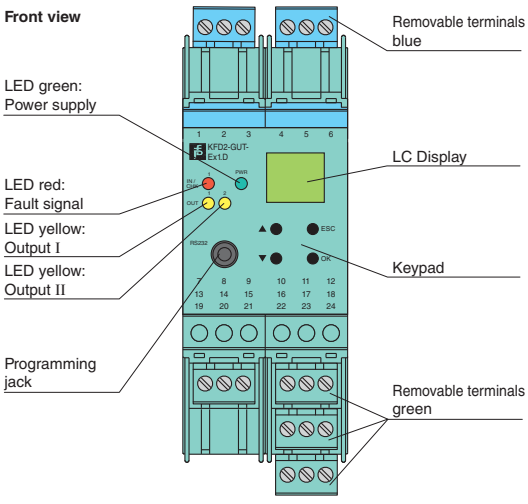
A unique collective error messaging feature is available when used with the Power Rail system.

For additional information, refer to the manual and www.pepperl-fuchs.com.

Diagrams







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KFU8-GUT-Ex1.D

Temperature Converter with Trip Values

Features

- **1-channel isolated barrier**
- **AC/DC wide range supply**
- **TC, RTD, potentiometer or voltage input**
- **Redundant TC input**
- **Current output 0/4 mA ... 20 mA**
- **2 relay contact outputs**
- **Line fault (LFD) and sensor burnout detection**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It is designed for a wide range of measurement applications. It converts the signal of an RTD, thermocouple, potentiometer, or voltage source to a proportional output current. It also provides a relay trip value.

A removable terminal block K-CJC-** is available for thermocouples when internal cold junction compensation is desired.

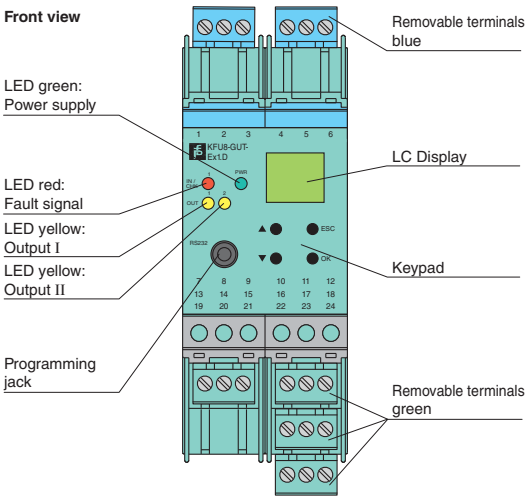
The unit is easily programmed by the use of a keypad located on the front of the unit or with the **PACT***ware*™ configuration software.

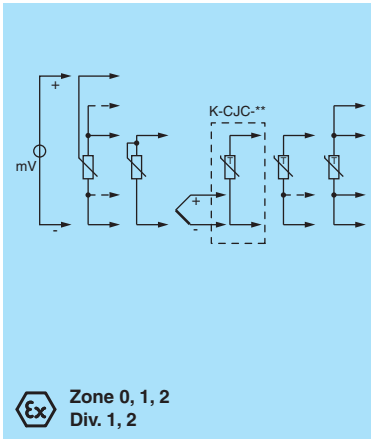
For additional information, refer to the manual and www.pepperl-fuchs.com.

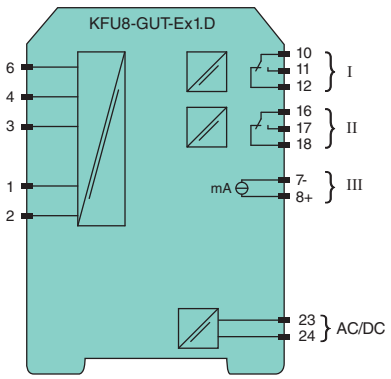
Technical data

Supply	
Rated voltage	20 ... 90 V DC/48 ... 253 V AC
Power loss/power consumption	≤2 W; 2.5 VA/2.2 W; 3 VA
Input	
RTD	Pt100, Pt500, Pt1000, Ni100, Ni1000
Types of measuring	2-, 3-, 4-wire technology
Lead resistance	≤50 Ω
Measuring circuit monitoring	sensor burnout, sensor short-circuit
Thermocouples	type B, E, J, K, L, N, R, S, T
Cold junction compensation	external and internal
Measuring circuit monitoring	sensor burnout
Voltage	0 ... 10 V, 2 ... 10 V, 0 ... 1 V, -100 ... 100 mV
Potentiometer	0.8 ... 20 kΩ
Types of measuring	2-, 3-, 5-wire technology
Input resistance	≥ 250 kΩ (0 ... 10 V) ≥ 1 MΩ (0 ... 1 V, -100 ... 100 mV)
Measuring current	approx. 400 µA with resistance measuring sensor
Output	
Output I, II	relay
Contact loading	250 V AC/2 A/cos Φ≥ 0.7; 40 DC/2 A
Mechanical life	5 x 10^7 switching cycles
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Output III	Analog current output
Current range	0 ... 20 mA or 4 ... 20 mA
Open loop voltage	≤24 V DC
Load	≤650 Ω
Fault signal	downscale I ≤ 3.6 mA, upscale I ≥ 21 mA (acc. NAMUR NE43)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 in), housing type C3
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	TÜV 03 ATEX 2140
Group, category, type of protection	Ⓔx II (1) G [Ex ia] IIC Ⓔx II (1) D [Ex iaD]

Diagrams







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Power consumption	0.6 W
Input	
Lead resistance	5 % of the potentiometer resistance (adjustable)
Potentiometer	
Types of measuring	3-, 4-, 5-wire technology
Nominal resistance	≥ 800 Ω
Supply voltage	approx. 4.7 V
Output	
Voltage output	0 ... 10 V
Output resistance	≤ 30 Ω
Transfer characteristics	
Deviation	
Linearity	≤ ± 5 mV
Influence of ambient temperature	≤ 0.5 mV/K
Rise time	10 to 90 % ≤ 8 ms; 10 to 90 % within 1 % of span ≤ 25 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 120 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 00 ATEX 7171
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 02 ATEX 1797 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132
IECEx approval	IECEx BAS 10.0060 IECEx BAS 10.0061X
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I Ex nA II T4

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Potentiometer input**
- **Voltage output 0 V ... 10 V**
- **Lead resistance compensation adjustment**
- **Accuracy 0.05 %**

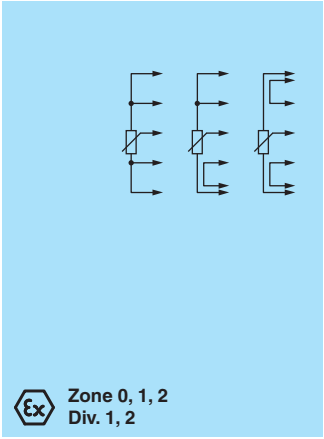
Function

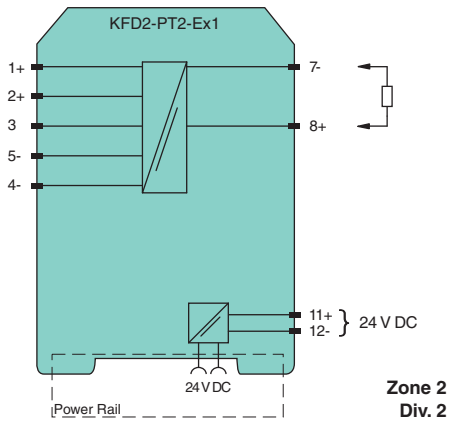
This isolated barrier is used for intrinsic safety applications. It provides the source voltage to a potentiometer and transfers its wiper position from hazardous areas to safe areas. It then converts the signal to a 0 V ... 10 V voltage output (consistant with 0 mA ... 20 mA current output, see for example KFD2-PT2-Ex1-4).

The unit can be used in a 3-, 4-, or 5-wire configuration depending on the required measurement accuracy. Terminals 2 and 5 are used as the sense line for the potentiometer lead resistance compensation in a 5-wire configuration.

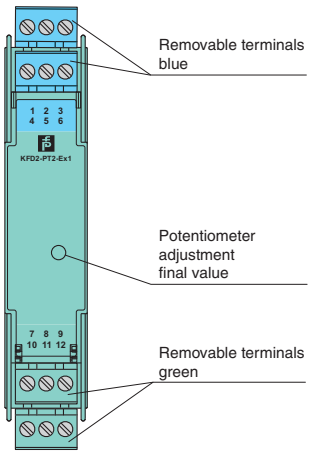
The barrier's potentiometer can be used to compensate for lead resistance up to 5 % of the hazardous area potentiometer value.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Potentiometer input**
- **Voltage output 0 V ... 5 V**
- **Lead resistance compensation adjustment**
- **Accuracy 0.05 %**

Function

This isolated barrier is used for intrinsic safety applications. It provides the source voltage to a potentiometer and transfers its wiper position from hazardous areas to safe areas. It then converts the signal to a 0 V ... 5 V voltage output (consistant with 0 mA ... 20 mA current output, see for example KFD2-PT2-Ex1-4).

The unit can be used in a 3-, 4-, or 5-wire configuration depending on the required measurement accuracy. Terminals 2 and 5 are used as the sense line for the potentiometer lead resistance compensation in a 5-wire configuration.

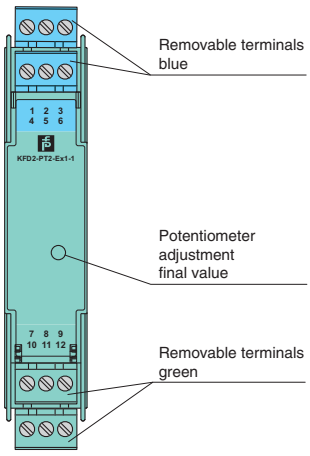
The barrier's potentiometer can be used to compensate for lead resistance up to 5 % of the hazardous area potentiometer value.

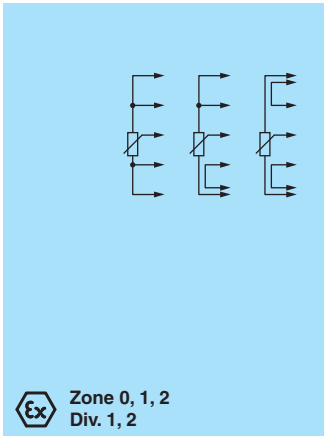
Technical data

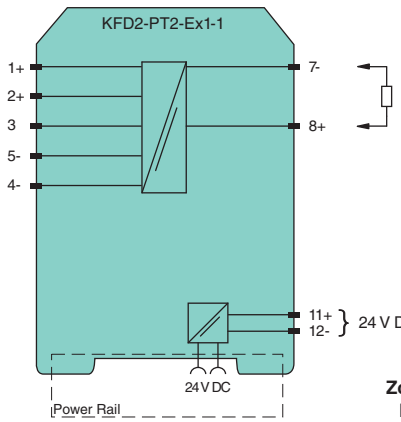
Supply	
Rated voltage	20 ... 35 V DC
Power consumption	0.6 W
Input	
Lead resistance	5 % of the potentiometer resistance (adjustable)
Potentiometer	
Types of measuring	3-, 4-, 5-wire technology
Nominal resistance	≥ 800 Ω
Supply voltage	approx. 4.7 V
Output	
Voltage output	0 ... 5 V
Output resistance	≤ 30 Ω
Transfer characteristics	
Deviation	
Linearity	≤ ± 5 mV
Influence of ambient temperature	≤ 0.5 mV/K
Rise time	10 to 90 % ≤ 8 ms; 10 to 90 % within 1 % of span ≤ 25 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 120 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 00 ATEX 7171
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 02 ATEX 1797 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132
IECEx approval	IECEx BAS 10.0060 IECEx BAS 10.0061X
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I Ex nA II T4

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Power consumption	1.3 W
Input	
Lead resistance	5 % of the potentiometer resistance (adjustable)
Potentiometer	
Types of measuring	3-, 4-, 5-wire technology
Nominal resistance	≥ 800 Ω
Supply voltage	approx. 4.7 V
Output	
Current output	0 ... 20 mA, load ≤ 1 kΩ
Transfer characteristics	
Deviation	
Linearity	≤ ± 10 µA
Influence of ambient temperature	≤ 1 µA/K
Rise time	10 to 90 % ≤ 8 ms; 10 to 90 % within 1 % of span ≤ 25 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 120 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 00 ATEX 7171
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 02 ATEX 1797 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132
IECEx approval	IECEx BAS 10.0060 IECEx BAS 10.0061X
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I Ex nA II T4

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Potentiometer input**
- **Current output 0 mA ... 20 mA**
- **Lead resistance compensation adjustment**
- **Accuracy 0.05 %**

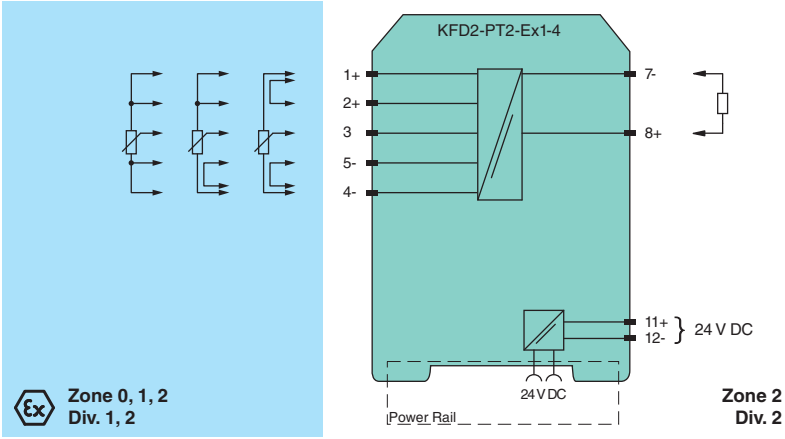
Function

This isolated barrier is used for intrinsic safety applications. It provides the source voltage to a potentiometer and transfers its wiper position from hazardous areas to safe areas. It then converts the signal to a 0 mA ... 20 mA current output.

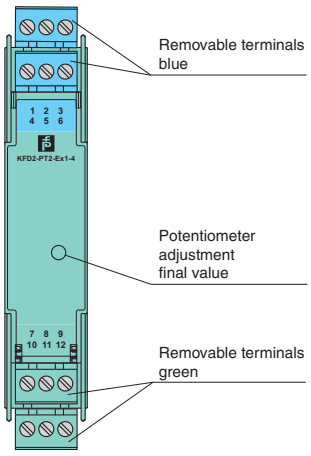
The unit can be used in a 3-, 4-, or 5-wire configuration depending on the required measurement accuracy. Terminals 2 and 5 are used as the sense line for the potentiometer lead resistance compensation in a 5-wire configuration.

The barrier's potentiometer can be used to compensate for lead resistance up to 5 % of the hazardous area potentiometer value.

Diagrams



Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Potentiometer input**
- **Current output 4 mA ... 20 mA**
- **Lead resistance compensation adjustment**
- **Accuracy 0.05 %**

Function

This isolated barrier is used for intrinsic safety applications. It provides the source voltage to a potentiometer and transfers its wiper position from hazardous areas to safe areas. It then converts the signal to a 4 mA ... 20 mA current output.

The unit can be used in a 3-, 4-, or 5-wire configuration depending on the required measurement accuracy. Terminals 2 and 5 are used as the sense line for the potentiometer lead resistance compensation in a 5-wire configuration.

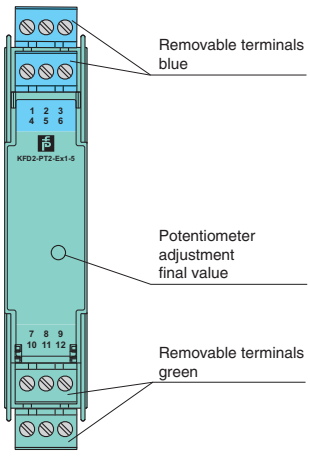
The barrier's potentiometer can be used to compensate for lead resistance up to 5 % of the hazardous area potentiometer value.

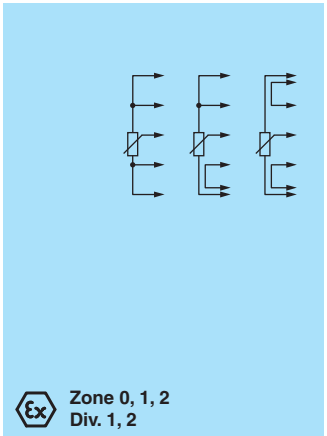
Technical data

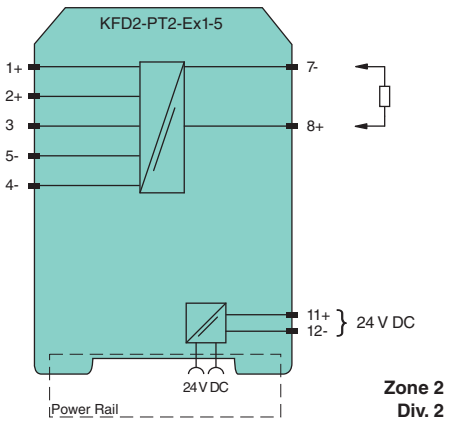
Supply	
Rated voltage	20 ... 35 V DC
Power consumption	1.3 W
Input	
Lead resistance	5 % of the potentiometer resistance (adjustable)
Potentiometer	
Types of measuring	3-, 4-, 5-wire technology
Nominal resistance	≥ 800 Ω
Supply voltage	approx. 4.7 V
Output	
Current output	4 ... 20 mA, load ≤ 1 kΩ
Transfer characteristics	
Deviation	
Linearity	± 10 µA
Influence of ambient temperature	≤ 1 µA/K
Rise time	10 to 90 % ≤ 8 ms; 10 to 90 % within 1 % of span ≤ 25 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 120 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	BAS 00 ATEX 7171
Group, category, type of protection	Ⓔx II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 02 ATEX 1797 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132
IECEx approval	IECEx BAS 10.0060 IECEx BAS 10.0061X
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I Ex nA II T4

Diagrams

Front view







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Technical data

Supply	
Rated voltage	12 ... 35 V DC loop powered
Input	
Lead resistance	≤ 100 Ω per lead
Measuring current	approx. 1 mA
Output	
Load	(U -12 V)/0.02 A
Current output	4 ... 20 mA, limited to ≤ 35 mA
Fault signal	lead breakage: upscaling ≥ 22 mA, limited to ≤ 35 mA
Transfer characteristics	
Measurement range f_n	(adjustable) 0.5 ... 11 kΩ; final value: 0.45 ... 11 kΩ; zero point: 0 ... 10 % of full-scale value
Deviation	
After calibration	0.1 % of full-scale value
Temperature effect	Span 5 µA/K; zero point 5 µA/K
Linearization	≤ 0.04 % of full-scale value
Influence of supply voltage	6.5 ppm/V
Rise time	700 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 258 for entity parameters
EC-Type Examination Certificate	TÜV 98 ATEX 1381
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC [Ex iaD]
Statement of conformity	TÜV 01 ATEX 1777X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4

Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Resistance input 0.5 kΩ ... 11 kΩ**
- **Output 4 mA ... 20 mA**
- **Rotary switch selectable ranges**
- **Line fault detection (LFD)**

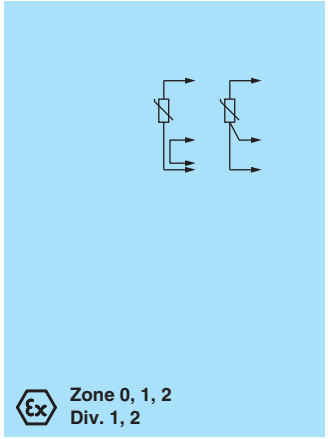
Function

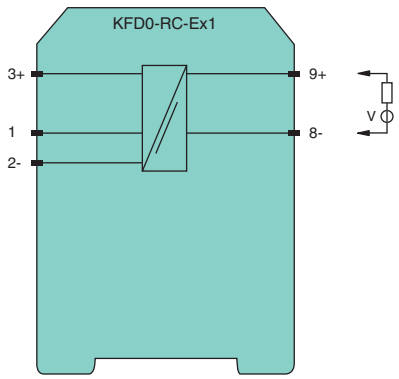
This isolated barrier is used for intrinsic safety applications. It converts a 500 Ω ... 11 kΩ resistance in the hazardous area to a 4 mA ... 20 mA signal in the safe area.

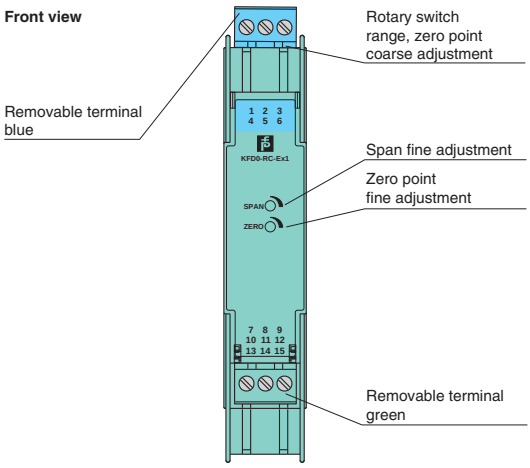
A 3-wire connection is possible to compensate for lead resistance. If only 2-wire connection is desired, a jumper between terminal 1 and 2 must be connected.

Additional features include rotary switches and potentiometers for easy field calibration.

Diagrams







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ATEX Entity Parameters

Model Number	Terminals	U_o (V)	I_o (mA)	P_o (mW)
Transmitter Power Supplies				
DN421	1, 2	19.6	30.4	596
	2, 3	5	52	64
KCD2-STC-Ex1	1, 2	25.2	100	630
	3, 4	7.2	100	25
KFD2-STC4-Ex1	1, 3	25.4	86.8	551
	2, 3	3.5	74	64
	1, 2, 3	25.4	115	584
	5, 6	8.7	0	–
KFD2-STC4-Ex1-Y122583	1, 3	25.4	86.8	551
	2, 3	3.5	74	64
	1, 2, 3	25.4	115	584
	5, 6	8.7	0	–
KFD2-STC4-Ex1.H	1, 3	27.2	93	632
	2, 3	3.5	73	64
	1, 2, 3	27.2	117	639
	5, 6	8.7	0	–
KFD2-STV4-Ex1-1	1, 3	25.4	86.8	551
	2, 3	3.5	74	64
	1, 2, 3	25.4	115	584
	5, 6	8.7	0	–
KFD2-STV4-Ex1-2	1, 3	25.4	86.8	551
	2, 3	3.5	74	64
	1, 2, 3	25.4	115	584
	5, 6	8.7	0	–
KFD2-STC4-Ex1.2O	1, 3	25.4	86.8	551
	2, 3	3.5	74	64
	1, 2, 3	25.4	115	584
	5, 6	8.7	0	–
KFD2-STC4-Ex1.2O-Y122582	1, 3	25.4	86.8	551
	2, 3	3.5	74	64
	1, 2, 3	25.4	115	584
	5, 6	8.7	0	–
KFD2-STC4-Ex1.2O.H	1, 3	27.2	93	632
	2, 3	3.5	73	64
	1, 2, 3	27.2	117	639
	5, 6	8.7	0	–
KFD2-STV4-Ex1.2O-1	1, 3	25.4	86.8	551
	2, 3	3.5	74	64
	1, 2, 3	25.4	115	584
	5, 6	8.7	0	–
KFD2-STV4-Ex1.2O-2	1, 3	25.4	86.8	551
	2, 3	3.5	74	64
	1, 2, 3	25.4	115	584
	5, 6	8.7	0	–
KFD2-STC4-Ex2	1, 3; 4, 6	25.2	93	586
KFD2-STC4-Ex2-Y203646	1, 3; 4, 6	25.2	93	586
KFD2-STV4-Ex2-1	1, 3; 4, 6	25.2	93	586
KFD2-STV4-Ex2-2	1, 3; 4, 6	25.2	93	586
KFD2-STC3-Ex1	1, 3	25.2	93	587
KFD2-STV3-Ex1-1	1, 3	25.2	93	587
KFD2-STV3-Ex1-2	1, 3	25.2	93	587

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Model Number	Terminals	U_o (V)	I_o (mA)	P_o (mW)
Transmitter Power Supplies with Trip Value				
KFD2-CRG2-Ex1.D	1, 3	25.8	93	603
	2, 3	5	0.3	0.3
	1, 2, 3	25.8	112	720
KFU8-CRG2-Ex1.D	1, 3	25.8	93	603
	2, 3	5	0.3	0.3
	1, 2, 3	25.8	112	720
Transmitter Power Supplies with HART Communication (HART Loop Converter)				
KFD2-HLC-Ex1.D	1, 3, 4	25.2	104.9	661
	2, 3, 5	1.1	11.9	4
KFD2-HLC-Ex1.D.2W	1, 3, 4	25.2	104.9	661
	2, 3, 5	1.1	11.9	4
KFD2-HLC-Ex1.D.4S	1, 3, 4	25.2	104.9	661
	2, 3, 5	1.1	11.9	4
Current Repeaters				
KFD0-SCS-Ex1.55	1, 3	23.1	28	647
KFD0-CS-Ex1.50P	1, 2	25.2	93	585
KFD0-CS-Ex1.51P	1, 2	25.2	93	585
KFD0-CS-Ex1.52	1, 2	25.2	0	–
KFD0-CS-Ex1.54	1, 2	28	93	653
KFD0-CS-Ex2.50P	1, 2; 4, 5	25.2	93	585
KFD0-CS-Ex2.51P	1, 2; 4, 5	25.2	93	585
KFD0-CS-Ex2.52	1, 2; 4, 5	25.2	0	–
KFD0-CS-Ex2.54	1, 2; 4, 5	28	93	653
Voltage Repeaters				
KFD2-VR2-Ex1.50M	4, 5	5.5	2.4	3.3
KFD2-VR2-Ex1.500M	4, 5	5.5	2.4	3.3
KFD2-VR-Ex1.12	4, 5	12	2.8	8.4
KFD2-VR-Ex1.18	4, 5	18	4.2	19
KFD2-VR-Ex1.19	4, 5	18	4.2	19
KFD2-VR-Ex1.19-Y109129	4, 5	15.5	7.2	28
KFD2-VR4-Ex1.26	1, 3, 4, 5	25.2	90	570
	2, 4, 6	1.2	0.12	0.036
Current and Voltage Converters				
KFD0-CC-Ex1	1, 2	9.6	0.5	1.1
KFD2-WAC2-Ex1.D	1, 2, 3, 4, 5, 6	14	238	833
Temperature Converters and Repeaters				
KFD2-UT2-Ex1	1, 2, 3, 4	9	22	50
KFD2-UT2-Ex1-1	1, 2, 3, 4	9	22	50
KFD2-UT2-Ex2	1, 2, 3, 4, 5, 6	9	22	50
KFD2-UT2-Ex2-1	1, 2, 3, 4, 5, 6	9	22	50
KFD0-TR-Ex1	1, 2, 3	16.1	33	131
KFD0-TT-Ex1	1, 2, 3	16.1	0.8	3.2
KCD2-RR-Ex1	1, 2, 3, 4	12.4	17.4	54
Temperature Converters with Trip Value				
KFD2-GU-Ex1	1, 2, 3, 4, 5, 6	10.5	27	70
KFD2-GUT-Ex1.D	1, 2, 3, 4, 6	13.1	21	67
	2, 6	13.1	8	67
KFU8-GUT-Ex1.D	1, 2, 3, 4, 6	13.1	21	67
	2, 6	13.1	8	67
Potentiometers and Resistor Converters				
KFD2-PT2-Ex1	1, 2, 3, 4, 5	10.4	31.4	82
KFD2-PT2-Ex1-1	1, 2, 3, 4, 5	10.4	31.4	82
KFD2-PT2-Ex1-4	1, 2, 3, 4, 5	10.4	31.4	82
KFD2-PT2-Ex1-5	1, 2, 3, 4, 5	10.4	31.4	82
KFD0-RC-Ex1	1, 2, 3	16.2	13.1	53

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CSA Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)
Current Repeaters			
KFD0-CS-Ex1.50P	1, 2	25.2	93
KFD0-CS-Ex1.51P	1, 2	25.2	93
KFD0-CS-Ex1.52	1, 2	28	0
KFD0-CS-Ex1.54	1, 2	28	93
KFD0-CS-Ex2.50P	1, 2; 4, 5	25.2	93
KFD0-CS-Ex2.51P	1, 2; 4, 5	25.2	93
KFD0-CS-Ex2.52	1, 2; 4, 5	28	0
KFD0-CS-Ex2.54	1, 2; 4, 5	28	93
Voltage Repeaters			
KFD2-VR-Ex1.18	4, 5	18	4.2
KFD2-VR-Ex1.19	4, 5	18	4,2
KFD2-VR-Ex1.19-Y109129	4, 5	15.5	7.2
Current and Voltage Converters			
KFD0-CC-Ex1	1, 2	9.6	0.5
Temperature Converters and Repeaters			
KFD2-UT2-Ex1	1, 2, 3, 4	9	22
KFD2-UT2-Ex1-1	1, 2, 3, 4	9	22
KFD2-UT2-Ex2	1, 2, 3, 4, 5, 6	9	22
KFD2-UT2-Ex2-1	1, 2, 3, 4, 5, 6	9	22
KFD0-TR-Ex1	1, 2, 3	8.9	19
KFD0-TT-Ex1	1, 2, 3	6.4	6.4
Potentiometers and Resistor Converters			
KFD2-PT2-Ex1	1, 2, 3, 4, 5	10.4	31.4
KFD2-PT2-Ex1-1	1, 2, 3, 4, 5	10.4	31.4
KFD2-PT2-Ex1-4	1, 2, 3, 4, 5	10.4	31.4
KFD2-PT2-Ex1-5	1, 2, 3, 4, 5	10.4	31.4

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FM Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
Transmitter Power Supplies					
KCD2-STC-Ex1	1, 2	25.2	100	–	–
	3, 4	7.2	100	–	–
Transmitter Power Supplies with Trip Value					
KFD2-CRG2-Ex1.D	1, 3	25,8	93.7	–	–
	2, 3	5	0.3	–	–
	1, 2, 3	25,8	112	–	–
KFU8-CRG2-Ex1.D	1, 3	25,8	93.7	–	–
	2, 3	5	0.3	–	–
	1, 2, 3	25,8	112	–	–
Current Repeaters					
KFD0-CS-Ex1.50P	1, 2	25.2	93	–	–
KFD0-CS-Ex1.51P	1, 2	25.2	93	–	–
KFD0-CS-Ex1.52	1, 2	28	0	–	–
KFD0-CS-Ex1.54	1, 2	28.5	95	–	–
KFD0-CS-Ex2.50P	1, 2; 4, 5	25.2	93	–	–
KFD0-CS-Ex2.51P	1, 2; 4, 5	25.2	93	–	–
KFD0-CS-Ex2.52	1, 2; 4, 5	28	0	–	–
KFD0-CS-Ex2.54	1, 2; 4, 5	28.5	95	–	–
Voltage Repeaters					
KFD2-VR-Ex1.18	4, 5	18	4.2	–	–
KFD2-VR-Ex1.19	4, 5	18	4.2	–	–
KFD2-VR-Ex1.19-Y109129	4, 5	15.5	7.2	–	–
Current and Voltage Converters					
KFD2-WAC2-Ex1.D	1, 2, 3, 4, 5, 6	14	238	–	–
Temperature Converters and Repeaters					
KCD2-RR-Ex1	1, 2, 3, 4	–	–	12.4	17.4
Potentiometers and Resistor Converters					
KFD2-PT2-Ex1	1, 2, 3, 4, 5	–	–	11	33
KFD2-PT2-Ex1-1	1, 2, 3, 4, 5	–	–	10.4	31.4
KFD2-PT2-Ex1-4	1, 2, 3, 4, 5	–	–	10.4	31.4
KFD2-PT2-Ex1-5	1, 2, 3, 4, 5	–	–	10.4	31.4

UL Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
Transmitter Power Supplies					
KCD2-STC-Ex1	1, 2	25.2	100	–	–
	3, 4	7.2	100	–	–
KFD2-STC4-Ex1	1, 3	25.4	86.8	–	–
	2, 3	3.5	74	–	–
	1, 2, 3	–	–	25.4	115
KFD2-STC4-Ex1-Y122583	1, 3	25.4	86.8	–	–
	2, 3	3.5	74	–	–
	1, 2, 3	–	–	25.4	115
KFD2-STC4-Ex1.H	1, 3	27.2	93	–	–
	2, 3	3.5	73	–	–
	1, 2, 3	27.2	117	–	–
KFD2-STV4-Ex1-1	1, 3	25.4	86.8	–	–
	2, 3	3.5	74	–	–
	1, 2, 3	–	–	25.4	115
KFD2-STV4-Ex1-2	1, 3	25.4	86.8	–	–
	2, 3	3.5	74	–	–
	1, 2, 3	–	–	25.4	115

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Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
KFD2-STC4-Ex1.2O	1, 3	25.4	86.8	–	–
	2, 3	3.5	74	–	–
	1, 2, 3	–	–	25.4	115
KFD2-STC4-Ex1.2O-Y122582	1, 3	25.4	86.8	–	–
	2, 3	3.5	74	–	–
	1, 2, 3	–	–	25.4	115
KFD2-STC4-Ex1.2O.H	1, 3	27.2	93	–	–
	2, 3	3.5	73	–	–
	1, 2, 3	27.2	117	–	–
KFD2-STV4-Ex1.2O-1	1, 3	25.4	86.8	–	–
	2, 3	3.5	74	–	–
	1, 2, 3	–	–	25.4	115
KFD2-STV4-Ex1.2O-2	1, 3	25.4	86.8	–	–
	2, 3	3.5	74	–	–
	1, 2, 3	–	–	25.4	115
KFD2-STC4-Ex2	1, 3; 4, 6	25.2	93	–	–
KFD2-STC4-Ex2-Y203646	1, 3; 4, 6	25.2	93	–	–
KFD2-STV4-Ex2-1	1, 3; 4, 6	25.2	93	–	–
KFD2-STV4-Ex2-2	1, 3; 4, 6	25.2	93	–	–
KFD2-STC3-Ex1	1, 3	28	93	–	–
KFD2-STV3-Ex1-1	1, 3	28	93	–	–
KFD2-STV3-Ex1-2	1, 3	28	93	–	–
Current Repeaters					
KFD0-CS-Ex1.50P	1, 2	25.2	93	–	–
KFD0-CS-Ex1.51P	1, 2	25.2	93	–	–
KFD0-CS-Ex1.52	1, 2	28	0	–	–
KFD0-CS-Ex1.54	1, 2	28.5	95	–	–
KFD0-CS-Ex2.50P	1, 2; 4, 5	25.2	93	–	–
KFD0-CS-Ex2.51P	1, 2; 4, 5	25.2	93	–	–
KFD0-CS-Ex2.52	1, 2; 4, 5	28	0	–	–
KFD0-CS-Ex2.54	1, 2; 4, 5	28.5	95	–	–
Voltage Repeaters					
KFD2-VR2-Ex1.50M	4, 5	5.5	2.4	–	–
KFD2-VR2-Ex1.500M	4, 5	5.5	2.4	–	–
KFD2-VR-Ex1.18	4, 5	18	4.2	–	–
KFD2-VR-Ex1.19	4, 5	18	4.2	–	–
KFD2-VR-Ex1.19-Y109129	4, 5	15.5.	7.2	–	–
KFD2-VR4-Ex1.26	1, 3, 4, 5	-25.4	90	–	–
	2, 4, 6	1.2	0.12	–	–
	2, 3, 4, 5, 6	–	–	-26.4	90
Temperature Converters and Repeaters					
KFD2-UT2-Ex1	1, 2, 3, 4	9	22	–	–
KFD2-UT2-Ex1-1	1, 2, 3, 4	9	22	–	–
KFD2-UT2-Ex2	1, 2, 3; 4, 5, 6	9	22	–	–
KFD2-UT2-Ex2-1	1, 2, 3; 4, 5, 6	9	22	–	–
KCD2-RR-Ex1	1, 2, 3, 4	12.4	17	–	–
Temperature Converters with Trip Value					
KFD2-GU-Ex1	1, 2, 3, 4, 5, 6	–	–	10.5	27
Potentiometers and Resistor Converters					
KFD2-PT2-Ex1	1, 2, 3, 4, 5	–	–	10.4	31.4
KFD2-PT2-Ex1-1	1, 2, 3, 4, 5	–	–	10.4	31.4
KFD2-PT2-Ex1-4	1, 2, 3, 4, 5	–	–	10.4	31.4
KFD2-PT2-Ex1-5	1, 2, 3, 4, 5	–	–	10.4	31.4

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Current Drivers

Model Number	Channels	Input (Control System)				Output (Field)					Supply		SIL	Installation in Zone 2/Division 2	Page
		0 mA ... 20 mA	0 mA ... 40 mA	4 mA ... 20 mA	0 V ... 10 V	mA	0 V ... 10 V	Fire Alarm	Line Fault Detection	SMART	24 V DC	Loop Powered			
KCD2-SCD-Ex1	1			■		■				■	■		2	■	264
KFD2-SCD-Ex1.LK	1			■		■			■	■	■		2	■	265
KFD2-SCD2-Ex1.LK	1			■		■			■	■	■		2		266
KFD2-SCD2-Ex1-Y1	1			■		■			■	■	■		2		267
KFD2-CD2-Ex1	1			■		■					■		2		268
KFD2-CD-Ex1.32.**	1	■			■	■	■				■		2	■	269
KFD2-SCD2-Ex2.LK	2			■		■			■	■	■		2		270
KFD2-SCD2-Ex2-Y1	2			■		■			■	■	■		2		271
KFD2-CD2-Ex2	2			■		■					■		2		272
KFD0-SCS-Ex1.55	1			■		■			■	■		■	2	■	273
KFD0-CS-Ex1.50P	1			■		■		■				■	2	■	274
KFD0-CS-Ex1.51P	1		■			■		■				■	2	■	275
KFD0-CS-Ex1.53	1		■			■						■	2	■	276
KFD0-CS-Ex2.50P	2			■		■		■				■	2	■	277
KFD0-CS-Ex2.51P	2		■			■		■				■	2	■	278
KFD0-CS-Ex2.53	2		■			■						■	2	■	279

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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Current output up to 650 Ω load**
- **HART I/P and valve positioner**
- **Lead breakage monitoring**
- **Accuracy 0.1 %**
- **Housing width 12.5 mm**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It drives SMART I/P converters, electrical valves, and positioners in hazardous areas.

Digital signals are superimposed on the analog values at the field or control side and are transferred bi-directionally.

Current transferred across the DC/DC converter is repeated at terminals 1 and 2.

An open field circuit presents a high input impedance to the control side to allow lead breakage monitoring by control system.

If the loop resistance for the digital communication is too low, an internal resistor of 250 Ω between terminals 6 and 8 is available, which may be used as the HART communication resistor.

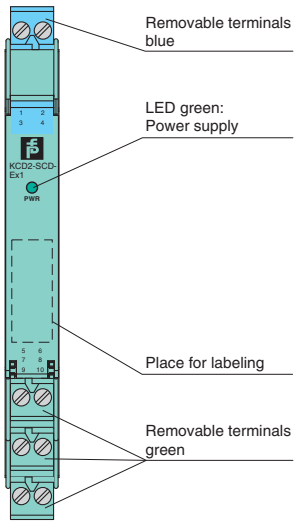
Sockets for the connection of a HART communicator are integrated into the terminals of the device.

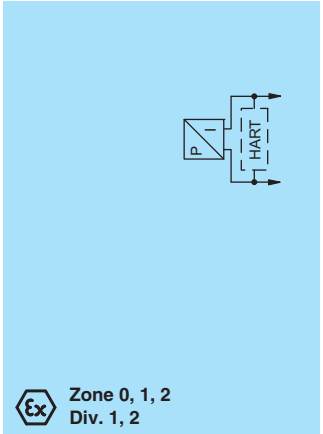
Technical data

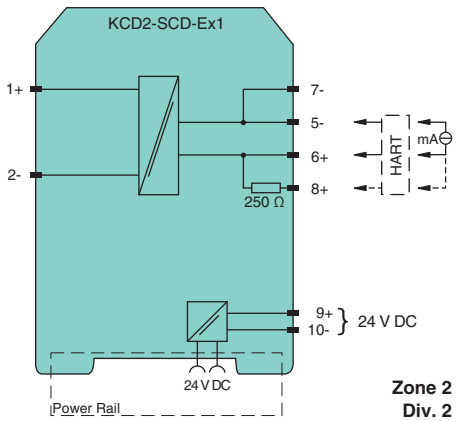
Supply	
Rated voltage	19 ... 30 V DC
Power consumption	≤ 700 mW
Input	
Input signal	4 ... 20 mA limited to approx. 30 mA
Input resistance	> 100 kΩ at max. 23 V, with field wiring open
Output	
Current	4 ... 20 mA
Load	0 ... 650 Ω
Voltage	≥ 13 V at 20 mA
Ripple	20 mV_{rms}
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/4 ... 20 mA ≤ ± 0.1 % incl. non-linearity and hysteresis
Influence of ambient temperature	< 2 µA/K (0 ... 60 °C (32 ... 140 °F)); < 4 µA/K (-20 ... 0 °C (-4 ... 32 °F))
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 3 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0 ... 3 kHz (-3 dB)
Rise time	10 to 90 % ≤ 100 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 114 x 124 mm (0.5 x 4.5 x 4.9 in), housing type A2
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	CESI 06 ATEX 021
Group, category, type of protection	Ⓔx II (1)GD [EEx ia] IIC, [Ex ia D] [circuit(s) in zone 0/1/2/20/21/22]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 X
FM approval	
Control drawing	16-533FM-12 (cFMus)
UL approval	
Control drawing	16-533FM-12 (cULus)
IECEx approval	IECEx CES 06.0001
Approved for	[Ex ia] IIC

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 35 V DC
Power consumption	1.3 W
Input	
Voltage drop U_d	approx. 4 V or internal resistance 200 Ω at 20 mA
Input resistance	> 100 kΩ, when wiring resistance in the field < 50 Ω or > 800 Ω at 20 mA
Current	4 ... 20 mA limited to approx. 25 mA
Output	
Current	4 ... 20 mA
Load	100 ... 700 Ω
Voltage	≥ 14 V at 20 mA
Transfer characteristics	
Deviation	
After calibration	at 20 °C (68 °F): ≤ ± 0.1 % incl. non-linearity and hysteresis
Influence of ambient temperature	≤ ± 20 ppm/K
Rise time	< 100 µs (bounce from 10 ... 90 %)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 115 x 115 mm (0.8 x 4.5 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 00 ATEX 7215
Group, category, type of protection	Ⓔx II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Current output up to 700 Ω load**
- **HART I/P and valve positioner**
- **Line fault detection (LFD)**
- **Accuracy 0.1 %**
- **Terminals with test points**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It drives SMART I/P converters, electrical valves, and positioners in hazardous areas.

Digital signals are superimposed on the analog values at the field or control side and are transferred bi-directionally.

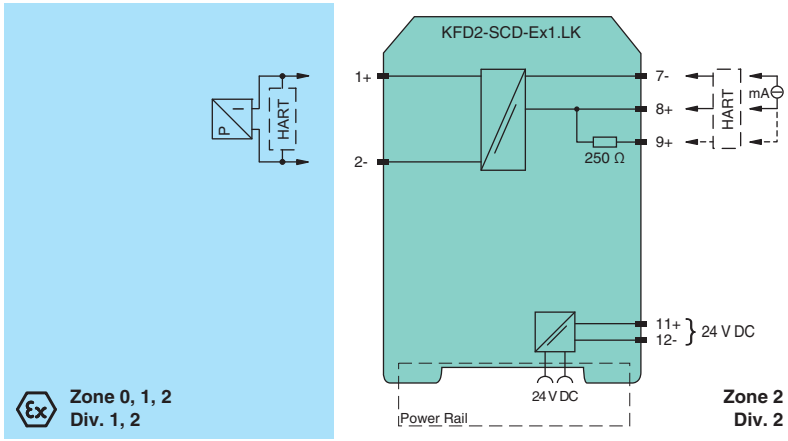
Current transferred across the DC/DC converter is repeated at terminals 1 and 2.

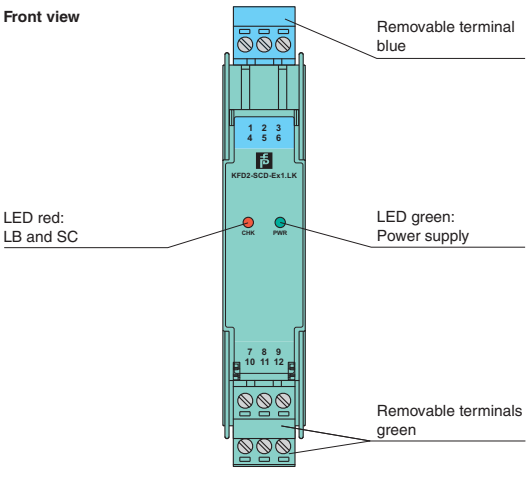
An open and shorted field circuit presents a high input impedance to the control side to allow line fault detection by control system.

If the loop resistance for the digital communication is too low, an internal resistor of 250 Ω between terminals 8 and 9 is available, which may be used as the HART communication resistor.

Sockets for the connection of a HART communicator are integrated into the terminals of the device.

Diagrams





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KFD2-SCD2-Ex1.LK

SMART Current Driver

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Current output up to 700 Ω load**
- **HART I/P and valve positioner**
- **Line fault detection (LFD)**
- **Accuracy 0.05 %**
- **Terminals with test points**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It drives SMART I/P converters, electrical valves, and positioners in hazardous areas.

Digital signals are superimposed on the analog values at the field or control side and are transferred bi-directionally.

Current transferred across the DC/DC converter is repeated at terminals 1 and 2.

An open and shorted field circuit presents a high input impedance to the control side to allow line fault detection by control system.

If the loop resistance for the digital communication is too low, an internal resistor of 250 Ω between terminals 8 and 9 is available, which may be used as the HART communication resistor.

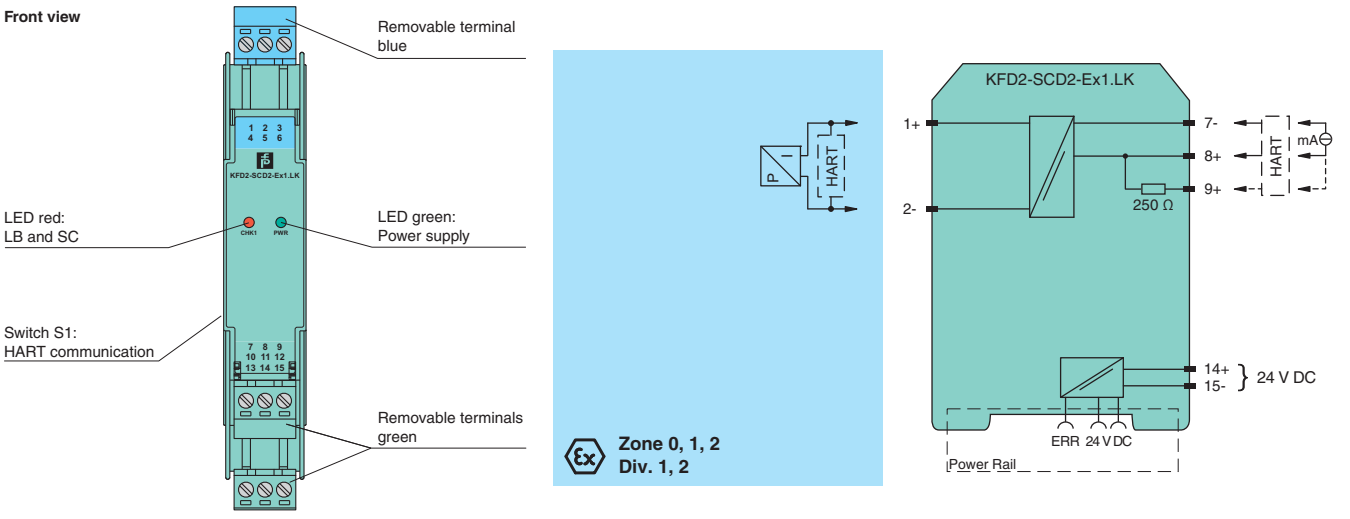
Sockets for the connection of a HART communicator are integrated into the terminals of the device.

A unique collective error messaging feature is available when used with the Power Rail system.

Technical data

Supply	
Rated voltage	10 ... 35 V DC
Power consumption	1 W at 20 mA
Input	
Voltage drop U_d	approx. 4 V or internal resistance 200 Ω at 20 mA
Input resistance	> 100 kΩ, when wiring resistance in the field > 16 V (equivalent to 800 Ω at 20 mA)
Current	4 ... 20 mA limited to approx. 25 mA
Output	
Current	4 ... 20 mA
Load	100 ... 700 Ω
Voltage	≥ 14 V at 20 mA
Transfer characteristics	
Deviation	
After calibration	at 20 °C (68 °F): 10 µA incl. non-linearity, calibration, hysteresis, supply and load changes
Influence of ambient temperature	1 µA/K
Rise time	< 100 µs (bounce from 10 ... 90 %)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 00 ATEX 7240
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)
IECEx approval	IECEx BAS 04.0014
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I

Diagrams



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Technical data

Supply	
Rated voltage	10 ... 35 V DC
Power loss	0.8 W
Power consumption	1 W at 20 mA
Input	
Voltage drop U_d	approx. 4 V (equivalent to 200 Ω at 20 mA)
Input resistance	> 100 kΩ, when wiring resistance in the field > 16 V (equivalent to 800 Ω at 20 mA)
Current	4 ... 20 mA limited to approx. 25 mA
Output	
Current	4 ... 20 mA
Load	0 ... 700 Ω
Voltage	≥ 14 V at 20 mA
Transfer characteristics	
Deviation	
After calibration	at 20 °C (68 °F): 10 µA incl. non-linearity, calibration, hysteresis, supply and load changes
Influence of ambient temperature	1 µA/K
Rise time	< 100 µs (bounce from 10 ... 90 %)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 00 ATEX 7240
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)
IECEx approval	IECEx BAS 04.0014
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I

Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Current output up to 700 Ω load**
- **HART I/P and valve positioner**
- **Lead breakage monitoring**
- **Accuracy 0.05 %**
- **Terminals with test points**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It drives SMART I/P converters, electrical valves, and positioners in hazardous areas.

Digital signals are superimposed on the analog values at the field or control side and are transferred bi-directionally.

Current transferred across the DC/DC converter is repeated at terminals 1 and 2.

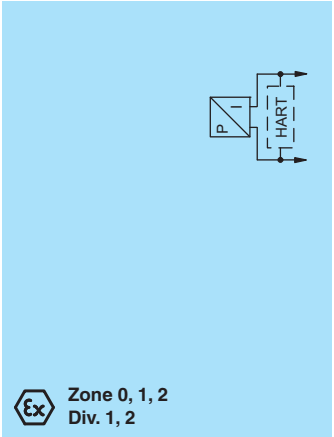
An open field circuit presents a high input impedance to the control side to allow lead breakage monitoring by control system.

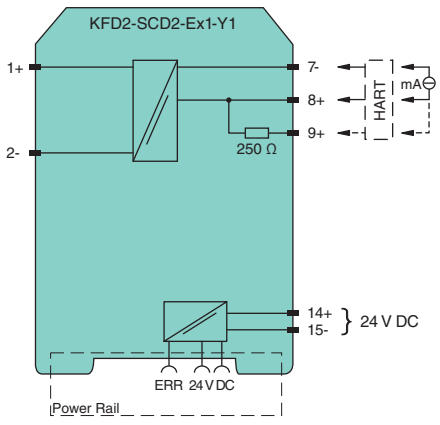
If the loop resistance for the digital communication is too low, an internal resistor of 250 Ω between terminals 8 and 9 is available, which may be used as the HART communication resistor.

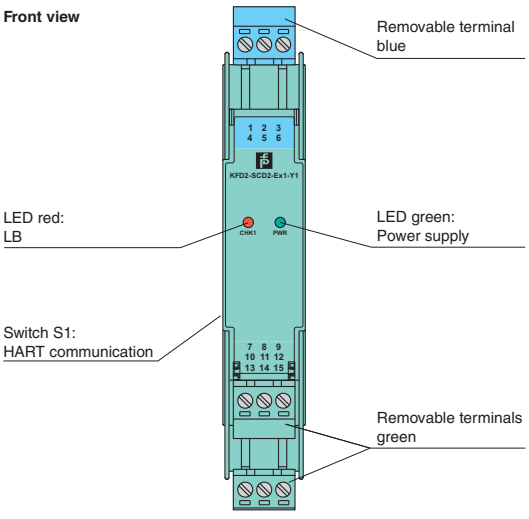
Sockets for the connection of a HART communicator are integrated into the terminals of the device.

A unique collective error messaging feature is available when used with the Power Rail system.

Diagrams







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Features

- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Current output up to 700 Ω load**
- **I/P and valve positioners**
- **Accuracy 0.05 %**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It drives a 4 mA ... 20 mA signal from the safe area to I/P converters, electrical valves, and positioners located in the hazardous area.

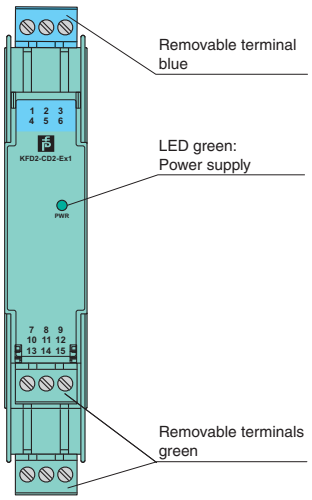
The voltage drop at the current input (terminals 7-, 8+) is lower than 2.5 V equivalent to an input resistance of 125 Ω at 20 mA.

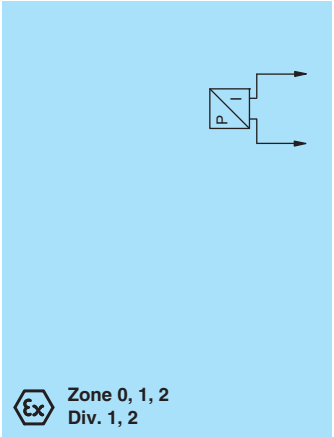
Technical data

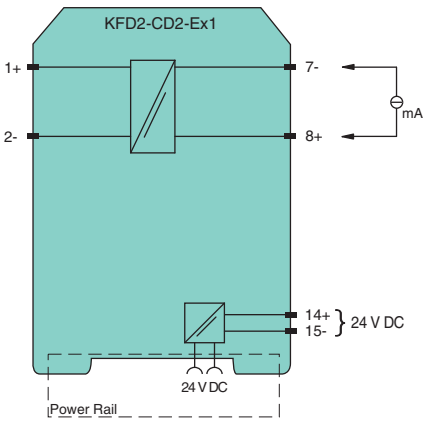
Supply	
Rated voltage	10 ... 35 V DC
Power consumption	1 W at 20 mA
Input	
Voltage drop U_d	approx. 2.5 V or internal resistance 125 Ω at 20 mA
Input resistance	≤ 2.5 V, equivalent to 125 Ω at 20 mA
Ripple	50 μA_{rms}
Current	4 ... 20 mA limited to approx. 24 mA
Output	
Current	4 ... 20 mA
Load	0 ... 700 Ω
Voltage	≥ 14 V at 20 mA
Transfer characteristics	
Deviation	
After calibration	at 20 °C (68 °F): 10 µA incl. non-linearity, calibration, hysteresis, supply and load changes
Influence of ambient temperature	1 µA/K
Rise time	< 100 µs (bounce from 10 ... 90 %)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 00 ATEX 7240
Group, category, type of protection	Ⓔx II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)
IECEx approval	IECEx BAS 04.0014
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I

Diagrams

Front view







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Technical data

Input	Output					
	0 ... 20 mA	4 ... 20 mA	0 ... 5 V	1 ... 5 V	0 ... 10 V	2 ... 10 V
0 ... 20 mA	0	2	–	–	12	1
4 ... 20 mA	1	(0)	–	–	13	(12)
0 ... 5 V	3	5	(15)	–	–	–
1 ... 5 V	–	(3)	–	(15)	–	–
0 ... 10 V	6	8	21	–	15	–
2 ... 10 V	–	(6)	–	–	–	(15)

Ordering example:
- Input 0 ... 10 V and output 4 ... 20 mA is code number 8.
- Model number is KFD2-CD-Ex1.32.8.
- The values shown in parentheses are subsets of the larger signal range.

Supply	
Rated voltage	20 ... 35 V DC
Input	
Input current	≤ 100 µA up to 50 °C (122 °F) at 10 V
Limit	optional current input: Input current: approx. ≤ 40 mA optional voltage input: input voltage: 12 V DC
Output	
Current	optional current output: 0 ... 20 mA/ optional voltage output: ≤ 20 mA
Voltage	optional current output: 17 V at 20 mA/ optional voltage output: 0 ... 10 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 02 ATEX 7203
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Features

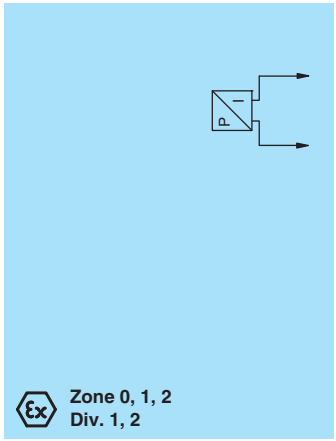
- **1-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Current or voltage output**
- **Factory configured input/output**
- **Accuracy 0.1 %**
- **Up to SIL2 acc. to IEC 61508**

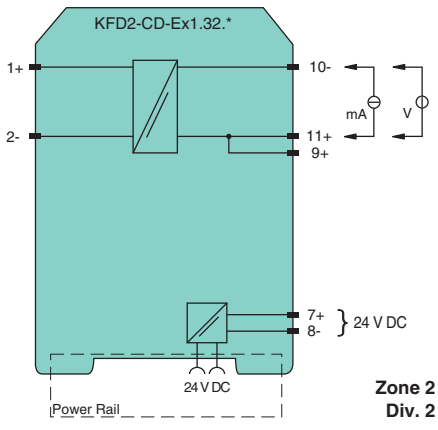
Function

This isolated barrier is used for intrinsic safety applications. It drives a voltage or current signal from the safe area to I/P converters, electrical valves and positioners located in the hazardous areas.

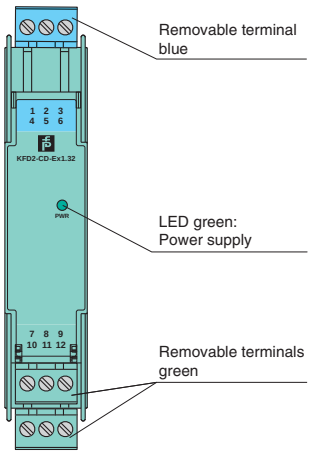
This barrier is designed to provide various inputs and outputs of voltage and current.

Diagrams





Front view



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Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Current output up to 700 Ω load**
- **HART I/P and valve positioner**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It drives SMART I/P converters, electrical valves, and positioners in hazardous areas.

Digital signals are superimposed on the analog values at the field or control side and are transferred bi-directionally.

An open and shorted field circuit presents a high input impedance to the control side to allow line fault detection by control system.

If the loop resistance for the digital communication is too low, an internal resistor of 250 Ω between terminals 8, 9 and 11, 12 is available, which may be used as the HART communication resistor.

Terminal 3 (6) is connected to terminal 2 (5) via a 100 Ω resistor. Terminal 3 (6) can be used for an earth leakage connection in combination with the KFD2-ELD-Ex16.

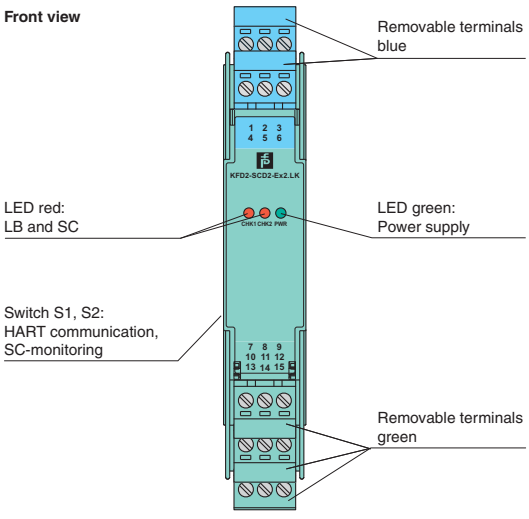
Sockets for the connection of a HART communicator are integrated into the terminals of the device.

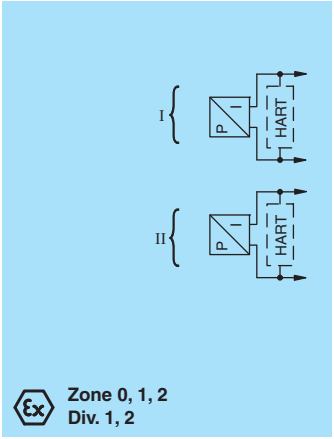
A unique collective error messaging feature is available when used with the Power Rail system.

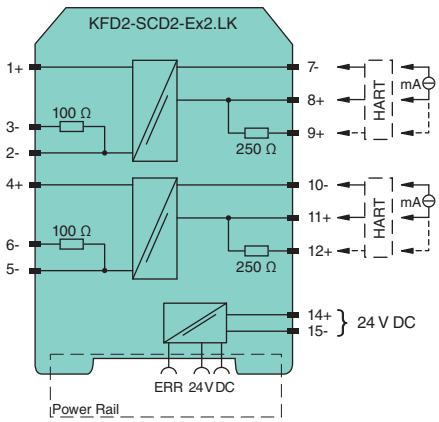
Technical data

Supply	
Rated voltage	10 ... 35 V DC
Power consumption	1.8 W at 20 mA
Input	
Voltage drop U_d	< 4 V
Input resistance	> 100 kΩ, when an open circuit is applied to the field circuit
Current	4 ... 20 mA limited to approx. 25 mA
Output	
Current	4 ... 20 mA
Load	100 ... 700 Ω
Voltage	≥ 14 V at 20 mA
Transfer characteristics	
Deviation	
After calibration	at 20 °C (68 °F): 10 µA incl. non-linearity, calibration, hysteresis, supply and load changes
Influence of ambient temperature	1 µA/K
Rise time	< 100 µs (bounce from 10 ... 90 %)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 00 ATEX 7240
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)
IECEx approval	IECEx BAS 04.0014
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I

Diagrams







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Technical data

Supply	
Rated voltage	10 ... 35 V DC
Power consumption	1.8 W at 20 mA
Input	
Voltage drop U_d	approx. 4 V (equivalent to 200 Ω at 20 mA)
Input resistance	> 100 kΩ, when wiring resistance in the field > 16 V (equivalent to 800 Ω at 20 mA)
Current	4 ... 20 mA limited to approx. 25 mA
Output	
Current	4 ... 20 mA
Load	0 ... 700 Ω
Voltage	≥ 14 V at 20 mA
Transfer characteristics	
Deviation	
After calibration	at 20 °C (68 °F): 10 µA incl. non-linearity, calibration, hysteresis, supply and load changes
Influence of ambient temperature	1 µA/K
Rise time	< 100 µs (bounce from 10 ... 90 %)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in, housing type B2
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 00 ATEX 7240
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)
IECEx approval	IECEx BAS 04.0014
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Current output up to 700 Ω load**
- **HART I/P and valve positioner**
- **Lead breakage monitoring**
- **Accuracy 0.05 %**
- **Terminals with test points**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It drives SMART I/P converters, electrical valves, and positioners in hazardous areas.

Digital signals are superimposed on the analog values at the field or control side and are transferred bi-directionally.

Current transferred across the DC/DC converter is repeated at terminals 1, 2 and 4, 5.

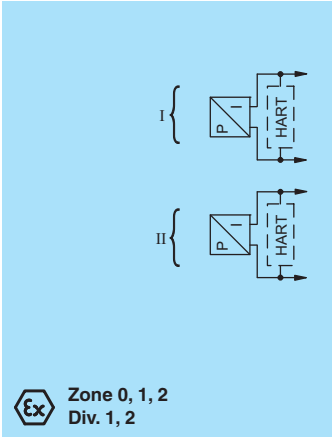
An open field circuit presents a high input impedance to the control side to allow lead breakage monitoring by control system.

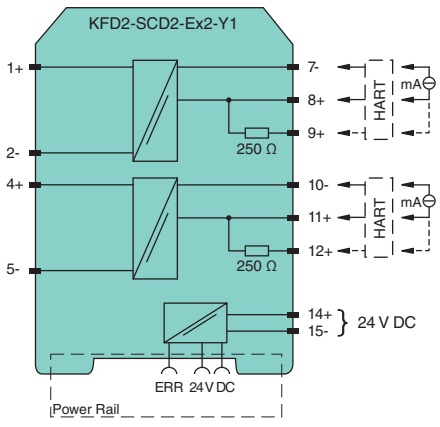
If the loop resistance for the digital communication is too low, an internal resistor of 250 Ω between terminals 8, 9 and 11, 12 is available, which may be used as the HART communication resistor.

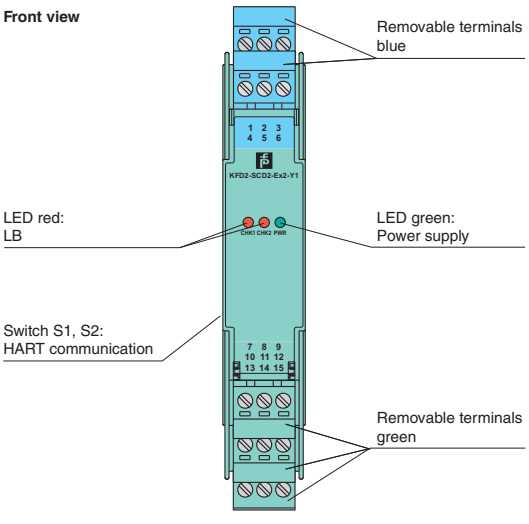
Sockets for the connection of a HART communicator are integrated into the terminals of the device.

A unique collective error messaging feature is available when used with the Power Rail system.

Diagrams







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KFD2-CD2-Ex2

Current Driver

Features

- **2-channel isolated barrier**
- **24 V DC supply (Power Rail)**
- **Current output up to 700 Ω load**
- **I/P and valve positioners**
- **Accuracy 0.05 %**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It drives a 4 mA ... 20 mA signal from the safe area to I/P converters, electrical valves, and positioners located in the hazardous area.

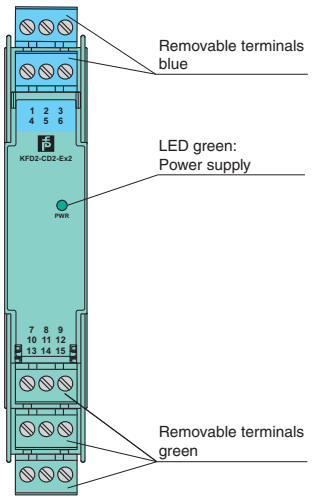
The voltage drop at the current input (terminals 7-, 8+ and 10-, 11+) is lower than 2.5 V equivalent to an input resistance of 125 Ω at 20 mA.

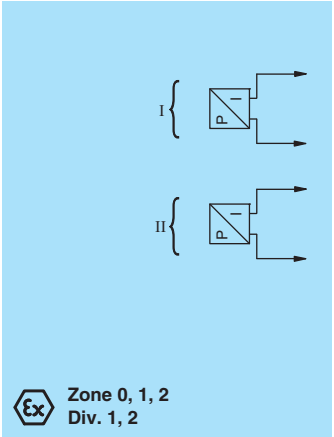
Technical data

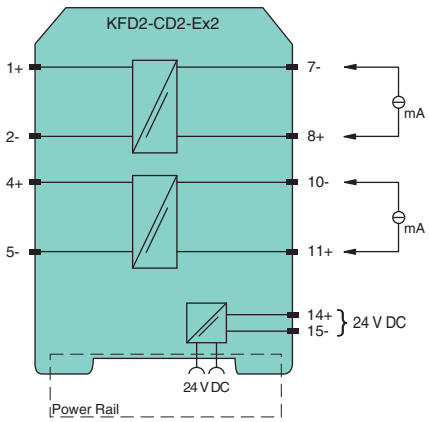
Supply	
Rated voltage	10 ... 35 V DC
Power consumption	1 W at 20 mA
Input	
Voltage drop U_d	approx. 2.5 V or internal resistance 125 Ω at 20 mA
Input resistance	≤ 2.5 V, equivalent to 125 Ω at 20 mA
Ripple	50 μA_{rms}
Current	4 ... 20 mA limited to approx. 25 mA
Output	
Current	4 ... 20 mA
Load	0 ... 700 Ω
Voltage	≥ 14 V at 20 mA
Transfer characteristics	
Deviation	
After calibration	at 20 °C (68 °F): 10 µA incl. non-linearity, calibration, hysteresis, supply and load changes
Influence of ambient temperature	1 µA/K
Rise time	< 100 µs (bounce from 10 ... 90 %)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 00 ATEX 7240
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
UL approval	
Control drawing	116-0173 (cULus)
IECEx approval	IECEx BAS 04.0014
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I

Diagrams

Front view







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Technical data

Supply	
Rated voltage	loop powered
Power loss	0.2 W
Field circuit	
Connection	terminals 1+, 2/3-
Available voltage	≥ 16 V for supply voltage > 21 V
Current	4 ... 20 mA (linear transmission 1 ... 22 mA)
Load	≤ 800 Ω (at 20 mA)
Supply circuit	
Voltage	max. 30 V DC
Current	4 ... 20 mA (quiescent current < 0.5 mA)
Power loss	150 mW at 20 mA and U_E < 24 V
Transfer characteristics	
Deviation	
After calibration	≤ ± 80 µA linearity, load and voltage dependence at 20 °C (68 °F)
Influence of ambient temperature	< 0.5 µA/K
Damping	approx. 3 dB
Rise time	≤ 20 µs at 0 Ω, ≤ 600 µs with 800 Ω load
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 120 g
Dimensions	20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	PTB 02 ATEX 2064
Group, category, type of protection	⟨Ex⟩ II (2)G [EEx ib] IIC
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G EEx nA II T4 X
FM approval	device with FM approval on request

Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 4 mA ... 20 mA**
- **HART I/P or transmitter power supply**
- **Low voltage drop**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

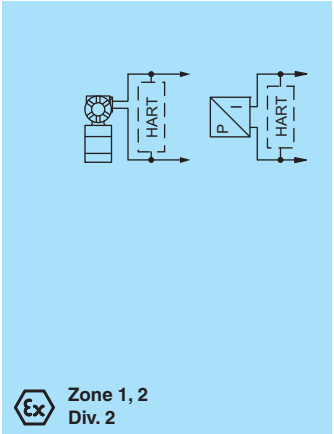
This isolated barrier is used for intrinsic safety applications. It is loop powered and isolates a 4 mA ... 20 mA signal for transmitters and positioners and is HART compatible.

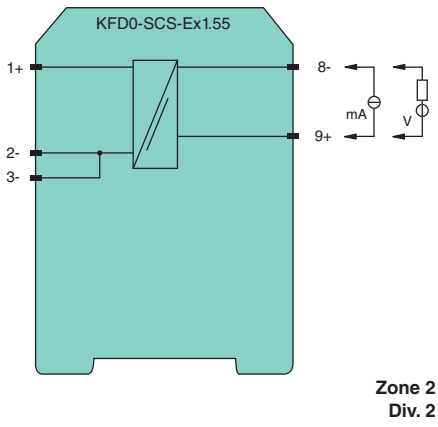
With a noticeably lower power loss compared to active isolator modules, the barriers 5 V drop makes it suitable for transmitter applications with unstable power sources between 20 V DC ... 30 V DC.

Line fault detection of the field circuit is possible if the control loop in the safe area is monitored for overscale or underscale conditions of the 4 mA ... 20 mA range.

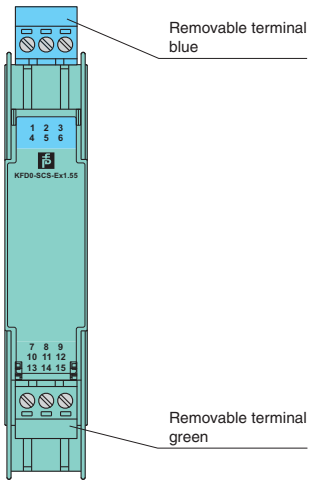
The module can also be used for controlling solenoid valves and discrete outputs, such as LEDs. In this case, terminals 8- and 9+ are driven with a 24 V signal.

Diagrams





Front view



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Features

- 1-channel isolated barrier
- 24 V DC supply (loop powered)
- Current input/output 4 mA ... 20 mA
- I/P or transmitter power supply
- Accuracy 0.1 %
- Reverse polarity protection
- Up to SIL2 acc. to IEC 61508

Function

This isolated barrier is used for intrinsic safety applications. It transfers DC signals from fire alarms, smoke alarms, and temperature sensors in hazardous areas. It can also be used to control I/P converters, power solenoids, LEDs, and audible alarms.

Reverse polarity protection prevents damage to the isolator caused by faulty wiring.

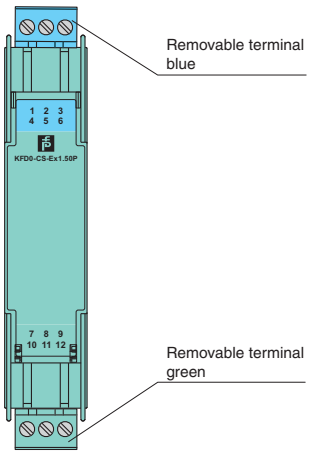
Since this isolator is loop powered, use the technical data to verify that proper voltage is available to the field devices.

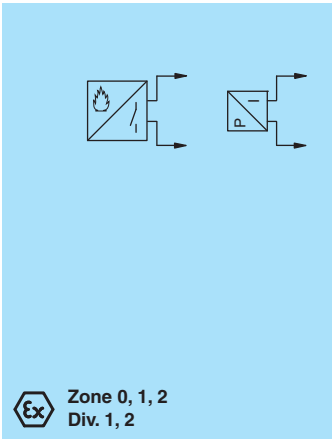
Technical data

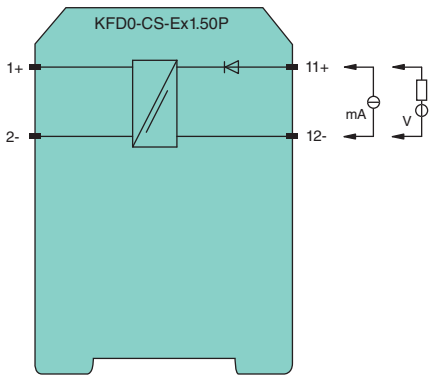
Supply	
Rated voltage	loop powered
Safe circuit	
Voltage	5 ... 35 V DC
Current	4 ... 20 mA
Power loss	at 20 mA and U_{in} < 24.3 V: < 250 mW per channel at 20 mA and U_{in} > 24.3 V: < 500 mW per channel
Field circuit	
Voltage	for 5V < U_e < 24.3V: ≥ 0.9 x U_e - (0.37 x current in mA) - 1.0 for U_{in} > 24.3 V: ≥ 21 V - (0.36 x current in mA)
Short-circuit current	at U_{in} > 24.3 V : ≤ 65 mA
Transfer current	≤ 40 mA
Transfer characteristics	
Deviation	
After calibration	≤ ± 20 µA; incl. calibration, linearity, hysteresis and load fluctuations at the output up to a load of 1 kΩ at 20 °C (68 °F)
Rise time	≤ 5 ms at 4 ... 20 mA step and U_{in} < 24 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 98 ATEX 7343
Group, category, type of protection	Ⓔx II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Diagrams

Front view







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Technical data

Supply	
Rated voltage	loop powered
Inputs/Outputs (not intrinsically safe)	
Voltage	4 ... 35 V DC
Current	0 ... 40 mA
Power loss	at 40 mA and U_{in} < 22 V: 700 mW per channel at 40 mA and U_{in} > 22 V: 1.2 W per channel
Inputs/Outputs (Intrinsically safe)	
Output voltage	for 4 V < U_{in} < 24 V: ≥ U_{in} - (0.37 x current in mA) - 1.0 for U_{in} > 24 V: ≥ 21 V - (0.36 x current in mA)
Short-circuit current	at U_{in} > 24 V: ≤ 65 mA
Transfer current	≤ 40 mA
Transfer characteristics	
Deviation	
After calibration	≤ ± 200 µA; incl. calibration, linearity, hysteresis and load fluctuations at the output up to a load of 1 kΩ and current ≤ 20 mA at 20 °C (68 °F)
Influence of ambient temperature	≤ ± 2 µA/K at U_{in} ≤ 20 V; ≤ ± 5 µA/K at U_{in} > 20 V
Rise time	≤ 5 ms at 4 ... 20 mA step and U_{in} < 24 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 98 ATEX 7343
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 0 mA ... 40 mA**
- **I/P or transmitter power supply**
- **Accuracy 1 %**
- **Reverse polarity protection**
- **Up to SIL2 acc. to IEC 61508**

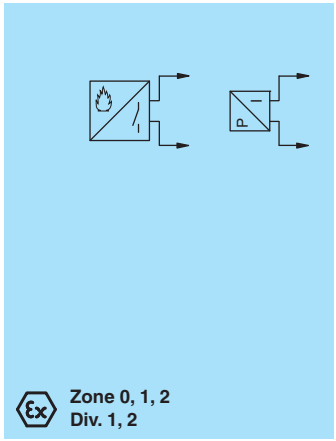
Function

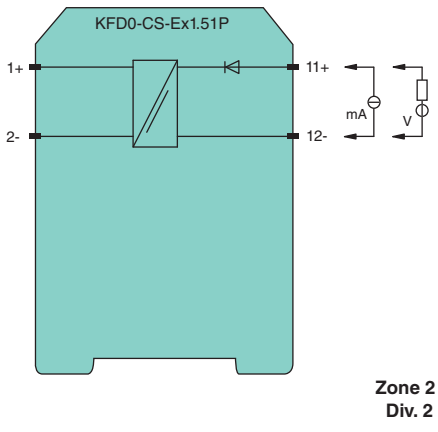
This isolated barrier is used for intrinsic safety applications. It transfers DC signals from fire alarms, smoke alarms, and temperature sensors in hazardous areas. It can also be used to control I/P converters, power solenoids, LEDs, and audible alarms.

Reverse polarity protection prevents damage to the isolator caused by faulty wiring.

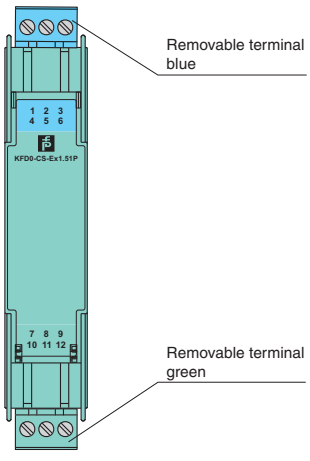
Since this isolator is loop powered, use the technical data to verify that proper voltage is available to the field devices.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **DC supply (loop powered)**
- **Current input/output 0 mA ... 40 mA**
- **Accuracy 1 %**
- **Low voltage drop**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It is a loop-powered and controls I/P converters.

It is ideal for applications where the control system in the safe area handles a small load.

Since this isolator is loop powered, use the technical data to verify that proper voltage is available to the field devices.

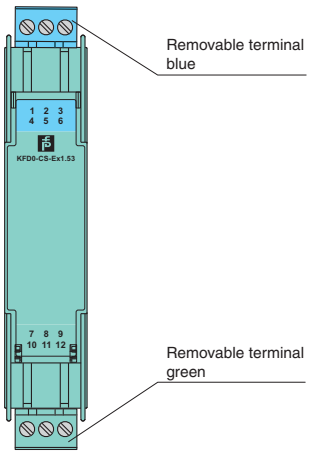
Note: The input voltage of 10 V must not be exceeded.

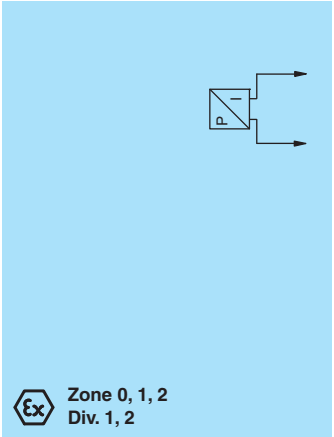
Technical data

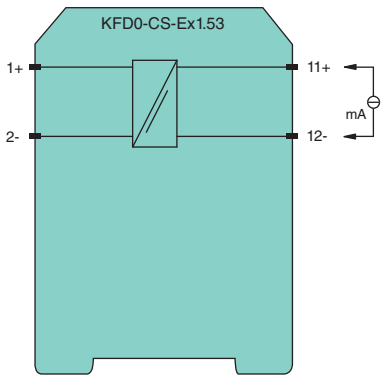
Supply	
Rated voltage	loop powered
Power loss	0.2 W
Input	
Rated voltage U_i	10 V DC
Rated current I_i	0 ... 40 mA
Output	
Load	≤ 270 Ω at 20 mA
Short-circuit current	≤ 95 mA
Transfer current	≤ 40 mA
Transfer characteristics	
Deviation	
After calibration	± 200 µA incl. calibration, linearity, hysteresis and load fluctuations at the output
Influence of ambient temperature	≤ 2 µA/K (0 ... 50 °C (32 ... 122 °F)), ≤ 5 µA/K (-20 ... 60 °C (-4 ... 140 °F))
Rise time	≤ 20 ms at 4 ... 20 mA and 250 Ω load
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 98 ATEX 7343
Group, category, type of protection	Ⓔx II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Diagrams

Front view







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Technical data

Supply	
Rated voltage	loop powered
Safe circuit	
Voltage	5 ... 35 V DC
Current	4 ... 20 mA
Power loss	at 20 mA and U_{in} < 24.3 V: < 250 mW per channel at 20 mA and U_{in} > 24.3 V: < 500 mW per channel
Field circuit	
Voltage	for 5V < U_e < 24.3V: ≥ 0.9 x U_e - (0.37 x current in mA) - 1.0 for U_{in} > 24.3 V: ≥ 21 V - (0.36 x current in mA)
Short-circuit current	at U_{in} > 24.3 V : ≤ 65 mA
Transfer current	≤ 40 mA
Transfer characteristics	
Deviation	
After calibration	≤ ± 20 µA; incl. calibration, linearity, hysteresis and load fluctuations at the output up to a load of 1 kΩ at 20 °C (68 °F)
Rise time	≤ 5 ms at 4 ... 20 mA step and U_{in} < 24 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 98 ATEX 7343
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Features

- **2-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 4 mA ... 20 mA**
- **I/P or transmitter power supply**
- **Accuracy 0.1 %**
- **Reverse polarity protection**
- **Up to SIL2 acc. to IEC 61508**

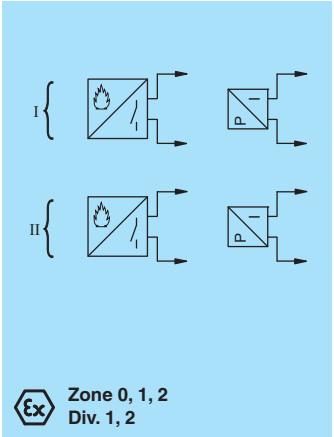
Function

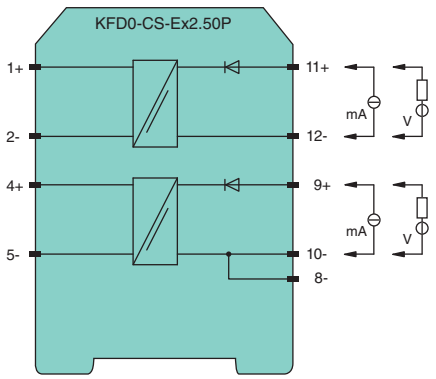
This isolated barrier is used for intrinsic safety applications. It transfers DC signals from fire alarms, smoke alarms, and temperature sensors in hazardous areas. It can also be used to control I/P converters, power solenoids, LEDs, and audible alarms.

Reverse polarity protection prevents damage to the isolator caused by faulty wiring.

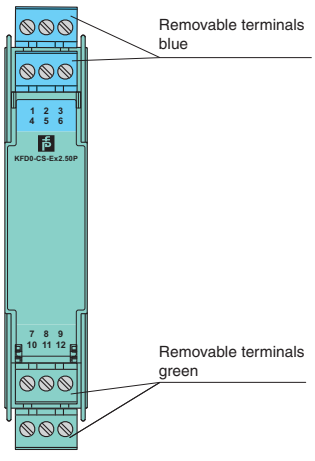
Since this isolator is loop powered, use the technical data to verify that proper voltage is available to the field devices.

Diagrams





Front view



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KFD0-CS-Ex2.51P

Current Driver/Repeater

Features

- **2-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 0 mA ... 40 mA**
- **I/P or transmitter power supply**
- **Accuracy 1 %**
- **Reverse polarity protection**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers DC signals from fire alarms, smoke alarms, and temperature sensors in hazardous areas. It can also be used to control I/P converters, power solenoids, LEDs, and audible alarms.

Reverse polarity protection prevents damage to the isolator caused by faulty wiring.

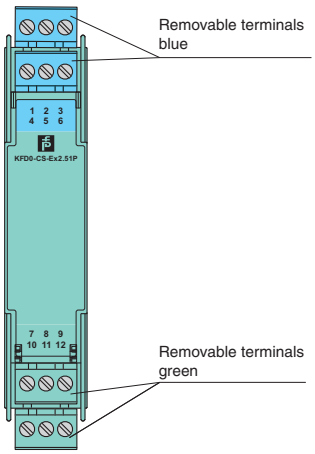
Since this isolator is loop powered, use the technical data to verify that proper voltage is available to the field devices.

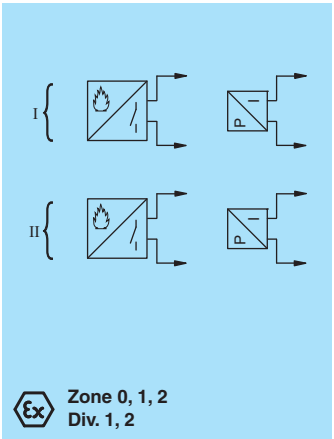
Technical data

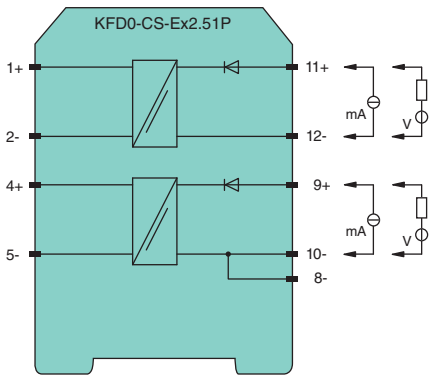
Supply	
Rated voltage	loop powered
Inputs/Outputs (not intrinsically safe)	
Voltage	4 ... 35 V DC
Current	0 ... 40 mA
Power loss	at 40 mA and U_{in} < 22 V: 700 mW per channel at 40 mA and U_{in} > 22 V: 1.2 W per channel
Inputs/Outputs (Intrinsically safe)	
Output voltage	for 4 V < U_{in} < 24 V: ≥ U_{in} - (0.37 x current in mA) - 1.0 for U_{in} > 24 V: ≥ 21 V - (0.36 x current in mA)
Short-circuit current	at U_{in} > 24 V: ≤ 65 mA
Transfer current	≤ 40 mA
Transfer characteristics	
Deviation	
After calibration	≤ ± 200 µA; incl. calibration, linearity, hysteresis and load fluctuations at the output up to a load of 1 kΩ and current ≤ 20 mA at 20 °C (68 °F)
Influence of ambient temperature	≤ ± 2 µA/K at U_{in} ≤ 20 V; ≤ ± 5 µA/K at U_{in} > 20 V
Rise time	≤ 5 ms at 4 ... 20 mA step and U_{in} < 24 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 98 ATEX 7343
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Diagrams

Front view







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Technical data

Supply	
Rated voltage	loop powered
Power loss	0.4 W
Input	
Rated voltage U_i	10 V DC
Rated current I_i	0 ... 40 mA
Output	
Load	≤270 Ω at 20 mA
Short-circuit current	≤95 mA
Transfer current	≤40 mA
Transfer characteristics	
Deviation	
After calibration	± 200 µA incl. calibration, linearity, hysteresis and load fluctuations at the output
Influence of ambient temperature	≤ 2 µA/K (0 ... 50 °C (32 ... 122 °F)), ≤ 5 µA/K (-20 ... 60 °C (-4 ... 140 °F))
Rise time	≤20 ms at 4 ... 20 mA and 250 Ω load
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	see page 280 for entity parameters
EC-Type Examination Certificate	BAS 98 ATEX 7343
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC (-20 °C ≤ T_{amb} ≤60 °C)
Statement of conformity	TÜV 99 ATEX 1499 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
CSA approval	
Control drawing	116-0132

Features

- **2-channel isolated barrier**
- **DC supply (loop powered)**
- **Current input/output 0 mA ... 40 mA**
- **Accuracy 1 %**
- **Low voltage drop**
- **Up to SIL2 acc. to IEC 61508**

Function

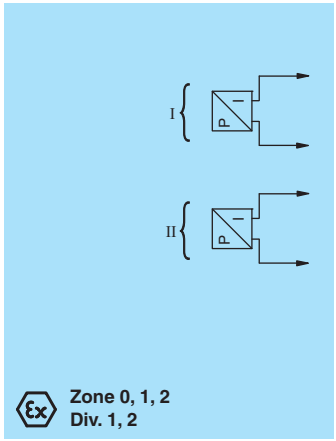
This isolated barrier is used for intrinsic safety applications. It is a loop-powered and controls I/P converters.

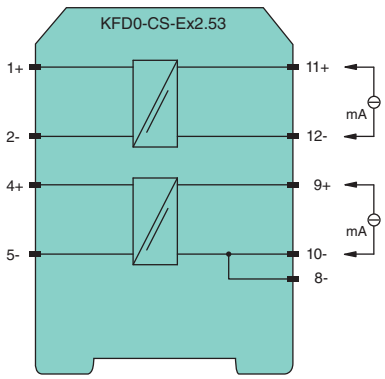
It is ideal for applications where the control system in the safe area handles a small load.

Since this isolator is loop powered, use the technical data to verify that proper voltage is available to the field devices.

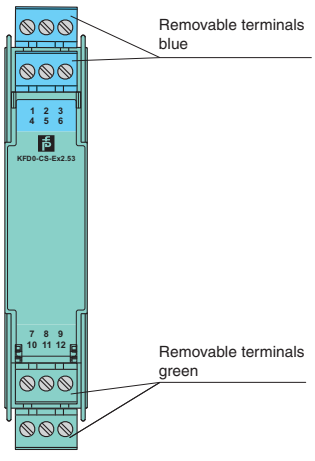
Note: The input voltage of 10 V must not be exceeded.

Diagrams





Front view



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ATEX Entity Parameters

Model Number	Terminals	U_o (V)	I_o (mA)	P_o (mW)
KCD2-SCD-Ex1	1, 2	25.2	100	630
KFD2-SCD-Ex1.LK	1, 2	25.2	93	585
KFD2-SCD2-Ex1.LK	1, 2	25.2	93	585
KFD2-SCD2-Ex1-Y1	1, 2	25.2	93	585
KFD2-CD2-Ex1	1, 2	25.2	93	585
KFD2-CD-Ex1.32.*	1, 2	25.2	93/95	586
KFD2-SCD2-Ex2.LK	1, 2; 4, 5	25.2	93	585
KFD2-SCD2-Ex2-Y1	1, 2; 4, 5	25.2	93	585
KFD2-CD2-Ex2	1, 2; 4, 5	25.2	93	585
KFD0-SCS-Ex1.55	1, 3	23.1	28	647
KFD0-CS-Ex1.50P	1, 2	25.2	93	585
KFD0-CS-Ex1.51P	1, 2	25.2	93	585
KFD0-CS-Ex1.53	1, 2	10.5	95	247
KFD0-CS-Ex2.50P	1, 2; 4, 5	25.2	93	585
KFD0-CS-Ex2.51P	1, 2; 4, 5	25.2	93	585
KFD0-CS-Ex2.53	1, 2; 4, 5	10.5	95	247

CSA Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)
KFD2-SCD-Ex1.LK	1, 2	25.2	93
KFD2-CD-Ex1.32.*	1, 2	28	93
KFD0-CS-Ex1.50P	1, 2	25.2	93
KFD0-CS-Ex1.51P	1, 2	25.2	93
KFD0-CS-Ex1.53	1, 2	10.5	95
KFD0-CS-Ex2.50P	1, 2; 4, 5	25.2	93
KFD0-CS-Ex2.51P	1, 2; 4, 5	25.2	93
KFD0-CS-Ex2.53	1, 2; 4, 5	10.5	95

FM Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
KCD2-SCD-Ex1	1, 2	25.2	100	–	–
KFD2-SCD-Ex1.LK	1, 2	25.2	93	–	–
KFD2-CD-Ex1.32.*	1, 2	28	93	–	–
KFD0-CS-Ex1.50P	1, 2	25.2	93	–	–
KFD0-CS-Ex1.51P	1, 2	25.2	93	–	–
KFD0-CS-Ex1.53	1, 2	10.5	95	–	–
KFD0-CS-Ex2.50P	1, 2; 4, 5	25.2	93	–	–
KFD0-CS-Ex2.51P	1, 2; 4, 5	25.2	93	–	–
KFD0-CS-Ex2.53	1, 2; 4, 5	10.5	95	–	–

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UL Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
KCD2-SCD-Ex1	1, 2	25.2	100	–	–
KFD2-SCD-Ex1.LK	1, 2	25.2	93	–	–
KFD2-SCD2-Ex1.LK	1, 2	25.2	93	–	–
KFD2-SCD2-Ex1-Y1	1, 2	25.2	93	–	–
KFD2-CD2-Ex1	1, 2	25.2	93	–	–
KFD2-CD-Ex1.32.*	1, 2	25.2	95	–	–
KFD2-SCD2-Ex2.LK	1, 2; 4, 5	25.2	93	–	–
KFD2-SCD2-Ex2-Y1	1, 2; 4, 5	25.2	93	–	–
KFD2-CD2-Ex2	1, 2; 4, 5	25.2	93	–	–
KFD0-CS-Ex1.50P	1, 2	25.2	93	–	–
KFD0-CS-Ex1.51P	1, 2	25.2	93	–	–
KFD0-CS-Ex1.53	1, 2	10.5	95	–	–
KFD0-CS-Ex2.50P	1, 2; 4, 5	25.2	93	–	–
KFD0-CS-Ex2.51P	1, 2; 4, 5	25.2	93	–	–
KFD0-CS-Ex2.53	1, 2; 4, 5	10.5	95	–	–

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Supply and Installation

Model Number	Description	Page
KFA6-STR-1.24.500	Power Supply, 24 V, 500 mA	285
KFA6-STR-1.24.4	Power Supply, 24 V, 4 A	286
KFD2-EB2	Power Feed Module	287
KFD2-EB2.R4A.B	Redundant Power Feed Module	288
UPR-03-*	Universal Power Rail, insert for DIN rail, 3-lead	289
UPR-05-*	Universal Power Rail, insert for DIN rail, 5-lead	290
UPR-E	End Cap for Universal Power Rail UPR-**-*	289, 290
UPR-I	Insulation Spacer for Universal Power Rail UPR-**-*	295
K-DUCT-BU-UPR-03	Profile Rail with UPR-03-* insert, 3-lead, wiring comb field side blue	291
K-DUCT-BU-UPR-05	Profile Rail with UPR-05-* insert, 5-lead, wiring comb field side blue	292
K-DUCT-GY-UPR-03	Profile Rail with UPR-03-* insert, 3-lead, wiring comb field side grey	293
K-DUCT-GY-UPR-05	Profile Rail with UPR-05-* insert, 5-lead, wiring comb field side grey	294
E/AL-NS35	End Bracket	296
TS 35 Typ 12	End Bracket	296
K-MS	Mounting Socket	295

Terminal Blocks

Model Number	Description	Type		Module		Number of Poles	Test Sockets	Cold Junction Compensation	Packaging Unit, Color				Page
		Screw Terminal	Cage Clamp Terminal	KC-Modules	KF-Modules				Green	Blue	Black	Red	
K-CJC-BK	Terminal Block	■			■	3		■			1		297
K-CJC-BU	Terminal Block	■			■	3		■		1			297
KC-ST-5BU	Terminal Block	■		■		2				5			297
KC-ST-5GN	Terminal Block	■		■		2			5				297
KF-ST-5BU	Terminal Block	■			■	3				5			298
KF-ST-5GN	Terminal Block	■			■	3			5				298
KC-STP-5BU	Terminal Block	■		■		2	■			5			298
KC-STP-5GN	Terminal Block	■		■		2	■		5				298
KF-STP-5BU	Terminal Block	■			■	3	■			5			299
KF-STP-5GN	Terminal Block	■			■	3	■		5				299
KC-CTT-3GN2BU	Terminal Block		■	■		2	■		3	2			299
KC-CTT-5BU	Terminal Block		■	■		2	■			5			299
KC-CTT-5GN	Terminal Block		■	■		2	■		5				299
KF-CTT-3GN2BU	Terminal Block		■		■	3	■		3	2			300
KF-CTT-5BU	Terminal Block		■		■	3	■			5			300
KF-CTT-5GN	Terminal Block		■		■	3	■		5				300
KF-CP	Coding Pins			■	■							20 x 6	300

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Commissioning

Model Number	Description	Page
PACT*ware*™ 4.X	FDT-Framework	301
K-ADP-USB	Adapter with USB Interface	302
K-ADP1	Adapter with RS 232 Interface	303
IS01	Simulator	304

Further Accessories

Model Number	Description	Page
F-KD-Ex2	Clamp Module	305
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Technical data

Supply	
Rated voltage	90 ... 253 V AC, 48 ... 63 Hz
Power loss	2.5 W
Output	
Current	500 mA at 60 °C (140 °F), permanent short-circuit protection (electronic)
Voltage	24 V ± 0.5 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2

Features

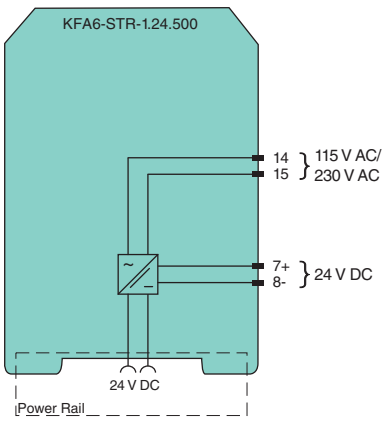
- **115/230 V AC supply**
- **Output 24 V DC, 500 mA**
- **Electronic short circuit protection**
- **Power Rail connection**

Function

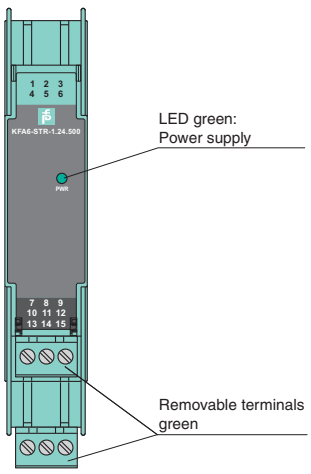
This regulated power supply provides 24 V DC, at 500 mA.

The KFA6-STR-1.24.500 features removable terminals and mounts directly on the Power Rail. This allows usage as Power Rail supply as well as stand alone power supply.

Diagrams



Front view



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Features

- **115/230 V AC supply**
- **Output 24 V DC, 4 A**
- **Fused output**
- **Power Rail connection**

Function

This regulated power supply provides 24 V DC, at 4 A. It features removable terminals, LED fault indication, and mounts directly on the Power Rail.

Designed with a replaceable fuse and LED, it will provide a green visual indication for normal operation or a flashing red indication if a fault occurs.

Attention: Ignoring the safety instructions (i. e., touching hot sections when the device is open, handling malpractices) can be extremely dangerous.

When exceeding the values stated in the technical data, there is a danger of overheating. As a result, the operation of the power supply and its electrical safety may be impaired.

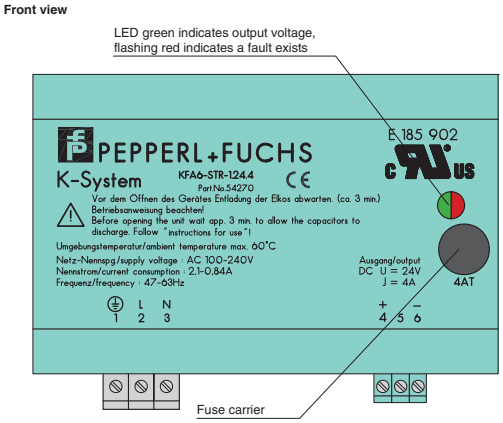
Before starting installation or service, switch mains off. Do not plug or unplug powered!

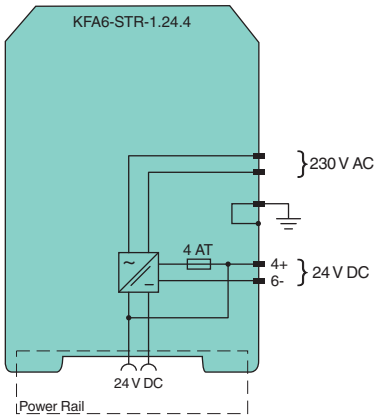
Technical data

Supply	
Rated voltage	92 ... 265 V AC, 47 ... 63 Hz
Rated current	2.1 ... 0.84 A
Failure override time	> 75 ms/230 V AC; 5 ms/115 V AC
Output	
Current	0 ... 4 A, Power Rail limiting by means of fuse 4 AT, electron. limitation typ. 4.6 A
Voltage	23.28 ... 24.72 V DC
Ripple	< 100 mV_{pp}
Efficiency	typ. 87 %
Overvoltage protected	< 28 V DC
Electromagnetic compatibility	
Safety	acc. to VDE 0805/EN 60950
Radio-interference supression	acc. to VDE 0875 Part 11, EN 55011 class B
Electrostatic discharge	acc. to IEC 60801-2
Contact discharging	8 kV
Air discharging	15 kV
Electromagnetic fields	acc. to IEC 801-3, 10 V/m
Burst IEC 60801-4	Input: 4 kV; output/capacitively coupled: 2 kV
Surge IEC 60801-5	asymmetrical: L, N -> PE 4 kV; symmetrical: L -> N 2 kV
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 800 g
Dimensions	140 x 103.5 x 99 mm (5.5 x 4.1 x 3.9 in)
Mounting	mounting clips for snap-mounting on DIN rail as per DIN EN 60715
Connection possibilities	self-opening connection terminals, max. core cross-section 2 x 2.5 mm^2
Data for application in connection with Ex-areas	
UL approval	UL recognized E185902

Diagrams

Front view





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Technical data

Supply	
Rated voltage	20 ... 30 V DC The maximum rated operational voltage of the devices plugged onto the Power Rail must not be exceeded.
Power loss	≤ 1 W
Output	
Power Rail feed	output current: ≤ 4 A
Fault signal	relay output: NO
Contact loading	40 V DC; 2 A
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Fusing	5 AT
Ambient conditions	
Ambient temperature	-25 ... 60 °C (-13 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	
Statement of conformity	TÜV 00 ATEX 1618 X
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4
FM approval	
Control drawing	116-0160
Approved for	Class I, Division 2, Groups A, B, C, D; Class I, Zone 2, IIC
CSA approval	
Control drawing	116-0160
Approved for	Class I, Division 2, Groups A, B, C, D; Class I, Zone 2, IIC

Features

- **Interface for Power Rail**
- **Supply rating 4 A, external fused**
- **Relay contact output, reversible**
- **LED status indication**

Function

The power feed module interfaces 24 V DC power to the Power Rail at a maximum current of 4 A. The twin input terminals allow for daisy-chaining of supply (max. 10 A).

A green LED on the front of the unit indicates that power is on, and a red LED illuminates during error conditions.

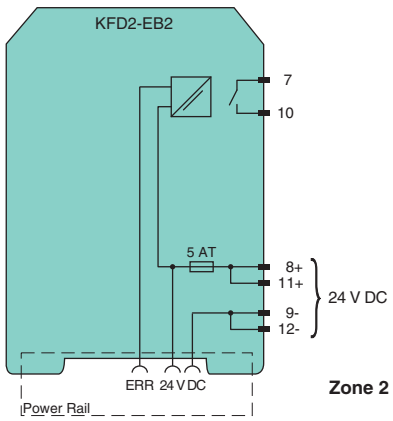
In the event of a field wiring or barrier fault from any barrier on the Power Rail, the integral collective error messaging relay alerts the controller via a single discrete I/O point.

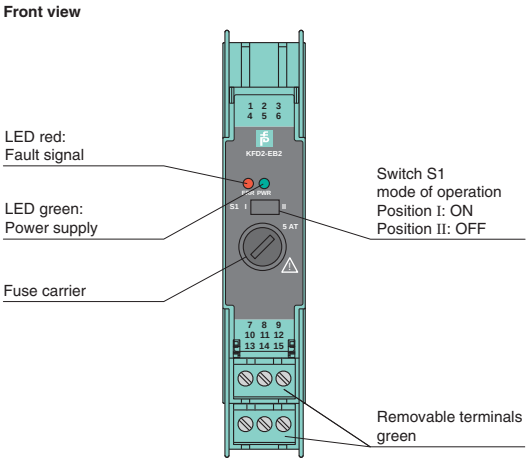
This relay can be configured as normally open or normally closed.

In the sense of functional safety (SIL) the device provides no dangerous failures. Thereby the safe condition of the supplied barrier must be defined as the powerless state. Thus the device will not influence the safety calculation or the SIL value.

This device is compatible with all versions of the Power Rail.

Diagrams





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KFD2-EB2.R4A.B

Redundant Power Feed Module

Features

- **Interface for Power Rail**
- **Used for redundant configuration**
- **Supply rating 4 A, external fused**
- **Relay contact output, reversible**

Function

The power feed module interfaces 24 V DC power to the Power Rail at a maximum current of 4 A and is designed for applications requiring redundant power. The twin input terminals allow for daisy-chaining of supply (max. 10 A).

A green LED on the front of the unit indicates that power is on, and a red LED illuminates during error conditions.

In the event of a field wiring or barrier fault from any barrier on the Power Rail, the integral collective error messaging relay alerts the controller via a single digital I/O point. This relay can be configured as normally open or normally closed.

Additionally, the bus implemented in the Power Rail is forwarded to the outside terminals 13 and 15 for usage with KFD2-WAC2-Ex1.D RS 485 connection. Terminal 14 is only for test purposes.

In the sense of functional safety (SIL) the device provides no dangerous failures. Thereby the safe condition of the supplied barrier must be defined as the powerless state. Thus the device will not influence the safety calculation or the SIL value.

This device is compatible with all versions of the Power Rail and provides group fusing.

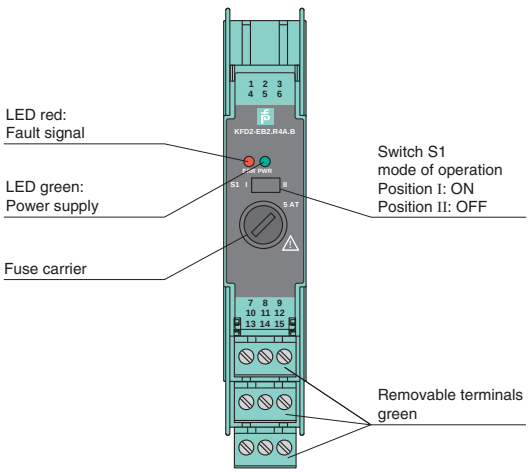
Note: Redundant systems require two KFD2-EB.R4A.B modules.

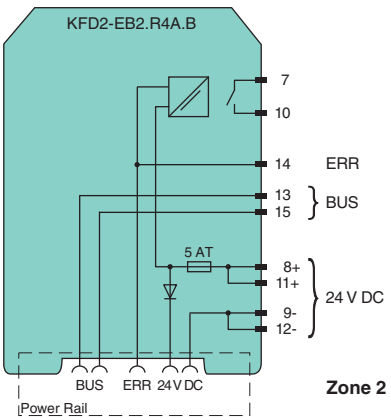
Technical data

Supply	
Rated voltage	20 ... 30 V DC The maximum rated operational voltage of the devices plugged onto the Power Rail must not be exceeded.
Power loss	≤ 2.4 W
Output	
Power Rail feed	output current: ≤ 4 A
Fault signal	relay output: NO
Contact loading	40 V DC; 2 A
Energized/De-energized delay	approx. 20 ms/approx. 20 ms
Fusing	5 AT
Ambient conditions	
Ambient temperature	-25 ... 60 °C (-13 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
Data for application in connection with Ex-areas	
Statement of conformity	TÜV 00 ATEX 1618 X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA nC IIC T4
FM approval	
Control drawing	116-0160
Approved for	Class I, Division 2, Groups A, B, C, D; Class I, Zone 2, IIC
CSA approval	
Control drawing	116-0160
Approved for	Class I, Division 2, Groups A, B, C, D; Class I, Zone 2, IIC

Diagrams

Front view





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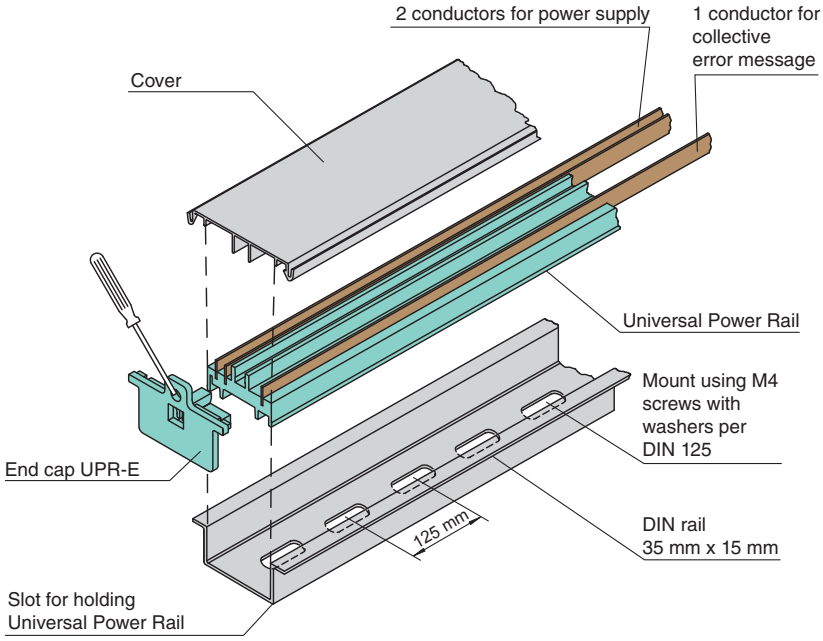
Dimensions



Technical data

Electrical specifications	
Rated voltage	24 V DC
Rated current	4 A
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Dimensions	UPR-03-S: 35 x 15 x 800 mm (1.4 x 0.6 x 31.5 in) UPR-03: 35 x 15 x 2000 mm (1.4 x 0.6 x 78.7 in)

Features

- **Gold plated 3-conductor insert in 35 mm DIN rail acc. to EN 60715**
- **Provides DC supply voltage to all equipped K-System modules**
- **Standard length 0.8 m (2.6 ft) or 2 m (6 ft), simple to customize to application space**
- **Eliminates daisy-chains**

Function

The universal Power Rail is a plastic insert with integral gold-plated conductors that fits into its own integral, 35 mm DIN rail and supplies components with power.

It has two conductors for power and one conductor for collective error messaging.

It reduces wiring and maintenance costs because it eliminates the need to daisy-chain the wires. It also simplifies expansion – just snap in a new module when you're ready to expand a system.

It comes in 2 m segments (UPR-03) or in 0.8 m segments (UPR-03-S) but can be cut to any size.

It is delivered with two UPR-E end caps. More end caps can be ordered separately.

In conjunction with K-System modules the universal Power Rail can be mounted in Zone 2.

Accessories

UPR-E

End cap for UPR-03-* and UPR-05-*

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Features

- **Gold plated 5-conductor insert in 35 mm DIN rail acc. to EN 60715**
- **Provides DC supply voltage and the bus connection to all equipped K-System modules**
- **Standard length 0.8 m (2.6 ft) or 2 m (6 ft), simple to customize to application space**
- **Eliminates daisy-chains**

Function

The universal Power Rail is a plastic insert with integral gold-plated conductors that fits into its own integral, 35 mm DIN rail and supplies components with power.

It has two conductors for power, one conductor for collective error messaging, and two conductors for bus connections.

It reduces wiring and maintenance costs because it eliminates the need to daisy-chain the wires. It also simplifies expansion – just snap in a new module when you're ready to expand a system.

It comes in 2 m segments (UPR-05) or in 0.8 m segments (UPR-05-S) but can be cut to any size.

It is delivered with two UPR-E end caps. More end caps can be ordered separately.

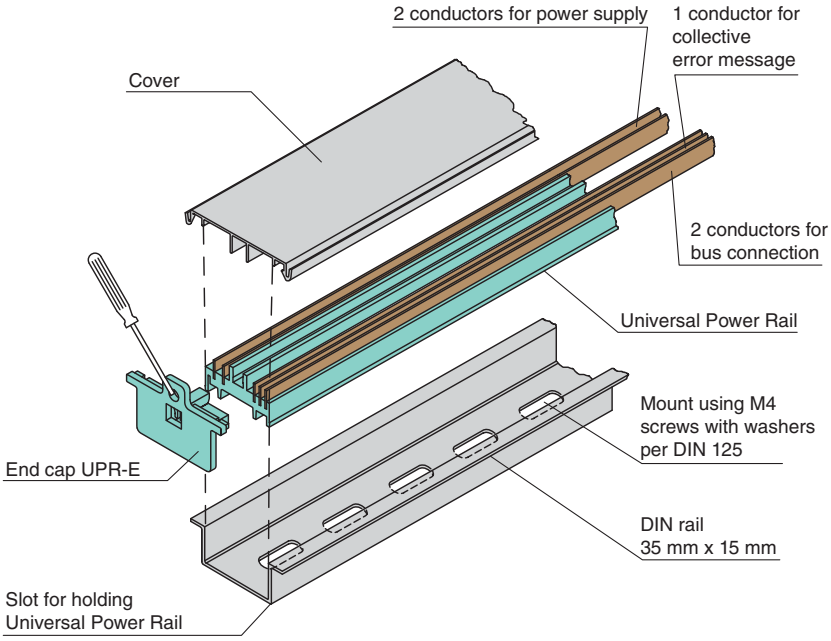
In conjunction with K-System modules the universal Power Rail can be mounted in Zone 2.

Accessories

UPR-E

End cap for UPR-03-* and UPR-05-*

Dimensions



Technical data

Electrical specifications	
Rated voltage	24 V DC
Rated current	4 A
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Dimensions	UPR-05-S: 35 x 15 x 800 mm (1.4 x 0.6 x 31.5 in) UPR-05: 35 x 15 x 2000 mm (1.4 x 0.6 x 78.7 in)

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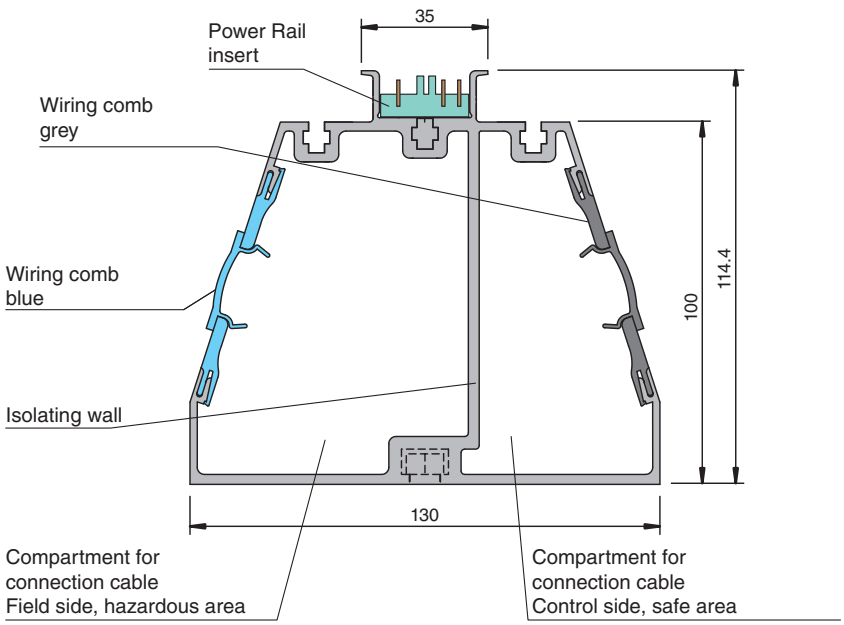
Dimensions



Technical data

Mechanical specifications	
Dimensions	130 x 114.4 x 1800 mm (5 x 4.5 x 71 in)

Features

- **Cable trunking with integrated Power Rail UPR-03**
- **Safe spacious separation of safe and hazardous signals**
- **No additional cable guides necessary**
- **Provides DC supply voltage to all equipped K-System modules**
- **Standard length 1.8 m (5.8 ft), simple to customize to application space**

Function

The profile rail can be used to provide space-saving mounting for interface modules and accommodate the associated wiring. The system and field cables for safe and hazardous signals are easily installed in the integral cable ducts of the profile rail. Thus no additional cable guides are necessary.

The power supply to the individual modules is preferably provided via the Power Rail UPR-03 that is integrated into the system. Additionally the Power Rail UPR-03 has one lead for collective error messaging.

The asymmetrical segmented connection compartment can be changed dependent on the required space by turning the profile rail. Please note that the Power Rail insert must be also rotated and the wiring combs of different colors must be changed too.

In conjunction with K-System modules the profile rail can be mounted in Zone 2.

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Features

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- **Safe spacious separation of safe and hazardous signals**
- **No additional cable guides necessary**
- **Provides DC supply voltage and the bus connection to all equipped K-System modules**
- **Standard length 1.8 m (5.8 ft), simple to customize to application space**

Function

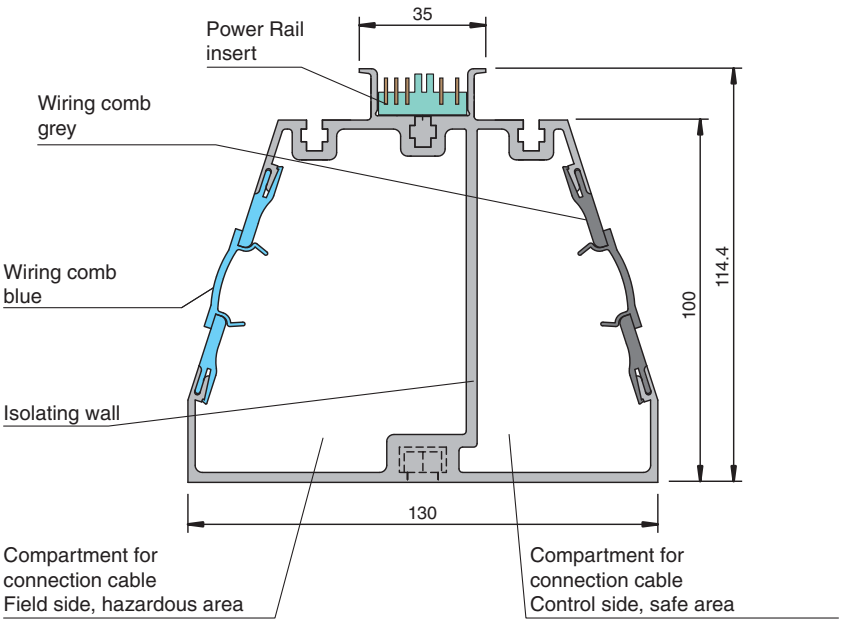
The profile rail can be used to provide space-saving mounting for interface modules and accommodate the associated wiring. The system and field cables for safe and hazardous signals are easily installed in the integral cable ducts of the profile rail. Thus no additional cable guides are necessary.

The power supply to the individual modules is preferably provided via the Power Rail UPR-05 that is integrated into the system. Additionally the Power Rail UPR-05 has one lead for collective error messaging and two leads for bus connections.

The asymmetrical segmented connection compartment can be changed dependent on the required space by turning the profile rail. Please note that the Power Rail insert must be also rotated and the wiring combs of different colors must be changed too.

In conjunction with K-System modules the profile rail can be mounted in Zone 2.

Dimensions



Technical data

Mechanical specifications	
Dimensions	130 x 114.4 x 1800 mm (5 x 4.5 x 71 in)

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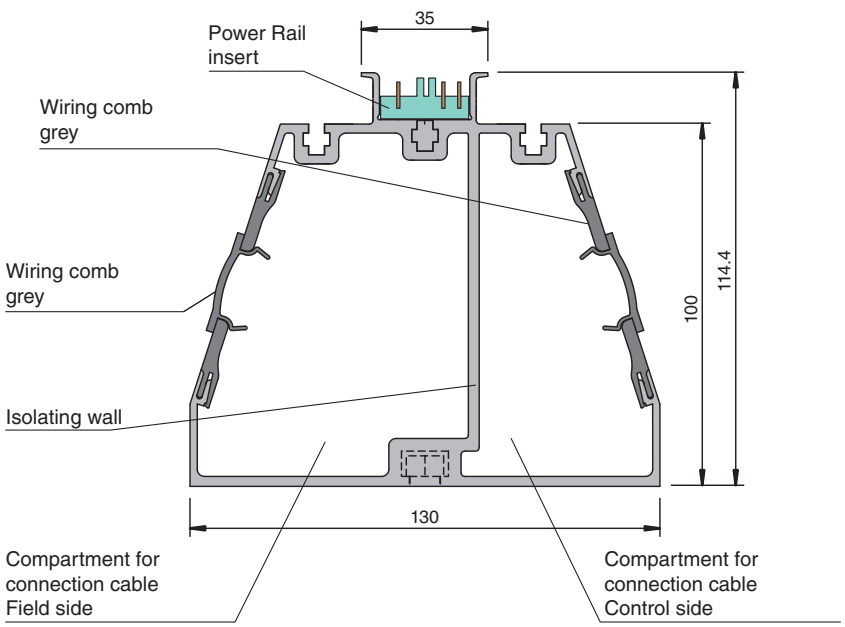
Dimensions



Technical data

Mechanical specifications	
Dimensions	130 x 114.4 x 1800 mm (5 x 4.5 x 71 in)

Features

- **Cable trunking with integrated Power Rail UPR-03**
- **Safe spacious separation of field and control signals**
- **No additional cable guides necessary**
- **Provides DC supply voltage to all equipped K-System modules**
- **Standard length 1.8 m (5.8 ft), simple to customize to application space**

Function

The profile rail can be used to provide space-saving mounting for interface modules and accommodate the associated wiring. The system and field cables are easily installed in the integral cable ducts of the profile rail. Thus no additional cable guides are necessary.

The power supply to the individual modules is preferably provided via the Power Rail UPR-03 that is integrated into the system. Additionally the Power Rail UPR-03 has one lead for collective error messaging.

The asymmetrical segmented connection compartment can be changed dependent on the required space by turning the profile rail. Please note that the Power Rail insert must be also rotated.

In conjunction with K-System modules the profile rail can be mounted in Zone 2.

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Features

- **Cable trunking with integrated Power Rail UPR-05**
- **Safe spacious separation of field and control signals**
- **No additional cable guides necessary**
- **Provides DC supply voltage and the bus connection to all equipped K-System modules**
- **Standard length 1.8 m (5.8 ft), simple to customize to application space**

Function

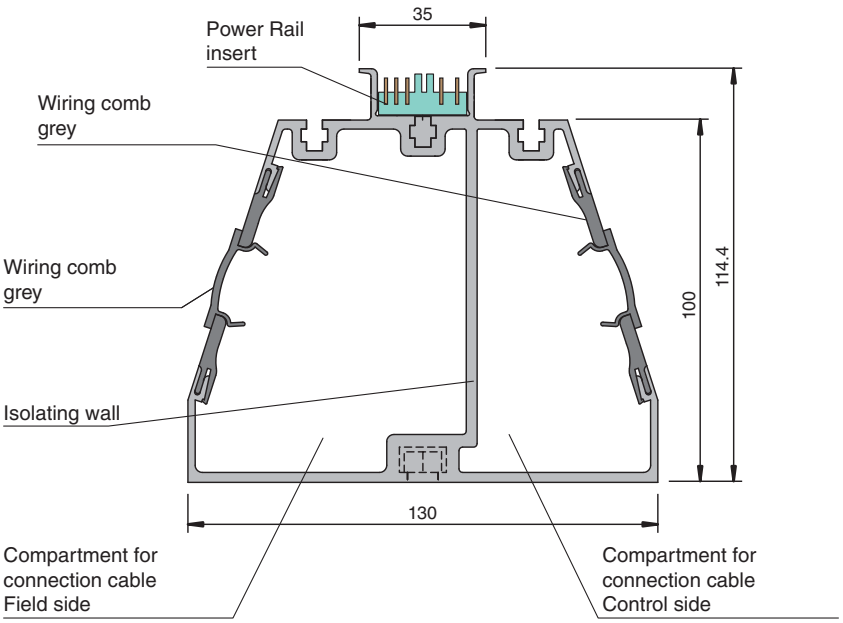
The profile rail can be used to provide space-saving mounting for interface modules and accommodate the associated wiring. The system and field cables are easily installed in the integral cable ducts of the profile rail. Thus no additional cable guides are necessary.

The power supply to the individual modules is preferably provided via the Power Rail UPR-05 that is integrated into the system. Additionally the Power Rail UPR-05 has one lead for collective error messaging and two leads for bus connections.

The asymmetrical segmented connection compartment can be changed dependent on the required space by turning the profile rail. Please note that the Power Rail insert must be also rotated.

In conjunction with K-System modules the profile rail can be mounted in Zone 2.

Dimensions



Technical data

Mechanical specifications	
Dimensions	130 x 114.4 x 1800 mm (5 x 4.5 x 71 in)

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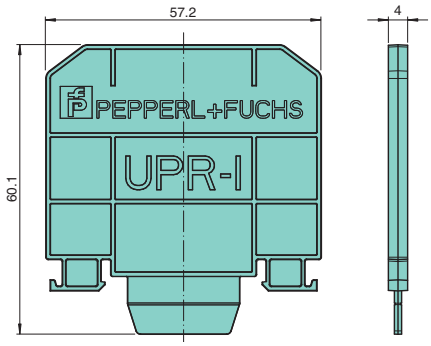


Insulation Spacer for UPR-**-* UPR-I

Features

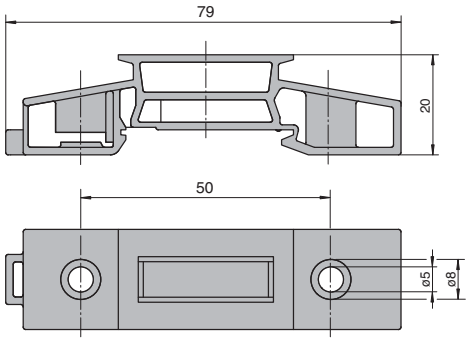
- **Electrical insulation of segmented Power Rail inserts**

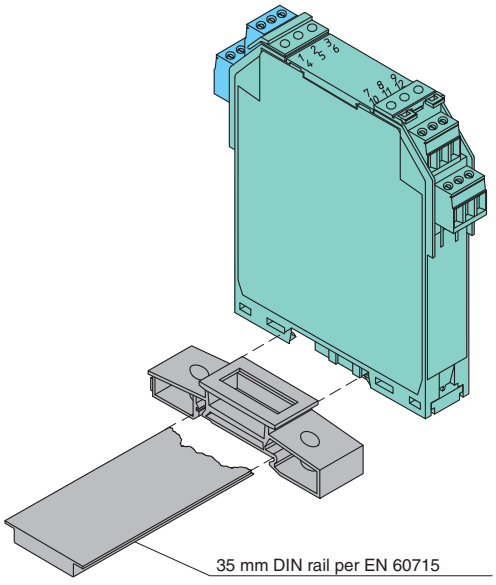
Function

The insulation spacer mounts onto a 35 mm DIN rail. It is used for electrical insulation of segmented Power Rail inserts.

Technical data

Mechanical specifications	
Material	Polycarbonate
Mass	approx. 20 g
Dimensions	4 x 57 x 60 mm (0.16 x 2.24 x 2.36 in)
Mounting	mounting on 35 mm DIN rail acc. to DIN EN 60715





Mounting Socket K-MS

Features

- **1-channel**
- **KF module DIN rail isolation block**
- **Snaps on to 35 mm DIN rail acc. to EN 60715**
- **Easy panel mounting**

Function

This mounting socket enables the "snap-on" mounting of K devices on a 35 mm DIN rail when there is not enough space to install the Power Rail device contacts.

Sockets can be mounted in rows, so mounting can be accomplished with a minimum loss of space. The socket may also be used to cover unused mounting positions on the Power Rail.

Technical data

Mechanical specifications	
Material	Polyamide PA 66
Mass	approx. 30 g
Dimensions	20 x 20 x 79 mm (0.8 x 0.8 x 3.1 in)
Mounting	mounting on 35 mm DIN rail acc. to DIN EN 60715

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End Bracket E/AL-NS35

Features

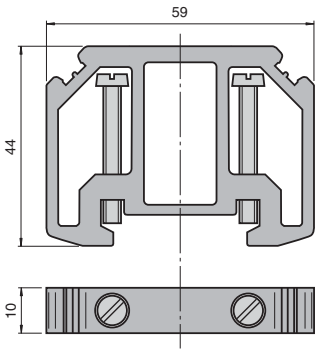
- **For end support**

Function

The end bracket is used for end support of devices on the 35 mm DIN rail. It is pushed onto DIN rail and fixed with two screws.

Note: This component is not supplied by Pepperl+Fuchs.

Supplier: Phoenix Contact



Technical data

Mechanical specifications	
Material	aluminium
Mass	approx. 25 g
Dimensions	10 x 44 x 59 mm (0.4 x 1.7 x 2.3 in)
Mounting	mounting on 35 mm DIN rail acc. to DIN EN 60715

End Bracket TS 35 Typ 12

Features

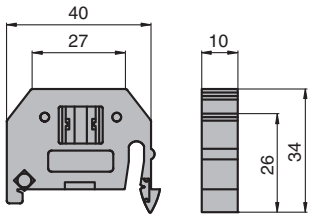
- **End terminal as termination for DIN rail**

Function

TS 35 Type 12 end brackets are used as terminations when K devices are mounted on the DIN rail.

Note: This component is not supplied by Pepperl+Fuchs.

Supplier: Wago



Technical data

Mechanical specifications	
Mass	approx. 10 g
Dimensions	10 x 34 x 40 mm (0.4 x 1.34 x 1.57 in)
Mounting	mounting on 35 mm DIN rail acc. to DIN EN 60715

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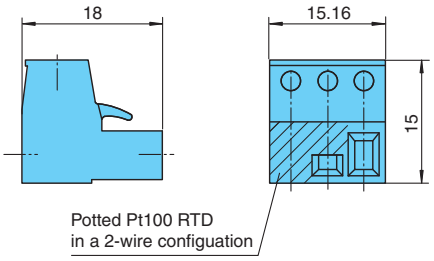


Technical data

Mechanical specifications	
Core cross-section	max. 2.5 mm²
Mass	approx. 5 g
Dimensions	15.2 x 15 x 18 mm (0.6 x 0.6 x 0.7 in)
Construction type	removable screw terminal with integrated cold junction compensation

Terminal Block with Cold Junction Compensation
K-CJC-BU
K-CJC-BK

Features

- **3-pin screw terminal**
- **For KF modules**
- **Integrated Cold Junction Compensation**
- **Packaging unit: 1 piece, blue**
- **Packaging unit: 1 piece, black**

Function

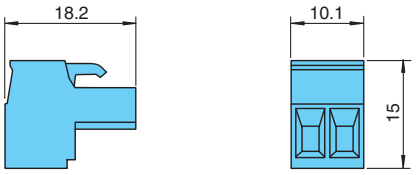
The terminal block is suitable for K-System applications.

The blue terminal block is used for connection of signals from or in the hazardous area.

The black terminal block is used for connection of field signals as well as the connection of control signals.

This terminal block has an integrated encapsulated Pt100 RTD for cold junction compensation.

The terminal block can be coded with the provided coding pins KF-CP.



Technical data

Mechanical specifications	
Core cross-section	max. 2.5 mm²
Mass	approx. 4 g
Dimensions	10.1 x 15 x 18.2 mm (0.4 x 0.5 x 0.7 in)
Construction type	removable screw terminal

Terminal Block
KC-ST-5BU
KC-ST-5GN

Features

- **2-pin screw terminal**
- **For KC modules**
- **Packaging unit: 5 pieces blue**
- **Packaging unit: 5 pieces green**

Function

The terminal block is suitable for K-System applications.

The blue terminal block is used for connection of signals from or in the hazardous area.

The green terminal block is used for connection of field signals as well as the connection of control signals.

The terminal block can be coded with the provided coding pins KF-CP.

Notes

The removable terminals guarantee protection from direct contact by means of a strengthened insulation. This applies to design insulation voltages with the occurrence of maximum overvoltages in accordance with overvoltage category III of EN 50178 (1500 V AC).

The voltage is to be switched off in the case of design insulation voltages greater than 50 V AC before connecting or disconnecting the device connectors.

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Terminal Block
KF-ST-5BU
KF-ST-5GN

Features

- **3-pin screw terminal**
- **For KF modules**
- **Packaging unit: 5 pieces blue**
- **Packaging unit: 5 pieces green**

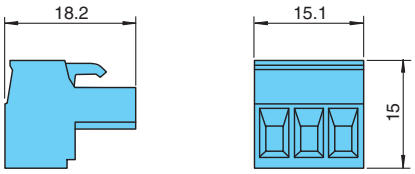
Function

The terminal block is suitable for K-System applications.

The blue terminal block is used for connection of signals from or in the hazardous area.

The green terminal block is used for connection of field signals as well as the connection of control signals.

The terminal block can be coded with the provided coding pins KF-CP.



Technical data

Mechanical specifications	
Core cross-section	max. 2.5 mm²
Mass	approx. 5 g
Dimensions	15.1 x 15 x 18.2 mm (0.5 x 0.5 x 0.7 in)
Construction type	removable screw terminal

Notes

The removable terminals guarantee protection from direct contact by means of a strengthened insulation. This applies to design insulation voltages with the occurrence of maximum overvoltages in accordance with overvoltage category III of EN 50178 (1500 V AC).

The voltage is to be switched off in the case of design insulation voltages greater than 50 V AC before connecting or disconnecting the device connectors.

Terminal Block with Test Points
KC-STP-5BU
KC-STP-5GN

Features

- **2-pin screw terminal**
- **For KC modules**
- **Integrated test points for connection of HART communicators**
- **Packaging unit: 5 pieces blue**
- **Packaging unit: 5 pieces green**

Function

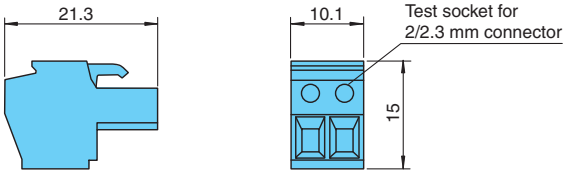
The terminal block is suitable for K-System applications.

The blue terminal block is used for connection of signals from or in the hazardous area.

The green terminal block is used for connection of field signals as well as the connection of control signals.

This terminal block has integrated test points for connection of HART communicators.

The terminal block can be coded with the provided coding pins KF-CP.



Technical data

Mechanical specifications	
Core cross-section	max. 2.5 mm²
Mass	approx. 4 g
Dimensions	10.1 x 15 x 21.3 mm (0.4 x 0.5 x 0.84 in)
Construction type	removable screw terminal with integrated test points

Notes

The removable terminals guarantee protection from direct contact by means of a strengthened insulation. This applies to design insulation voltages with the occurrence of maximum overvoltages in accordance with overvoltage category III of EN 50178 (1500 V AC).

The voltage is to be switched off in the case of design insulation voltages greater than 50 V AC before connecting or disconnecting the device connectors.

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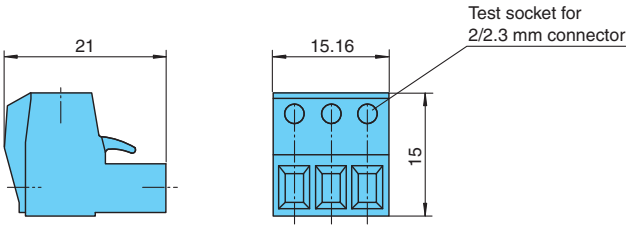


Terminal Block with Test Points
KF-STP-5BU
KF-STP-5GN

Features

- 3-pin screw terminal
- For KF modules
- Integrated test points for connection of HART communicators
- Packaging unit: 5 pieces blue
- Packaging unit: 5 pieces green

Technical data

Mechanical specifications	
Core cross-section	max. 2.5 mm^2
Mass	approx. 5 g
Dimensions	15.2 x 15 x 21 mm (0.6 x 0.6 x 0.83 in)
Construction type	removable screw terminal with integrated test points

Function

The terminal block is suitable for K-System applications.

The blue terminal block is used for connection of signals from or in the hazardous area.

The green terminal block is used for connection of field signals as well as the connection of control signals.

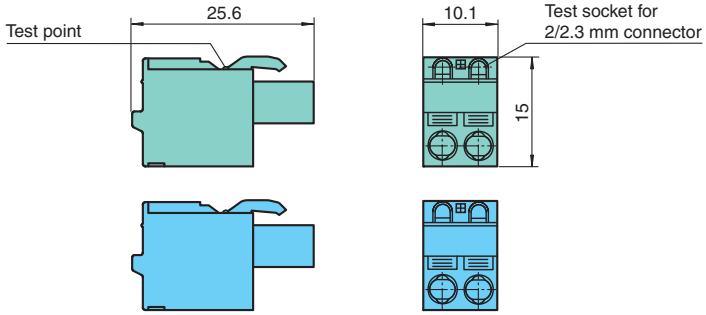
This terminal block has integrated test points for connection of HART communicators.

The terminal block can be coded with the provided coding pins KF-CP.

Notes

The removable terminals guarantee protection from direct contact by means of a strengthened insulation. This applies to design insulation voltages with the occurrence of maximum overvoltages in accordance with overvoltage category III of EN 50178 (1500 V AC).

The voltage is to be switched off in the case of design insulation voltages greater than 50 V AC before connecting or disconnecting the device connectors.



Terminal Block with Test Points
KC-CTT-3GN2BU
KC-CTT-5BU
KC-CTT-5GN

Features

- 2-pin cage clamp terminal
- For KC modules
- Integrated test points for connection of HART communicators
- Packaging unit: 3 pieces green, 2 pieces blue
- Packaging unit: 5 pieces blue
- Packaging unit: 5 pieces green

Technical data

Mechanical specifications	
Core cross-section	max. 2.5 mm^2
Mass	approx. 4 g
Dimensions	10.1 x 15 x 25.6 mm (0.4 x 0.5 x 1 in)
Construction type	removable cage clamp terminal with integrated test points

Function

The terminal block is suitable for K-System applications.

The blue terminal block is used for connection of signals from or in the hazardous area.

The green terminal block is used for connection of field signals as well as the connection of control signals.

This terminal block has integrated test points for connection of HART communicators.

The terminal block can be coded with the provided coding pins KF-CP.

Notes

The removable terminals guarantee protection from direct contact by means of a strengthened insulation. This applies to design insulation voltages with the occurrence of maximum overvoltages in accordance with overvoltage category III of EN 50178 (1500 V AC).

The voltage is to be switched off in the case of design insulation voltages greater than 50 V AC before connecting or disconnecting the device connectors.

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Terminal Block with Test Points
KF-CTT-3GN2BU
KF-CTT-5BU
KF-CTT-5GN

Features

- **3-pin cage clamp terminal**
- **For KF modules**
- **Integrated test points for connection of HART communicators**
- **Packaging unit: 3 pieces green, 2 pieces blue**
- **Packaging unit: 5 pieces blue**
- **Packaging unit: 5 pieces green**

Function

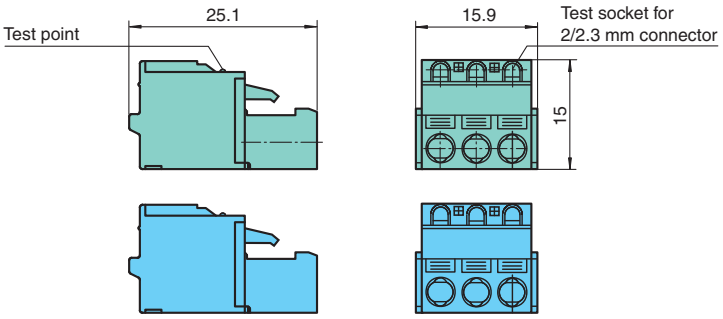
The terminal block is suitable for K-System applications.

The blue terminal block is used for connection of signals from or in the hazardous area.

The green terminal block is used for connection of field signals as well as the connection of control signals.

This terminal block has integrated test points for connection of HART communicators.

The terminal block can be coded with the provided coding pins KF-CP.



Technical data

Mechanical specifications	
Core cross-section	max. 2.5 mm²
Mass	approx. 5 g
Dimensions	15.9 x 15 x 25.1 mm (0.63 x 0.6 x 1 in)
Construction type	removable cage clamp terminal with integrated test points

Notes

The removable terminals guarantee protection from direct contact by means of a strengthened insulation. This applies to design insulation voltages with the occurrence of maximum overvoltages in accordance with overvoltage category III of EN 50178 (1500 V AC).

The voltage is to be switched off in the case of design insulation voltages greater than 50 V AC before connecting or disconnecting the device connectors.

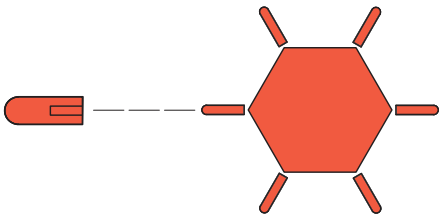
Coding Pins
KF-CP

Features

- **Coding of K-System terminal blocks**
- **Packaging unit: 20 x 6 coding pins**

Function

The terminals can be coded with an coding pin by inserting the red tab into a particular slot of the terminal block.



Technical data

Mechanical specifications	
Material	red insulating material
Mass	approx. 1 g per coding pin
Dimensions	0.5 x 2 x 8 mm (0.02 x 0.08 x 0.3 in)

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Technical data

Interface	
Connection	adapter with RS 232 interface K-ADP1 or USB interface K-ADP-USB (for K-System) adapter for gateways with RS 232 intrface K-ADP2 (for RPI-System) adapter for gateways with RS 485 interface K-ADP4 (for RPI-System) USB/RS 485 interface converter (for LB-System)
Software	
Hardware requirements	PACTware requires 50 MBytes hard drive memory and a minimum of 40 MBytes main memory. Depending on the complexity of the projects and the DTMs used, the main memory requirement can be greater. A computer with a Pentium IV 450 MHz processor or better is recommended, XGA graphics, and a Microsoft-compatible mouse or equivalent pointing device arealso required.
Software requirements	PACTware runs in operating systems Windows XP/Vista/7. The software .NET Framework 2.0 must be installed. For printing and online help, MS Internet Explorer 4.0 or higher is required
Languages	German, English, French, Spanish, Russian can be selected
Licensing	PACTware does not require licensing. Please take the license conditions of the DTMs out of the data sheets of the corresponding DTMs.
Configuration	
Representation of the system configuration	Graphic representation of all communication and device DTMs in the tree structure. In case of online operation colour code for identification of defective units and simulation operation. Multiple windows can be open simultaneously. It is therefore possible to view the set device parameters, to monitor the measurement value and to display the device diagnostic simultaneously.
System planning, application processing	Generation of a configuration by means of a graphical application processing menu. Editing of available projects. Selection switch markings for each channel. Offline configuration, saving of project data to hard disk or disk. Automatic comparison of the project plan to the actual available system when establishing connections on the device and parameter levels.
Associated products	CD-ROM with PACTware and complete DTM-Collection of all available DTMs of the Pepperl+Fuchs H-, K-, and E-System devices, HART Multiplexers, Remote I/O-Systems, FieldConnex devices, and level devices.

Features

- **Universal DTM host platform**
- **For all DTMs of Pepperl+Fuchs**
- **Approved FDT/DTM technology**
- **Free of charge**
- **Internet download possible**

Function

Manufacturer and fieldbus independent configuration tool with FDT interface (**F**ield **D**evice **T**ool)

- Based on FDT technology
- Device Type Manager (DTMs) available for all Pepperl+Fuchs devices and systems
- Commissioning, configuration and parameter assignment independent of the process control system
- Communication DTMs available for serial interfaces and fieldbus systems
- Maintenance, diagnostics and error correction
- In accordance with VDI/VDE 2187

Accessories

Microsoft .NET

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Features

- **Isolated USB interface cable**
- **Used with K-, E- and H-System devices**
- **Used with PACT*ware*™**

Function

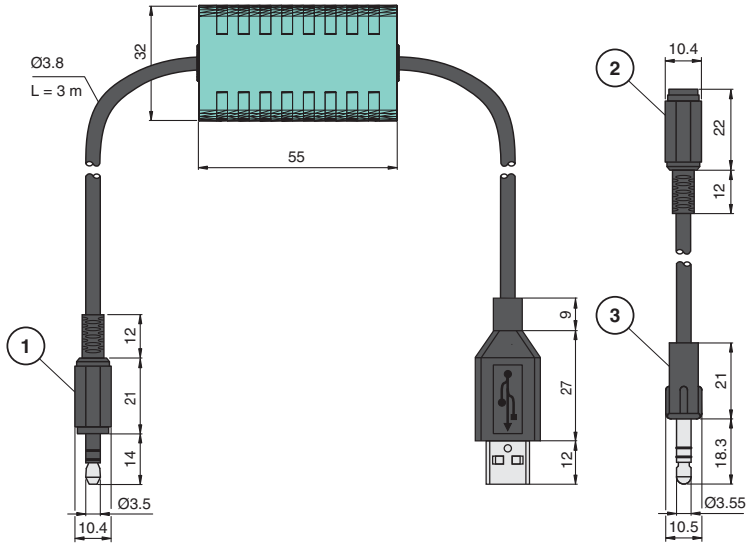
The K-ADP-USB is a programming adapter that connects the USB interface of a PC/notebook for the **PACT*ware*™** configuration software and can be used to program K-, E- and H system barriers via the programming socket on the front panel of these barriers.

As K-, E- and H-System devices have formerly been equipped with programming sockets with different standard dimensions (3.55 mm x 18.3 mm, see drawing, pos. 3 – newer devices 3.5 mm x 14 mm, pos. 1), an adapter (pos. 2) for the parameterisation of all devices is attached to K-ADP-USB.

The 18.3 mm version can still be used for urgent service assignments. However, the user must be aware of the fact that the plug protrudes from new units by approx. 4 mm. Extensive pushing of the plug may lead to damage on units.

For information about programming and software, refer to www.pepperl-fuchs.com.

Dimensions



Technical data

Electrical specifications	
Current consumption	50 mA (via USB)
Electrical isolation	functional insulation acc. to IEC 62103, rated insulation voltage 50 V_{eff}
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Connection	to the PC: USB type A to the device: connector 3.5 mm and 3.55 mm
Cable	
Length L	3 m

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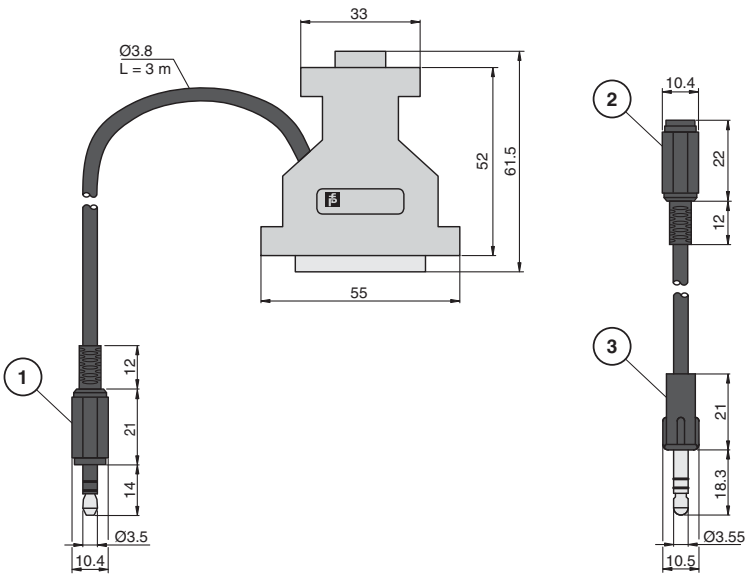
Dimensions



Technical data

Electrical specifications	
Electrical isolation	functional insulation acc. to IEC 62103, rated insulation voltage 50 V_{eff}
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Connection	to the PC: 9-pin and 25-pin to the device: connector 3.5 mm and 3.55 mm
Cable	
Length L	3 m

Features

- **Isolated RS 232 interface cable**
- **Used with K-, E- and H-System devices**
- **Used with PACT*ware*™**

Function

The K-ADP1 is an interface adapter that connects the serial interface of a PC/notebook for the **PACT*ware*™** configuration software and can be used to program K-, H-, and E-System barriers via the programming socket on the front panel of these barriers.

As K-, E- and H-System devices have formerly been equipped with programming sockets with different standard dimensions (3.55 mm x 18.3 mm, see drawing, pos. 3 – newer devices 3.5 mm x 14 mm, pos. 1), an adapter (pos. 2) for the parameterisation of all devices is attached to K-ADP1.

The 18.3 mm version can still be used for urgent service assignments. However, the user must be aware of the fact that the plug protrudes from new units by approx. 4 mm. Extensive pushing of the plug may lead to damage on units.

For information about programming and software, refer to www.pepperl-fuchs.com.

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Features

- **1-channel**
- **Loop powered**
- **NAMUR sensor simulator and pulse generator**
- **Simulates line faults**

Function

This simulator imitates a NAMUR proximity sensor by implementing a three-position switch. A three-position switch facilitates the selection of various test conditions.

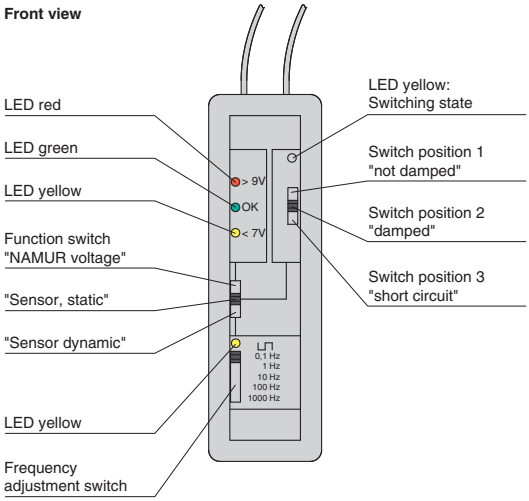
The first position (NAMUR voltage) simulates a 1 kΩ resistive load, while the second position (sensor static) offers various sensor-damping conditions, including a short circuit simulation. The third switch position (sensor dynamic) offers the user several frequency settings between 0.1 Hz ... 1 kHz using a rectangular wave with a 50 % duty cycle.

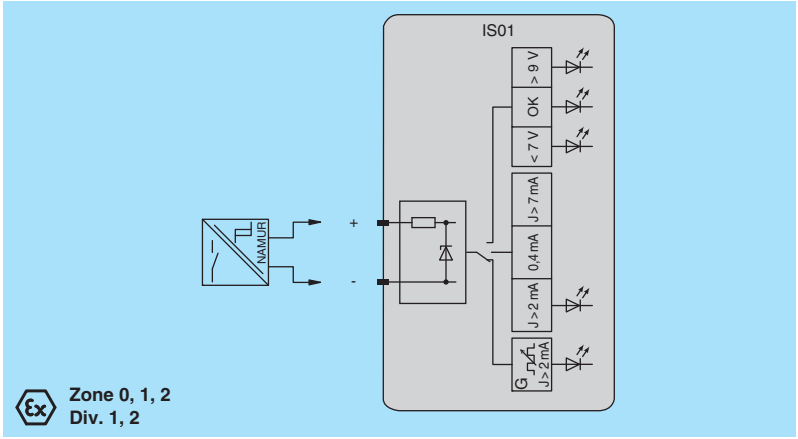
Technical data

Ambient conditions	
Ambient temperature	-20 ... 50 °C (-4 ... 122 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 70 g
Dimensions	40 x 130 x 25 mm (1.6 x 5.1 x 1 in)
Construction type	gray ABS handheld housing
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	DMT 02 ATEX E 008
Group, category, type of protection, temperature classification	Ⓔx II 1G EEx ia IIB T4 [circuit(s) in zone 0/1/2]

Diagrams

Front view





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Technical data

Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	6.5 x 68.5 x 90.5 mm (0.2 x 2.7 x 3.6 in)
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	
Group, category, type of protection, temperature classification	II 2G EEx ia IIC T6

Features

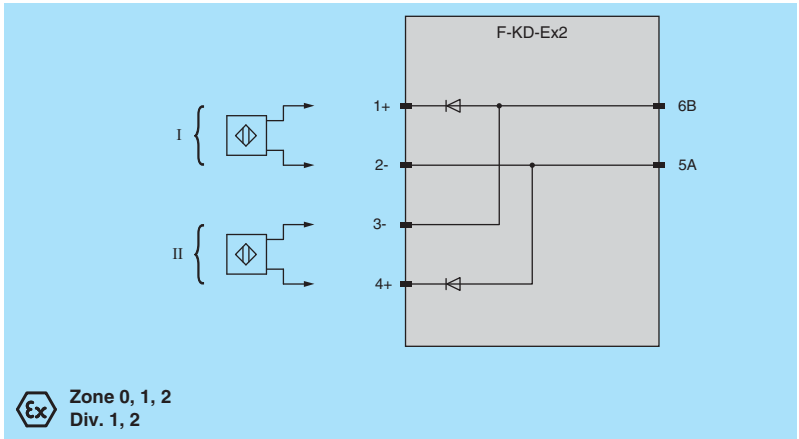
- **2-channel**
- **NAMUR sensor input**
- **Reduces field wiring by 50%**
- **Supports 2:1 technology**

Function

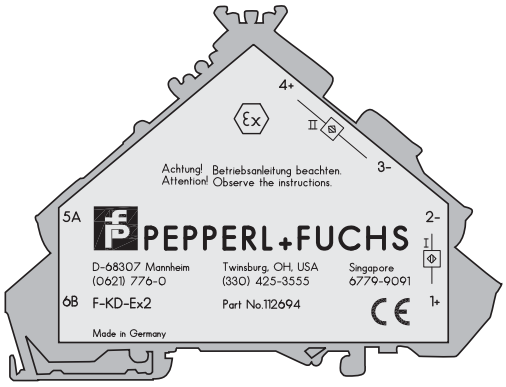
This terminal block module is equipped with a diode network and is designed for use with the KFD2-SRA-Ex4 barrier with its exclusive 2:1 operating mode.

This terminal block will interface with NAMUR sensors that are not equipped with an integrated diode or with dry contacts located in the hazardous area.

Diagrams



Side view



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Features

- **2-channel**
- **Dry contact input**
- **Reduces field wiring by 50%**
- **Supports 2:1 technology**

Function

This terminal block module is equipped with a diode/resistor network and is designed for use with the KFD2-SRA-Ex4 barrier with its exclusive 2:1 operating mode.

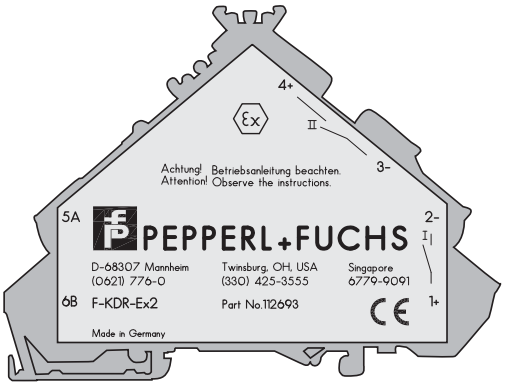
Built with diodes for polarity protection together with lead breakage and short circuit monitoring resistors, this terminal block is ideal for use with dry contacts located in the hazardous area.

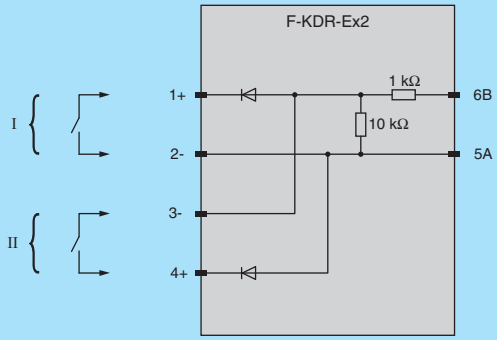
Technical data

Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	6.5 x 68.5 x 90.5 mm (0.2 x 2.7 x 3.6 in)
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	
Group, category, type of protection, temperature classification	Ⓔx II 2G EEx ia IIC T6

Diagrams

Side view





Ⓔx **Zone 0, 1, 2**
Div. 1, 2

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Technical data

Supply	
Rated voltage	max. 20 V DC
Electrical specifications	
Resistor	1 kΩ/0.6 W 10 kΩ/0.6 W
Input	
Error detection	lead breakage, short circuit, open switch, closed switch
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	screw terminals, wire cross section: ≤ 1.5 mm^2
Mass	approx. 20 g
Dimensions	Ø15.5 x 35 mm (0.61 x 1.38 in)

Features

- **1-channel**
- **Dry contact input**
- **For line fault detection (LFD)**

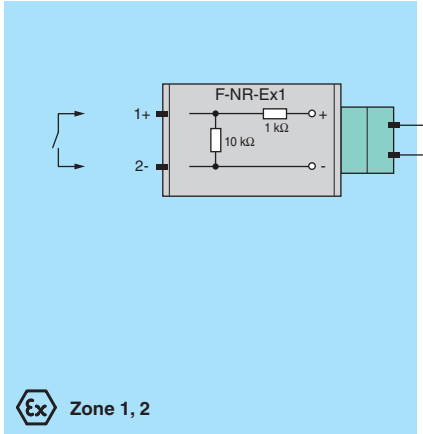
Function

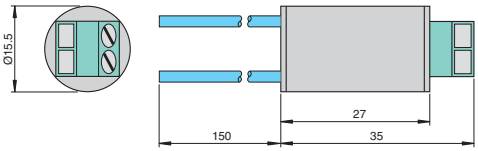
The NAMUR Resistance is used to monitor lead breakage and short circuit detection in switch amplifier circuits controlled by mechanical contacts.

The component is installed directly to the control contact or inside its terminal box.

The component can be used with all switch amplifiers featuring line fault detection.

Diagrams





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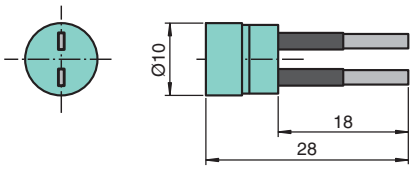
Measuring Resistor K-500R0%1

Features

- 1-channel
- High precision resistor
- Conversion of 4 mA ... 20 mA/2 V ... 10 V

Function

A 500 Ω 0.1% high-precision resistor that can be used to convert 4 mA ... 20 mA to 2 V ... 10 V.



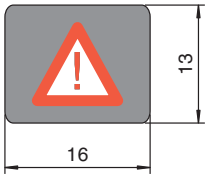
Technical data

Electrical specifications	
Measuring resistor	500 Ω, 0.1 %, TK10
Mechanical specifications	
Dimensions	Ø10 x 28 mm (0.4 x 1.1 in)

Adhesive Sticker KF-SEAL

Features

- Destructive, removable Scotchmark sticker 3812, white, matte
- Rectangular shape, 16 mm x 13 mm
- For securing front-side programming switches and sockets as well as potentiometers, designed to match the K-system
- Packaging unit: 20 pieces



Technical data

Mechanical specifications	
Dimensions	16 x 13 mm (0.63 x 0.5 in)

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Technical data

Electrical specifications	
Rated voltage	≤ 50 V
Rated current	≤ 2 A
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 80 g
Dimensions	12.5 x 114 x 104 mm (0.5 x 4.5 x 4.1 in), housing type A2
Data for application in connection with Ex-areas	
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	II 3G Ex nA II T4 X

Features

- **IS K-System place holder module**
- **Housing width 12.5 mm**
- **Marshalling for field and control side circuits**
- **Jumper configurable**

Function

This place holder barrier is a module for use in cable distribution. It improves accessibility and compactness within a control cabinet.

Different configurations are possible by using solder bridges.

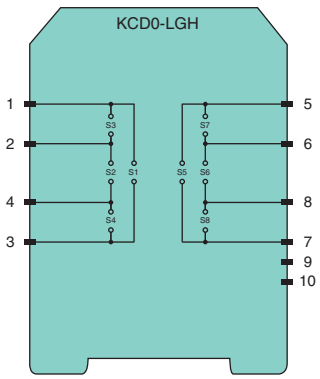
Intrinsically safe circuits can be connected to terminals 1, 2, 3 and 4. Terminals 1 to 4 are linked.

Safe area circuits can be connected to terminals 5 to 8.

In addition, two green replaceable terminals are attached with the device.

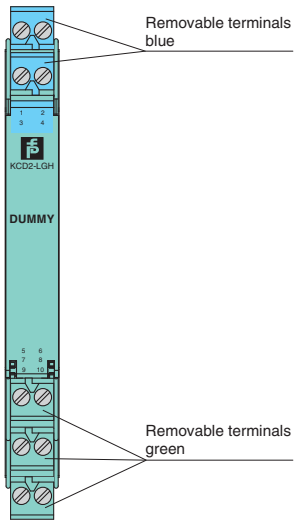
Diagrams

Zone 0, 1, 2



Zone 2

Front view



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Features

- **IS K-System place holder module**
- **Housing width 20 mm**
- **Marshalling for field and control side circuits**
- **Jumper configurable**

Function

The place holder barrier is a module for use in cable distribution. It improves accessibility and compactness within a control cabinet.

Different configurations are possible by using solder bridges.

Intrinsically safe circuits can be connected to terminals 1, 2 and 3 or 4, 5 and 6. Terminals 1 to 6 are linked.

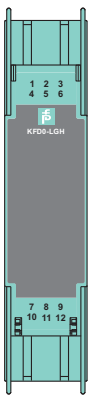
Safe area circuits can be connected to terminals 7, 8 and 9 or 10, 11 and 12.

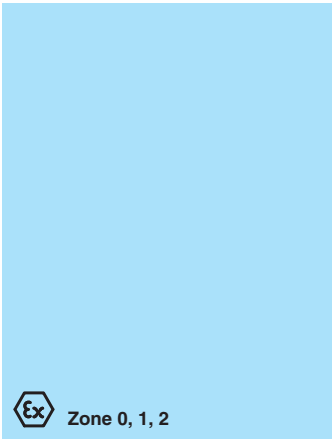
Technical data

Electrical specifications	
Rated voltage	≤ 50 V
Rated current	≤ 2 A
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 120 g
Dimensions	20 x 93 x 115 mm (0.8 x 3.7 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 X

Diagrams

Front view





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Technical data

Electrical specifications	
Rated voltage	≤ 50 V
Rated current	≤ 2 A
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 120 g
Dimensions	20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 X

Features

- **Non-IS K-System place holder module**
- **Housing width 20 mm**
- **Marshalling for field and control side circuits**
- **Jumper configurable**

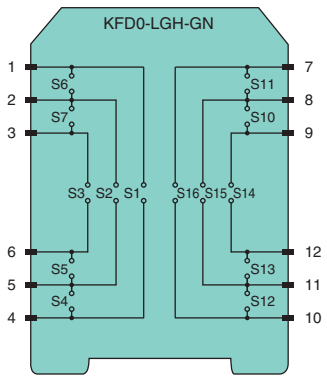
Function

This place holder barrier is a module for use in cable distribution cables. It improves accessibility and compactness within a control cabinet.

Different configurations are possible by using solder bridges.

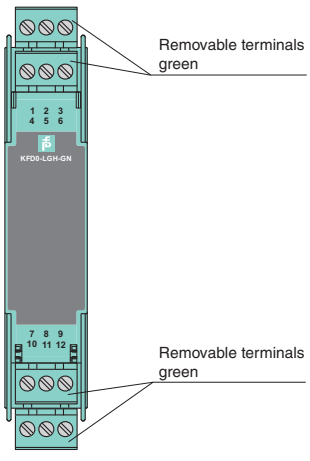
Safe area circuits can be connected to the terminals.

Diagrams



Zone 2

Front view



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Features

- **IS K-System place holder module**
- **Housing width 20 mm**
- **Marshalling for field and control side circuits**
- **No electrical function: empty housing**

Function

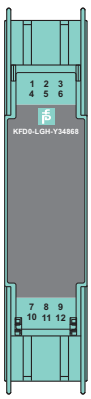
This place holder barrier is an empty housing that fills unused space on DIN rail or Power Rail.

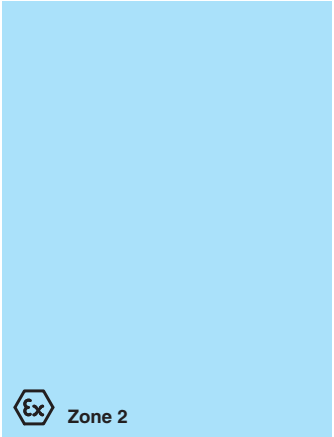
Technical data

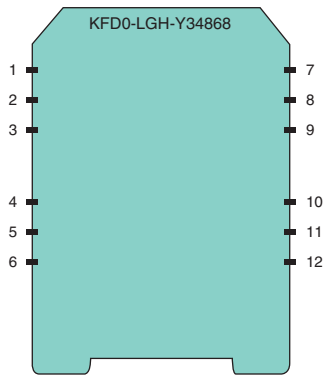
Electrical specifications	
Rated voltage	≤ 50 V
Rated current	≤ 2 A
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	20 x 93 x 115 mm (0.8 x 3.7 x 4.5 in), housing type B1
Data for application in connection with Ex-areas	
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 X

Diagrams

Front view







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H-System

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Introduction

The H-System offers the ideal Termination Board solution for hazardous location applications. Universal and DCS-specific Termination Boards are available. Customized versions are also available for specific I/O requirements including system connectors, terminal block type and special electronic function. The design of an H-System project is optimized with Fault Indication Boards, HART Communication Boards and a complete range of accessories. The H-System includes a wide range of plug-in, isolated barriers that are mounted on Termination Boards. The H-System is easy to specify, integrate and expand and has become synonymous with safety and reliability.

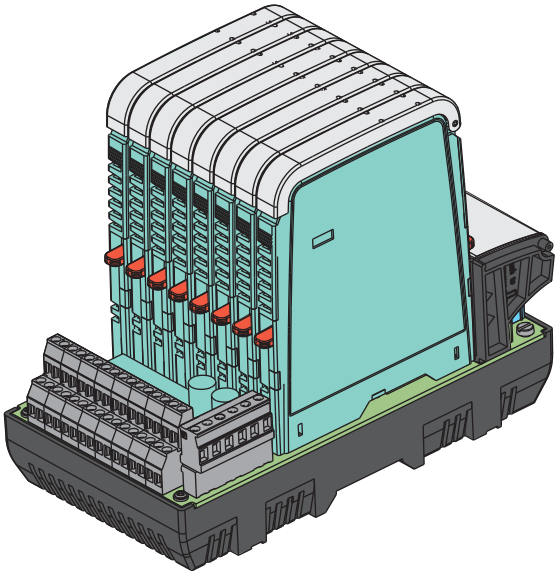

Figure 1 H-System Termination Board with isolated barriers

Modules and Termination Boards

Depending on the functionality and application, the H-System barriers have two housing widths, the 12.5 mm HiC modules and the 18 mm HiD modules, all with the features and interoperability of the H-System. The pin-out and terminal designations for each board are consistent throughout the range; therefore, any H-System module can be installed on any H-System Termination Board. The board can be coded in combination with the modules to ensure the safety relevant data is maintained for the connected field devices.

HiC module housing

Used for high signal integrity

- Small housing, only 12.5 mm wide
- Highest packing density in single loop integrity

Figure 2 12.5 mm housing (HiC module)

HiD module housing

Used for high channel density

- Compact 18 mm housing
- Highest channel density on the market
- As low as 4.5 mm per channel

Figure 3 18 mm housing (HiD module)

Termination Boards

- For HiC and HiD isolated barrier modules
- 8- or 16-position Termination Boards
- Redundant and fused powered
- Diagnostic and fault monitoring

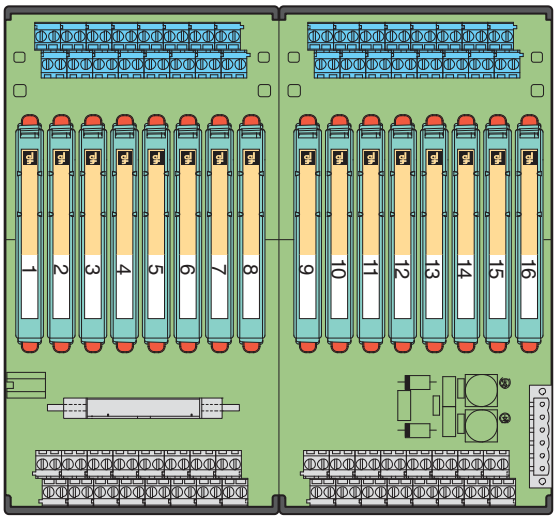

Figure 4 16-position Termination Board

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Accessory boards

Fault Indication Board

The Fault Indication Board reports power supply failure or other circuit errors supported by the modules.The internal fault bus works in a quasi safety mode and can be wired in a ring (daisy chain) or redundant star configuration.

Errors are displayed on the Fault Indication Board via an LED and are made available through a potential-free relay contact.

Figure 5 Fault Indication Board

HART Communication Board

The HART Communication Board can interface with HART enabled H-System Termination Boards. It contains one slot to mount the 32-channel HART multiplexer type HiDMux2700.

Pre-assembled cables provide easy connection between the H-System Termination Boards and the HART Communication Board.

It offers redundantly fused, power supply connections with LED indication. Redundant RS 485 terminals are also available and can be wired in a daisy chain configuration.

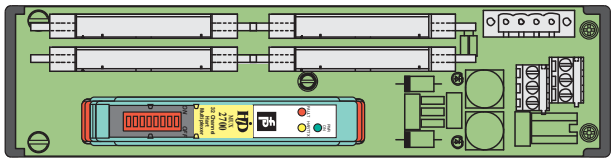

Figure 6 HART Communication Board

Topology

This figure illustrates a typical H-System solution. It contains a Termination Board, Fault Indication Board and HART Communication Board.

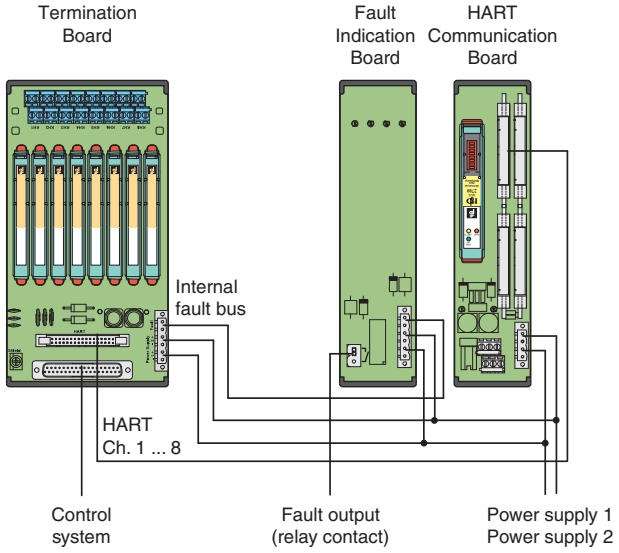

Figure 7 H-System topology

Mounting

The Termination Boards are mounted on a 35 mm DIN rail. The DIN rail is centered under the Termination Board.

The H-System Termination Boards have been designed for protection category IP20 with isolated barriers installed (IP00 without modules) according to EN 60529; therefore, the boards must be appropriately protected against splashing water and contamination.

Mounting the Termination Board

- Place the Termination Board onto the DIN rail (Figure 8).
- Tighten the fastening screws (Figure 9).

The Termination Board is now properly mounted and secured.

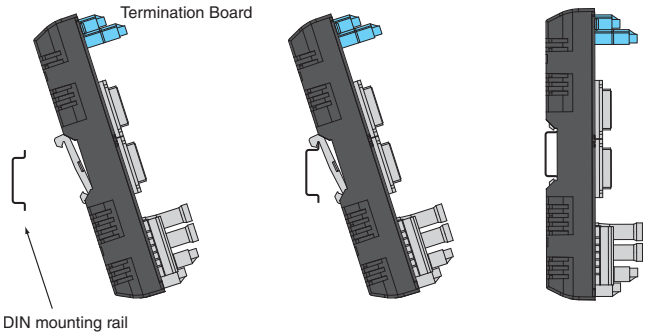

Figure 8 Proper mounting of the H-System Termination Board

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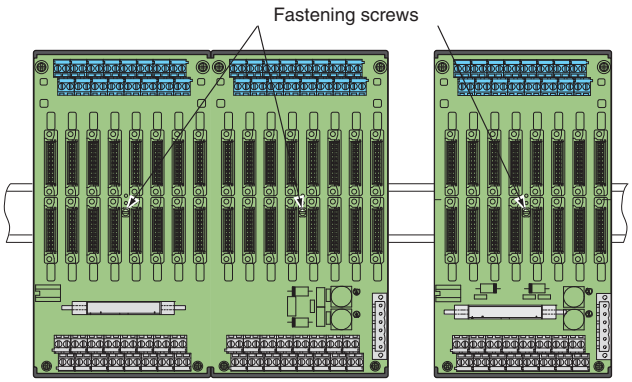

Figure 9 Top view of the H-System Termination Board – horizontal mounting

Mounting the module on the Termination Board

- Ensure that the red Quick Lok Bar (1) is in the upper position.
- Observe the plug orientation of the device. Insert the coding pins (2) of the module in the corresponding coding holes on the board. Now center the adjustment pins (3) to the adjustment holes on the Termination Board.
- Carefully press the device into the contacts and adjustment holes.
- For the mechanical adjustment of the module press the red Quick Lok Bar (1) down on either side of the device (see Figure 10)

This completes the mounting of a module.

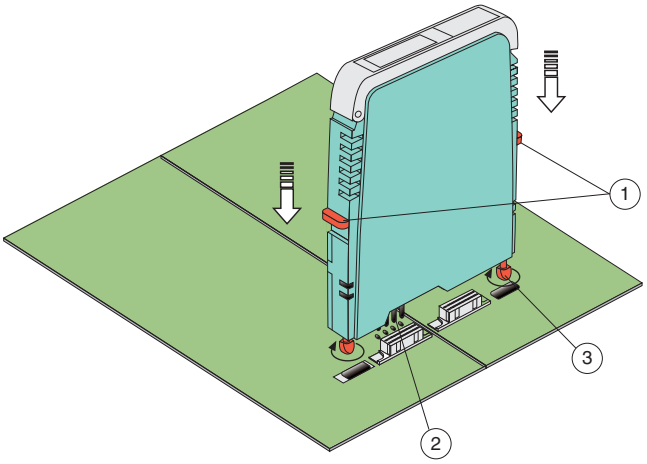

Figure 10 Proper mounting of an H-System isolated barrier

Terminal designation

Field side

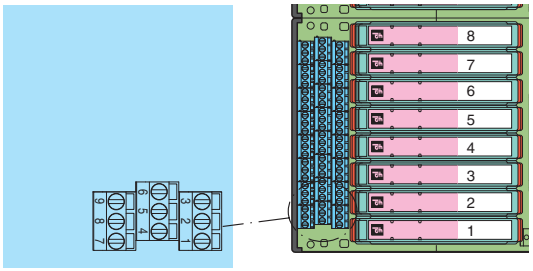

Figure 11 Example: field side arrangement of the terminals

Control side

Screw clamp terminals

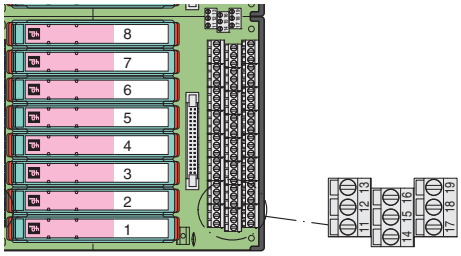

Figure 12 Example: control side arrangement of the terminals

SUB-D (male) connector, 37-pin

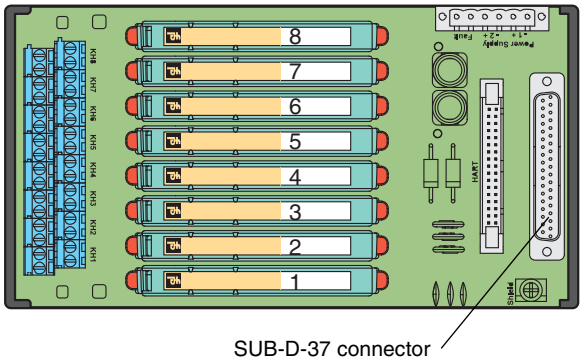

Figure 13 Control side SUB-D-37 connector

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Model number description

Modules

Hi		2			

Type of signal

0 Analog modules

2010 to 2020	Converters
2020 to 2030	Transmitter Power Supplies
2031 to 2040	Current Drivers
2060 to 2090	Temperature Converter

8 Digital modules

2820 to 2860	Switch Amplifiers
2870 to 2880	Solenoid

Housing

C	12.5 mm modules
D	18 mm modules

Hi H-System

Termination Boards

		–		–		–		–		–	SC

Connection in hazardous area

SC screw clamp terminals

Connection in safe area

SC	screw clamp terminals
SD37	SUB-D (male) connectors, 37-pin

Channel

***** no specification

DCS system

UNI-** Universal board

Number of slots

08	8 slots
16	16 slots

Termination Board type

HiDTB	for HiD modules
HiCTB	for HiC modules

* Unused options may be left out.

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Example HiCTB16-UNI-SD37-SC

HiCTB	16	–	UNI	–	SD37	–	SC

Connection in hazardous area
SC Screw clamp terminals

Connection in safe area
SD37 SUB-D (male) connectors, 37-pin

DCS system
UNI Universal board

Number of slots
16 16 slots

Termination Board type
HiCTB for HiC modules

Safety information

The corresponding data sheets, the Declaration of Conformity, the EC-Type Examination Certificate and applicable certificates (see data sheet) are an integral part of this document.

Intended use

Laws and regulations applicable to the usage or planned purpose of usage must be observed. Devices are only approved for proper usage in accordance with intended use. Improper handling will result in voiding of any warrantee or manufacturer's responsibility.

These devices are used in C&I technology for the galvanic isolation of C&I signals, such as 20 mA and 10 V unit signals, and also for the adaptation and/or standardization of signals. Devices which have intrinsically safe control circuits are used to operate field devices within hazardous areas.

The devices are not suitable for the isolation of signals in power engineering, unless this is specifically referred to in the respective data sheet.

Protection of operating personnel and the system is not ensured if the product is not used in accordance with its intended use.

Intrinsic safety circuits that were operated with circuits of other types of protection may not be used as intrinsically safe circuits afterwards.

Installation and commissioning

Commissioning and installation must be carried out by specially trained and qualified personnel only.

Installation of the interface devices in the safe area

The devices are constructed to satisfy the IP20 protection classification and must be protected from adverse environmental conditions such as water spray or dirt exceeding the pollution degree 2.

The devices must be installed outside the hazardous area!

Depending on the level of protection, the intrinsically safe circuits of the devices (light blue identification on the device) can be located in the hazardous area. It is especially important to ensure that the intrinsically safe circuits are safely separated from all non-intrinsically safe circuits.

The installation of the intrinsically safe circuits is to be conducted in accordance with the relevant installation regulations.

The respective peak values of the field device and the associated device with regard to explosion protection should be considered when connecting intrinsically safe field devices with the intrinsically safe circuits of H-System devices (demonstration of intrinsic safety). EN 60079-14/ IEC 60079-14 or NEC and CEC electrical codes for US and Canada respectively must be observed (where appropriate). If available, also the product certification control drawing must be observed.

If more channels of one device are to be connected in parallel, it must be ensured that the parallel connection is made directly at the terminals. For the demonstration of intrinsic safety, the maximum values of the parallel connection are to be regarded.

The EC-Type Examination Certificates or standard certificates/approvals should be observed. It is especially important to observe the "special conditions" if these are included in the certificates.

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Installation and commissioning of the interface devices within Zone 2/Div. 2 of the hazardous area

Only devices with the corresponding manufacturer's Declaration of Conformity or separate certificate of conformity can be installed in Zone 2/Div. 2.

The individual data sheets indicate whether these conditions are met.

For US and Canada installations, in Zone 2/Div. 2 follow the NEC and CEC wiring methods. The enclosure must be able to accept Zone 2/Div. 2 wiring methods. The referenced product certification control drawing must be observed.

For all other applications, the devices should be installed in a switch or junction box that:

- meets at least IP54 in accordance to EN 60529.
- meets to the requirements of resistance to light and resistance to impact according to EN 60079-0/ IEC 60079-0.
- meets to the requirements of thermal endurance according to EN 60079-15/IEC 60079-15.
- must not cause ignition danger by electrostatic charge during intended use, maintenance and cleaning.

Depending on the level of protection, the intrinsically safe circuits of the devices (light blue identification on the device) can be located in the hazardous area. It is especially important to ensure that the intrinsically safe circuits are safely separated from all non-intrinsically safe circuits.

The installation of the intrinsically safe circuits is to be conducted in accordance with the relevant installation regulations.

The respective peak values of the field device and the associated device with regard to explosion protection should be considered when connecting intrinsically safe field devices with the intrinsically safe circuits of H-System devices (demonstration of intrinsic safety). EN 60079-14/ IEC 60079-14 or NEC and CEC electrical codes for US and Canada respectively must be observed (where appropriate). If available, also the product certification control drawing must be observed.

If more channels of one device are to be connected in parallel, it must be ensured that the parallel connection is made directly at the terminals. For the demonstration of intrinsic safety, the maximum values of the parallel connection are to be regarded.

The EC-Type Examination Certificates, standard certificates/approvals or the manufacturer's Declaration of Conformity should be observed. It is especially important to observe the "special conditions" if these are included in the certificates.

Repair and maintenance

The transfer characteristics of the devices remain stable over long periods of time. This eliminates the need for regular adjustment. Maintenance is not required.

Fault elimination

No changes can be made to devices which are operated in hazardous areas. Repairs on the device are not allowed.

Isolation coordinates for devices with Ex-certificate according to EN 50020 and EN 60079-11

The devices are assessed for pollution degree 2 and overvoltage category II according to EN 50178.

Isolation coordinates for installations for galvanic isolation according to EN 50178 and EN 61140

The devices of the H-System are electronic equipment for use in secluded electrical operating sites where only skilled personnel or electrically instructed personnel will have admission or access.

The devices are assessed for pollution degree 2 and overvoltage category II according to EN 50178.

For additional details, see data sheets.

Technical data

Electrical data

Power supply (modules)

- HiC modules: 19.6 V DC to 30 V DC
- HiD modules: 20.4 V DC to 30 V DC

The voltage drop across the series diode on the Termination Board must be considered.

Each module is protected internally. The Termination Boards have redundant power supply connections with fuses that can be replaced by the customer.

Mechanical data

Location

Mounting outside hazardous areas possible as well as in Zone 2/Div. 2 where a manufacturer's Declaration of Conformity exists.

Protection degree

- Termination Boards: IP20 with modules plugged in (IP00 without modules)
- Modules: IP20

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Mass

Termination Boards:

- HiCTB08 approx. 420 g
- HiCTB16 approx. 840 g
- HiDTB08 approx. 600 g
- HiDTB16 approx. 1200 g

Modules:

- HiC module approx. 100 g
- HiD module approx. 140 g

Material

Modules: Polycarbonate

Termination Boards: Polycarbonate, fiber glass reinforced

Dimensions

Termination Boards (height inclusive module assembly):

- HiCTB08: 108 x 200 x 163 mm
- HiCTB16: 216 x 200 x 163 mm
- HiDTB08: 150 x 200 x 163 mm
- HiDTB16: 300 x 200 x 163 mm

Modules:

- HiC module: 12.5 x 106 x 130 mm
- HiD module: 18 x 106 x 130 mm

Housing drawings please refer to appendix.

Fire protection class

Housing: V2 according to UL 94 standard. (Unless stated otherwise all details relate to the reference conditions.)

Labeling

A plastic label holder is available on the front of the module:

- HiC modules, HiD modules: 35 x 10.5 mm

A large label carrier kit HiALC-… for the Termination Boards is available as an option.

Ambient conditions

Ambient temperature:

-20 °C to 60 °C, (-4 °F to 140 °F)

Storage temperature:

-40 °C to 90 °C, (-40 °F to 194 °F)

Relative humidity:

max. 95 % no moisture condensation

Vibration resistance

acc. to EN 60068-2-6, 10 Hz to 150 Hz, 1 g, high crossover frequency

Shock resistance

acc. to EN 60068-2-27, 15 g, 11 ms, half-sine

Reference conditions

- temperature: 20 °C (68 °F)
- relative humidity: 50 %
- supply voltage: 24 V DC
- working resistance, where applicable: 250 Ω
- full scale value: 20 mA

Conformity with standards and directives

General

- Isolator modules with and without explosion protection, mostly with Ex ia IIC/Class I Div. 1, international approvals
- EMC acc. to NAMUR NE21 and EN 61326
- LEDs acc. to NAMUR NE44
- Software acc. to NAMUR NE53

Digital inputs/outputs according to NAMUR

The standards references for this interface have changed many times:

German standard (old): **DIN 19234**: Electrical distance sensors – DC interface for distance sensors and switch amplifiers; 1990-06

European standard (old): **EN 50227**: Low voltage switch gear and control gear – control devices and switching elements – proximity switches, DC interface for proximity sensors and switch amplifiers (NAMUR), 1996-10

German version (old): **DIN EN 50227**: Low voltage switch gear – control devices and switching elements – proximity switches, DC interface for proximity sensors and switch amplifiers (NAMUR), 1997, German nomenclature VDE 0660, part 212

Current designation: DIN EN 60947-5-6: Low voltage switch gear – control devices and switching elements – proximity switches, DC interface for proximity sensors and switch amplifiers (NAMUR), 2000, German nomenclature: VDE 0660 part 212

Current IEC designation: IEC 60947-5-6: Low voltage switch gear and control gear – part 5-6: Control circuit devices and switching elements – DC interface for proximity sensors and switching amplifiers (NAMUR), 1999.

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Switch Amplifiers

Model Number	Housing		Channels	Input (Field)		Output (Control System)			Supply		SIL	Zone 2/Division 2 Mounting	Page
	HiC	HiD		NAMUR Sensor/ Dry Contact	Line Fault Detection	Relay	20 V DC ... 31 V DC	Transistor (Active/Passive)	24 V DC (Bus Powered)	24 V DC (Loop Powered)			
HiC2821	■		1	■	■	2			■		2	■	324
HiC2822	■		2	■	■	2			■		2	■	325
HiC2841	■		1	■	■			2	■		2	■	326
HiC2842	■		2	■	■			2	■		2	■	327
HiC2851	■		1	SN*	■		■	■	■		3		328
HiD2821		■	1	■	■	4			■		2		329
HiD2822		■	2	■	■	4			■		2		330
HiD2824		■	4	■	■	4			■		2		331
HiD2842		■	2	■	■		4	4	■		2		332
HiD2844		■	4	■	■		4	4	■		2		333

* Pepperl+Fuchs Safety Sensors

Frequency Converters

Model Number	Housing		Functions		Input (Field)				Output (Control System)				SIL	Zone 2/Division 2 Mounting	Page
	HiC	HiD	Speed Monitor	Frequency Conversion	Current/Voltage	Magnetic Pickup	NAMUR Sensor/ Dry Contact	Line Fault Detection	Relay	Transistor (Active/Passive)	0/4 mA ... 20 mA Sink/Source	Supply 24 V DC (Bus Powered)			
HiD2891		■	■	■	■	■	■	■	1	1	1	■			334

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Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Dry contact or NAMUR inputs**
- **Relay contact output**
- **Fault relay contact output**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

The proximity sensor or switch controls a form A normally open relay contact for the safe area load. The module output changes state when the input signal changes state. The mode of operation can be reversed with switch S1 on the side of the unit.

One additional relay is available for the fault output. Line fault detection (LFD) can be selected or disabled via switch S2.

During an error condition, the relay reverts to its de-energized state and the LEDs indicate the fault. A separate output bus is available. The fault conditions can be monitored via a Fault Indication Board.

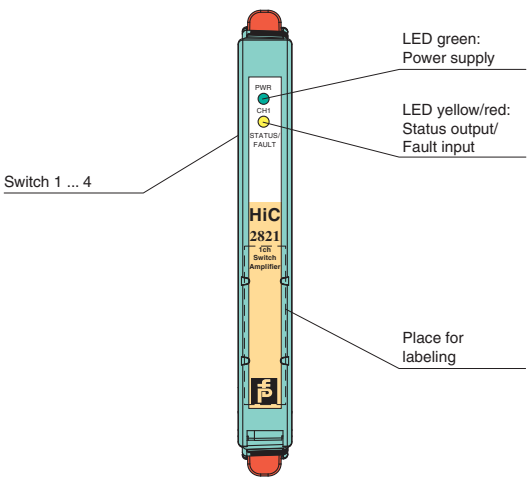
This module mounts on a HiC Termination Board.

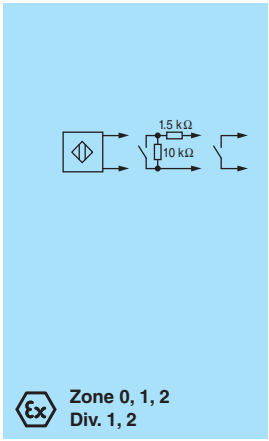
Technical data

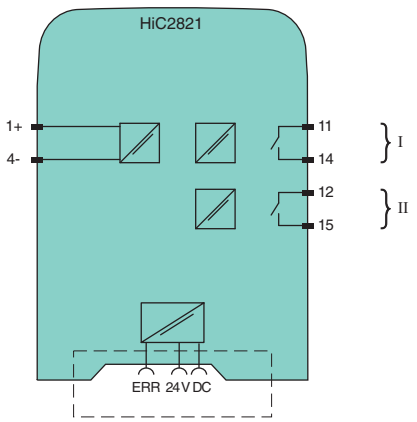
Supply	
Rated voltage	19 ... 30 V DC via Termination Board
Power consumption	≤ 500 mW
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 10 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I ≥ 6.5 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Output I	signal; relay
Output II	signal or error message; relay
Contact loading	50 V DC/0.5 A
Minimum switch current	2 mA/24 V DC
Energized/De-energized delay	≤ 20 ms/≤ 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 in)
Data for application in connection with Ex-areas	see page 335 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0093 X
Group, category, type of protection	Ⓔx II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22] Ⓔx I (M1) [Ex ia] I
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA nC IIC T4 X
FM approval	
Control drawing	16-534FM-12 (cFMus)
IECEx approval	IECEx BAS 06.0026X
Approved for	[Ex ia] IIC, [Ex ia] I

Diagrams

Front view







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Technical data

Supply	
Rated voltage	19 ... 30 V DC via Termination Board
Power consumption	≤ 600 mW
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 10 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I ≥ 6.5 mA
Pulse/Pause ratio	≥ 20 ms/≥ 20 ms
Output	
Output I	signal; relay
Output II	signal; relay
Contact loading	50 V DC/0.5 A
Minimum switch current	2 mA/24 V DC
Energized/De-energized delay	≤ 20 ms/≤ 20 ms
Mechanical life	10^7 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 in)
Data for application in connection with Ex-areas	see page 335 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0093 X
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22] ⟨Ex⟩ I (M1) [Ex ia] I
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA nC IIC T4 X
FM approval	
Control drawing	16-534FM-12 (cFMus)
IECEx approval	IECEx BAS 06.0026X
Approved for	[Ex ia] IIC, [Ex ia] I

Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Dry contact or NAMUR inputs**
- **2 relay contact outputs**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

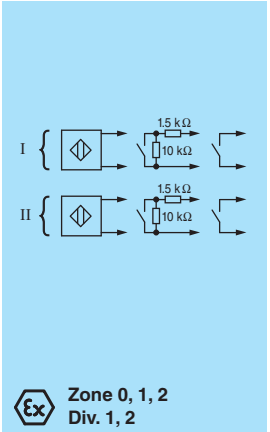
The proximity sensor or switch controls a form A normally open relay output for the safe area load. The module output changes state when the input signal changes state. The mode of operation can be reversed with the switches S1 and S3 on the side of the unit.

Line fault detection (LFD) can be selected or disabled via the switches S2 and S4.

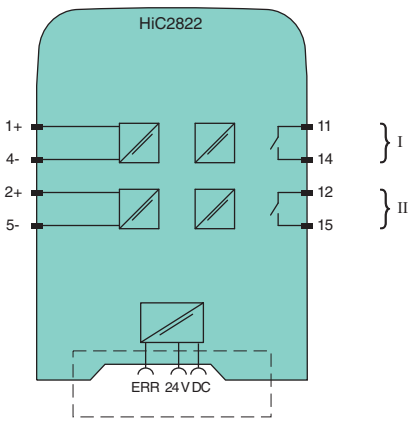
During an error condition, the relay reverts to its de-energized state and the LEDs indicate the fault. A separate fault output bus is available. The fault conditions can be monitored via a Fault Indication Board.

This module mounts on a HiC Termination Board.

Diagrams

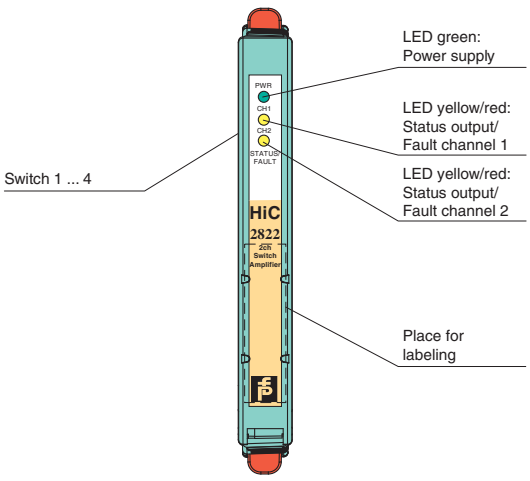


⟨Ex⟩ **Zone 0, 1, 2**
Div. 1, 2



Zone 2
Div. 2

Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Dry contact or NAMUR inputs**
- **2 passive transistor outputs**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

The proximity sensor or switch controls two passive transistors for the safe area load. Both transistor outputs are isolated from each other and isolated from the power supply.

The mode of operation can be reversed using switch S1. Switch S3 allows output II to be switched between a signal output and an error message output. Switch S2 enables or disables line fault detection of the field circuit.

During an error condition, the transistors revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44. A separate output bus is available. The fault conditions can be monitored via a Fault Indication Board.

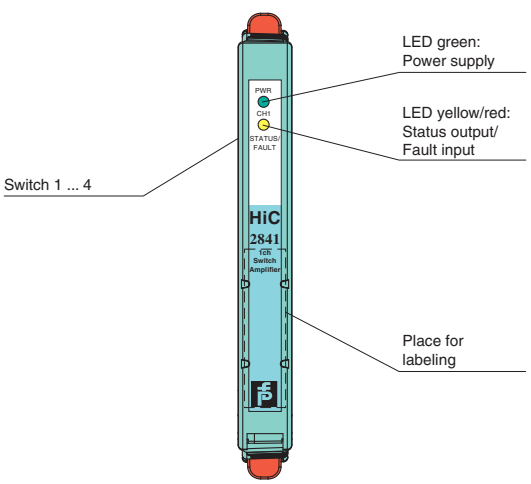
This module mounts on a HiC Termination Board.

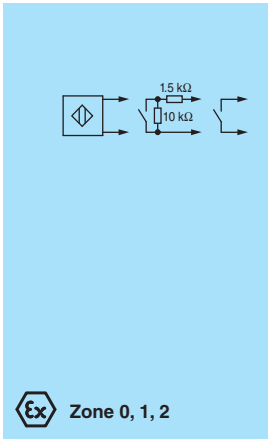
Technical data

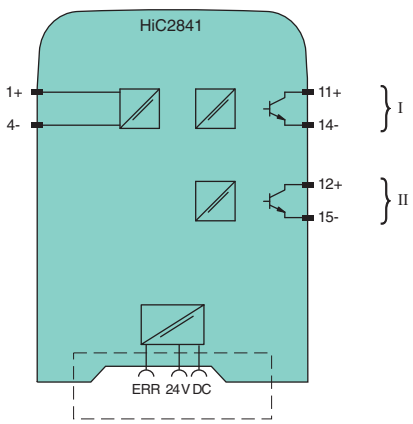
Supply	
Rated voltage	19 ... 30 V DC via Termination Board
Power consumption	≤ 500 mW
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 10 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I ≥ 6.5 mA
Pulse/Pause ratio	≥ 100 µs/≥ 100 µs
Output	
Rated voltage	30 V DC
Rated current	50 mA
Response time	≤ 200 µs
Signal level	1-signal: (external voltage) - 1 V max. for 50 mA (T_{amb} = 25 °C (77 °F)) 0-signal: blocked output (off-state current ≤ 10 µA)
Output I	signal; transistor
Output II	signal or error message; transistor
Error message output	
Output type	open collector transistor (internal fault bus)
Transfer characteristics	
Switching frequency	≤ 5 kHz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 in)
Data for application in connection with Ex-areas	see page 335 for entity parameters
EC-Type Examination Certificate	BVS 09 ATEX E 157
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC, [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22] ⟨Ex⟩ I (M1) [Ex ia] I
IECEx approval	IECEx BVS 09.0060
Approved for	[Ex ia Ga] IIC, [Ex ia] I, [Ex iaD]

Diagrams

Front view







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Technical data

Supply	
Rated voltage	19 ... 30 V DC via Termination Board
Power consumption	≤ 600 mW
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 10 V DC/approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA/approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA, short-circuit I ≥ 6.5 mA
Pulse/Pause ratio	≥ 100 µs/≥ 100 µs
Output	
Rated voltage	30 V DC
Rated current	50 mA
Response time	≤ 200 µs
Signal level	1-signal: (external voltage) - 1 V max. for 50 mA (T_{amb} = 25 °C (77 °F)) 0-signal: blocked output (off-state current ≤ 10 µA)
Output I	signal; transistor
Output II	signal; transistor
Error message output	
Output type	open collector transistor (internal fault bus)
Transfer characteristics	
Switching frequency	≤ 5 kHz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 in)
Data for application in connection with Ex-areas	see page 335 for entity parameters
EC-Type Examination Certificate	BVS 09 ATEX E 157
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC, [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22] ⟨Ex⟩ I (M1) [Ex ia] I
IECEx approval	IECEx BVS 09.0060
Approved for	[Ex ia Ga] IIC, [Ex ia] I, [Ex iaD]

Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Dry contact or NAMUR inputs**
- **2 passive transistor outputs**
- **Line fault detection (LFD)**
- **Reversible mode of operation**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

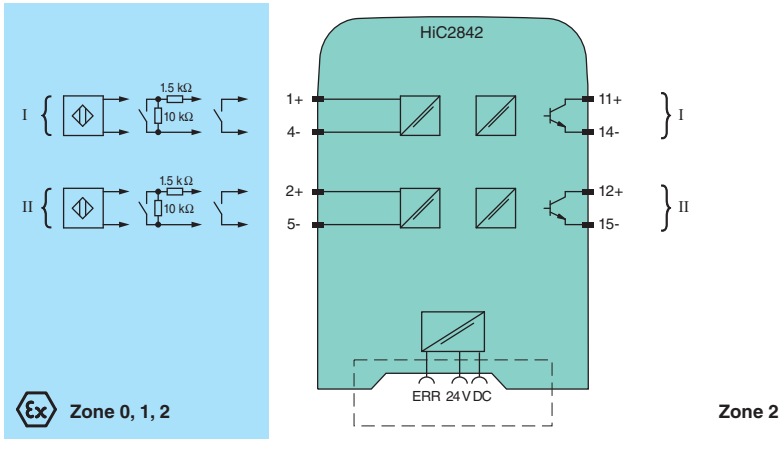
The proximity sensor or switch controls two passive transistors for the safe area load. Both transistor outputs are isolated from each other and isolated from the power supply.

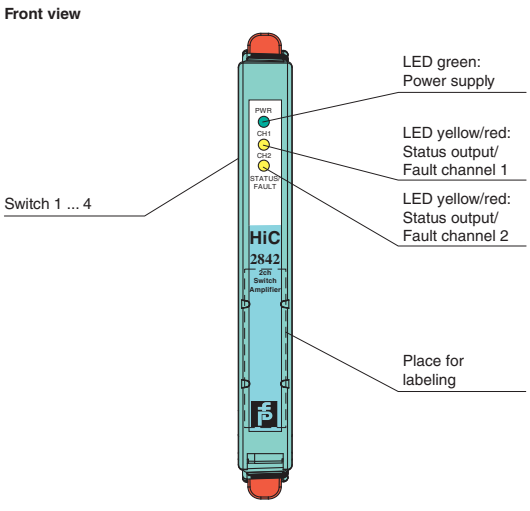
The mode of operation can be reversed using switches S1 and S3. Switches S2 and S4 enable or disable line fault detection of the field circuit.

During an error condition, the transistors revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44. A separate output bus is available. The fault conditions can be monitored via a Fault Indication Board.

This module mounts on a HiC Termination Board.

Diagrams





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Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Input for dry contacts or SN/S1N sensors**
- **Active signal output**
- **Passive signal output (NAMUR compatible)**
- **For usage in accordance with ISO 13849-1**
- **Line fault detection (LFD)**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (SN/S1N proximity sensors and approved mechanical contacts) from a hazardous area to a safe area. It has additional protective circuitry to maintain a reliable safety function.

The proximity sensor or switch controls one 24 V DC voltage source safety output, one passive NAMUR compatible signal output, and a separate collective error message. Lead breakage (LB) and short circuit (SC) conditions are continuously monitored.

Unlike a SN/S1N series safety sensor, a mechanical contact requires a 10 kΩ resistor to be placed across the contact in addition to a 1.5 kΩ resistor in series.

During an error condition, the outputs I and II de-energize.

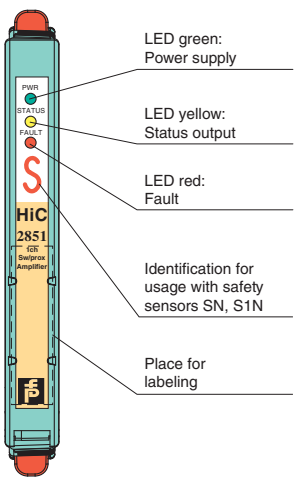
This barrier mounts on a HiC Termination Board.

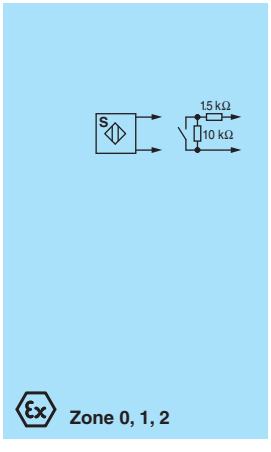
Technical data

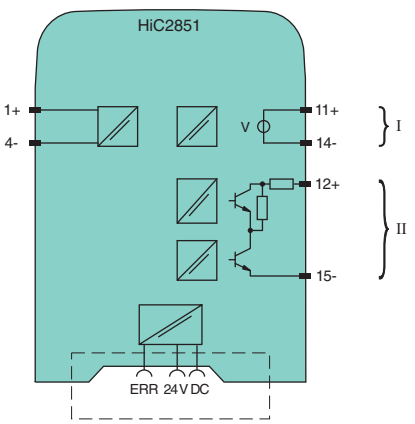
Supply	
Rated voltage	19 ... 30 V DC
Power consumption	≤ 1300 mW
Input	
Open circuit voltage/short-circuit current	approx. 8.4 V DC/approx. 11.7 mA
Lead resistance	≤ 50 Ω, consider capacities and inductances
Switching point	1-signal: I > 2.8 mA 0-signal: I < 2.1 mA
Response delay	≤ 1 ms
Output	
Rated voltage	output II: typ. 8 V DC, max. 22 V DC
Output I	signal, 20 ... 31 V DC at max. 15 mA
Output II	signal or error message, passive transistor output (resistive) 0-signal: 14 kΩ ± 10 % 1-signal: 1.8 kΩ ± 10 %
Transfer characteristics	
Switching frequency	
Output I	≤ 50 Hz
Output II	≤ 50 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 180 g
Dimensions	12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 in)
Data for application in connection with Ex-areas	see page 335 for entity parameters
EC-Type Examination Certificate	BASEEFA 07 ATEX 0302X
Group, category, type of protection	⟨Ex⟩ II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 X
FM approval	
Control drawing	16-534FM-12 (cFMus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V DC via Termination Board
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Connectable sensor types	potential free contact or proximity sensor
Switching point	contact open 0.2 ... 1.2 mA, contact closed 2.1 ... 6.5 mA
Lead monitoring	breakage 0 ... 0.2 mA, short-circuit 6.5 mA ... maximum value
Output	
Output	signal: relay DPST per STATUS, phase selectable fault: relay DPST per STATUS, one pole N.O. (terminals 12, 15), the other N.C. (terminals 13, 16)
Response time	20 ms
Contact loading	50 V DC/0.5 A non-inductive
Error message output	
Output type	open collector transistor, fault bus signal
Transfer characteristics	
Switching frequency	< 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 335 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **1-channel isolated barrier for ESD applications**
- **24 V DC supply (bus powered)**
- **Dry contact or NAMUR inputs**
- **2 relay contact outputs**
- **2 fault relay contact outputs**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

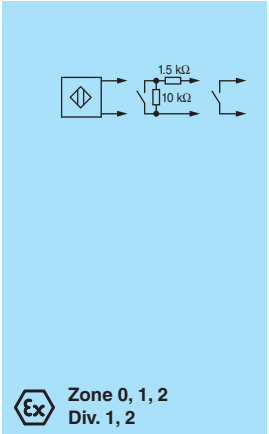
The proximity sensor or switch controls two form A normally open relay outputs for the safe area load. The module output changes state when the input signal changes state. The normal output state can be reversed with the selector switches on the side of the unit.

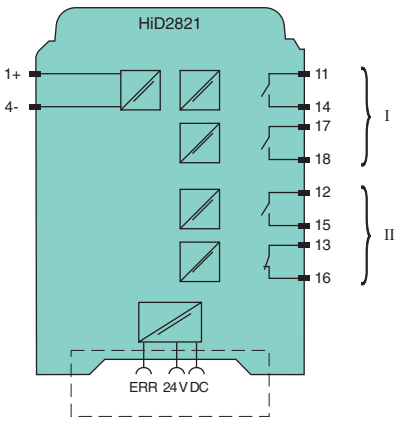
Two additional relays are available for the fault output. Line fault detection (LFD) can be selected or disabled via a selector switch.

During an error condition, the relay reverts to its de-energized state and the LEDs indicate the fault. A separate fault output bus is available. The fault conditions can be monitored via a Fault Indication Board.

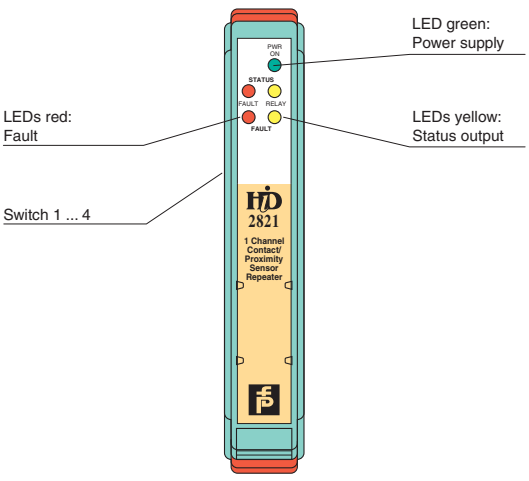
This module mounts on a HiD Termination Board.

Diagrams





Front view



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Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Dry contact or NAMUR inputs**
- **2 relay contact outputs per channel**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

The proximity sensor or switch controls two form A normally open relay outputs for the safe area load. The module output changes state when the input signal changes state. The normal output state can be reversed with the selector switches on the side of the unit.

Line fault detection (LFD) can be selected or disabled via a selector switch.

During an error condition, the relay reverts to its de-energized state and the LEDs indicate the fault. A separate fault output bus is available. The fault conditions can be monitored via a Fault Indication Board.

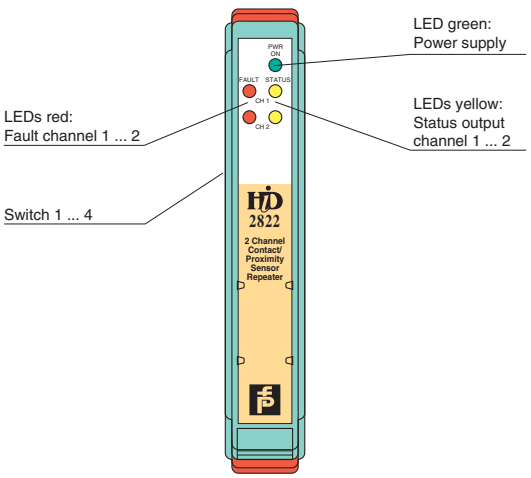
This module mounts on a HiD Termination Board.

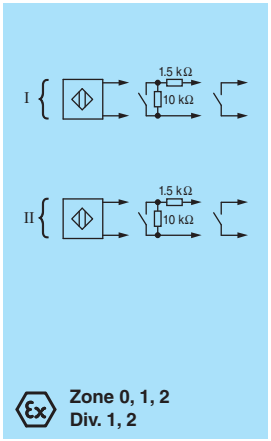
Technical data

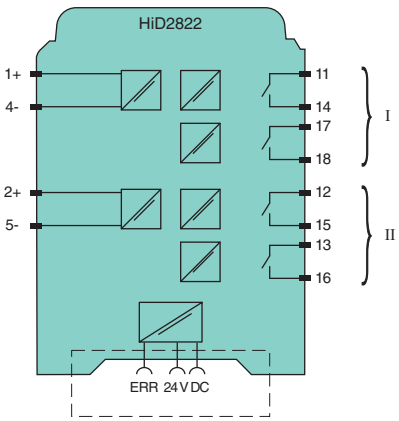
Supply	
Rated voltage	20.4 ... 30 V DC via Termination Board
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Connectable sensor types	potential free contact or proximity sensor
Switching point	contact open 0.2 ... 1.2 mA, contact closed 2.1 ... 6.5 mA
Lead monitoring	breakage 0 ... 0.2 mA, short-circuit 6.5 mA ... maximum value
Output	
Output	signal: relay DPST per channel, phase selectable
Response time	20 ms
Contact loading	50 V DC/0.5 A non-inductive
Error message output	
Output type	open collector transistor (common to both channels), fault bus signal
Transfer characteristics	
Switching frequency	< 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 335 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ⓔx II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V DC via Termination Board
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Connectable sensor types	potential free contact or proximity sensor
Switching point	contact open 0.2 ... 1.2 mA, contact closed 2.1 ... 6.5 mA
Lead monitoring	breakage 0 ... 0.2 mA, short-circuit 6.5 mA ... maximum value
Output	
Output	signal: relay SPST per channel, phase selectable
Response time	20 ms
Contact loading	50 V DC/0.5 A non-inductive
Error message output	
Output type	open collector transistor (common to all channels), fault bus signal
Transfer characteristics	
Switching frequency	< 10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 335 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ⓔx II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **4-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Dry contact or NAMUR inputs**
- **4 relay contact outputs**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

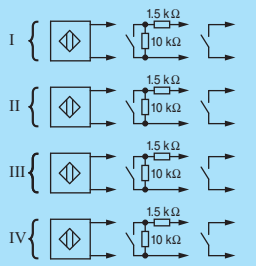
The proximity sensor or switch controls two form A normally open relay outputs for the safe area load. The module output changes state when the input signal changes state. The normal output state can be reversed with the selector switches on the side of the unit.

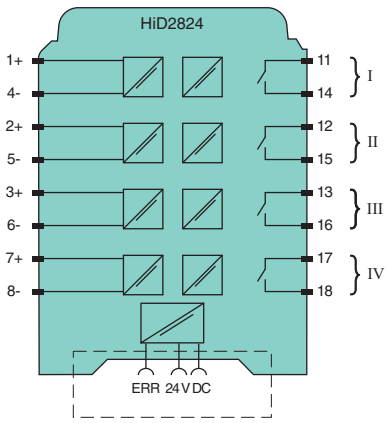
Line fault detection (LFD) can be selected or disabled via a selector switch.

During an error condition, the relay reverts to its de-energized state and the LEDs indicate the fault. A separate fault output bus is available. The fault conditions can be monitored via a Fault Indication Board.

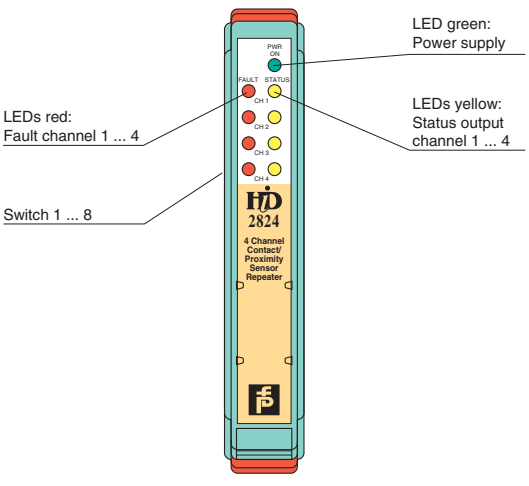
This module mounts on a HiD Termination Board.

Diagrams





Front view



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Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Dry contact or NAMUR inputs**
- **2 passive transistor outputs per channel**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

The proximity sensor or switch controls two passive transistors for the safe area load. The module output changes state when the input signal changes state. The normal output state can be reversed with the selector switches on the side of the unit.

Line fault detection (LFD) can be selected or disabled via a selector switch.

During an error condition, the transistor reverts to its de-energized state and the LEDs indicate the fault. A separate fault output bus is available. The fault conditions can be monitored via a Fault Indication Board.

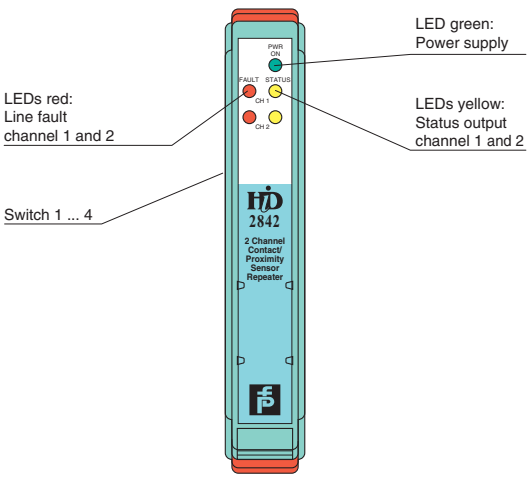
This module mounts on a HiD Termination Board.

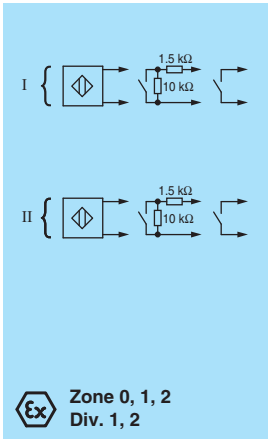
Technical data

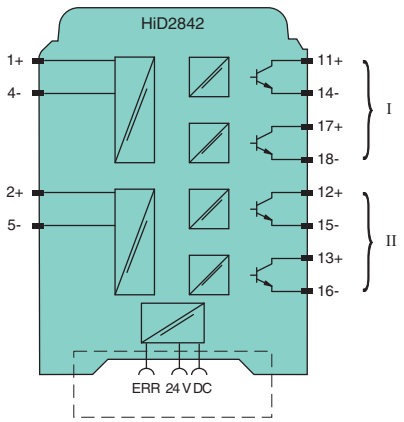
Supply	
Rated voltage	20.4 ... 30 V DC via Termination Board
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Connectable sensor types	potential free contact or proximity sensor
Switching point	contact open 0.2 ... 1.2 mA, contact closed 2.1 ... 6.5 mA
Lead monitoring	breakage 0 ... 0.2 mA, short-circuit 6.5 mA ... maximum value
Output	
Rated voltage	30 V
Rated current	50 mA
Output	two optocoupled transistors per channel
Signal level	1-signal: (external voltage) -1 V 0-signal: blocked output (off-state current max. 50 µA, typical 5 µA)
Error message output	
Output type	open collector transistor (internal fault bus)
Transfer characteristics	
Switching frequency	< 2 kHz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 335 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ex II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V DC via Termination Board
Input	
Rated values	acc. to EN 60947-5-6 (NAMUR)
Connectable sensor types	potential free contact or proximity sensor
Switching point	contact open 0.2 ... 1.2 mA, contact closed 2.1 ... 6.5 mA
Lead monitoring	breakage 0 ... 0.2 mA, short-circuit 6.5 mA ... maximum value
Output	
Rated voltage	30 V
Rated current	50 mA
Output	one optocoupled transistor per channel
Signal level	1-signal: (external voltage) -1 V 0-signal: blocked output (off-state current max. 50 µA, typical 5 µA)
Error message output	
Output type	open collector transistor (internal fault bus)
Transfer characteristics	
Switching frequency	< 2 kHz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 335 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **4-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Dry contact or NAMUR inputs**
- **4 passive transistor outputs**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

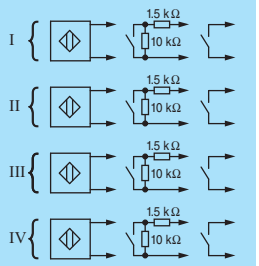
The proximity sensor or switch controls a passive transistor for the safe area load. The module output changes state when the input signal changes state. The normal output state can be reversed with the selector switches on the side of the unit.

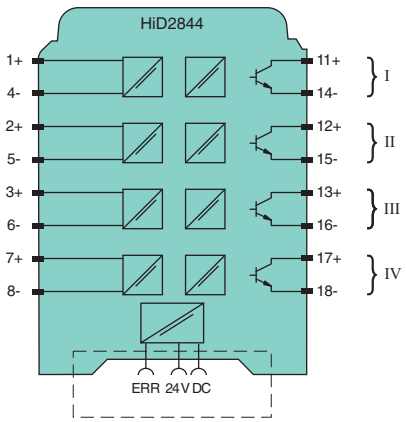
Line fault detection (LFD) can be selected or disabled via a selector switch.

During an error condition, the transistor reverts to its de-energized state and the LEDs indicate the fault. A separate fault output bus is available. The fault conditions can be monitored via a Fault Indication Board.

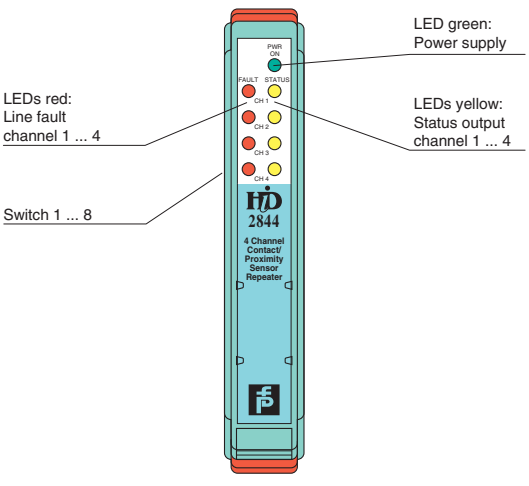
This module mounts on a HiD Termination Board.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Dry contact, mag pickup, NAMUR or current/voltage inputs**
- **Current or voltage output**
- **Sink and source mode output**
- **Relay contact output**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It changes a digital input (NAMUR sensor/mechanical contact, magnetic pick-up sensors) into a proportional analog output (current source, current sink, or voltage source). It also functions as a switch isolator and trip alarm.

The input from the hazardous area is transferred to the safe area via a passive transistor output.

One relay output can be programmed to actuate at desired frequencies for min/max control or during a fault condition.

The unit is easily programmed by the use of a DIP switches on the side of the unit or with the **PACT***ware*™ configuration software.

Line fault detection of the field circuit is indicated by a red LED.

This module mounts on a HiD Termination Board.

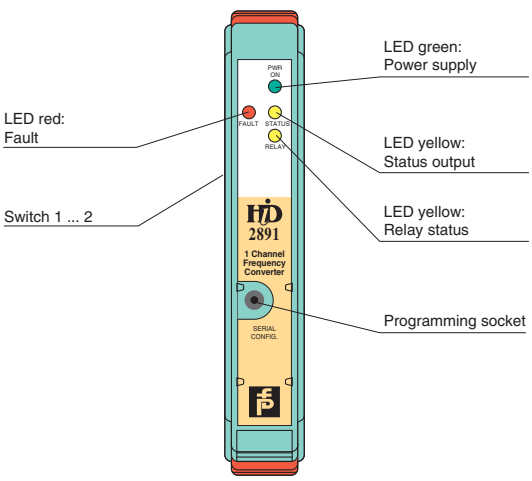
For additional information, refer to the manual and www.pepperl-fuchs.com.

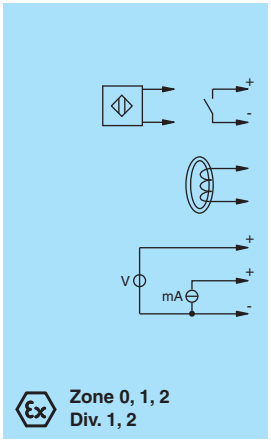
Technical data

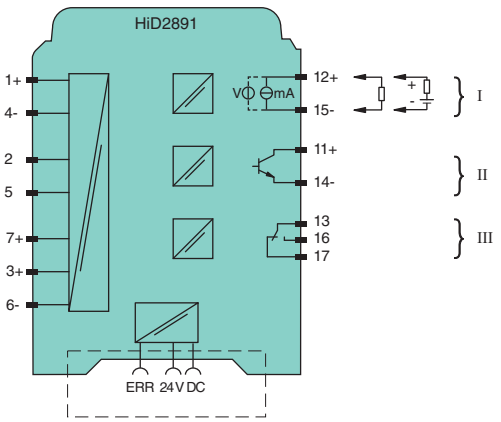
Supply	
Rated voltage	20.4 ... 30 V DC
Input	
Connectable sensor types	potential free contact or proximity sensor, magnetic pick-up, voltage or current level
Input resistance	magnetic pick-up: 10 kΩ current logic level: 50 Ω voltage logic level: 30 kΩ
Input frequency	max. 10 kHz
Pulse duration	min. 40 µs
Output	
Output	analog output: proportional to input frequency digital output: optocoupled transistor relay output: SPDT
Output signal	analog output: - current source 0/4 ... 20mA, load 0 ... 550 Ω - current sink 0/4 ... 20mA, working voltage 3 ... 30 V - voltage 0/1 ... 5 V on internal shunt 250 Ω - voltage 0/2 ... 10 V on internal shunt 500 Ω
Ripple	typ. 15 mV $_{eff}$
Leakage current	digital output typ. 5 µA, max. 50 µA
Saturation voltage	digital output 1.2 V at 50 mA
Error message output	
Output type	relay output: high/low alarm, input repeater (max. 5 Hz), error message fault bus signal: open collector transistor on common bus
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (current output)
Measuring time	≥ 100 ms
Influence of temperature	< ± 0.01 %/K, typ. ± 0.005%/K
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 335 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]

Diagrams

Front view







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ATEX Entity Parameters

Model Number	Terminals	U_o (V)	I_o (mA)	P_o (mW)
HiC2821	1, 4	10.5	17.1	45
HiC2822	1, 4; 2, 5	10.5	17.1	45
HiC2841	1, 4	10.5	17.1	45
HiC2842	1, 4; 2, 5	10.5	17.1	45
HiC2851	1, 4	10.5	17.1	45
HiD2821	1, 4	13.2	20	66
HiD2822	1, 4; 2, 5	13.2	20	66
HiD2824	1, 4; 2, 5; 3, 6; 7, 8	13.2	20	66
HiD2842	1, 4; 2, 5	13.2	20	66
HiD2844	1, 4; 2, 5; 3, 6; 7, 8	13.2	20	66
HiD2891	1, 4	10	10	25
	2, 5	10	1	2.5
	3, 6	1.5	1	0.4
	6, 7	1.5	1	0.4

CSA Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)
HiD2821	1, 4	13.2	20
HiD2822	1, 4; 2, 5	13.2	20
HiD2824	1, 4; 2, 5; 3, 6; 7, 8	13.2	20
HiD2842	1, 4; 2, 5	13.2	20
HiD2844	1, 4; 2, 5; 3, 6; 7, 8	13.2	20

FM Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
HiC2821	1, 4	10.5	17.1	–	–
HiC2822	1, 4; 2, 5	10.5	17.1	–	–
HiC2851	1, 4	10.5	17.1	–	–

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Solenoid Drivers

Model Number	Housing		Channels	Input (Control System)		Output (Field)		Supply		SIL	Zone 2/Division 2 Mounting	Page
	HiC	HiD		Contact Input	Logic Input	Voltage (V)	Max. Current (mA)	24 V DC (Bus Powered)	24 V DC (Loop Powered)			
HiC2871	■		1		■	12	45		■	3	■	338
HiD2871		■	1		■	12	40	■	■	3		339
HiD2872		■	2	■	■	12	40	■	■	3		340
HiD2873		■	1	■	■	12	40	■				341
HiD2874		■	2	■	■	12	40	■				342
HiD2875		■	1	■	■	11.2	40	■	■	3		343
HiD2876		■	2	■	■	11.2	40	■	■	3		344
HiD2877		■	1	■	■	11.2	40	■				345
HiD2878		■	2	■	■	11.2	40	■				346
HiD2881		■	1	■	■	13	60	■	■	3		347

Relay Outputs

Model Number	Housing		Channels	Input (Control System)		Output (Field)	Supply		SIL	Zone 2/Division 2 Mounting	Page
	HiC	HiD		Contact Input	Logic Input	Relay	24 V DC (Bus Powered)	24 V DC (Loop Powered)			
HiD2862		■	2	■	■	■	■	■			348

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Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current limit 45 mA at 12 V DC**
- **Up to SIL3 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

It is loop powered, so the available energy at the output is received from the input signal. The output signal has a resistive characteristic. As a result the output voltage and current are dependent on the load and the input voltage.

At full load, 12 V at 45 mA is available for the hazardous area application.

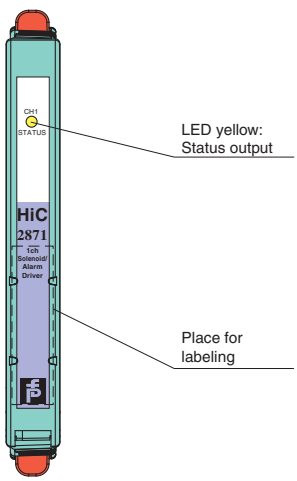
This module mounts on a HiC Termination Board.

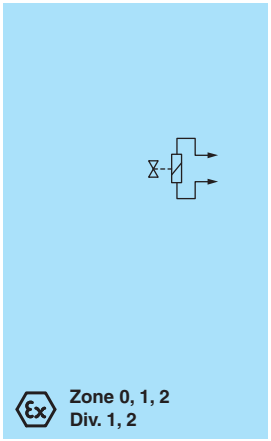
Technical data

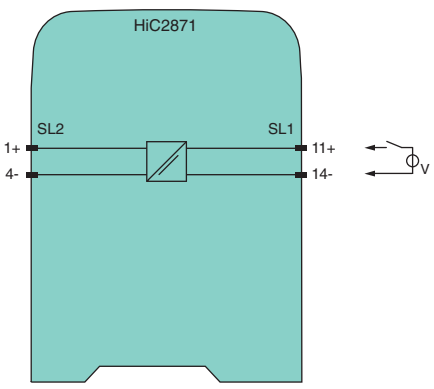
Supply	
Power loss	< 1 W
Input	
Rated voltage U_i	19 ... 30 V loop powered
Current	72 mA at 19 V input voltage, load = 265 Ω 50 mA at 30 V input voltage, load = 265 Ω
Output	
Internal resistor	≤ 238 Ω
Limit	current I_E: ≥ 45 mA voltage U_E: ≥ 12 V
Open loop voltage	≥ 22.7 V
Output rated operating current	45 mA
Output signal	These values are valid for the rated operational voltage 19 ... 30 V DC.
Energized/De-energized delay	single operation: 300 µs/50 µs; periodical: 5 µs/50 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 in)
Data for application in connection with Ex-areas	see page 349 for entity parameters
EC-Type Examination Certificate	BASEEFA 06 ATEX 0171X
Group, category, type of protection	Ⓔx II (1)GD [Ex ia] IIC (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 X
FM approval	
Control drawing	16-534FM-12 (cFMus)
IECEx approval	IECEx BAS 06.0031X
Approved for	[Ex ia] IIC, [Ex ia] I

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board 21 ... 30 V DC loop powered
Input	
Control input	voltage free contact or open collector output on with contact close or transistor on output off with contact open or transistor off
Input current	20 mA with open output 70 mA at 300 Ω load 75 mA with shorted output
Power loss	1.2 W at 24 V, 300 Ω load
Inrush current	1 A, 0.5 ms loop powered
Output	
Output characteristics	40 mA at 12 V DC, 60 mA current limit
Switching frequency f	max. 50 Hz
Response time	turn-on time 1 ms, turn-off time 8 ms, at 300 Ω load
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 349 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (bus or loop powered)**
- **Output 40 mA at 12 V DC, 60 mA current limit**
- **Contact or logic control input**
- **Low current output for LEDs**
- **Up to SIL2 acc. to IEC 61508 (bus powered)**
- **Up to SIL3 acc. to IEC 61508 (loop powered)**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

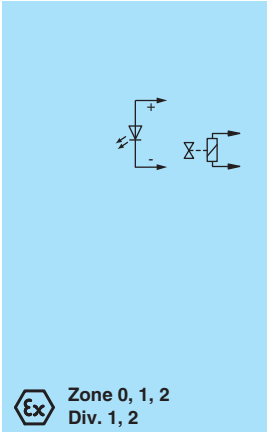
It is controlled with a loop-powered control signal, a switch contact, or transistor.

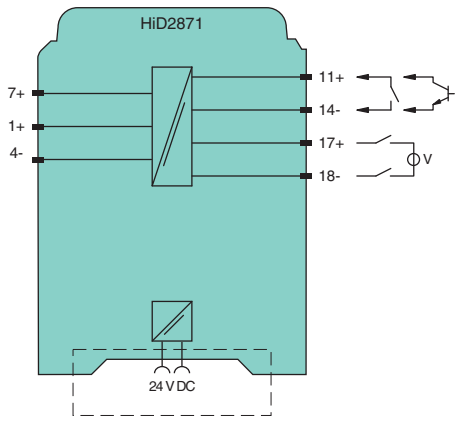
At full load, 12 V at 40 mA (with 60 mA current limit) is available for the hazardous area application.

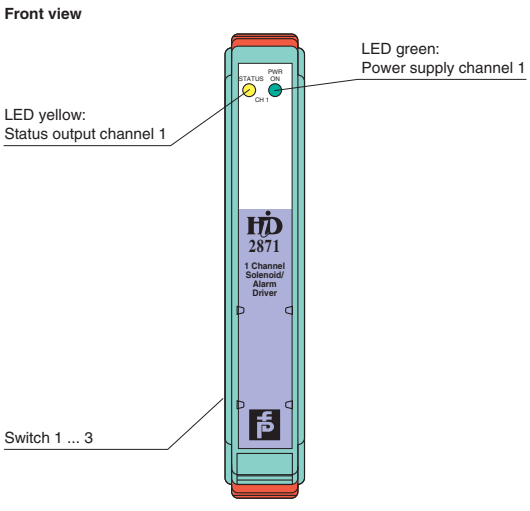
An alternative low current output is available for driving a single LED without installing an external current limiting resistor.

This module mounts on a HiD Termination Board.

Diagrams







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Features

- **2-channel isolated barrier**
- **24 V DC supply (bus or loop powered)**
- **Output 40 mA at 12 V DC, 60 mA current limit**
- **Contact or logic control input**
- **Low current output for LEDs**
- **Up to SIL2 acc. to IEC 61508 (bus powered)**
- **Up to SIL3 acc. to IEC 61508 (loop powered)**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

It is controlled with a loop-powered control signal, a switch contact, or transistor.

At full load, 12 V at 40 mA (with 60 mA current limit) is available for the hazardous area application.

An alternative low current output is available for driving a single LED without installing an external current limiting resistor.

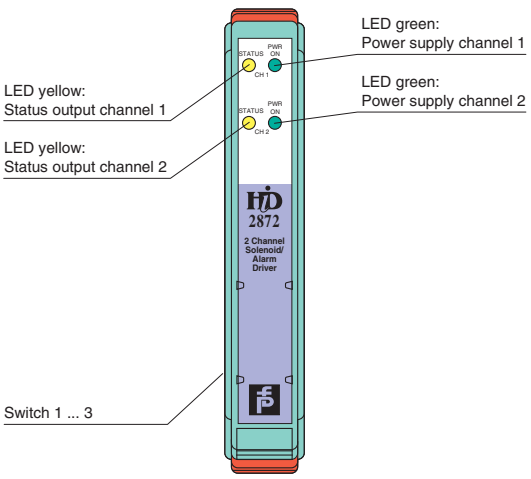
This module mounts on a HiD Termination Board.

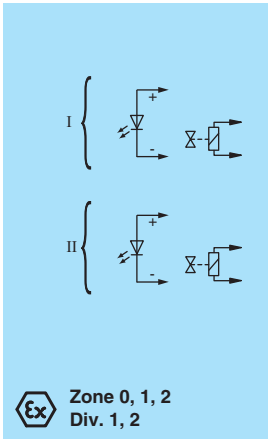
Technical data

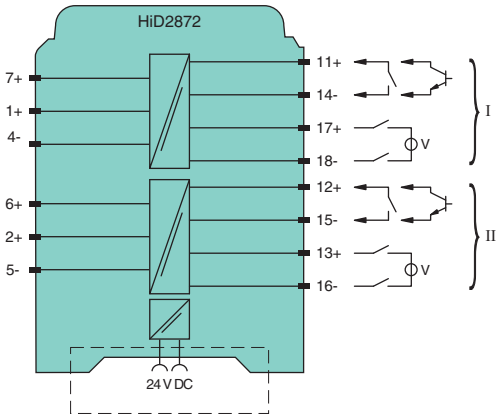
Supply	
Rated voltage	20.4 ... 30 V via Termination Board 21 ... 30 V DC loop powered
Input	
Control input	voltage free contact or open collector output on with contact close or transistor on output off with contact open or transistor off
Input current	20 mA with open output 70 mA at 300 Ω load 75 mA with shorted output
Power loss	1.2 W at 24 V, 300 Ω load (per channel)
Inrush current	1 A, 0.5 ms loop powered
Output	
Output characteristics	40 mA at 12 V DC, 60 mA current limit
Switching frequency f	max. 50 Hz
Response time	turn-on time 1 ms, turn-off time 8 ms, at 300 Ω load
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 349 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	1.1 W at 24 V, 300 Ω load
Input	
Control input	external switch (dry contact or open collector) non isolated or logic level input fully floating
Operating mode	output on with contact close or transistor on or logic > 4 V output off with contact open or transistor off or logic level < 1.5 V
Output	
Output characteristics	40 mA at 12 V DC, 52 mA current limit
Load	0.1 ... 5 kΩ
Switching frequency f	max. 250 Hz
Response time	turn-on time 1 ms, turn-off time 2 ms, at 300 Ω load
Fault level	lead short-circuit detection at < 25 Ω lead breakage detection at > 100 kΩ typical
Fault current	4 mA typical
Error message output	
Output type	open collector transistor
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 349 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Output 40 mA at 12 V DC, 52 mA current limit**
- **Contact or logic control input**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

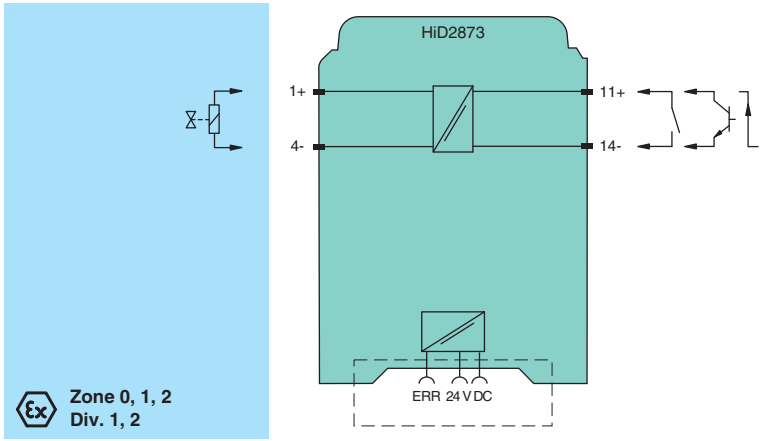
It is controlled with a switch contact, transistor, or logic-level signal.

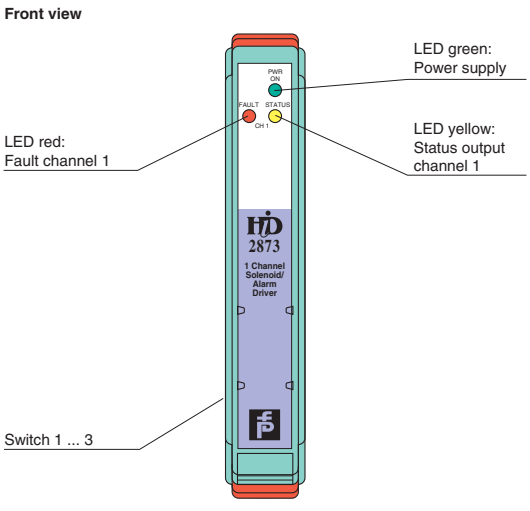
At full load, 12 V at 40 mA (with 52 mA current limit) is available for the hazardous area application.

Line fault detection of the field circuit is indicated by a red LED and an output on the fault bus. The fault conditions are monitored via a Fault Indication Board.

This module mounts on a HiD Termination Board.

Diagrams





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Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Output 40 mA at 12 V DC, 52 mA current limit**
- **Contact or logic control input**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

It is controlled with a switch contact, transistor, or logic-level signal.

At full load, 12 V at 40 mA (with 52 mA current limit) is available for the hazardous area application.

Line fault detection of the field circuit is indicated by a red LED and an output on the fault bus. The fault conditions are monitored via a Fault Indication Board.

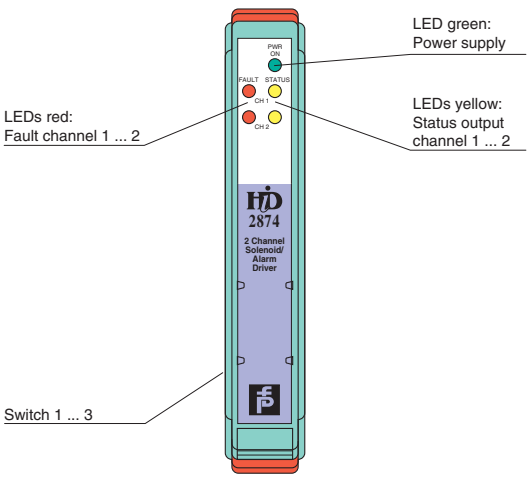
This module mounts on a HiD Termination Board.

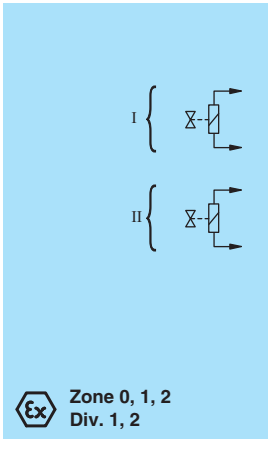
Technical data

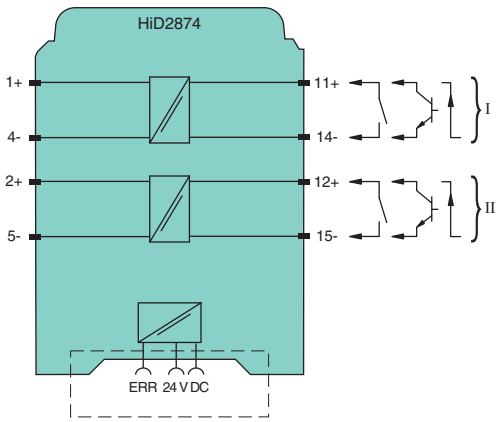
Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	1.1 W at 24 V, 300 Ω load (per channel)
Input	
Control input	external switch (dry contact or open collector) non isolated or logic level input fully floating
Operating mode	output on with contact close or transistor on or logic level > 4 V output off with contact open or transistor off or logic level < 1.5 V
Output	
Output characteristics	40 mA at 12 V DC, 52 mA current limit
Load	0.1 ... 5 kΩ
Switching frequency f	max. 250 Hz
Response time	turn-on time 1 ms, turn-off time 2 ms, at 300 Ω load
Fault level	lead short-circuit detection at < 25 Ω lead breakage detection at > 100 kΩ typical
Fault current	4 mA typical
Error message output	
Output type	open collector transistor (common to both channels)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 349 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board 21 ... 30 V DC loop powered
Input	
Control input	voltage free contact or open collector output on with contact close or transistor on output off with contact open or transistor off
Input current	30 mA with open output 70 mA with 300 Ω load 80 mA with shorted output
Power loss	1.2 W at 24 V, 300 Ω load
Inrush current	1 A, 0.5 ms loop powered
Output	
Output characteristics	40 mA at 11.2 V DC, 55 mA current limit
Switching frequency f	max. 50 Hz
Response time	turn-on time 1 ms, turn-off time 8 ms, at 300 Ω load
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 349 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ⓔx II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (bus or loop powered)**
- **Output 40 mA at 11.2 V DC, 55 mA current limit**
- **Contact or logic control input**
- **Entity parameter I_o/I_{sc} = 93 mA**
- **Up to SIL2 acc. to IEC 61508 (bus powered)**
- **Up to SIL3 acc. to IEC 61508 (loop powered)**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

It is controlled with a loop-powered control signal, a switch contact, or transistor.

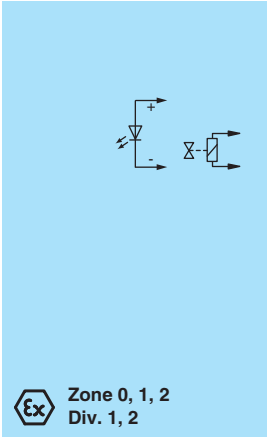
At full load, 11.2 V at 40 mA (with 55 mA current limit) is available for the hazardous area application.

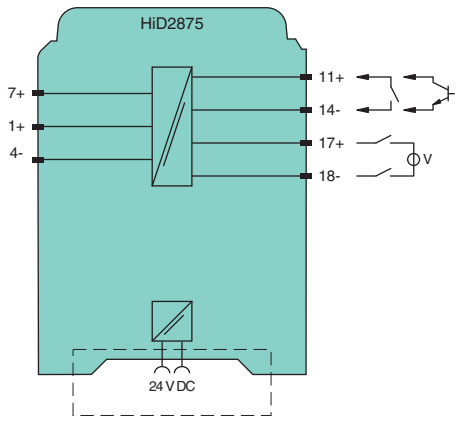
An alternative low current output is available for driving a single LED without installing an external current limiting resistor.

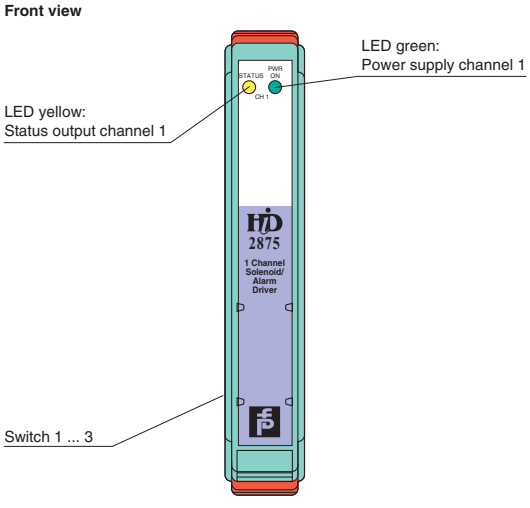
This module has a low I_o/I_{sc} = 93 mA entity parameter.

This module mounts on a HiD Termination Board.

Diagrams







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Features

- **2-channel isolated barrier**
- **24 V DC supply (bus or loop powered)**
- **Output 40 mA at 11.2 V DC, 55 mA current limit**
- **Contact or logic control input**
- **Entity parameter I_o/I_{sc} = 93 mA**
- **Up to SIL2 acc. to IEC 61508 (bus powered)**
- **Up to SIL3 acc. to IEC 61508 (loop powered)**

Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms located in a hazardous area.

It is controlled with a loop-powered control signal, a switch contact, or transistor.

At full load, 11.2 V at 40 mA (with 55 mA current limit) is available for the hazardous area application.

An alternative low current output is available for driving a single LED without installing an external current limiting resistor.

This module has a low I_o/I_{sc} = 93 mA entity parameter.

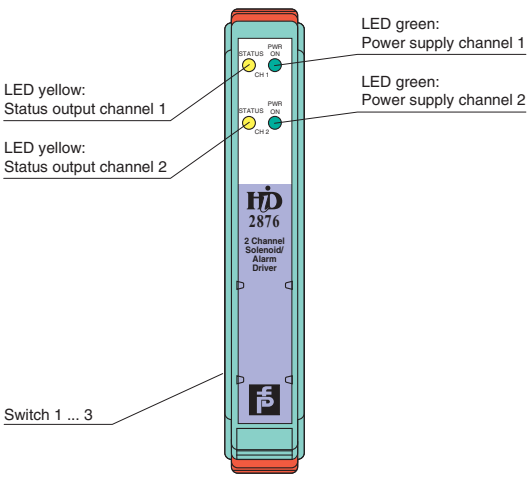
This module mounts on a HiD Termination Board.

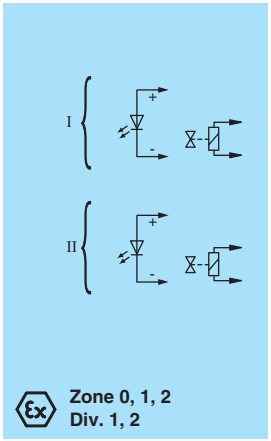
Technical data

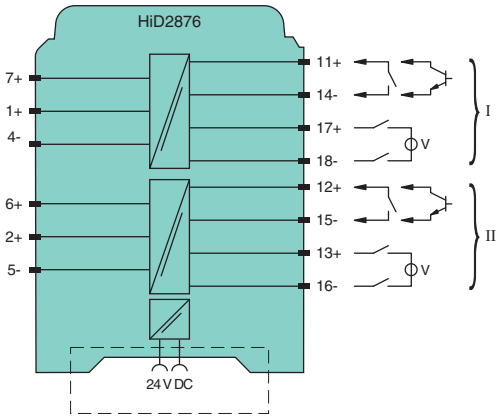
Supply	
Rated voltage	20.4 ... 30 V via Termination Board 21 ... 30 V DC loop powered
Input	
Control input	voltage free contact or open collector output on with contact close or transistor on output off with contact open or transistor off
Input current	30 mA with open output 70 mA with 300 Ω load 80 mA with shorted output
Power loss	1.2 W at 24 V, 300 Ω load (per channel)
Inrush current	1 A, 0.5 ms loop powered
Output	
Output characteristics	40 mA at 11.2 V DC, 55 mA current limit
Switching frequency f	max. 50 Hz
Response time	turn-on time 1 ms, turn-off time 8 ms, at 300 Ω load
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 349 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ⓔx II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	1 W at 24 V, 300 Ω load
Input	
Control input	external switch (dry contact or open collector) non isolated or logic level input fully floating
Operating mode	output on with contact close or transistor on or logic level > 4 V output off with contact open or transistor off or logic level < 1.5 V
Output	
Output characteristics	40 mA at 11.2 V DC, 52 mA current limit
Load	0.1 ... 5 kΩ
Switching frequency f	max. 250 Hz
Response time	turn-on time 1 ms, turn-off time 2 ms, at 300 Ω load
Fault level	lead short-circuit detection at < 25 Ω lead breakage detection at > 100 kΩ typical
Fault current	4 mA typical
Error message output	
Output type	open collector transistor
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 349 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Output 40 mA at 11.2 V DC, 52 mA current limit**
- **Contact or logic control input**
- **Entity parameter I_o/I_{sc} = 93 mA**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It is used to supply power to solenoid valves, audible alarms, or LED indicators in the hazardous area.

It is controlled with a switch contact, transistor, or logic-level signal.

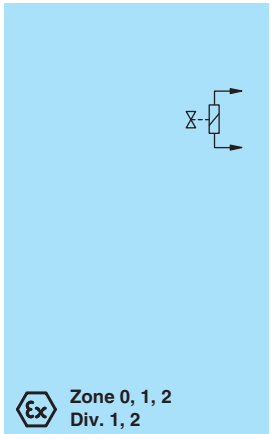
At full load, 11.2 V at 40 mA (with 52 mA current limit) is available for the hazardous area application.

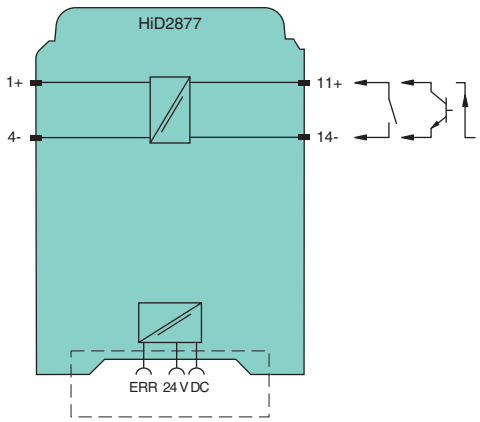
This barrier has a low I_o/I_{sc} = 93 mA entity parameter.

Line fault detection of the field circuit is indicated by a red LED and an output on the fault bus. The fault conditions are monitored via a Fault Indication Board.

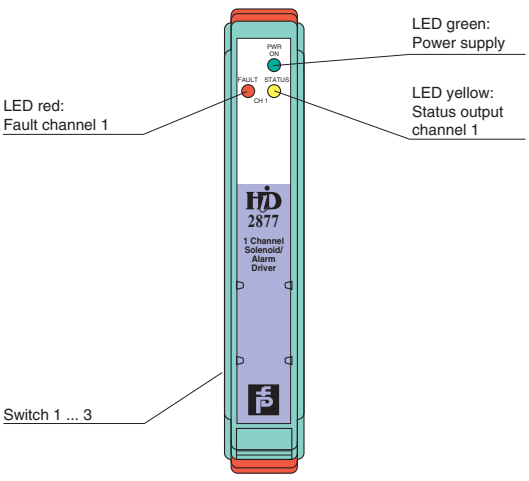
This module mounts on a HiD Termination Board.

Diagrams





Front view



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Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Output 40 mA at 11.2 V DC, 52 mA current limit**
- **Contact or logic control input**
- **Entity parameter I_o/I_{sc} = 93 mA**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It is used to supply power to solenoid valves, audible alarms, or LED indicators in the hazardous area.

It is controlled with a switch contact, transistor, or logic-level signal.

At full load, 11.2 V at 40 mA (with 52 mA current limit) is available for the hazardous area application.

This barrier has a low I_o/I_{sc} = 93 mA entity parameter.

Line fault detection of the field circuit is indicated by a red LED and an output on the fault bus. The fault conditions are monitored via a Fault Indication Board.

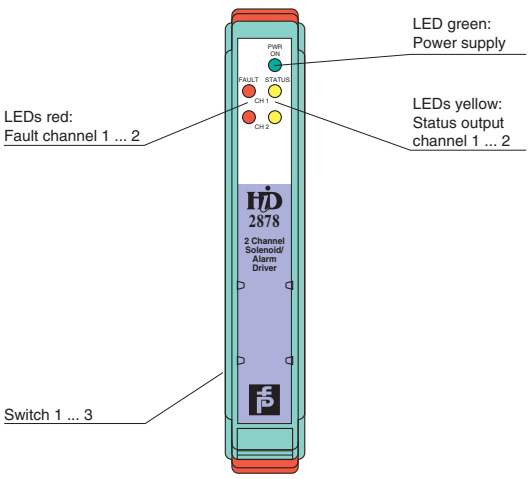
This module mounts on a HiD Termination Board.

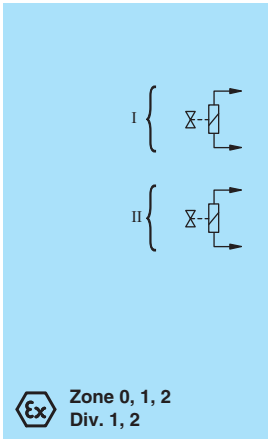
Technical data

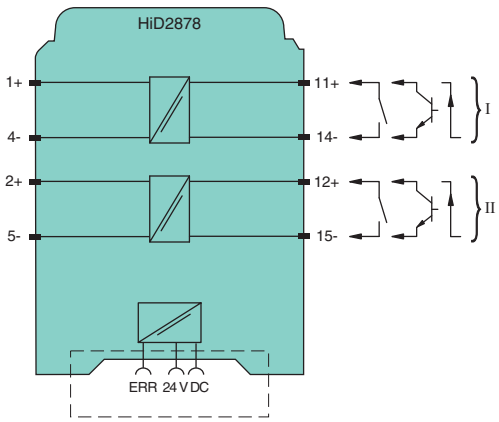
Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	1 W at 24 V, 300 Ω load (per channel)
Input	
Control input	external switch (dry contact or open collector) non isolated or logic level input fully floating
Operating mode	output on with contact close or transistor on or logic level > 4 V output off with contact open or transistor off or logic level < 1.5 V
Output	
Output characteristics	40 mA at 11.2 V DC, 52 mA current limit
Load	0.1 ... 5 kΩ
Switching frequency f	max. 250 Hz
Response time	turn-on time 1 ms, turn-off time 2 ms, at 300 Ω load
Fault level	lead short-circuit detection at < 25 Ω lead breakage detection at > 100 kΩ typical
Fault current	4 mA typical
Error message output	
Output type	open collector transistor (common to both channels)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 349 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ⓔx II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board 21 ... 30 V DC loop powered, reverse polarity protected
Input	
Control input	external switch (dry contact or open collector) non isolated or logic level input fully floating
Input current	80 mA at 24 V, 300 Ω load
Power loss	1.3 W at 24 V, 300 Ω load
Inrush current	1 A, max. 2 ms, loop powered
Operating mode	output on with contact close or transistor on or logic level > 4 V output off with contact open or transistor off or logic level < 1.5 V
Output	
Output characteristics	60 mA at 13 V DC, 65 mA current limit
Load	0.1 ... 5 kΩ
Switching frequency f	max. 50 Hz
Response time	turn-on time 2 ms, turn-off time 8 ms, at 300 Ω load
Fault level	lead short-circuit detection at < 25 Ω lead breakage detection at > 100 kΩ typical
Fault current	4 mA typical
Error message output	
Output type	open collector transistor on common bus and optocoupledtransistor (rating 30 V, max. 50 mA)
Connection	terminals 12+, 15-
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 349 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIB [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (bus or loop powered)**
- **Output 60 mA at 13 V DC, 65 mA current limit**
- **Gas group IIB/group C**
- **Contact or logic control input**
- **Line fault detection (LFD) with separate output**
- **Up to SIL2 acc. to IEC 61508 (bus powered)**
- **Up to SIL3 acc. to IEC 61508 (loop powered)**

Function

This isolated barrier is used for intrinsic safety applications. t is used to supply power to solenoid valves, audible alarms, or LED indicators in the hazardous area.

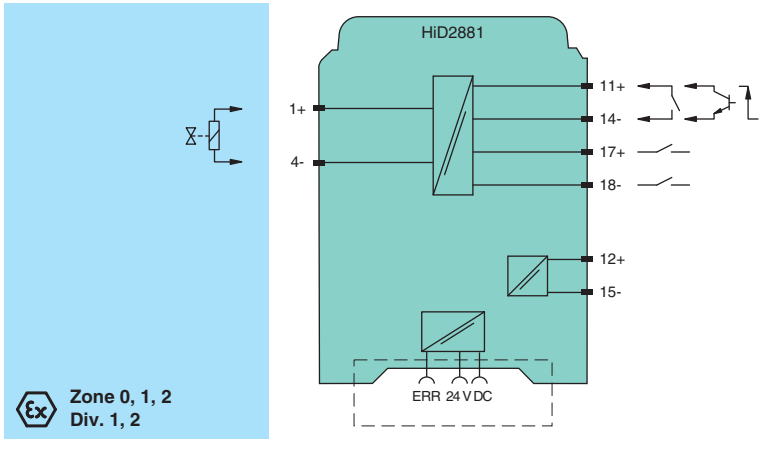
It is controlled with a loop-powered control signal, a switch contact, transistor, or logic-level signal.

At full load, 13 V at 60 mA (with 65 mA current limit) is available for the hazardous area application.

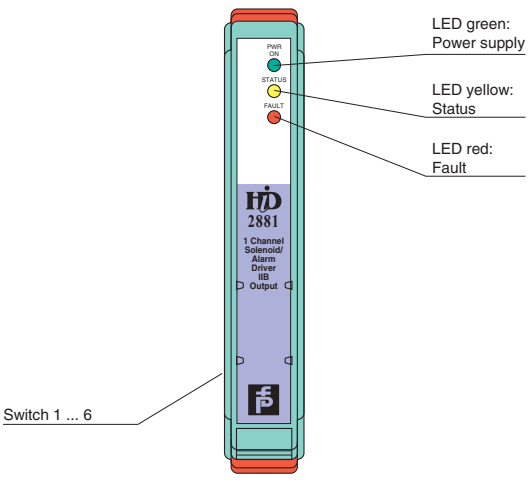
Line fault detection of the field circuit is indicated by a red LED and an output on the fault bus. The fault conditions are monitored via a Fault Indication Board.

This module mounts on a HiD Termination Board.

Diagrams



Front view



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Features

- **2-channel isolated barrier**
- **24 V DC supply (bus or loop powered)**
- **Contact or logic control input**
- **Relay contact output to hazardous area**

Function

This isolated barrier is used for intrinsic safety applications. It is used to initiate control signals or to switch power from a protected supply to a load in a hazardous area.

The relay output is driven from a loop-powered safe area control signal or controlled by a safe area switch contact, transistor, or logic-level input.

These command signals can be combined to enable the interaction of DCS and ESD systems. Each channel can be loop-powered, ensuring high integrity operation. LEDs provide the relay status of each channel.

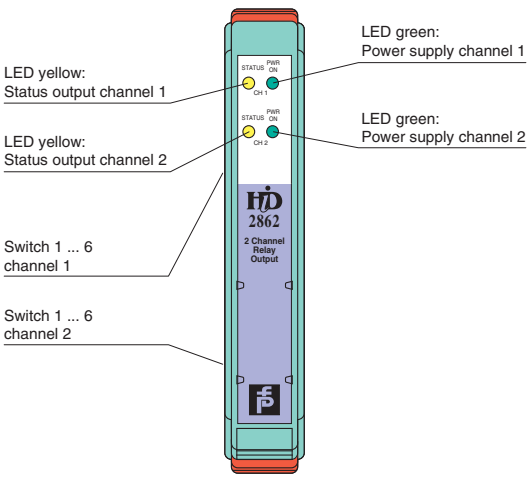
This module mounts on a HiD Termination Board.

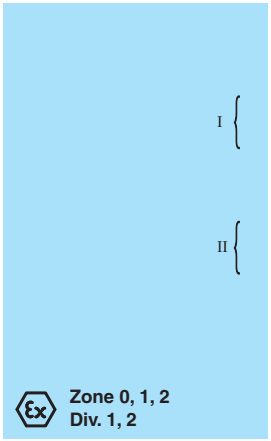
Technical data

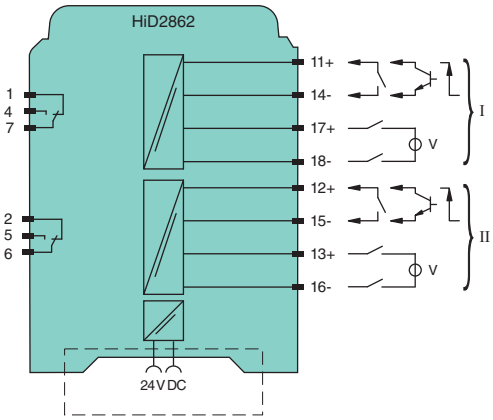
Supply	
Rated voltage	20.4 ... 30 V via Termination Board 21 ... 30 V DC loop powered
Power loss	loop powered 0.6 W at 24 V (per channel) bus powered 0.9 W at 24 V (per channel)
Input	
Control input	external switch (voltage free contact or open collector) or logic level signal
Input resistance	2.5 kΩ
Operating mode	relay energized with cntact closed, transistor on or logic level > 4 V relay de-energized with contact open, transistor off or logic level < 2 V
Output	
Contact loading	50 V DC/1 A
Transfer characteristics	
Switching frequency	10 Hz
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 349 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ex II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]

Diagrams

Front view







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ATEX Entity Parameters

Model Number	Terminals	U_o (V)	I_o (mA)	P_o (mW)
HiC2871	1, 4	25.2	110	693
HiD2871	1, 4, 7	26	110	715
HiD2872	1, 4, 7; 2, 5, 6	26	110	715
HiD2873	1, 4	26	110	715
HiD2874	1, 4; 2, 5	26	110	715
HiD2875	1, 4, 7	26	93	605
HiD2876	1, 4, 7; 2, 5, 6	26	93	605
HiD2877	1, 4	26	93	605
HiD2878	1, 4; 2, 5	26	93	605
HiD2881	1, 4	26	184	1200

Model Number	Terminals	U_i (V)	I_i (mA)
HiD2862	1, 4, 7; 2, 5, 6	30	1000

CSA Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)
HiD2871	1, 4, 7	26	110
HiD2872	1, 4, 7; 2, 5, 6	26	110
HiD2873	1, 4	26	110
HiD2874	1, 4; 2, 5	26	110
HiD2875	1, 4, 7	26	93
HiD2876	1, 4, 7; 2, 5, 6	26	93
HiD2877	1, 4	26	93
HiD2878	1, 4; 2, 5	26	93
HiD2881	1, 4	26	184

FM Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
HiC2871	1, 4	25.2	110	–	–

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Transmitter Power Supplies

Model Number	Housing		Channels	Input (Field)		Output (Control System)			Specials		Supply		SIL	Zone 2/Division 2 Mounting	Page
	HiC	HiD		2-wire Transmitter	Current Source	0/4 mA ... 20 mA (Source)	0/4 mA ... 20 mA (Sink)	0/1 V ... 5 V	SMART	Signal Splitting (1 Input – 2 Outputs)	24 V DC (Bus Powered)	24 V DC (Loop Powered)			
HiC2025	■		1	■	■	■		■	■		■		2	■	353
HiD2025		■	1	■		■		■	■		■		2		354
HiD2026		■	2	■		■		■	■		■		2		355
HiD2025SK		■	1	■			■		■		■		2		356
HiD2026SK		■	2	■			■		■		■		2		357
HiD2029		■	1	■	■	■		■	■		■		2		358
HiD2030		■	2	■	■	■		■	■	■	■		2		359
HiD2029SK		■	1	■	■		■		■		■		2		360
HiD2030SK		■	2	■	■		■		■	■	■		2		361
HiD2024		■	4	■	■	■	■		■		■			■	362

Current Repeaters

Model Number	Housing		Channels	Input (Field)			Output (Control System)			Supply 24 V DC (Loop Powered)	SIL	Zone 2/Division 2 Mounting	Page
	HiC	HiD		0 mA ... 40 mA	1.5 mA ... 50 mA	Fire Alarm	0 mA ... 20 mA	1.5 mA ... 50 mA	SMART				
HiD2035		■	1		■	■		■		■			363
HiD2036		■	2		■	■		■		■			364

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Voltage Repeaters

Model Number	Housing		Channels	Input (Field)			Output (Control System)			Supply 24 V DC (Bus Powered)	SIL	Zone 2/Division 2 Mounting	Page
	HiC	HiD		0 mV ... ± 50 mV	0 mV ... ± 500 mV	0 V ... -20 V	0 mV ... ± 50 mV	0 mV ... ± 500 mV	0 V ... -20 V				
HiC2065	■		1	■			■			■		■	365
HiD2096		■	2			■			■	■		■	366
HiC2068	■		1		■			■		■		■	367
HiC2095	■		1			■			■	■		■	368

Current and Voltage Converters

Model Number	Housing		Channels	Input (Field)					Output (Control System)			SMART	Supply 24 V DC (Bus Powered)	SIL	Zone 2/Division 2 Mounting	Page
	HiC	HiD		0/0.2 V ... 1 V	0/1 V ... 5 V	0/2 V ... 10 V	0/4 mA ... 20 mA	0 Ohm ... 50 Ohm	0/1 V ... 5 V	0/2 V ... 10 V	0/4 mA ... 20 mA					
HiD2012		■	2	■	■	■	■	■	■	■	■	■	■			369

Temperature Converters

Model Number	Housing		Channels	Input (Field)				Output (Control System)		Supply		SIL	Zone 2/Division 2 Mounting	Page
	HiC	HiD		RTD	TC	Potentiometer	mV/V	4 mA ... 20 mA	1 V ... 5 V	24 V DC (Bus Powered)	24 V DC (Loop Powered)			
HiD2061		■	1		■		■	■		■				370
HiD2062		■	2		■		■	■		■				371
HiD2071		■	1	■		■		■		■				372
HiD2072		■	2	■		■		■		■				373
HiD2081		■	1	■	■	■	■	■	■	■				374
HiD2082		■	2	■	■	■	■	■	■	■				375

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Technical data

Supply	
Rated voltage	19 ... 30 V DC via Termination Board
Power loss	≤ 800 mW
Power consumption	≤ 1.1 W
Input	
Input signal	4 ... 20 mA limited to approx. 30 mA
Voltage drop U_d	approx. 5 V on SL2: 5a (+), 1b (-)
Available voltage	≥ 15 V at 20 mA on SL2: 5a (+), 5b (-)
Output	
Load	0 ... 300 Ω (source mode)
Output signal	4 ... 20 mA or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt) 4 ... 20 mA (sink mode), operating voltage 15 ... 26 V
Ripple	20 mV_{rms}
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/4 ... 20 mA ≤ ± 0.1 % incl. non-linearity and hysteresis (source mode)
Influence of ambient temperature	< 2 µA/K (0 ... 60 °C (32 ... 140 °F)); < 4 µA/K (-20 ... 0 °C (-4 ... 32 °F))
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 3 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0 ... 3 kHz (-3 dB)
Rise time	10 to 90 % ≤ 20 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 06 ATEX 017
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC, [Ex ia D] [circuit(s) in zone 0/1/2/20/21/22]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 X
FM approval	
Control drawing	16-534FM-12 (cFMus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **2-wire transmitters or current sources**
- **Output 4 mA ... 20 mA or 1 V ... 5 V**
- **Low power dissipation**
- **Up to SIL2 acc. to IEC 61508**

Function

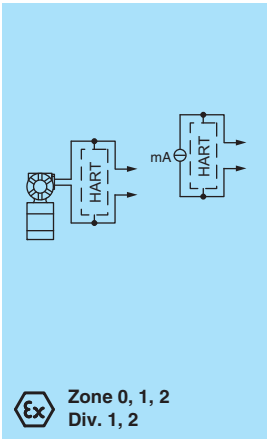
This isolated barrier is used for intrinsic safety applications. It provides 2-wire SMART transmitters with power in the hazardous area and transfers the analog values to the safe area. It is also used with 2-wire SMART current sources.

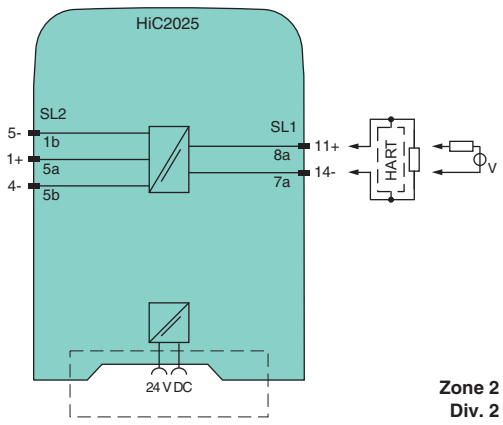
Bi-directional communication is supported for SMART transmitters that use current modulation to transmit data and voltage modulation to receive data.

The output is selected as a current source, current sink, or voltage source via DIP switches on the side of the unit.

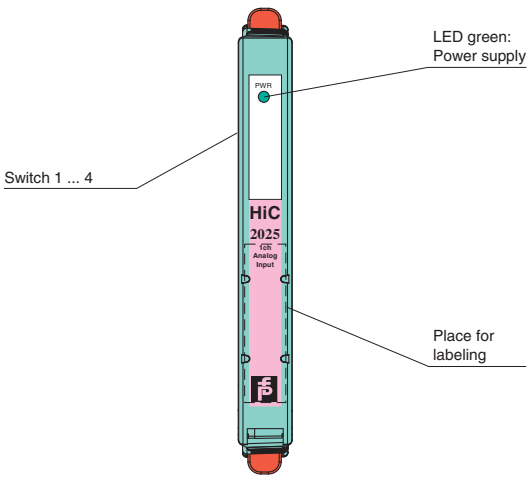
This module mounts on a HiC Termination Board.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **2-wire SMART transmitter**
- **Output 4 mA ... 20 mA or 1 V ... 5 V**
- **Low power dissipation**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It provides 2-wire SMART transmitters with power in the hazardous area, and repeats the current to drive a safe area load.

Bi-directional communication is supported for SMART transmitters that use current modulation to transmit data and voltage modulation to receive data.

The output is isolated from the input and are referenced to the power supply common.

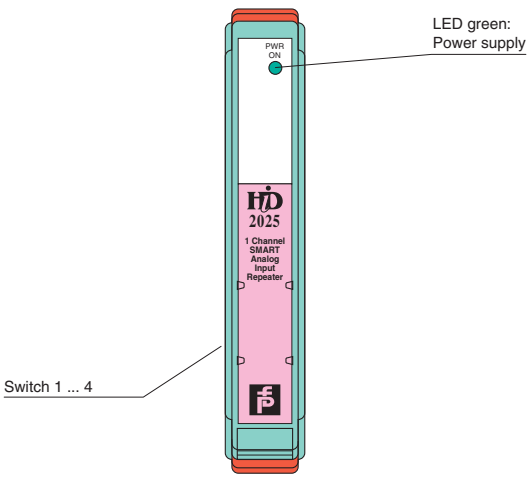
This module mounts on a HiD Termination Board.

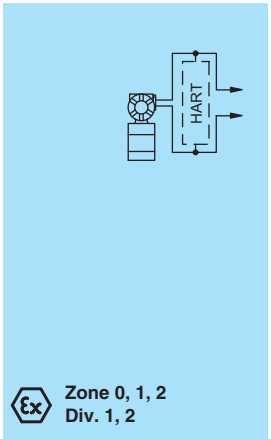
Technical data

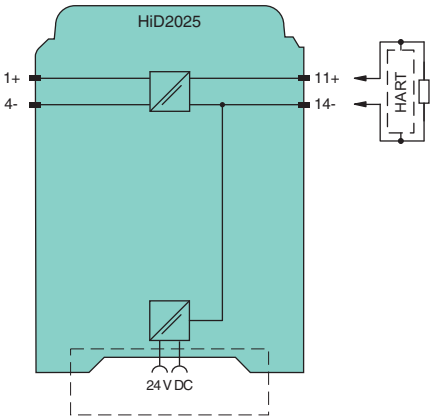
Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	0.8 W at 24 V
Input	
Input current	4 ... 20 mA, current limit 26 mA
Ripple	10 mV_{rms}
Voltage	min. 15.5 V at 20 mA
Output	
Load	0 ... 650 Ω
Output signal	4 ... 20 mA or 1 ... 5 V (on 250 Ω internal shunt)
Ripple	10 mV_{rms} on a load of 250 Ω, reqired for communications
Response time	40 ms, 10 ... 90 % step change
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (current output)
Influence of temperature	< ± 0.01 %/K
Frequency range	communication channel: 0.5 ... 40 kHz within 3 db, (-6 db at 100 kHz), Tx to output and output to Tx, suitable for use with SMART transmitters using HART or similar protocol
Influence of load	< 0.1 % of full-scale value from 0 ... 650 Ω
Linearity	< ± 0.1 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ex II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	0.8 W at 24 V (per channel)
Input	
Input current	4 ... 20 mA, current limit 26 mA
Ripple	10 mV_{rms}
Voltage	min. 15.5 V at 20 mA
Output	
Load	0 ... 650 Ω
Output signal	4 ... 20 mA or 1 ... 5 V (on 250 Ω internal shunt)
Ripple	10 mV_{rms} on a load of 250 Ω, reqired for communications
Response time	40 ms, 10 ... 90 % step change
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (current output)
Influence of temperature	< ± 0.01 %/K
Frequency range	communication channel: 0.5 ... 40 kHz within 3 db, (-6 db at 100 kHz), Tx to output and output to Tx, suitable for use with SMART transmitters using HART or similar protocol
Influence of load	< ± 0.1 % of full-scale value from 0 ... 650 Ω
Linearity	< ± 0.1 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **2-wire SMART transmitter**
- **Output 4 mA ... 20 mA or 1 V ... 5 V**
- **Low power dissipation**
- **Up to SIL2 acc. to IEC 61508**

Function

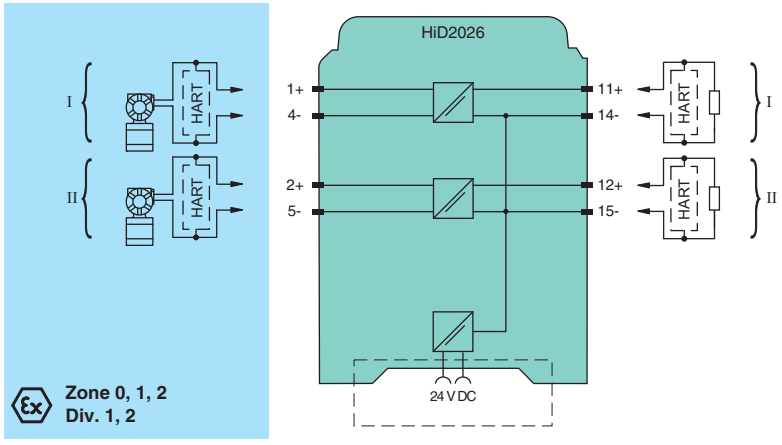
This isolated barrier is used for intrinsic safety applications. It provides 2-wire SMART transmitters with power in the hazardous area, and repeats the current to drive a safe area load.

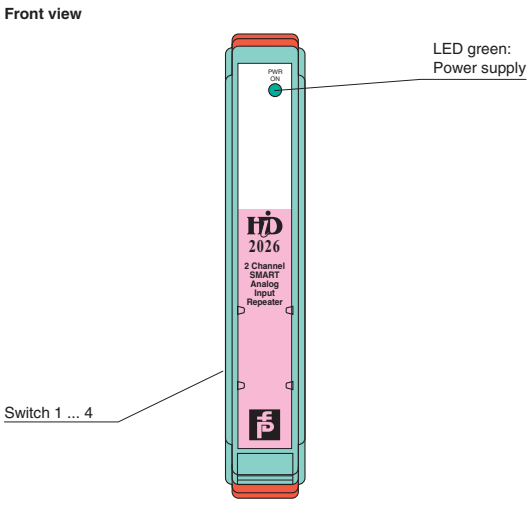
Bi-directional communication is supported for SMART transmitters that use current modulation to transmit data and voltage modulation to receive data.

The outputs are isolated from the inputs and are referenced to the power supply common.

This module mounts on a HiD Termination Board.

Diagrams





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Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **2-wire SMART transmitter**
- **Output 4 mA ... 20 mA, current sink**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It provides 2-wire SMART transmitters with power in the hazardous area and transfers the signal to the safe area. It is designed to provide a sink mode output on the safe area terminals.

Digital signals may be superimposed on the analog values in the hazardous or safe area, which are transferred bi-directionally.

The output is isolated from the input and are referenced to the power supply common.

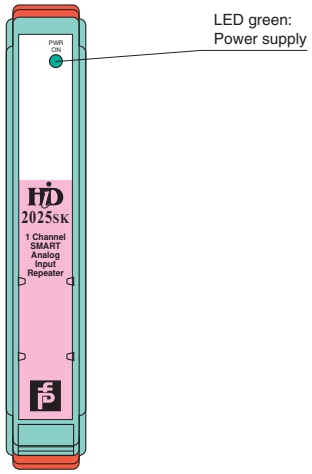
This module mounts on a HiD Termination Board.

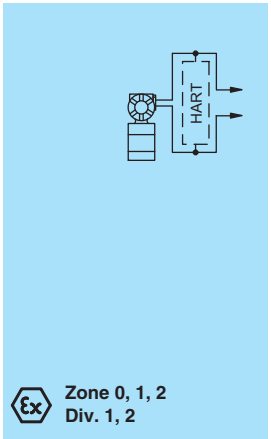
Technical data

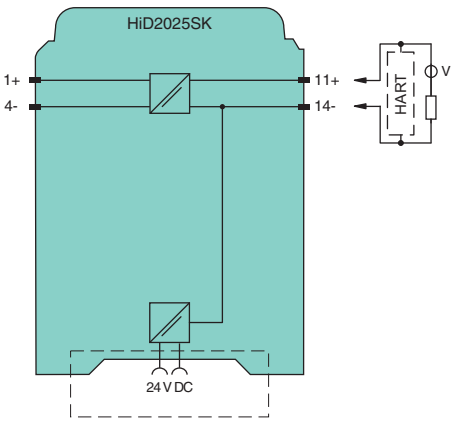
Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	1.3 W at 20 mA and 24 V external from DCS or PLC
Input	
Input current	4 ... 20 mA, current limit 26 mA
Ripple	10 mV_{rms}
Voltage	min. 15.5 V at 20 mA
Output	
Output	sink mode from external supply
Output signal	4 ... 20 mA, current limit 26 mA
Voltage	working voltage 7 ... 30 V
Response time	40 ms, 10 ... 90 % step change
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (current output)
Influence of temperature	< ± 0.01 %/K
Frequency range	communication channel: 0.5 ... 40 kHz within 3 db, (-6 db at 100 kHz), Tx to output and output to Tx, suitable for use with SMART transmitters using HART or similar protocol
Linearity	< ± 0.1 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ex II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	1.3 W at 20 mA and 24 V external from DCS or PLC (per channel)
Input	
Input current	4 ... 20 mA, current limit 26 mA
Ripple	10 mV_{rms}
Voltage	min. 15.5 V at 20 mA
Output	
Output	sink mode from external supply
Output signal	4 ... 20 mA, current limit 26 mA
Voltage	working voltage 7 ... 30 V
Response time	40 ms, 10 ... 90 % step change
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (current output)
Influence of temperature	< ± 0.01 %/K
Frequency range	communication channel: 0.5 ... 40 kHz within 3 db, (-6 db at 100 kHz), Tx to output and output to Tx, suitable for use with SMART transmitters using HART or similar protocol
Linearity	< ± 0.1 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **2-wire SMART transmitter**
- **Output 4 mA ... 20 mA, current sink**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It provides 2-wire SMART transmitters with power in the hazardous area and transfers the signal to the safe area.

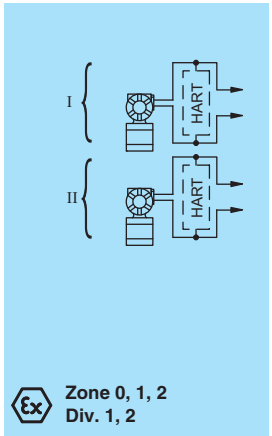
It is designed to provide a sink mode output on the safe area terminals.

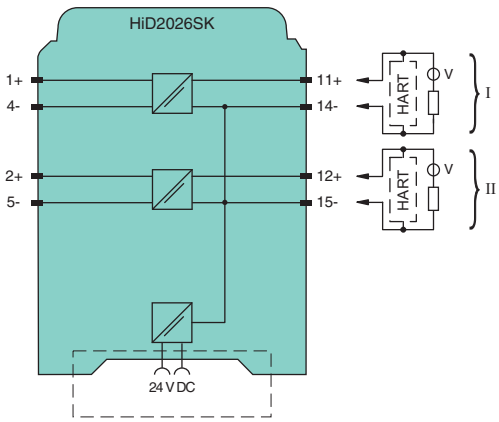
Digital signals may be superimposed on the analog values in the hazardous or safe area, which are transferred bi-directionally.

The outputs are isolated from the inputs and are referenced to the power supply common.

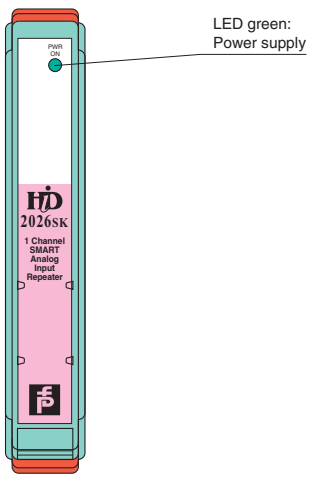
This module mounts on a HiD Termination Board.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **2-wire SMART transmitters or current sources**
- **Output 4 mA ... 20 mA or 1 V ... 5 V**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It provides a fully floating supply to power 2-wire SMART transmitters in the hazardous area, and repeats the current to drive a safe area load. It is also used with 2-wire current sources.

Digital signals may be superimposed on the analog values in the hazardous or safe area, which are transferred bi-directionally.

A separate fault output on the bus is signaled if the input signal is outside the range 0.2 mA ... 24 mA. The fault conditions can be monitored via a Fault Indication Board.

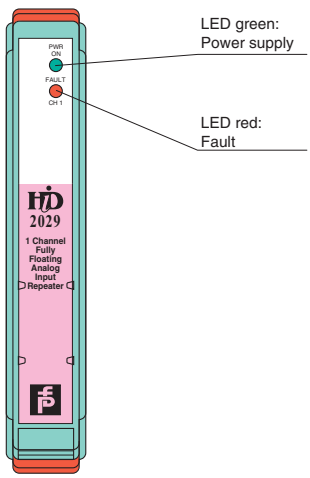
This module mounts on a HiD Termination Board.

Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	1.05 W at 24 V
Input	
Input current	4 ... 20 mA, current limit 26 mA
Input resistance	40 Ω, for current source
Ripple	10 mV_{rms}
Voltage	min. 15.5 V at 20 mA
Communication	pass-through of HART signal to safe area The current sink terminals 4 and 7 do not pass the HART signal to safe area.
Output	
Load	0 ... 650 Ω
Output signal	4 ... 20 mA or 1 ... 5 V (on 250 Ω internal shunt)
Ripple	10 mV_{rms} on a load of 250 Ω
Response time	70 ms, 10 ... 90 % step change
Signal level	no fault: 1 mA ... 23.5 mA input current fault detection: < 0.2 mA or > 24 mA input current
Error message output	
Output type	open collector transistor fault bus signal
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (current output)
Influence of temperature	< ± 0.01 %/K
Influence of load	< ± 0.1 % of full-scale value from 0 ... 650 Ω
Linearity	< ± 0.05 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ex II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

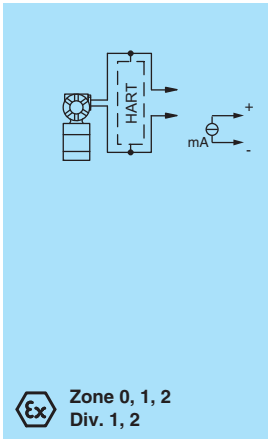
Diagrams

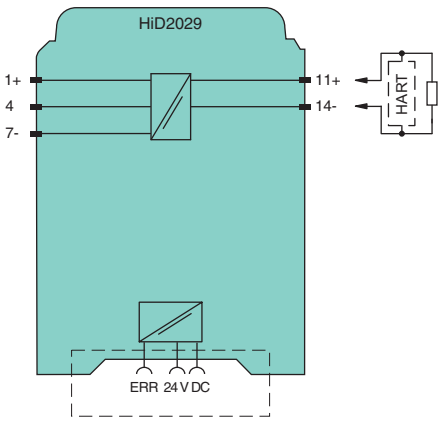
Front view



LED green: Power supply

LED red: Fault





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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	1.05 W at 24 V (per channel)
Input	
Input current	4 ... 20 mA, current limit 26 mA
Input resistance	40 Ω, for current source
Ripple	10 mV_{rms}
Voltage	min. 15.5 V at 20 mA
Communication	pass-through of HART signal to safe area The current sink terminals 4, 7 and 5, 6 do not pass the HART signal to safe area.
Output	
Load	0 ... 650 Ω
Output signal	4 ... 20 mA or 1 ... 5 V (on 250 Ω internal shunt)
Ripple	10 mV_{rms} on a load of 250 Ω
Response time	70 ms, 10 ... 90 % step change
Signal level	no fault: 1 mA ... 23.5 mA input current fault detection: < 0.2 mA or > 24 mA input current
Error message output	
Output type	open collector transistor (common to both channels) fault bus signal, collective error message
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (current output)
Influence of temperature	< ± 0.01 %/K
Influence of load	< ± 0.1 % of full-scale value from 0 ... 650 Ω
Linearity	< ± 0.05 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **2-wire SMART transmitters or current sources**
- **Output 4 mA ... 20 mA or 1 V ... 5 V**
- **Usable as signal splitter**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

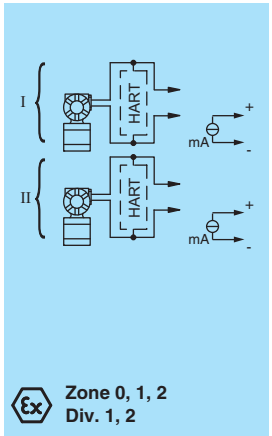
This isolated barrier is used for intrinsic safety applications. It provides a fully floating supply to power 2-wire SMART transmitters in the hazardous area, and repeats the current to drive a safe area load. It is also used with 2-wire current sources.

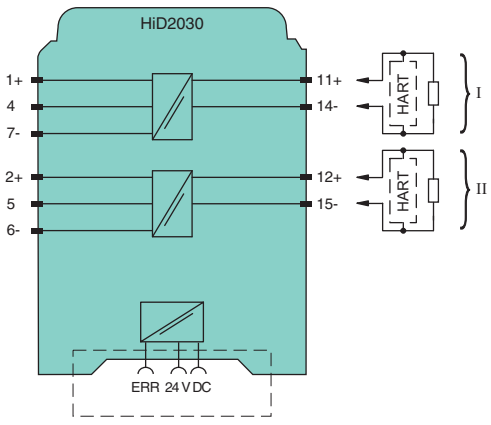
Digital signals may be superimposed on the analog values in the hazardous or safe area, which are transferred bi-directionally.

A separate fault output on the bus is signaled if the input signal is outside the range 0.2 mA ... 24 mA. The fault conditions can be monitored via a Fault Indication Board.

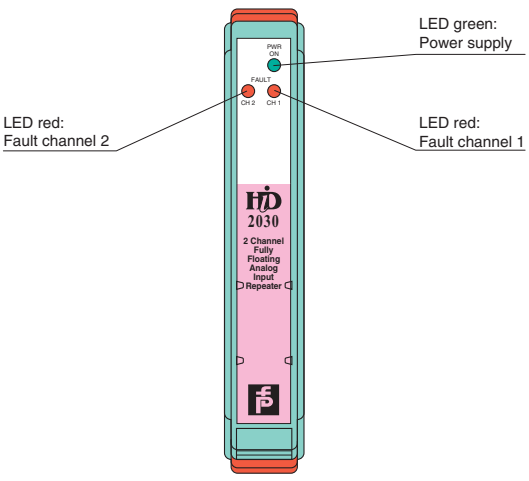
This module mounts on a HiD Termination Board.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **2-wire SMART transmitters or current sources**
- **Output 4 mA ... 20 mA, current sink**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It provides a fully floating supply to power 2-wire SMART transmitters in the hazardous area, and repeats the current to drive a safe area load. It is also used with 2-wire current sources. It is designed to provide a sink mode output on the safe area terminals

Digital signals may be superimposed on the analog values in the hazardous or safe area, which are transferred bi-directionally.

A separate fault output on the bus is signaled if the input signal is outside the range 0.2 mA ... 24 mA. The fault conditions can be monitored via a Fault Indication Board.

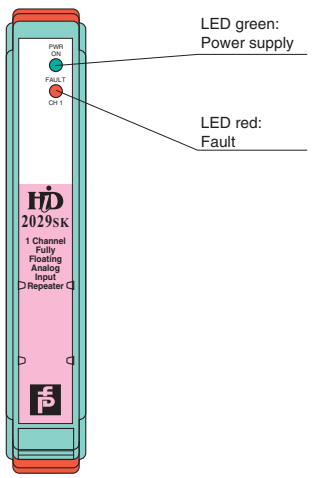
This module mounts on a HiD Termination Board.

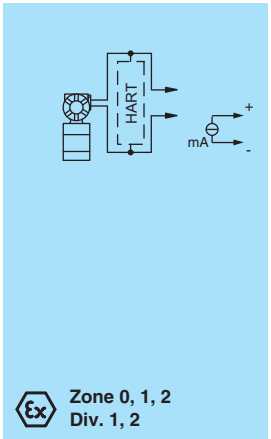
Technical data

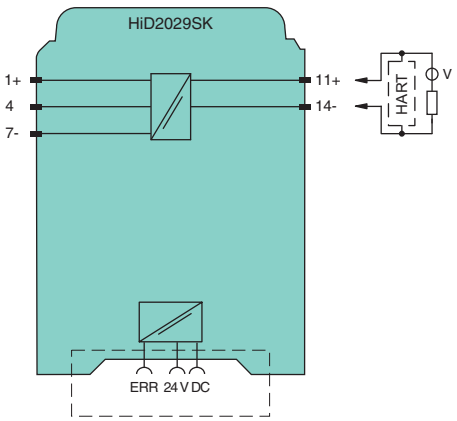
Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	1.05 W at 20 mA and 24 V external from DCS or PLC
Input	
Input current	4 ... 20 mA, current limit 26 mA
Input resistance	40 Ω, for current source
Ripple	10 mV_{rms}
Voltage	min. 15.5 V at 20 mA
Communication	pass-through of HART signal to safe area The current sink terminals 4 and 7 do not pass the HART signal to safe area.
Output	
Output	sink mode from external supply
Output signal	4 ... 20 mA, current limit 24 mA
Voltage	working voltage 7 ... 30 V
Response time	70 ms, 10 ... 90 % step change
Signal level	no fault: 1 mA ... 23.5 mA input current fault detection: < 0.2 mA or > 24 mA input current
Error message output	
Output type	open collector transistor fault bus signal
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value
Influence of temperature	< ± 0.01 %/K
Linearity	< ± 0.05 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ⓔx II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	1.05 W at 20 mA and 24 V external from DCS or PLC (per channel)
Input	
Input current	4 ... 20 mA, current limit 26 mA
Input resistance	40 Ω, for current source
Ripple	10 mV_{rms}
Voltage	min. 15.5 V at 20 mA
Communication	pass-through of HART signal to safe area The current sink terminals 4, 7 and 5, 6 do not pass the HART signal to safe area.
Output	
Output	sink mode from external supply
Output signal	4 ... 20 mA, current limit 24 mA
Voltage	working voltage 7 ... 30 V
Response time	70 ms, 10 ... 90 % step change
Signal level	no fault: 1 mA ... 23.5 mA input current fault detection: < 0.2 mA or > 24 mA input current
Error message output	
Output type	open collector transistor (common to both channels) fault bus signal, collective error message
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value
Influence of temperature	< ± 0.01 %/K
Linearity	< ± 0.05 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **2-wire SMART transmitters or current sources**
- **Output 4 mA ... 20 mA, current sink**
- **Usable as signal splitter**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

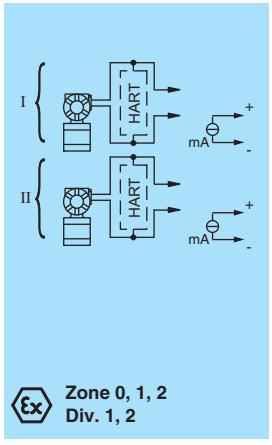
This isolated barrier is used for intrinsic safety applications. It provides a fully floating supply to power 2-wire SMART transmitters in the hazardous area, and repeats the current to drive a safe area load. It is also used with 2-wire current sources. It is designed to provide a sink mode output on the safe area terminals

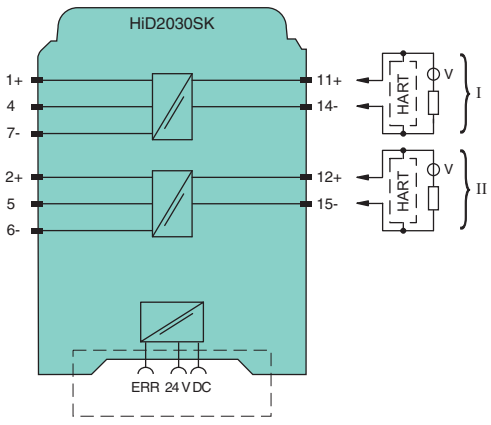
Digital signals may be superimposed on the analog values in the hazardous or safe area, which are transferred bi-directionally.

A separate fault output on the bus is signaled if the input signal is outside the range 0.2 mA ... 24 mA. The fault conditions can be monitored via a Fault Indication Board.

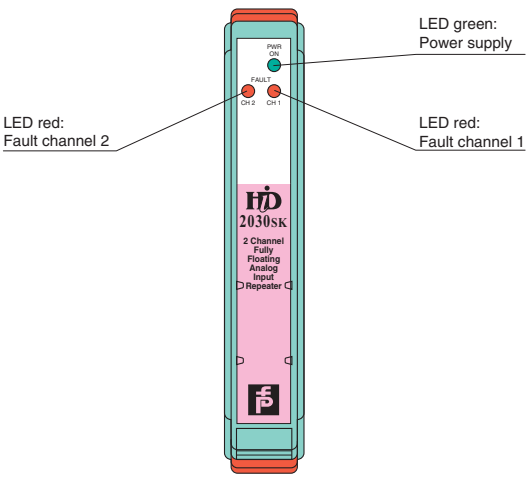
This module mounts on a HiD Termination Board.

Diagrams





Front view



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Features

- **4-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Analog in or analog out signals**
- **Sink and source mode outputs**
- **SMART pass-through**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications. It operates as a SMART transmitter power supply or as a repeater.

Bi-directional communication is supported for SMART transmitters that use current modulation to transmit data and voltage modulation to receive data.

The outputs are fully isolated from the inputs, the power supply, and each other.

An open field circuit presents a high impedance to the control side to allow alarm conditions to be monitored by control systems.

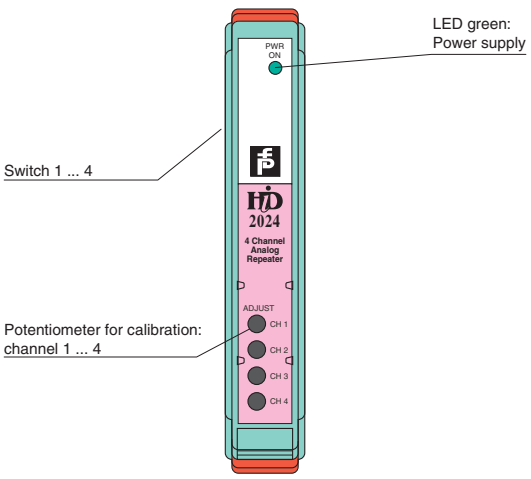
This module mounts on a HiD Termination Board.

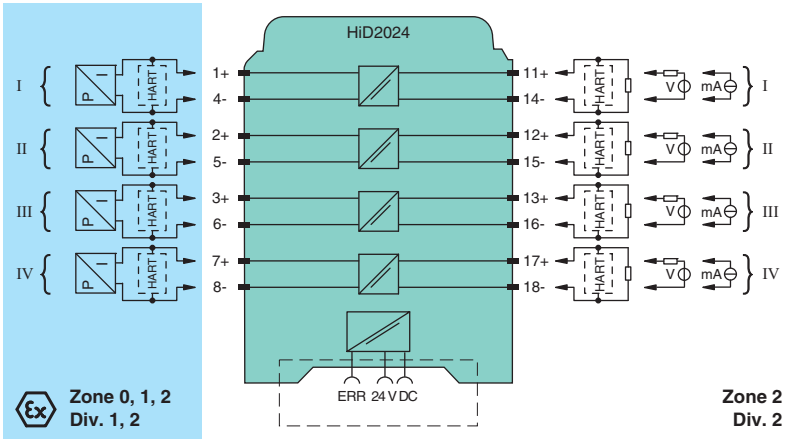
Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	≤ 1.8 W at 20 mA
Power consumption	≤ 3.3 W at 20 mA
Hazardous area connection	
Input signal	4 ... 20 mA, limited to approx. 30 mA
Available voltage	≥ 15 V at 20 mA
Output signal	4 ... 20 mA
Output load	0 ... 650 Ω
Safe area connection	
Input signal	4 ... 20 mA
Input resistance	> 100 kΩ at max. 23 V, with field wiring open
Voltage drop	approx. 6 V or internal resistance 300 Ω at 20 mA
Output signal	4 ... 20 mA or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt) 4 ... 20 mA (sink mode), operating voltage 15 ... 26 V
Output load	0 ... 300 Ω (source mode)
Ripple	20 mV_{rms}
Transfer characteristics	
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 3 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0 ... 3 kHz (-3 dB)
Rise time	10 to 90 % ≤ 20 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ⓔx II (1)GD [Ex ia] IIC, [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 X

Diagrams

Front view





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Technical data

Supply	
Rated voltage	6 ... 30 V, loop powered, reverse polarity protected
Power loss	0.7 W at 40 mA, 24 V
Safe circuit	
Current consumption	< 0.6 mA at 24 V and open circuit
Current	1.5 ... 50 mA, loop powered
Signal level	voltage drop 9.6 V at 20 mA and 500 Ω load (4 V at 4 mA)
Field circuit	
Characteristics	for fire and smoke detectors $U_{out} = (U_{in} - 1.6) - (0.4 \times I_{out})$ 6 V < U_{in} < 25 V $U_{out} = (25 - 1.6) - (0.4 \times I_{out})$ 25 V < U_{in} < 30 V
Load	0 ... 750 Ω for I/P applications
Signal	1.5 ... 50 mA for fire and smoke detectors 4 ... 20 mA on a load of max. 750 Ω for I/P applications
Ripple	≤ 150 µA peak to peak for I/P applications
Response time	50 ms, 10 ... 90 % step change for I/P applications
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (range 4 ... 20 mA)
Influence of temperature	< ± 0.01 %/K
Repeat accuracy	< ± 300 µA, 6 V < U_{in} < 25 V/1.5 mA < I_{out} < 50 mA
Influence of load	< ± 0.3 % of full-scale value from 0 ... 750 Ω
Linearity	< ± 0.1 % of full-scale value (range 4 ... 20 mA)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 1.5 mA ... 50 mA**
- **Fire detector or I/P supply**
- **Accuracy 0.1 %**

Function

This isolated barrier is used for intrinsic safety applications.

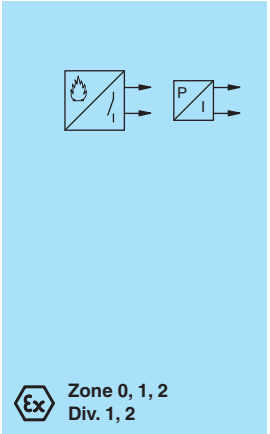
It is loop-powered and is primarily intended to interface with fire and smoke detectors or with similar switched resistor systems requiring a wide output current range (1.5 mA ... 50 mA) to operate correctly.

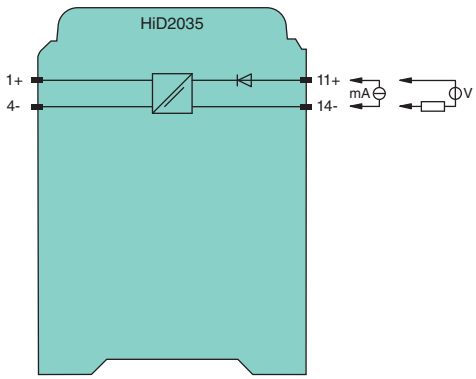
It is also used to drive a current to I/P converter.

Reverse polarity protection prevents damage to the isolator caused by faulty wiring.

This module mounts on a HiD Termination Board.

Diagrams





Front view

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Features

- **2-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 1.5 mA ... 50 mA**
- **Fire detector or I/P supply**
- **Accuracy 0.1 %**

Function

This isolated barrier is used for intrinsic safety applications.

It is loop-powered and is primarily intended to interface with fire and smoke detectors or with similar switched resistor systems requiring a wide output current range (1.5 mA ... 50 mA) to operate correctly.

It is also used to drive a current to I/P converter.

Reverse polarity protection prevents damage to the isolator caused by faulty wiring.

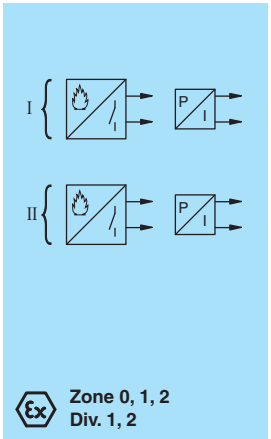
This module mounts on a HiD Termination Board.

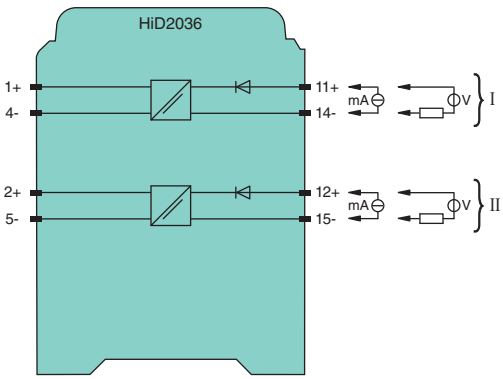
Technical data

Supply	
Rated voltage	6 ... 30 V, loop powered, reverse polarity protected
Power loss	0.7 W at 40 mA, 24 V (per channel)
Safe circuit	
Current consumption	< 0.6 mA at 24 V and open circuit
Current	1.5 ... 50 mA, loop powered
Signal level	voltage drop 9.6 V at 20 mA and 500 Ω load (4 V at 4 mA)
Field circuit	
Characteristics	for fire and smoke detectors $U_{out} = (U_{in} - 1.6) - (0.4 \times I_{out})$ 6 V < U_{in} < 25 V $U_{out} = (25 - 1.6) - (0.4 \times I_{out})$ 25 V < U_{in} < 30 V
Load	0 ... 750 Ω for I/P applications
Signal	1.5 ... 50 mA for fire and smoke detectors 4 ... 20 mA on a load of max. 750 Ω for I/P applications
Ripple	≤ 150 µA peak to peak for I/P applications
Response time	50 ms, 10 ... 90 % step change for I/P applications
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (range 4 ... 20 mA)
Influence of temperature	< ± 0.01 %/K
Repeat accuracy	< ± 300 µA, 6 V < U_{in} < 25 V/1.5 mA < I_{out} < 50 mA
Influence of load	< ± 0.3 % of full-scale value from 0 ... 750 Ω
Linearity	< ± 0.1 % of full-scale value (range 4 ... 20 mA)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ex II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view





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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power loss/power consumption	0.7 W max.
Input	
Input resistance	≥ 16 MΩ
Transmission range	0 ... ± 50 mV
Offset voltage/current	≤ 5 µV/≤ 5 nA
Output	
Load	Accuracy figures for infinite load impedance. Additional 0.03 % of span for a load resistance of 10 kΩ
Voltage	0 ... ± 50 mV
Output resistance	≤ 3 Ω
Fault voltage	open collector output: fault output shall be < V_{cc}/2 (when connected to V_{cc} via 10 kΩ pull up resistor)
Fault connection	via Termination Board
Line fault detection	input: ± 100 mV output: +200 mV, -115 mV
Transfer characteristics	
Bandwidth	DC to > 350 Hz (-3 dB)
Settling time	< 2 ms
Rise time/fall time	≤ 1 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	BASEEFA 10 ATEX 0031X
Group, category, type of protection	Ⓔx II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	BASEEFA 10 ATEX 0032X
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4
UL approval	
Control drawing	116-0317 (cULus)
IECEx approval	IECEx BAS 10.0012X IECEx BAS 10.0013X
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I Ex nA II T4

Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Voltage input 0 mV ... ± 50 mV**
- **Voltage output 0 mV ... ± 50 mV**
- **Selectable up/downscale burnout detection on Power Rail**
- **Fault output signal**

Function

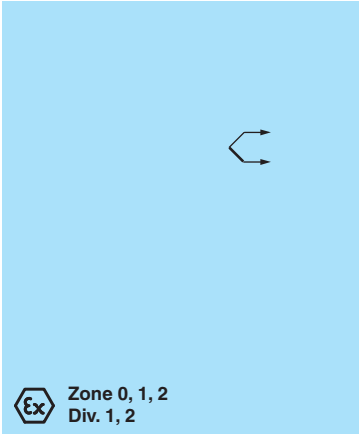
This isolated barrier is used for intrinsic safety applications. It transfers low voltage signals from thermocouples, load cells, strain gauges, operational amplifiers, and inductive oscillation sensors located in hazardous areas to safe areas.

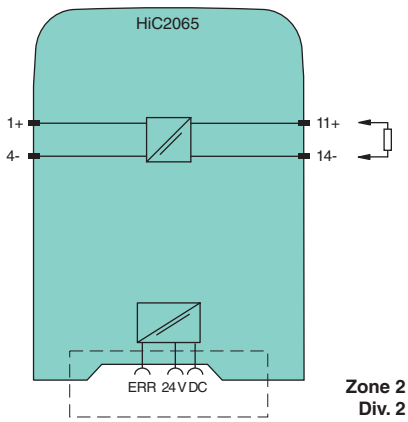
The input voltage of the terminals 1 and 4 is transferred to the terminals 11 and 14.

The input, output, and power supply are galvanically isolated from each other. Upscale or downscale lead breakage monitoring is selectable via switches located on the front panel of the device.

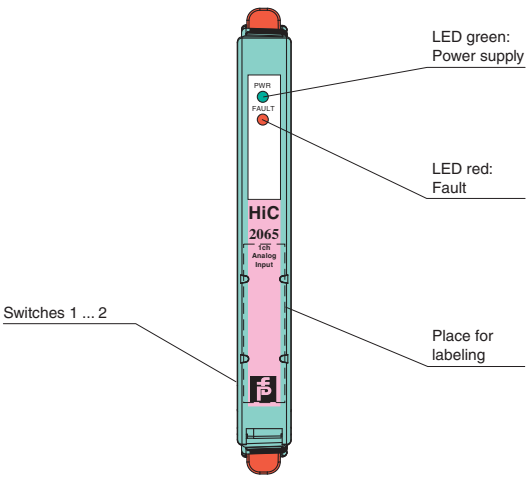
Note: This unit requires three minutes after power-up to reach the accuracy cited in the technical data.

Diagrams





Front view



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Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Voltage input 0 V ... -20 V**
- **Vibration sensor inputs**
- **Voltage/current field supply**
- **Voltage output 0 V ... -20 V**

Function

This isolated barrier is used for intrinsic safety applications. It provides a floating output to power a vibration sensor (e. g., Bently Nevada) or accelerometer in a hazardous area and transfers the voltage signal from that sensor to the safe area.

The device is designed to provide a voltage or current supply to the vibration sensor. Depending on connection the barrier provides 3.7 mA, 5.3 mA, or 9.0 mA supply current for 2-wire sensors, or 18 V at 20 mA for 3-wire sensors.

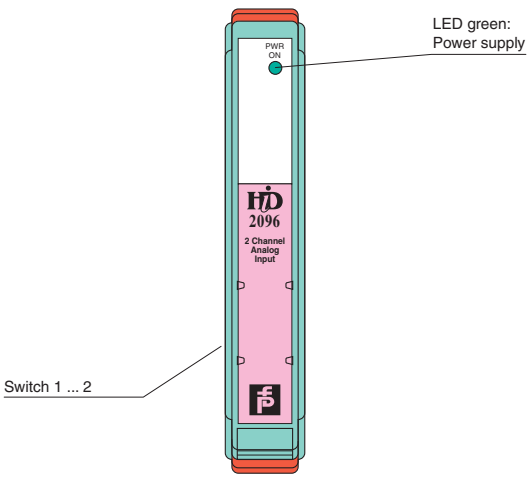
This barrier mounts on a HiD system termination board.

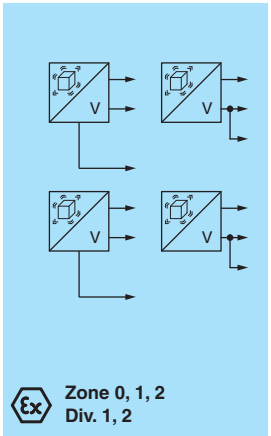
Technical data

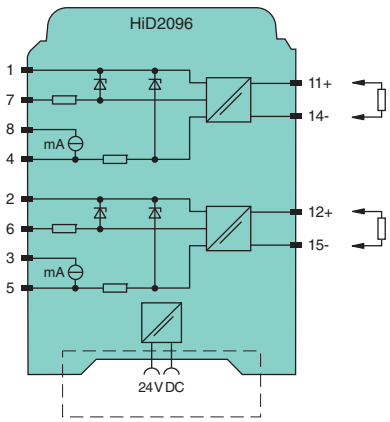
Supply	
Rated voltage	20.4 ... 30 V DC
Power consumption	≤ 2.4 W
Input	
Input resistance	10 kΩ terminals 1 and 5
Output rated operating current	terminals 1 (common), 4: > 10 mA at -21 V or > 20 mA at -18 V terminals 2 (common), 5: > 10 mA at -21 V or > 20 mA at -18 V terminals 1 (common), 8: 3.7 ± 0.26 mA, 5.3 ± 0.34 mA or 9.0 ± 0.55 mA, dependent on switch settings (see configuration) terminals 2 (common), 3: 3.7 ± 0.26 mA, 5.3 ± 0.34 mA or 9.0 ± 0.55 mA, dependent on switch settings (see configuration)
Signal span	0 ... -20 V
Output	
Load	≥ 2 kΩ
Voltage	0 ... -20 V
Output resistance	approx. 24 Ω Since this is much less than the end-to-end resistance of a zener barrier, it may be necessary to specify a monitor intended for use without a barrier. Please follow the advice of the monitor manufacturer.
Transfer characteristics	
Bandwidth	-0.1 dB at 10 kHz; -1 dB at 20 kHz
Time delay relative to input	7.0 ± 0.3 µs
Ripple	in 200 kHz bandwidth < 20 mV_{rms} in 20 kHz bandwidth < 3 mV_{rms}
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	pending
Group, category, type of protection	Ⓔx II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	pending
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 [device in zone 2]

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20 ... 30 V DC
Power loss/power consumption	0.7 W max.
Input	
Input resistance	≥ 1.4 MΩ
Transmission range	0 ... ± 500 mV
Offset voltage/current	≤ 5 µV/≤ 5 nA
Output	
Load	Accuracy figures for infinite load impedance. Additional 0.03 % of span for a load resistance of 10 kΩ
Voltage	0 ... ± 500 mV
Output resistance	≤ 3 Ω
Fault voltage	open collector output: fault output shall be < V_{cc}/2 (when connected to V_{cc} via 10 kΩ pull up resistor)
Fault connection	via Termination Board
Line fault detection	input: ± 700 mV output: ± 1 V
Transfer characteristics	
Bandwidth	DC to > 350 Hz (-3 dB)
Settling time	< 1 ms
Rise time/fall time	< 100 µs
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	BASEEFA 10 ATEX 0031X
Group, category, type of protection	Ex II (1)GD, I (M1), [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	BASEEFA 10 ATEX 0032X
Group, category, type of protection, temperature classification	Ex II 3G Ex nA II T4
UL approval	
Control drawing	116-0317 (cULus)
IECEx approval	IECEx BAS 10.0012X IECEx BAS 10.0013X
Approved for	[zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I Ex nA II T4

Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Voltage input 0 mV ... ± 500 mV**
- **Voltage output 0 mV ... ± 500 mV**
- **Selectable up/downscale burnout detection on Power Rail**
- **Fault output signal**

Function

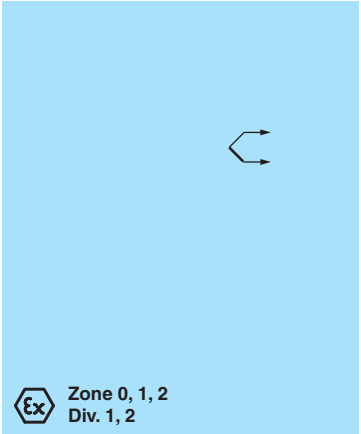
This isolated barrier is used for intrinsic safety applications. It transfers low voltage signals from thermocouples, load cells, strain gauges, operational amplifiers, and inductive oscillation sensors located in hazardous areas to safe areas.

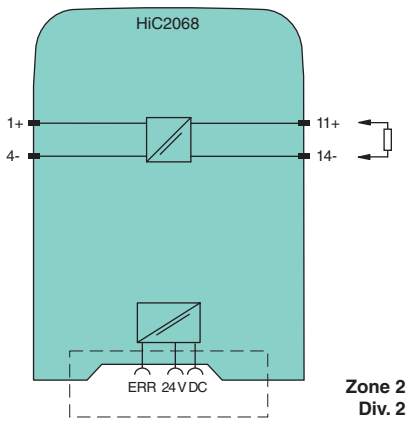
The input voltage of the terminals 1 and 4 is transferred to the terminals 11 and 14.

The input, output, and power supply are galvanically isolated from each other. Upscale or downscale lead breakage monitoring is selectable via switches located on the front panel of the device.

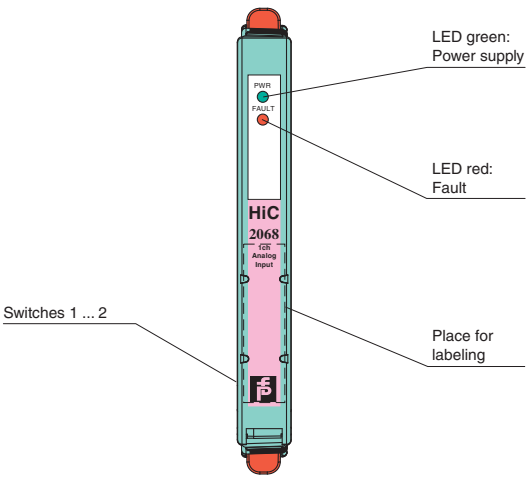
Note: This unit requires three minutes after power-up to reach the accuracy cited in the technical data.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Voltage input 0 V ... -20 V**
- **Vibration sensor inputs**
- **Voltage/current field supply**
- **Voltage output 0 V ... -20 V**

Function

This isolated barrier is used for intrinsic safety applications. It provides a floating output to power a vibration sensor (e. g., Bently Nevada) or accelerometer in a hazardous area and transfers the voltage signal from that sensor to the safe area.

The device is designed to provide a voltage or current supply to the vibration sensor. Depending on connection the barrier provides 3.7 mA, 5.3 mA, or 9.0 mA supply current for 2-wire sensors, or 18 V at 20 mA for 3-wire sensors.

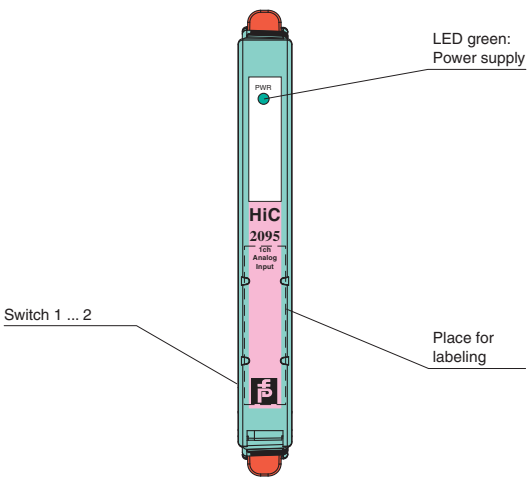
This barrier mounts on a HiC system termination board.

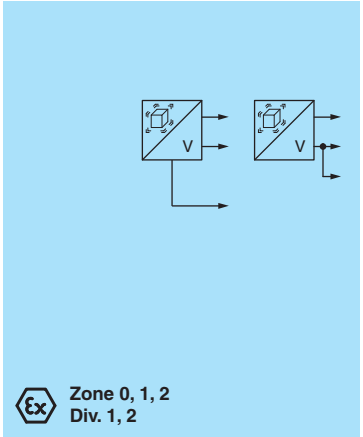
Technical data

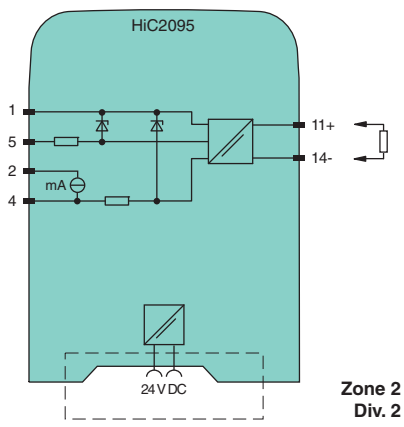
Supply	
Rated voltage	20.4 ... 30 V DC
Power consumption	≤ 1.3 W
Input	
Input resistance	10 kΩ terminals 1 and 5
Output rated operating current	terminals 1 (common), 4: > 10 mA at -21 V or > 20 mA at -18 V terminals 1 (common), 2: 3.7 ± 0.26 mA, 5.3 ± 0.34 mA or 9.0 ± 0.55 mA, dependent on switch settings (see configuration)
Signal span	0 ... -20 V
Output	
Load	≥ 2 kΩ
Voltage	0 ... -20 V
Output resistance	approx. 24 Ω Since this is much less than the end-to-end resistance of a zener barrier, it may be necessary to specify a monitor intended for use without a barrier. Please follow the advice of the monitor manufacturer.
Transfer characteristics	
Deviation	DC transfer error (with 10 kΩ load) < 10mV
Bandwidth	-0.1 dB at 10 kHz; -1 dB at 20 kHz
Time delay relative to input	7.0 ± 0.3 µs
Ripple	in 200 kHz bandwidth < 20 mV_{rms} in 20 kHz bandwidth < 3 mV_{rms}
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 in)
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	pending
Group, category, type of protection	⟨Ex⟩ II (1)GD, I (M1) [Ex ia] IIC, [Ex iaD], [Ex ia] I (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Statement of conformity	pending
Group, category, type of protection, temperature classification	⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	typ. 0.5 W (per channel)
Input	
Input current	0/4 ... 20 mA
Current range	0/4 ... 20 mA, with field selectable DC offset suppression
Voltage range	0/0.2 ... 1 V 0/1 ... 5 V 0/2 ... 10 V
Impedance	current input: 50 Ω (overcurrent protected) with field selectable 5 V level shift voltage input: 100 kΩ/U_{in}
Output	
Current range	0/4 ... 20 mA, source or sink mode
Voltage range	0 ... 5 V/1 ... 5 V (on 250 Ω internal shunt) 0 ... 10 V/2 ... 10 V (on 500 Ω internal shunt)
Ripple	≤ 15 mV_{rms}
Operating range	3 ... 30 V, sink mode
Output compliance	13 V (load 650 Ω at 20 mA), source mode
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (current output)
Influence of temperature	< ± 0.01 %/K of full-scale value
Linearity	< ± 0.1 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-022CS-12B (cCSAus)

Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Current and voltage inputs**
- **Analog current and voltage output**
- **Sink and source mode outputs**
- **SMART pass-through**

Function

This isolated barrier is used for intrinsic safety applications. It accepts current or voltage input signals from a hazardous area and converts them to a proportional, analog value in the safe area.

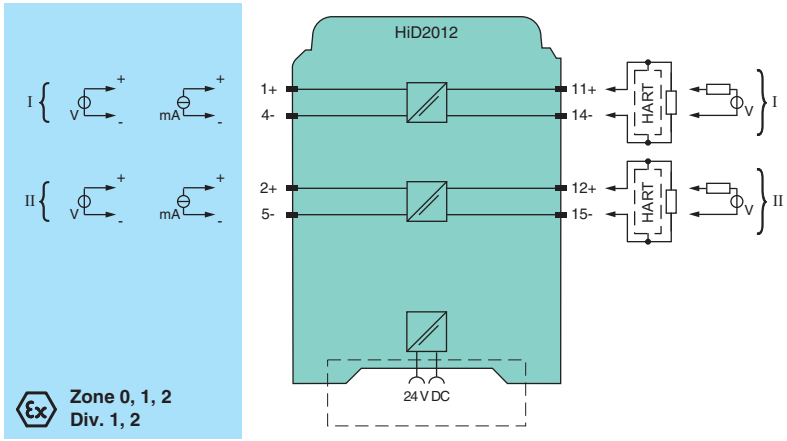
The outputs can be selected as current source, current sink, or voltage source.

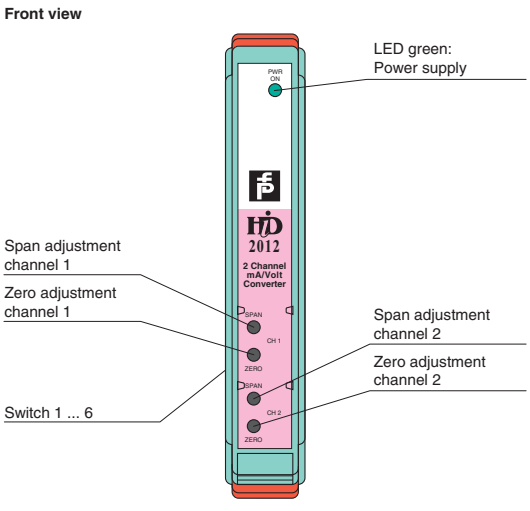
The passive current input configuration supports a pass through for SMART communication signals.

This unit has field programmable zero/span trimmers and input/output configuration by means of DIP switches. This feature allows simple field reconfiguration.

This module mounts on a HiD Termination Board.

Diagrams





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Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Thermocouple or mV inputs**
- **Output 4 mA ... 20 mA**
- **Sensor breakage detection**
- **Simple span and zero selection**

Function

This isolated barrier is used for intrinsic safety applications. It is a temperature converter that accepts thermocouple or mV input signals from a hazardous area and converts them to an isolated analog current signal in the safe area.

Input type, range, and error handling parameters are configurable by DIP switches and potentiometers.

Each module is supplied with a cold junction compensator (CJC), which is mounted on the screw terminals of the Termination Board.

The output is isolated from the input and are referenced to the power supply common.

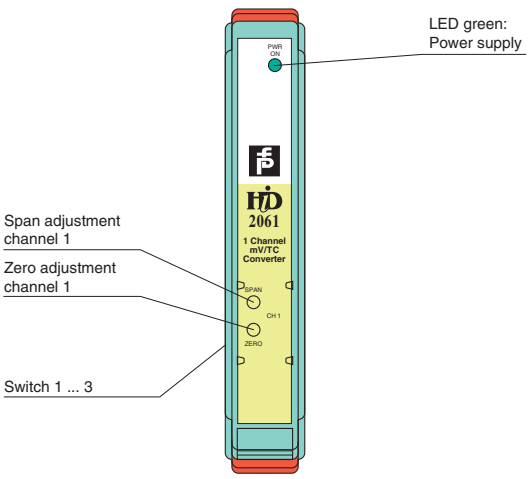
This module mounts on a HiD Termination Board.

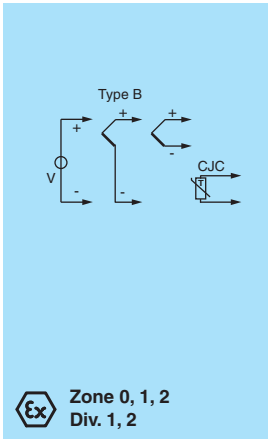
Technical data

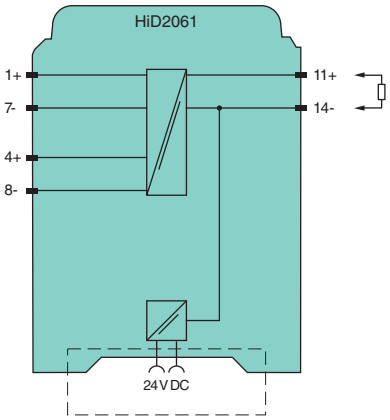
Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	0.6 W at 24 V
Input	
Thermocouples	type B, E, J, K, N, R, S, T (IEC 584-1), type L (GOST)
Cold junction compensation	at field terminals
Measurement range	-10 ... 100 mV
Span	2.6 ... 100 mV
Zero suppression	± 500 % of span
Lead monitoring	burnout 25 mA, upscale or downscale (selectable)
Output	
Load	0 ... 650 Ω
Output signal	4 ... 20 mA or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt)
Ripple	10 mV_{rms} (at load 250 Ω)
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (current output)
Influence of temperature	< ± 0.01 %/K on zero and span
Influence of load	< ± 0.1 % of full-scale value from 0 ... 650 Ω
Rise time/fall time	typ. 150 ms
Linearity	< ± 0.1 % of full-scale value (terminal based mV input to mA output of thermocouples)
Compensation error	± 0.5 K ± 0.05 K deviation from reference of 20 °C (68°F)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	0.6 W at 24 V (per channel)
Input	
Thermocouples	type B, E, J, K, N, R, S, T (IEC 584-1), type L (GOST)
Cold junction compensation	at field terminals
Measurement range	-10 ... 100 mV
Span	2.6 ... 100 mV
Zero suppression	± 500 % of span
Lead monitoring	burnout 25 mA, upscale or downscale (selectable)
Output	
Load	0 ... 650 Ω
Output signal	4 ... 20 mA or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt)
Ripple	10 mV_{rms} (at load 250 Ω)
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (current output)
Influence of temperature	< ± 0.01 %/K on zero and span
Influence of load	< ± 0.1 % of full-scale value from 0 ... 650 Ω
Rise time/fall time	typ. 150 ms
Linearity	< ± 0.1 % of full-scale value (terminal based mV input to mA output of thermocouples)
Compensation error	± 0.5 K ± 0.05 K deviation from reference of 20 °C (68 °F)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Thermocouple or mV inputs**
- **Output 4 mA ... 20 mA**
- **Sensor breakage detection**
- **Simple span and zero selection**

Function

This isolated barrier is used for intrinsic safety applications. It is a temperature converter that accepts thermocouple or mV input signals from a hazardous area and converts them to an isolated analog current signal in the safe area.

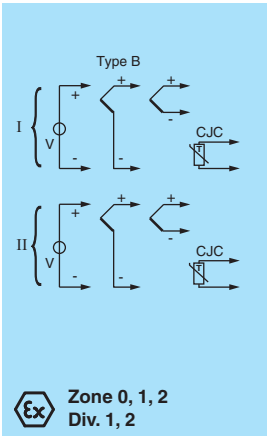
Input type, range, and error handling parameters are configurable by DIP switches and potentiometers.

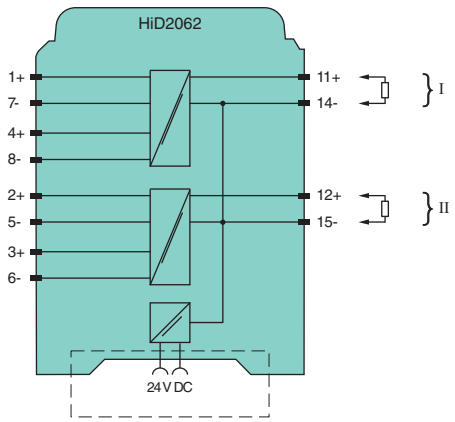
Each module is supplied with a cold junction compensator (CJC), which is mounted on the screw terminals of the Termination Board.

The outputs are isolated from the inputs and are referenced to the power supply common.

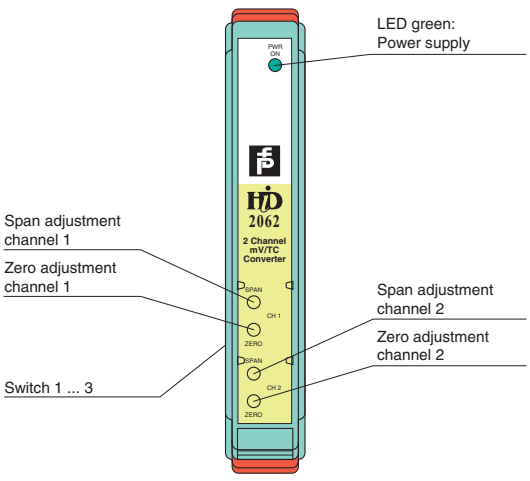
This module mounts on a HiD Termination Board.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **2-, 3-, and 4-wire RTDs or potentiometer**
- **Linearized output 4 mA ... 20 mA**
- **Sensor breakage detection**
- **Simple span and zero selection**

Function

This isolated barrier is used for intrinsic safety applications. It is a temperature converter that accepts input from resistance temperature detectors (RTD) or potentiometers from a hazardous area and converts them to an isolated analog current signal in the safe area.

Input type, range, and error handling parameters are configurable by DIP switches and potentiometers.

The output is isolated from the input and are referenced to the power supply common.

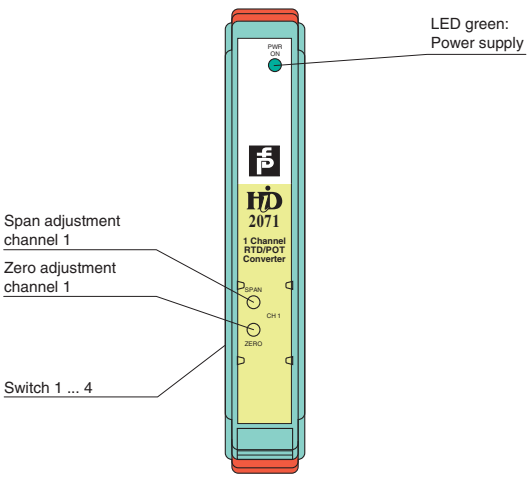
This module mounts on a HiD Termination Board.

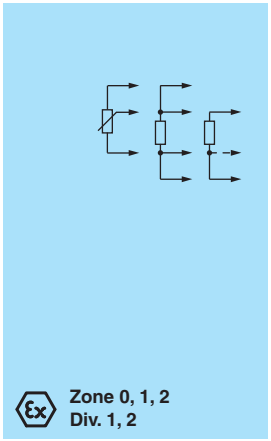
Technical data

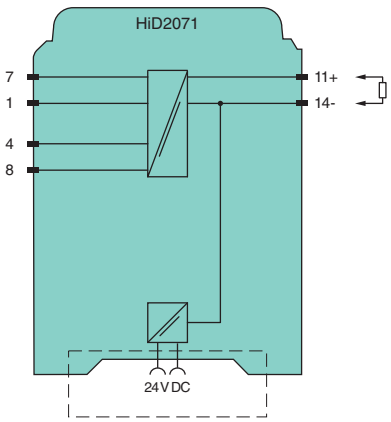
Supply	
Power loss	0.6 W at 24 V
Input	
RTD	2-, 3- or 4-wire Pt100 acc. to DIN 43760
Measuring current	max. 0.4 mA
Measurement range	-200 ... 850 °C (-328 ... 1562 °F)
Span limits	40 ... 850 °C (104 ... 1562 °F)
Zero suppression	± 500 % of span
Potentiometer	3-wire
Measurement range	100 ... 300 Ω or 0.3 ... 100 kΩ with external shunt
Lead monitoring	burnout, upscale or downscale (selectable) (not on potentiometer and 4-wire RTD)
Output	
Load	0 ... 650 Ω
Output signal	4 ... 20 mA or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt) Output signal is linear with temperature for Pt100.
Ripple	10 mV_{rms} (at load 250 Ω)
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (current output)
Influence of temperature	< ± 0.01 %/K on zero and span
Influence of load	< ± 0.1 % of full-scale value from 0 ... 650 Ω
Rise time/fall time	typ. 150 ms
Linearity	< ± 0.1 % of full-scale value (terminal based °C or °F input to mA out for Pt100)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	0.6 W at 24 V (per channel)
Input	
RTD	2-, 3- or 4-wire Pt100 acc. to DIN 43760
Measuring current	max. 0.4 mA
Measurement range	-200 ... 850 °C (-328 ... 1562 °F)
Span limits	40 ... 850 °C (104 ... 1562 °F)
Zero suppression	± 500 % of span
Potentiometer	3-wire
Measurement range	100 ... 300 Ω or 0.3 ... 100 kΩ with external shunt
Lead monitoring	burnout, upscale or downscale (selectable) (not on potentiometer and 4-wire RTD)
Output	
Load	0 ... 650 Ω
Output signal	4 ... 20 mA or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt) Output signal is linear with temperature for Pt100.
Ripple	10 mV_{rms} (at load 250 Ω)
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (current output)
Influence of temperature	< ± 0.01 %/K on zero and span
Influence of load	< ± 0.1 % of full-scale value from 0 ... 650 Ω
Rise time/fall time	typ. 150 ms
Linearity	< ± 0.1 % of full-scale value (terminal based °C or °F input to mA out for Pt100)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **2-, 3-, and 4-wire RTDs or potentiometer**
- **Linearized output 4 mA ... 20 mA**
- **Sensor breakage detection**
- **Simple span and zero selection**

Function

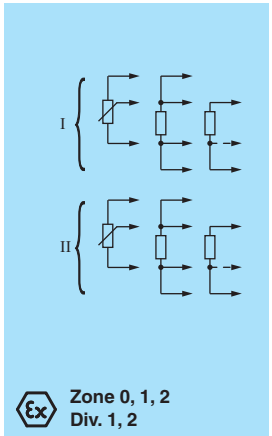
This isolated barrier is used for intrinsic safety applications. It is a temperature converter that accepts inputs from resistance temperature detectors (RTD) or potentiometers from a hazardous area and converts them to an isolated analog current signal in the safe area.

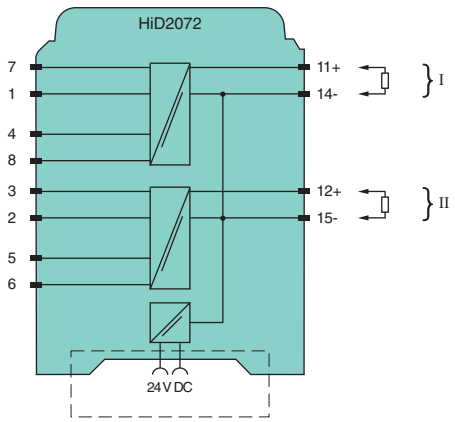
Input type, range, and error handling parameters are configurable by DIP switches and potentiometers.

The outputs are isolated from the inputs and are referenced to the power supply common.

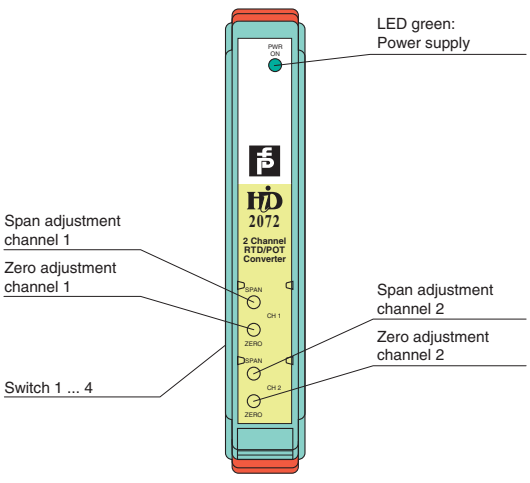
This module mounts on a HiD Termination Board.

Diagrams





Front view



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Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Thermocouple, RTD or potentiometer**
- **Linearized output 4 mA ... 20 mA, sink/source or 1 V ... 5 V**
- **Sensor breakage detection**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications.

This device accepts thermocouples (TC), millivolts, potentiometers, or resistance temperature detectors (RTD) from a hazardous area and converts them to an isolated, linearized analog output in the safe area.

The outputs can be selected as a current source, current sink, or voltage source with DIP switches on the side panel.

Line fault detection of the field circuit is indicated by a red LED and an output on the fault bus. The fault conditions are monitored via a Fault Indication Board.

The device is easily configured by the use of the PACTware configuration software.

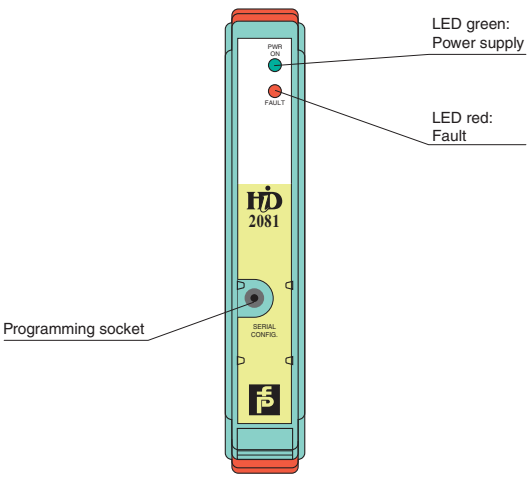
This device mounts on a HiD Termination Board.

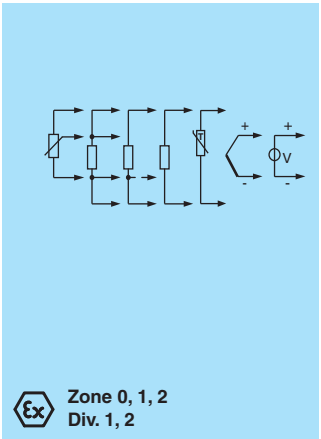
Technical data

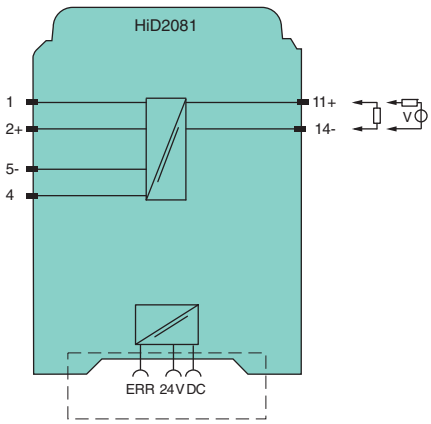
Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	1.2 W
Input	
RTD	type Cu10, Cu50, Cu100, Pt10, Pt50, Pt100, Pt500, Pt1000, Ni100 (EN 60751: 1995) type Pt10GOST, Pt50GOST, Pt100GOST, Pt50GOST, Pt1000GOST (P50353-92)
Measuring current	approx. 200 µA with RTD
Types of measuring	2-, 3-, 4-wire connection
Lead resistance	≤ 50 Ω per lead
Measuring circuit monitoring	sensor burnout, sensor short-circuit
Thermocouples	type B, E, J, K, N, R, S, T (IEC 584-1: 1995) type L (DIN 43710: 1985) type TXK, TXKH, TXA (P8.585-2001)
Cold junction compensation	at field terminals
Measuring circuit monitoring	sensor burnout
Voltage	selectable within the range -100 ... 100 mV
Potentiometer	0.1 ... 20 kΩ
Types of measuring	3-wire connection
Input resistance	≥ 1 MΩ (-100 ... 100 mV)
Output	
Output I, II	analog, current or voltage output
Current range	0/4 ... 20 mA
Fault signal	downscale 0 or 2 mA, upscale 21.5 mA (acc. NAMUR NE43)
Source	load 0 ... 550 Ω, open-circuit voltage ≤ 18 V
Sink	0/4 ... 20 mA (sink mode), working voltage 7 ... 30 V
Voltage range	0 ... 5 V or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ex II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	1.2 W
Input	
RTD	type Cu10, Cu50, Cu100, Pt10, Pt50, Pt100, Pt500, Pt1000, Ni100 (EN 60751: 1995) type Pt10GOST, Pt50GOST, Pt100GOST, Pt50GOST, Pt1000GOST (P50353-92)
Measuring current	approx. 200 µA with RTD
Types of measuring	2-, 3-, 4-wire connection
Lead resistance	≤ 50 Ω per lead
Measuring circuit monitoring	sensor burnout, sensor short-circuit
Thermocouples	type B, E, J, K, N, R, S, T (IEC 584-1: 1995) type L (DIN 43710: 1985) type TXK, TXKH, TXA (P8.585-2001)
Cold junction compensation	at field terminals
Measuring circuit monitoring	sensor burnout
Voltage	selectable within the range -100 ... 100 mV
Potentiometer	0.1 ... 20 kΩ
Types of measuring	3-wire connection
Input resistance	≥ 1 MΩ (-100 ... 100 mV)
Output	
Output I, II	analog, current or voltage output
Current range	0/4 ... 20 mA
Fault signal	downscale 0 or 2 mA, upscale 21.5 mA (acc. NAMUR NE43)
Source	load 0 ... 550 Ω, open-circuit voltage ≤ 18 V
Sink	0/4 ... 20 mA (sink mode), working voltage 7 ... 30 V
Voltage range	0 ... 5 V or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 376 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Thermocouple, RTD or potentiometer**
- **Linearized output 4 mA ... 20 mA, sink/source or 1 V ... 5 V**
- **Sensor breakage detection**
- **Line fault detection (LFD)**

Function

This isolated barrier is used for intrinsic safety applications.

This device accepts thermocouples (TC), millivolts, potentiometers, or resistance temperature detectors (RTD) from a hazardous area and converts them to an isolated, linearized analog output in the safe area.

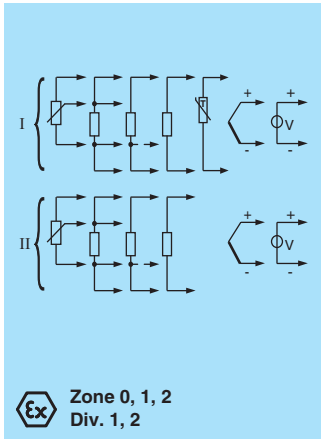
The outputs can be selected as a current source, current sink, or voltage source with DIP switches on the side panel.

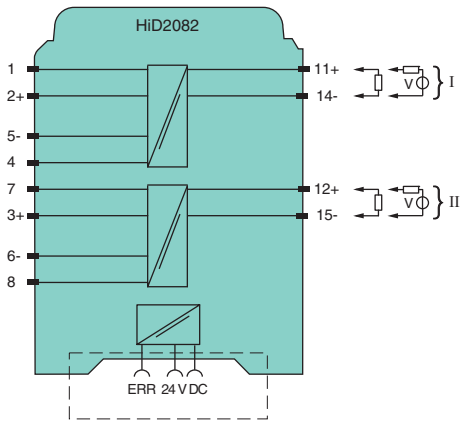
Line fault detection of the field circuit is indicated by a red LED and an output on the fault bus. The fault conditions are monitored via a Fault Indication Board.

The device is easily configured by the use of the PACTware configuration software.

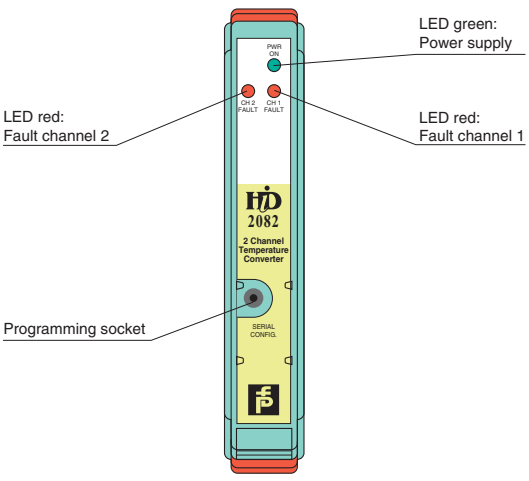
This device mounts on a HiD Termination Board.

Diagrams





Front view



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ATEX Entity Parameters

Model Number	Terminals	U_o (V)	I_o (mA)	P_o (mW)
HiC2025	1, 4 1, 5	25.2 7.2	100 100	630 25
HiC2065	1, 4	5.5	2.4	3.3
HiC2068	1, 4	5.5	2.4	3.3
HiD2012	1, 4; 2, 5	1.7	45	20
HiD2024	1, 4; 2, 5; 3, 6; 7, 8	25.2	93	586
HiD2025	1, 4	26	93	605
HiD2026	1, 4; 2, 5	26	93	605
HiD2025SK	1, 4	26	93	605
HiD2026SK	1, 4; 2, 5	26	93	605
HiD2029	1, 4 4, 7	26 1.2	93 50	605 15
HiD2030	1, 4; 2, 5 4, 7; 5, 6	26 1.2	93 50	605 15
HiD2029SK	1, 4 4, 7	26 1.2	93 50	605 15
HiD2030SK	1, 4; 2, 5 4, 7; 5, 6	26 1.2	93 50	605 15
HiD2035	1, 4	26	93	605
HiD2036	1, 4; 2, 5	26	93	605
HiD2061	1, 4; 7, 8	13.2	20	66
HiD2062	1, 4, 7, 8; 2, 5, 3, 6	13.2	20	66
HiD2071	1, 4; 7, 8	13.2	20	66
HiD2072	1, 4, 7, 8; 2, 5, 3, 6	13.2	20	66
HiD2081	1, 2; 4, 5	10	15	38
HiD2082	1, 4; 2, 5; 3, 6; 7, 8	10	15	38

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CSA Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)
HiD2012	1, 4; 2, 5	1.7	45
HiD2025	1, 4	26	93
HiD2026	1, 4; 2, 5	26	93
HiD2025SK	1, 4	26	93
HiD2026SK	1, 4; 2, 5	26	93
HiD2029	1, 4	26	93
	4, 7	1.2	50
	1, 4, 7	27.2	143
HiD2030	1, 4; 2, 5	26	93
	4, 7; 5, 6	1.2	50
	1, 4, 7; 2, 5, 6	27.2	143
HiD2029SK	1, 4	26	93
	4, 7	1.2	50
	1, 4, 7	27.2	143
HiD2030SK	1, 4; 2, 5	26	93
	4, 7; 5, 6	1.2	50
	1, 4, 7; 2, 5, 6	27.2	143
HiD2035	1, 4	26	93
HiD2036	1, 4; 2, 5	26	93
HiD2061	1, 4; 7, 8	13.2	20
HiD2062	1, 4, 7, 8; 2, 5, 3, 6	13.2	20
HiD2071	1, 4; 7, 8	13.2	20
HiD2072	1, 4, 7, 8; 2, 5, 3, 6	13.2	20
HiD2081	1, 2; 5, 4	10	15
HiD2082	1, 4; 2, 5; 3, 6; 7, 8	10	15

FM Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
HiC2025	1, 4	25.2	100	–	–
	1, 5	7.2	100	–	–

UL Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
HiC2065	1, 4	5.5	2.4	–	–
HiC2068	1, 4	5.5	2.4	–	–

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Current Drivers

Model Number	Housing		Channels	Input (Control System)		Output (Field)			SMART	Supply		SIL	Zone 2/Division 2 Mounting	Page
	HiC	HiD		0/4 mA ... 20 mA	1.5 mA ... 50 mA	0/4 mA ... 20 mA	1.5 mA ... 50 mA	Line Fault Detection		24 V DC (Bus Powered)	24 V DC (Loop Powered)			
HiC2031	■		1	■		■		■	■	■		2	■	380
HiD2031		■	1	■		■		■		■				381
HiD2032		■	2	■		■		■		■				382
HiD2033		■	1	■		■		■			■	2		383
HiD2034		■	2	■		■		■			■	2		384
HiD2035		■	1		■		■				■			385
HiD2036		■	2		■		■				■			386
HiD2037		■	1	■		■		■	■	■		2		387
HiD2038		■	2	■		■		■	■	■		2		388
HiD2038Y		■	2	■		■		■	■	■		2		389

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Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Current output up to 650 Ω load**
- **Low power dissipation**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It repeats a 4 mA ... 20 mA input signal from a control system to drive HART I/P converters, valve actuators, and displays located in a hazardous area.

Digital signals may be superimposed on the analog values in the hazardous or safe area, which are transferred bi-directionally.

An open field circuit presents a high impedance to the control side to allow alarm conditions to be monitored by control systems.

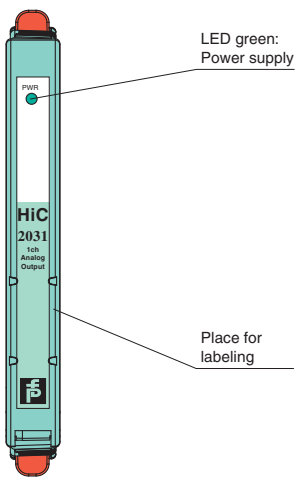
This module mounts on a HiC Termination Board.

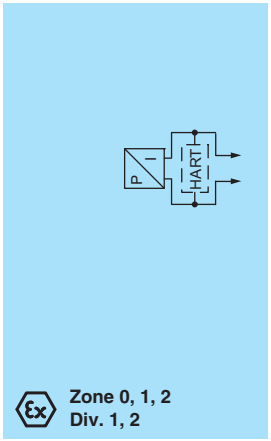
Technical data

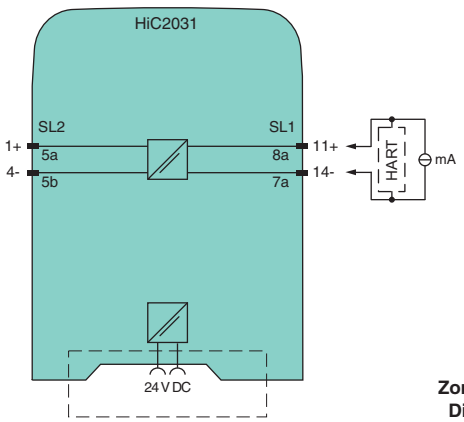
Supply	
Rated voltage	19 ... 30 V DC via Termination Board
Power loss	≤ 600 mW
Power consumption	≤ 700 mW
Input	
Input signal	4 ... 20 mA limited to approx. 30 mA
Voltage drop U_d	approx. 6 V or internal resistance 300 Ω at 20 mA
Input resistance	> 100 kΩ at max. 23 V, with field wiring open
Output	
Current	4 ... 20 mA
Load	0 ... 650 Ω
Voltage	≥ 13 V at 20 mA
Ripple	20 mV_{rms}
Transfer characteristics	
Deviation	at 20 °C (68 °F), 0/4 ... 20 mA ≤ ± 0.1 % incl. non-linearity and hysteresis
Influence of ambient temperature	< 2 µA/K (0 ... 60 °C (32 ... 140 °F)); < 4 µA/K (-20 ... 0 °C (-4 ... 32 °F))
Frequency range	hazardous area into the safe area: bandwidth with 0.5 V_{pp} 0 ... 3 kHz (-3 dB) safe area into the hazardous area: bandwidth with 0.5 V_{pp} 0 ... 3 kHz (-3 dB)
Rise time	10 to 90 % ≤ 100 ms
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 100 g
Dimensions	12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 in)
Data for application in connection with Ex-areas	see page 390 for entity parameters
EC-Type Examination Certificate	CESI 06 ATEX 017
Group, category, type of protection	Ⓔx II (1)GD [EEx ia] IIC, [Ex ia D] [circuit(s) in zone 0/1/2/20/21/22]
Statement of conformity	Pepperl+Fuchs
Group, category, type of protection, temperature classification	Ⓔx II 3G Ex nA II T4 X
FM approval	
Control drawing	16-534FM-12 (cFMus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	0.75 W at 24 V
Input	
Input current	4 ... 20 mA, reverse polarity protected
Signal level	input voltage drop < 4 V with field wiring intact input current < 1.2 mA with field wiring open
Output	
Rated current	4 ... 20 mA on a load of max. 750 Ω
Load	0 ... 750 Ω
Output signal	4 ... 20 mA
Ripple	15 mV_{rms}
Response time	50 ms, 10 ... 90 % step change
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value
Influence of temperature	< ± 0.01 %/K
Influence of load	< ± 0.1 % of full-scale value from 0 ... 750 Ω
Linearity	< ± 0.1 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 390 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Current output up to 750 Ω load**
- **Low power dissipation**

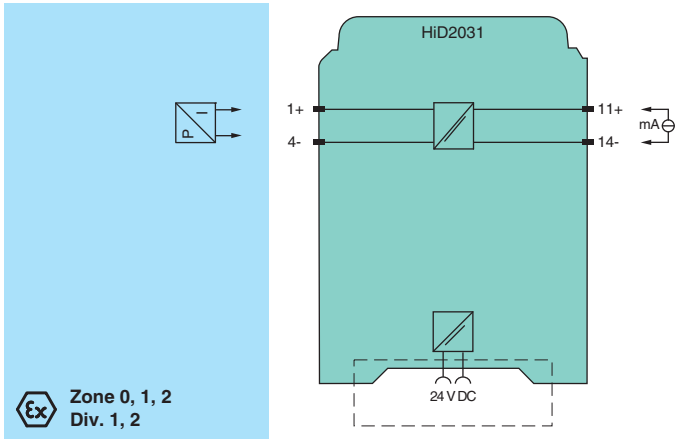
Function

This isolated barrier is used for intrinsic safety applications. It repeats a 4 mA ... 20 mA input signal from a control system to drive I/P converters, valve actuators, and displays located in a hazardous area.

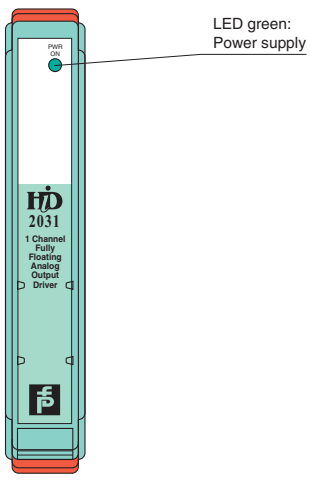
An open field circuit presents a high impedance to the control side to allow alarm conditions to be monitored by control systems.

This module mounts on a HiD Termination Board.

Diagrams



Front view



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Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Current output up to 750 Ω load**
- **Low power dissipation**

Function

This isolated barrier is used for intrinsic safety applications. It repeats a 4 mA ... 20 mA input signal from a control system to drive I/P converters, valve actuators, and displays located in a hazardous area.

An open field circuit presents a high impedance to the control side to allow alarm conditions to be monitored by control systems.

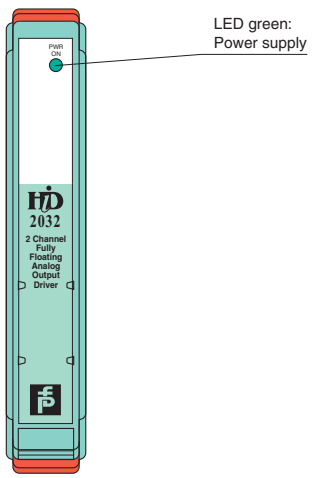
This module mounts on a HiD Termination Board.

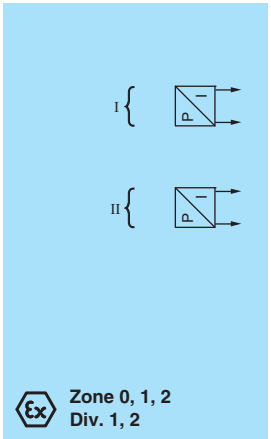
Technical data

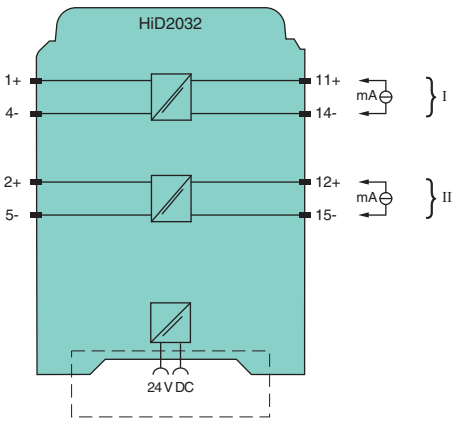
Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	0.75 W at 24 V (per channel)
Input	
Input current	4 ... 20 mA, reverse polarity protected
Signal level	input voltage drop < 4 V with field wiring intact input current < 1.2 mA with field wiring open
Output	
Rated current	4 ... 20 mA on a load of max. 750 Ω
Load	0 ... 750 Ω
Output signal	4 ... 20 mA
Ripple	15 mV_{rms}
Response time	50 ms, 10 ... 90 % step change
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value
Influence of temperature	< ± 0.01 %/K
Influence of load	< ± 0.1 % of full-scale value from 0 ... 750 Ω
Linearity	< ± 0.1 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 390 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ⓔx II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	7 ... 30 V, loop powered, reverse polarity protected
Power loss	0.14 W at 20 mA
Input	
Input current	4 ... 20 mA, loop powered open circuit consumption < 0.8 mA at 24 V
Signal level	voltage drop 7 V at 20 mA and 500 Ω load
Output	
Rated current	4 ... 20 mA on a load of max. 500 Ω
Load	0 ... 500 Ω
Output signal	4 ... 20 mA
Ripple	≤ 40 µA peak to peak
Response time	50 ms, 10 ... 90 % step change
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value
Influence of temperature	< ± 0.01 %/K
Influence of load	< ± 0.2 % of full-scale value from 0 ... 500 Ω
Linearity	< ± 0.1 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 390 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current output up to 500 Ω load**
- **Low voltage drop**
- **Up to SIL2 acc. to IEC 61508**

Function

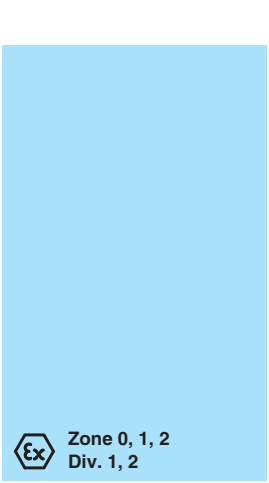
This isolated barrier is used for intrinsic safety applications. It repeats a 4 mA ... 20 mA input signal from a control system to drive I/P converters, valve actuators, and displays located in a hazardous area.

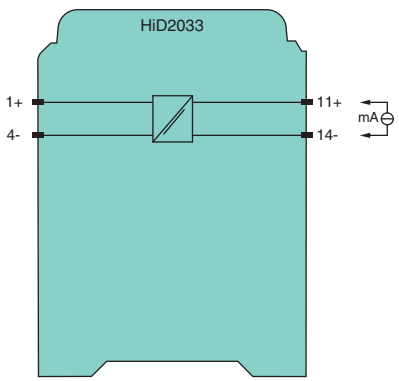
The barrier is loop powered with a low voltage drop and permits detection of line faults by the control system.

An open field circuit presents a high impedance to the control side to allow alarm conditions to be monitored by control systems.

This module mounts on a HiD Termination Board.

Diagrams





Front view

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Features

- **2-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current output up to 500 Ω load**
- **Low voltage drop**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It repeats a 4 mA ... 20 mA input signal from a control system to drive I/P converters, valve actuators, and displays located in a hazardous area.

The barrier is loop powered with a low voltage drop and permits detection of line faults by the control system.

An open field circuit presents a high impedance to the control side to allow alarm conditions to be monitored by control systems.

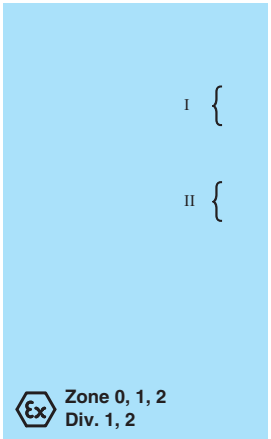
This module mounts on a HiD Termination Board.

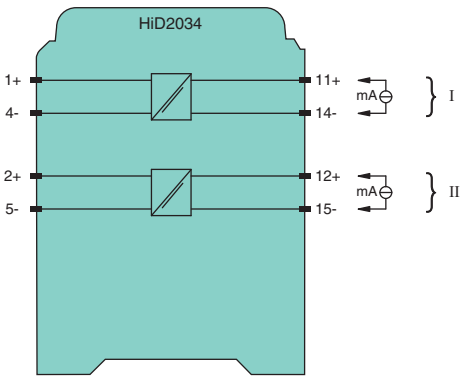
Technical data

Supply	
Rated voltage	7 ... 30 V, loop powered, reverse polarity protected
Power loss	0.14 W at 20 mA (per channel)
Input	
Input current	4 ... 20 mA, loop powered open circuit consumption < 0.8 mA at 24 V
Signal level	voltage drop 7 V at 20 mA and 500 Ω load
Output	
Rated current	4 ... 20 mA on a load of max. 500 Ω
Load	0 ... 500 Ω
Output signal	4 ... 20 mA
Ripple	≤ 40 µA peak to peak
Response time	50 ms, 10 ... 90 % step change
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value
Influence of temperature	< ± 0.01 %/K
Influence of load	< ± 0.2 % of full-scale value from 0 ... 500 Ω
Linearity	< ± 0.1 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 390 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ⓔx II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view





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Technical data

Supply	
Rated voltage	6 ... 30 V, loop powered, reverse polarity protected
Power loss	0.7 W at 40 mA, 24 V
Safe circuit	
Current consumption	< 0.6 mA at 24 V and open circuit
Current	1.5 ... 50 mA, loop powered
Signal level	voltage drop 9.6 V at 20 mA and 500 Ω load (4 V at 4 mA)
Field circuit	
Characteristics	for fire and smoke detectors $U_{out} = (U_{in} - 1.6) - (0.4 \times I_{out})$ 6 V < U_{in} < 25 V $U_{out} = (25 - 1.6) - (0.4 \times I_{out})$ 25 V < U_{in} < 30 V
Load	0 ... 750 Ω for I/P applications
Signal	1.5 ... 50 mA for fire and smoke detectors 4 ... 20 mA on a load of max. 750 Ω for I/P applications
Ripple	≤ 150 µA peak to peak for I/P applications
Response time	50 ms, 10 ... 90 % step change for I/P applications
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (range 4 ... 20 mA)
Influence of temperature	< ± 0.01 %/K
Repeat accuracy	< ± 300 µA, 6 V < U_{in} < 25 V/1.5 mA < I_{out} < 50 mA
Influence of load	< ± 0.3 % of full-scale value from 0 ... 750 Ω
Linearity	< ± 0.1 % of full-scale value (range 4 ... 20 mA)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 390 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 1.5 mA ... 50 mA**
- **Fire detector or I/P supply**
- **Accuracy 0.1 %**

Function

This isolated barrier is used for intrinsic safety applications.

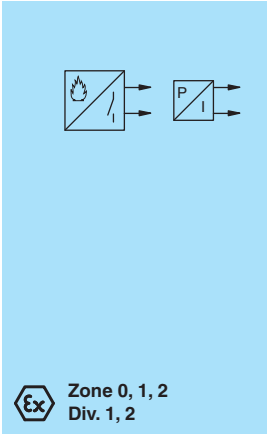
It is loop-powered and is primarily intended to interface with fire and smoke detectors or with similar switched resistor systems requiring a wide output current range (1.5 mA ... 50 mA) to operate correctly.

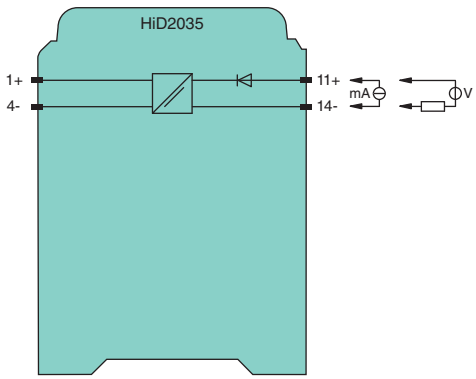
It is also used to drive a current to I/P converter.

Reverse polarity protection prevents damage to the isolator caused by faulty wiring.

This module mounts on a HiD Termination Board.

Diagrams





Front view

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Features

- **2-channel isolated barrier**
- **24 V DC supply (loop powered)**
- **Current input/output 1.5 mA ... 50 mA**
- **Fire detector or I/P supply**
- **Accuracy 0.1 %**

Function

This isolated barrier is used for intrinsic safety applications.

It is loop-powered and is primarily intended to interface with fire and smoke detectors or with similar switched resistor systems requiring a wide output current range (1.5 mA ... 50 mA) to operate correctly.

It is also used to drive a current to I/P converter.

Reverse polarity protection prevents damage to the isolator caused by faulty wiring.

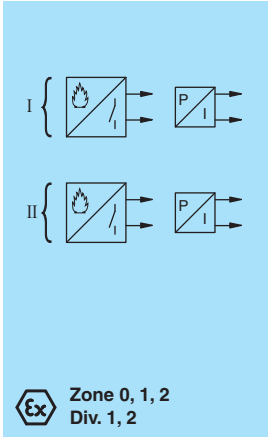
This module mounts on a HiD Termination Board.

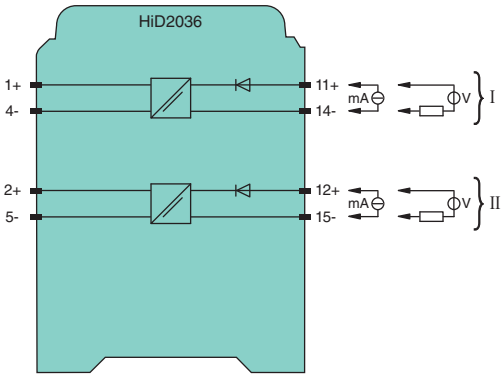
Technical data

Supply	
Rated voltage	6 ... 30 V, loop powered, reverse polarity protected
Power loss	0.7 W at 40 mA, 24 V (per channel)
Safe circuit	
Current consumption	< 0.6 mA at 24 V and open circuit
Current	1.5 ... 50 mA, loop powered
Signal level	voltage drop 9.6 V at 20 mA and 500 Ω load (4 V at 4 mA)
Field circuit	
Characteristics	for fire and smoke detectors $U_{out} = (U_{in} - 1.6) - (0.4 \times I_{out})$ 6 V < U_{in} < 25 V $U_{out} = (25 - 1.6) - (0.4 \times I_{out})$ 25 V < U_{in} < 30 V
Load	0 ... 750 Ω for I/P applications
Signal	1.5 ... 50 mA for fire and smoke detectors 4 ... 20 mA on a load of max. 750 Ω for I/P applications
Ripple	≤ 150 µA peak to peak for I/P applications
Response time	50 ms, 10 ... 90 % step change for I/P applications
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value (range 4 ... 20 mA)
Influence of temperature	< ± 0.01 %/K
Repeat accuracy	< ± 300 µA, 6 V < U_{in} < 25 V/1.5 mA < I_{out} < 50 mA
Influence of load	< ± 0.3 % of full-scale value from 0 ... 750 Ω
Linearity	< ± 0.1 % of full-scale value (range 4 ... 20 mA)
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 390 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ex II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view





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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	0.85 W at 24 V
Input	
Input current	4 ... 20 mA, reverse polarity protected
Signal level	input voltage drop < 4 V with field wiring intact input current < 1.2 mA with field wiring open
Output	
Load	0 ... 750 Ω
Output signal	4 ... 20 mA
Ripple	15 mV_{rms}
Response time	50 ms, 10 ... 90 % step change
Line fault detection	breakage, load > 100 kΩ, short-circuit, load < 70 Ω
Error message output	
Output type	open collector transistor
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value
Influence of temperature	< ± 0.01 %/K
Frequency range	0.5 ... 40 kHz within 3 db, (-6 db at 100 kHz) for use with SMART positioners using HART protocol
Influence of load	< ± 0.1 % of full-scale value from 0 ... 750 Ω
Linearity	< ± 0.1 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 390 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **1-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Current output up to 750 Ω load**
- **SMART I/P and valve positioners**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It repeats a 4 mA ... 20 mA input signal from a control system to drive SMART I/P converters, valve actuators, and displays located in a hazardous area.

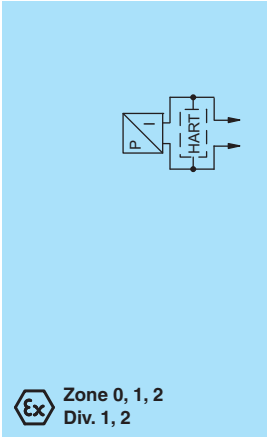
Digital signals may be superimposed on the analog values in the hazardous or safe area, which are transferred bi-directionally.

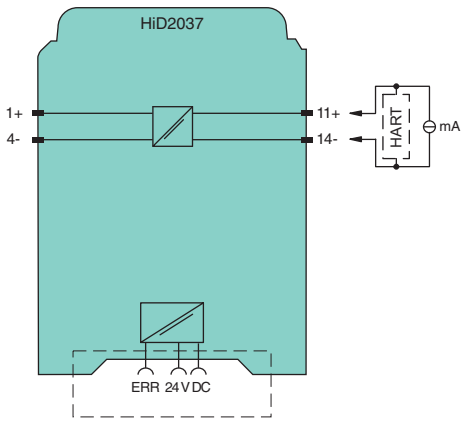
An open field circuit presents a high impedance to the control side to allow alarm conditions to be monitored by control systems.

Line fault detection of the field circuit is indicated by a red LED and an output on the fault bus. The fault conditions can be monitored via a Fault Indication Board.

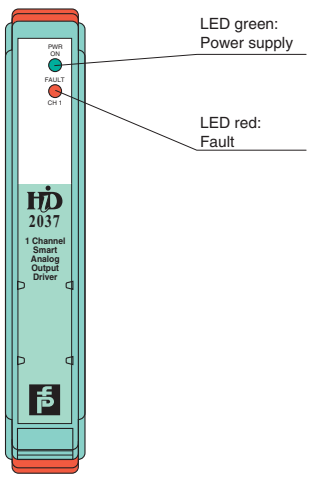
This module mounts on a HiD Termination Board.

Diagrams





Front view



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Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Current output up to 750 Ω load**
- **SMART I/P and valve positioners**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It repeats a 4 mA ... 20 mA input signal from a control system to drive SMART I/P converters, valve actuators, and displays located in a hazardous area.

Digital signals may be superimposed on the analog values in the hazardous or safe area, which are transferred bi-directionally.

An open field circuit presents a high impedance to the control side to allow alarm conditions to be monitored by control systems.

Line fault detection of the field circuit is indicated by a red LED and an output on the fault bus. The fault conditions can be monitored via a Fault Indication Board.

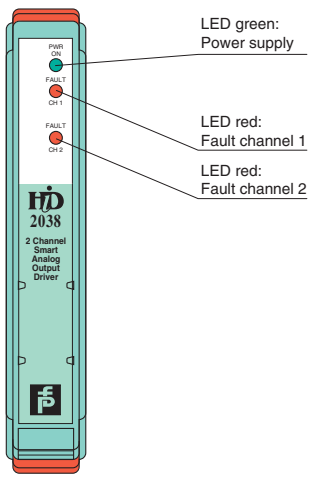
This module mounts on a HiD Termination Board.

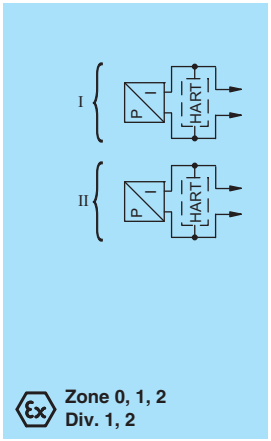
Technical data

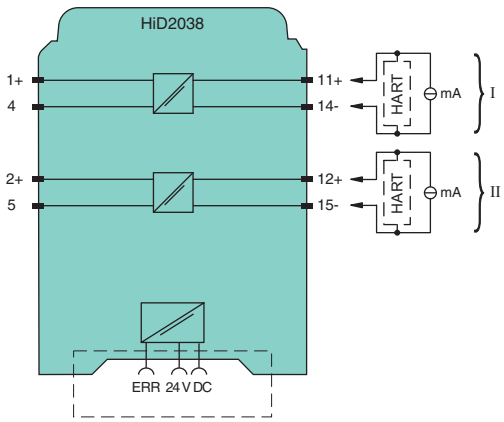
Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	0.85 W at 24 V (per channel)
Input	
Input current	4 ... 20 mA, reverse polarity protected
Signal level	input voltage drop < 4 V with field wiring intact input current < 1.2 mA with field wiring open
Output	
Load	0 ... 750 Ω
Output signal	4 ... 20 mA
Ripple	15 mV_{rms}
Response time	50 ms, 10 ... 90 % step change
Line fault detection	breakage, load > 100 kΩ, short-circuit, load < 70 Ω
Error message output	
Output type	open collector transistor (common to both channels)
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value
Influence of temperature	< ± 0.01 %/K
Frequency range	0.5 ... 40 kHz within 3 db, (-6 db at 100 kHz) for use with SMART positioners using HART protocol
Influence of load	< ± 0.1 % of full-scale value from 0 ... 750 Ω
Linearity	< ± 0.1 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 390 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	Ⓔx II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Diagrams

Front view







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Technical data

Supply	
Rated voltage	20.4 ... 30 V via Termination Board
Power loss	0.85 W at 24 V (per channel)
Input	
Input current	4 ... 20 mA, reverse polarity protected
Signal level	input voltage drop < 4 V with field wiring intact input current < 0.6 mA (47 kΩ) with field wiring open
Output	
Load	0 ... 750 Ω
Output signal	4 ... 20 mA
Ripple	15 mV_{rms}
Response time	50 ms, 10 ... 90 % step change
Line fault detection	breakage, load > 100 kΩ
Transfer characteristics	
Calibrated accuracy	< ± 0.1 % of full-scale value
Influence of temperature	< ± 0.01 %/K
Frequency range	0.5 ... 40 kHz within 3 db, (-6 db at 100 kHz) for use with SMART positioners using HART protocol
Influence of load	< ± 0.1 % of full-scale value from 0 ... 750 Ω
Linearity	< ± 0.1 % of full-scale value
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)
Data for application in connection with Ex-areas	see page 390 for entity parameters
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]
CSA approval	
Control drawing	366-005CS-12B (cCSAus)

Features

- **2-channel isolated barrier**
- **24 V DC supply (bus powered)**
- **Current output up to 750 Ω load**
- **SMART I/P and valve positioners**
- **Suitable for Yokogawa DCS system**
- **Line fault detection (LFD)**
- **Up to SIL2 acc. to IEC 61508**

Function

This isolated barrier is used for intrinsic safety applications. It repeats a 4 mA ... 20 mA input signal from a control system to drive SMART I/P converters, valve actuators, and displays located in a hazardous area.

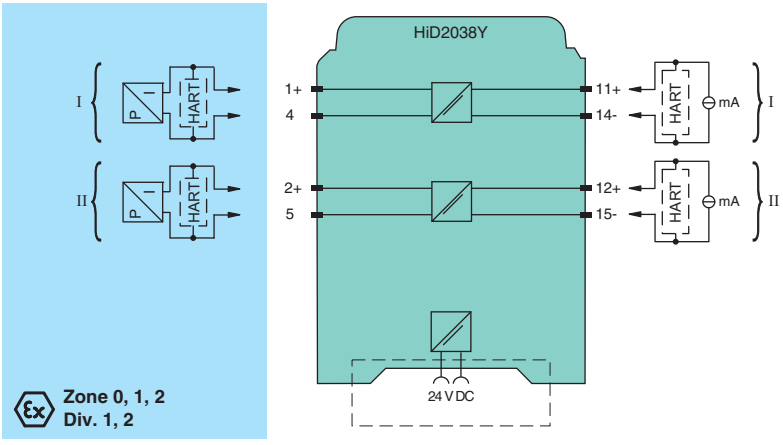
Digital signals may be superimposed on the analog values in the hazardous or safe area, which are transferred bi-directionally.

An open field circuit presents a high impedance to the control side to allow alarm conditions to be monitored by control systems.

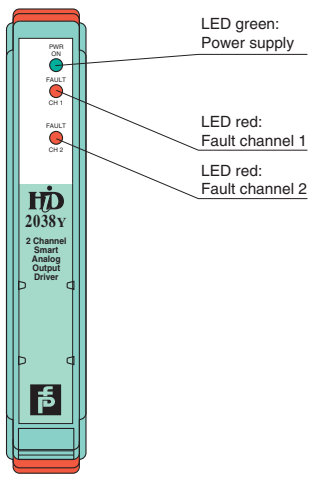
Line fault detection of the field circuit is indicated by a red LED.

This module mounts on a HiD Termination Board.

Diagrams



Front view



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ATEX Entity Parameters

Model Number	Terminals	U_o (V)	I_o (mA)	P_o (mW)
HiC2031	1, 4	25.2	100	630
HiD2031	1, 4	26	93	605
HiD2032	1, 4; 2, 5	26	93	605
HiD2033	1, 4	26	93	605
HiD2034	1, 4; 2, 5	26	93	605
HiD2035	1, 4	26	93	605
HiD2036	1, 4; 2, 5	26	93	605
HiD2037	1, 4	26	93	605
HiD2038	1, 4; 2, 5	26	93	605
HiD2038Y	1, 4; 2, 5	26	93	605

CSA Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)
HiD2031	1, 4	26	93
HiD2032	1, 4; 2, 5	26	93
HiD2033	1, 4	26	93
HiD2034	1, 4; 2, 5	26	93
HiD2035	1, 4	26	93
HiD2036	1, 4; 2, 5	26	93
HiD2037	1, 4	26	93
HiD2038	1, 4; 2, 5	26	93
HiD2038Y	1, 4; 2, 5	26	93

FM Entity Parameters

Model Number	Terminals	V_{oc} (V)	I_{sc} (mA)	V_t (V)	I_t (mA)
HiC2031	1, 4	25.2	100	–	–

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Termination Boards

Model Number	Housing		Modules per Board	Connections			Channels per Module				Supply 24 V DC	Line Fault Detection	Zone 2/Division 2 Mounting	Page
				Control System		Field								
	HiC	HiD		Screw Terminal	Sub-D (37-pin)	Screw Terminal	1 ... 2 Channels	1 ... 4 Channels	4 Channel HART	HART Communication Channels				
HiCTB08-UNI-SC-SC	■		8	■		■	■			1	■	■	■	392
HiCTB16-UNI-SC-SC	■		16	■		■	■			1	■	■	■	393
HiCTB08-UNI-SD37-SC	■		8		■	■	■			1	■	■	■	394
HiCTB16-UNI-SD37-SC	■		16		■	■	■			1	■	■	■	395
HiCTB16-UNI-SD37R-SC	■		16		■	■	■			1	■	■	■	396
HiDTB08-UNI-SC-SC		■	8	■		■		■		2	■	■	■	397
HiDTB16-UNI-SC-SC		■	16	■		■		■		2	■	■	■	398
HiDTB08-UNI-DA16-SD37-SC		■	8		■	■		■		2	■	■	■	399
HiDTB08-UNI-DA32-SD37-SC		■	8		■	■			■	4	■	■	■	400
HiDTB16-UNI-DA32-SD37-SC		■	16		■	■		■		2	■	■	■	401
HiDTB16-UNI-DA64-SD37-SC		■	16		■	■			■	4	■	■	■	402

Model Number	Accessory for		Channels	Supply 24 V DC	Zone 2/Division 2 Mounting	Page
	HiCTB...	HiDTB...				
HiATB01-FAULT-01	■	■	1	■	■	403
HiATB01-HART-2X16	■	■	32	■	■	404
HiATB01-HART-4X8	■	■	32	■	■	405

Accessories

Model Number	Description	Page
HiC2000 Blank	Place Holder Barrier, HiC Module	406
HiD2000 Blank	Place Holder Barrier, HiD Module	407
HiALC-HiCTB-SET-108	Label Carrier	408
HiALC-HiDTB-SET-150	Label Carrier	408
HiACA-UNI-FLK34-FLK34-0M5	HART Interface Cable	408
HiACA-UNI-FLK34-FLK34-2M0	HART Interface Cable	408
HiACA-UNI-FLK34-FLK34-3M0	HART Interface Cable	408
HiACA-UNI-FLK34-FLK34-6M0	HART Interface Cable	408

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Features

- **8 plug-in positions**
- **24 V DC supply**
- **Universal use**
- **Hazardous area: screw terminals, blue**
- **Safe area: screw terminals**

Function

This Termination Board has 8 plug-in slots. Any HiC module can be inserted into any slot, enabling a mixture of I/O types on one Termination Board.

The Termination Board features fixed screw terminals for both the hazardous and safe areas along with a plug-in HART connector for interconnection to a separate HART Communication Board.

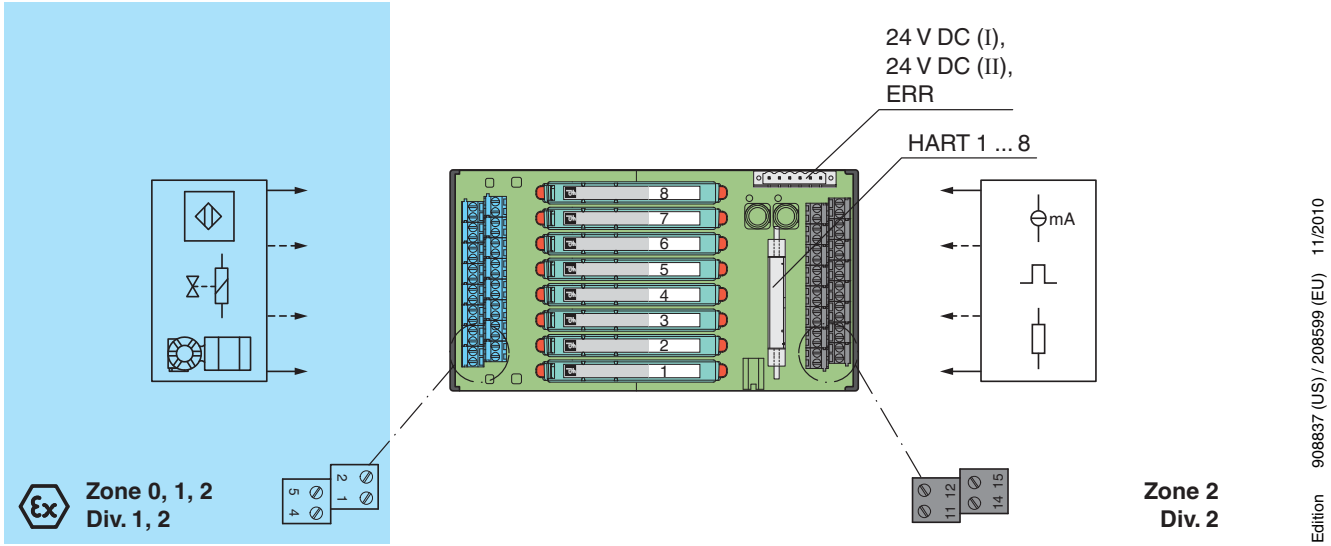
The Termination Board has a fault bus that is available at the redundant power supply terminals. The fault bus can be daisy chained and monitored by the optional Fault Indication Board. The fault bus signals are then available to the control system as a potential-free contact.

Termination Boards are supplied with a rugged fiberglass reinforced plastic housing. This design permits a fast and reliable installation in the marshalling cabinet.

Technical data

Supply	
Rated voltage	24 V DC, in consideration of rated voltage of used isolated barriers
Voltage drop	0.9 V, voltage drop across the series diode on the Termination Board must be considered
Ripple	≤ 10 %
Fusing	2 A, in each case for 8 modules
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Redundancy	
Supply	Redundancy available. The supply for the modules is decoupled, monitored and fused.
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	connection hazardous area (field side): screw terminals, blue connection safe area (process side): screw terminals
Mass	approx. 420 g
Dimensions	108 x 200 x 163 mm (4.25 x 7.9 x 6.42 in), height including module assembly
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	CESI 06 ATEX 022
Group, category, type of protection	⟨Ex⟩ II (1) GD [Ex ia] IIC; [Ex iaD] 20 ⟨Ex⟩ I (M1) [Ex ia] I
Accessories	
Designation	optional accessories: - Fault Indication Board HiATB01-FAULT-01 - HART Communication Board HiATB01-HART-4X8 - HART Multiplexer Master HiDMux2700 - HART connection cable HiACA-... - Label Carrier HiALC-...

Diagrams



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Technical data

Supply	
Rated voltage	24 V DC, in consideration of rated voltage of used isolated barriers
Voltage drop	0.9 V, voltage drop across the series diode on the Termination Board must be considered
Ripple	≤ 10 %
Fusing	4 A, in each case for 16 modules
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Redundancy	
Supply	Redundancy available. The supply for the modules is decoupled, monitored and fused.
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	connection hazardous area (field side): screw terminals, blue connection safe area (process side): screw terminals
Mass	approx. 840 g
Dimensions	216 x 200 x 163 mm (8.5 x 7.9 x 6.42 in), height including module assembly
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	CESI 06 ATEX 022
Group, category, type of protection	⟨Ex⟩ II (1) GD [Ex ia] IIC; [Ex iaD] 20 ⟨Ex⟩ I (M1) [Ex ia] I
Accessories	
Designation	optional accessories: - Fault Indication Board HiATB01-FAULT-01 - HART Communication Board HiATB01-HART-2X16 - HART Multiplexer Master HiDMux2700 - HART connection cable HiACA-... - Label Carrier HiALC-...

Features

- **16 plug-in positions**
- **24 V DC supply**
- **Universal use**
- **Hazardous area: screw terminals, blue**
- **Safe area: screw terminals**

Function

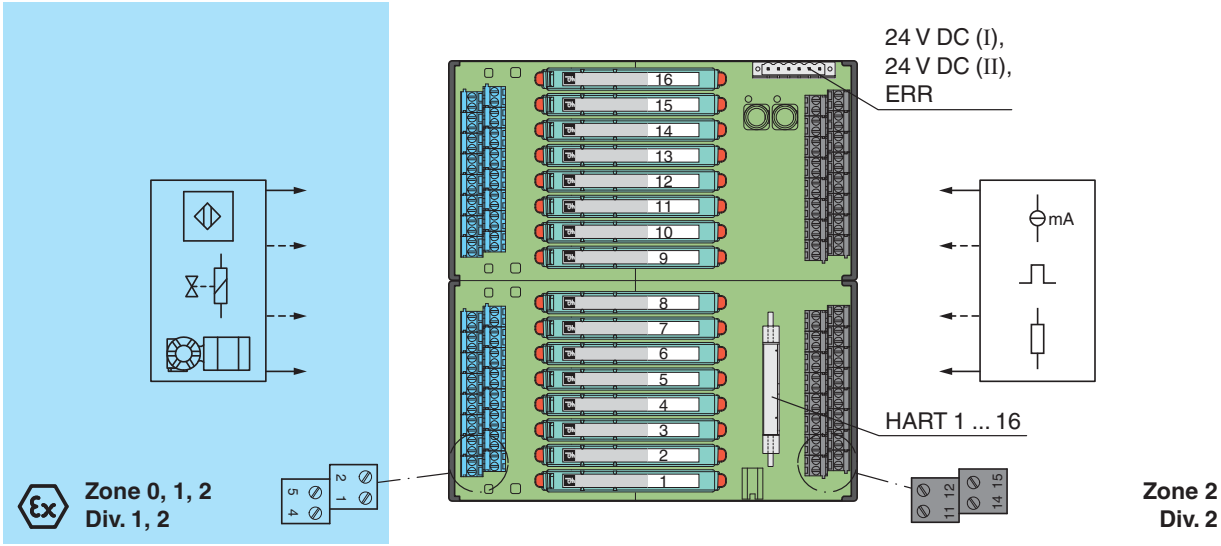
This Termination Board has 16 plug-in slots. Any HiC module can be inserted into any slot, enabling a mixture of I/O types on one Termination Board.

The Termination Board features fixed screw terminals for both the hazardous and safe areas along with a plug-in HART connector for interconnection to a separate HART Communication Board.

The Termination Board has a fault bus that is available at the redundant power supply terminals. The fault bus can be daisy chained and monitored by the optional Fault Indication Board. The fault bus signals are then available to the control system as a potential-free contact.

Termination Boards are supplied with a rugged fiberglass reinforced plastic housing. This design permits a fast and reliable installation in the marshalling cabinet.

Diagrams



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Features

- **8 plug-in positions**
- **24 V DC supply**
- **Universal use**
- **Hazardous area: screw terminals, blue**
- **Safe area: Sub-D connector (male), 37-pin**

Function

This Termination Board has 8 plug-in slots. Any HiC module can be inserted into any slot, enabling a mixture of I/O types on one Termination Board.

The Termination Board features fixed screw terminals for the hazardous and a 37-pin Sub-D connector for the safe area along with a plug-in HART connector for interconnection to a separate HART Communication Board.

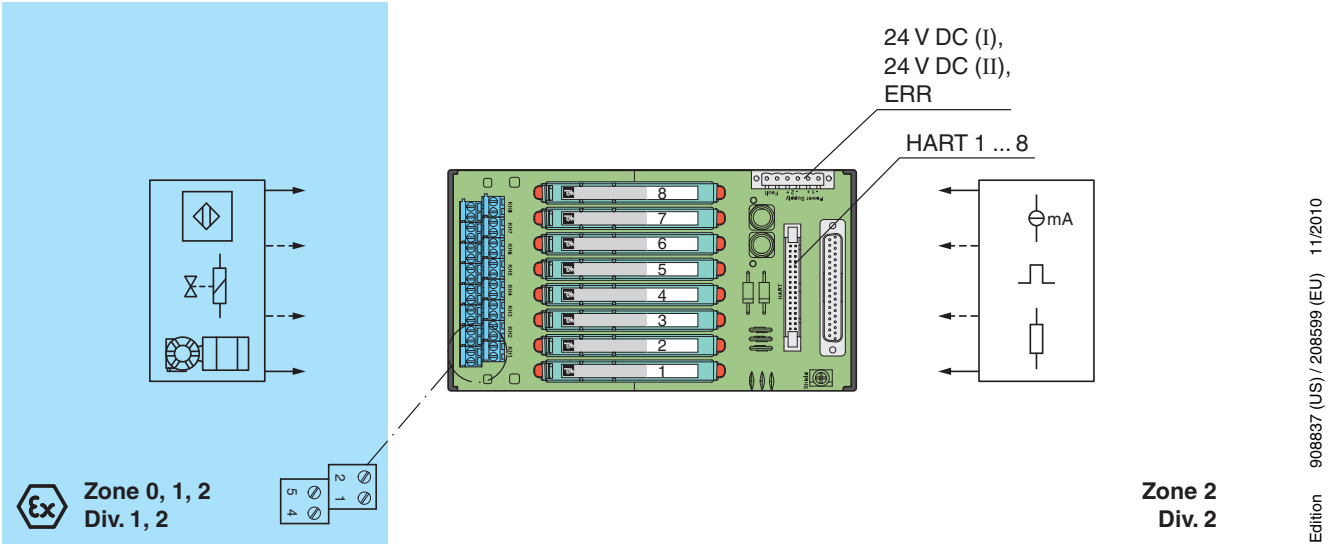
The Termination Board has a fault bus that is available at the redundant power supply terminals. The fault bus can be daisy chained and monitored by the optional Fault Indication Board. The fault bus signals are then available to the control system as a potential-free contact.

Termination Boards are supplied with a rugged fiberglass reinforced plastic housing. This design permits a fast and reliable installation in the marshalling cabinet.

Technical data

Supply	
Rated voltage	24 V DC, in consideration of rated voltage of used isolated barriers
Voltage drop	0.9 V, voltage drop across the series diode on the Termination Board must be considered
Ripple	≤ 10 %
Fusing	2 A, in each case for 8 modules
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Redundancy	
Supply	Redundancy available. The supply for the modules is decoupled, monitored and fused.
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	connection hazardous area (field side): screw terminals, blue safe area connection (process side): 37-pin Sub-D connector (male)
Mass	approx. 420 g
Dimensions	108 x 200 x 163 mm (4.25 x 7.9 x 6.42 in), height including module assembly
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	CESI 06 ATEX 022
Group, category, type of protection	⟨Ex⟩ II (1) GD [Ex ia] IIC; [Ex iaD] 20 ⟨Ex⟩ I (M1) [Ex ia] I
Accessories	
Designation	optional accessories: - Fault Indication Board HiATB01-FAULT-01 - HART Communication Board HiATB01-HART-4X8 - HART Multiplexer Master HiDMux2700 - HART connection cable HiACA-... - Label Carrier HiALC-...

Diagrams



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Technical data

Supply	
Rated voltage	24 V DC, in consideration of rated voltage of used isolated barriers
Voltage drop	0.9 V, voltage drop across the series diode on the Termination Board must be considered
Ripple	≤ 10 %
Fusing	4 A, in each case for 16 modules
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Redundancy	
Supply	Redundancy available. The supply for the modules is decoupled, monitored and fused.
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	connection hazardous area (field side): screw terminals, blue safe area connection (process side): 37-pin Sub-D connector (male)
Mass	approx. 840 g
Dimensions	216 x 200 x 163 mm (8.5 x 7.9 x 6.42 in), height including module assembly
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	CESI 06 ATEX 022
Group, category, type of protection	⟨Ex⟩ II (1) GD [Ex ia] IIC; [Ex iaD] 20 ⟨Ex⟩ I (M1) [Ex ia] I
Accessories	
Designation	optional accessories: - Fault Indication Board HiATB01-FAULT-01 - HART Communication Board HiATB01-HART-2X16 - HART Multiplexer Master HiDMux2700 - HART connection cable HiACA-... - Label Carrier HiALC-...

Features

- **16 plug-in positions**
- **24 V DC supply**
- **Universal use**
- **Hazardous area: screw terminals, blue**
- **Safe area: Sub-D connector (male), 37-pin**

Function

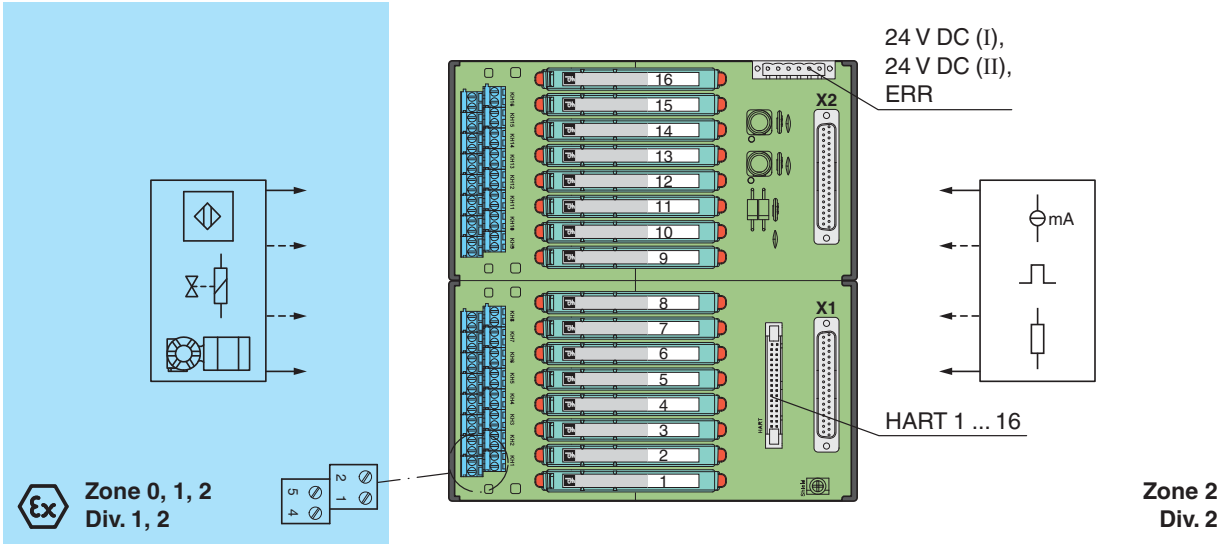
This Termination Board has 16 plug-in slots. Any HiC module can be inserted into any slot, enabling a mixture of I/O types on one Termination Board.

The Termination Board features fixed screw terminals for the hazardous and a 37-pin Sub-D connector for the safe area along with a plug-in HART connector for interconnection to a separate HART Communication Board.

The Termination Board has a fault bus that is available at the redundant power supply terminals. The fault bus can be daisy chained and monitored by the optional Fault Indication Board. The fault bus signals are then available to the control system as a potential-free contact.

Termination Boards are supplied with a rugged fiberglass reinforced plastic housing. This design permits a fast and reliable installation in the marshalling cabinet.

Diagrams



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HiCTB16-UNI-SD37R-SC

Termination Board

Features

- **16 plug-in positions**
- **24 V DC supply**
- **Universal use**
- **Hazardous area: screw terminals, blue**
- **Safe area: Sub-D connector (male), 37-pin**

Function

This Termination Board has 16 plug-in slots. Any HiC module can be inserted into any slot, enabling a mixture of I/O types on one Termination Board.

The Termination Board features fixed screw terminals for the hazardous and a 37-pin Sub-D connector for the safe area along with a plug-in HART connector for interconnection to a separate HART Communication Board.

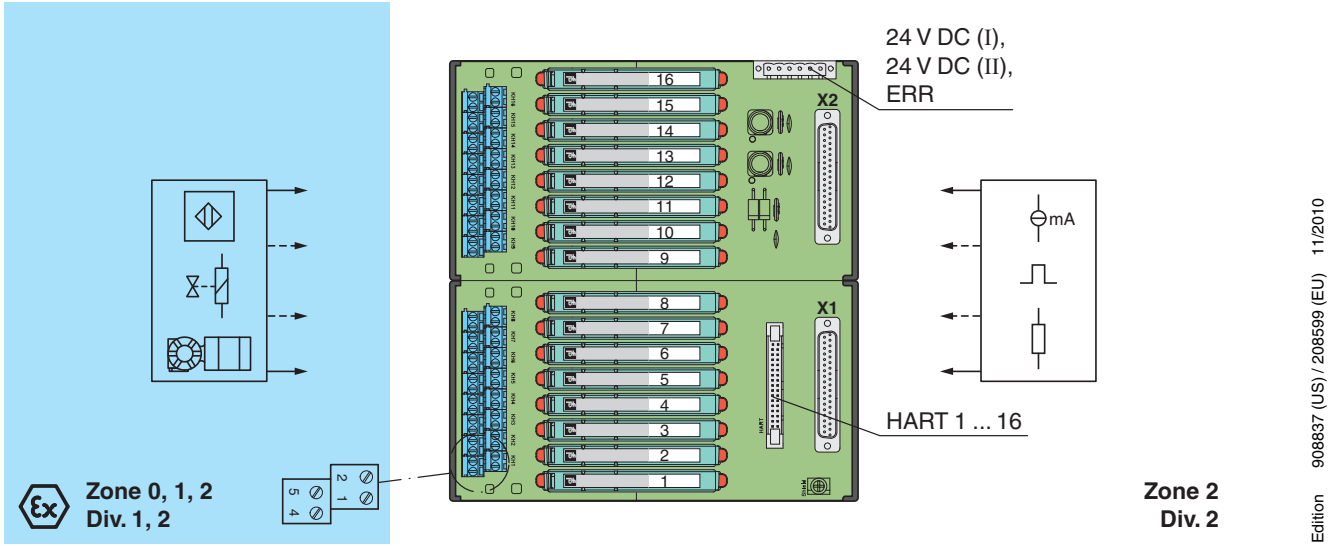
The Termination Board has a fault bus that is available at the redundant power supply terminals. The fault bus can be daisy chained and monitored by the optional Fault Indication Board. The fault bus signals are then available to the control system as a potential-free contact.

Termination Boards are supplied with a rugged fiberglass reinforced plastic housing. This design permits a fast and reliable installation in the marshalling cabinet.

Technical data

Supply	
Rated voltage	24 V DC, in consideration of rated voltage of used isolated barriers
Voltage drop	0.9 V, voltage drop across the series diode on the Termination Board must be considered
Ripple	≤ 10 %
Fusing	4 A, in each case for 16 modules
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Redundancy	
Supply	Redundancy available. The supply for the modules is decoupled, monitored and fused.
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	connection hazardous area (field side): screw terminals, blue safe area connection (process side): 37-pin Sub-D connector (male)
Mass	approx. 840 g
Dimensions	216 x 200 x 163 mm (8.5 x 7.9 x 6.42 in), height including module assembly
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	CESI 06 ATEX 022
Group, category, type of protection	⟨Ex⟩ II (1) GD [Ex ia] IIC; [Ex iaD] 20 ⟨Ex⟩ I (M1) [Ex ia] I
Accessories	
Designation	optional accessories: - Fault Indication Board HiATB01-FAULT-01 - HART Communication Board HiATB01-HART-2X16 - HART Multiplexer Master HiDMux2700 - HART connection cable HiACA-... - Label Carrier HiALC-...

Diagrams



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Technical data

Supply	
Rated voltage	24 V DC, in consideration of rated voltage of used isolated barriers
Voltage drop	0.9 V, voltage drop across the series diode on the Termination Board must be considered
Ripple	≤ 10 %
Fusing	2 A, in each case for 8 modules
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Redundancy	
Supply	Redundancy available. The supply for the modules is decoupled, monitored and fused.
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	connection hazardous area (field side): screw terminals, blue connection safe area (process side): screw terminals
Mass	approx. 600 g
Dimensions	150 x 200 x 163 mm (5.9 x 7.9 x 6.42 in), height including module assembly
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1) GD [Ex ia] IIC; [Ex iaD]
Accessories	
Designation	optional accessories: - Fault Indication Board HiATB01-FAULT-01 - HART Communication Board HiATB01-HART-4X8 - HART Multiplexer Master HiDMux2700 - HART connection cable HiACA-... - Label Carrier HiALC-...

Features

- **8 plug-in positions**
- **24 V DC supply**
- **Universal use**
- **Hazardous area: screw terminals, blue**
- **Safe area: screw terminals**

Function

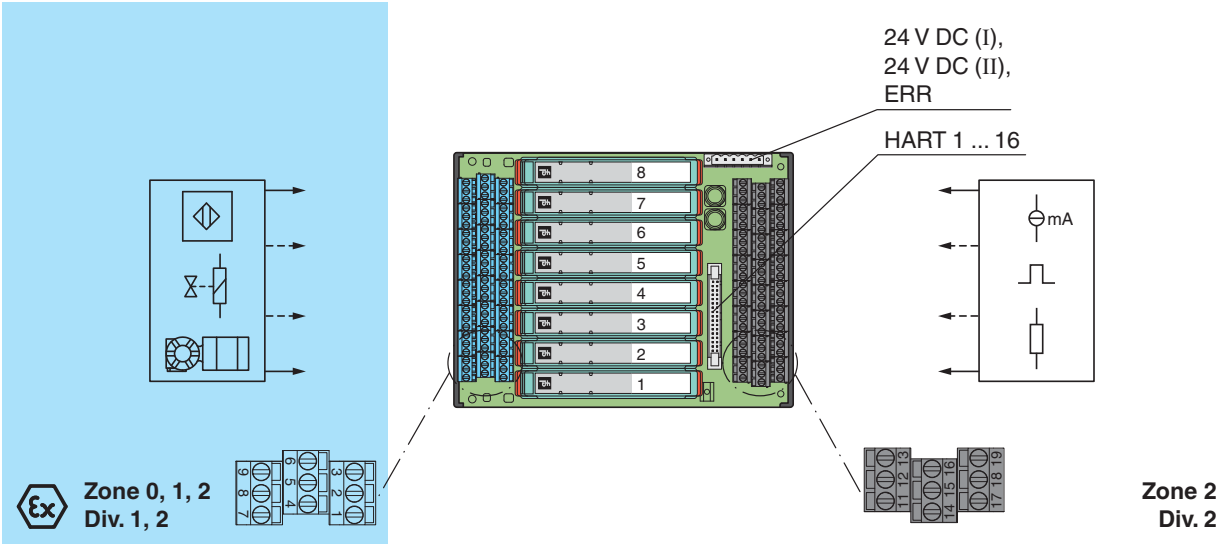
This Termination Board has 8 plug-in slots. Any HiD module can be inserted into any slot, enabling a mixture of I/O types on one Termination Board.

The Termination Board features fixed screw terminals for both the hazardous and safe areas along with a plug-in HART connector for interconnection to a separate HART Communication Board.

The Termination Board has a fault bus that is available at the redundant power supply terminals. The fault bus can be daisy chained and monitored by the optional Fault Indication Board. The fault bus signals are then available to the control system as a potential-free contact.

Termination Boards are supplied with a rugged fiberglass reinforced plastic housing. This design permits a fast and reliable installation in the marshalling cabinet.

Diagrams



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Features

- **16 plug-in positions**
- **24 V DC supply**
- **Universal use**
- **Hazardous area: screw terminals, blue**
- **Safe area: screw terminals**

Function

This Termination Board has 16 plug-in slots. Any HiD module can be inserted into any slot, enabling a mixture of I/O types on one Termination Board.

The Termination Board features fixed screw terminals for both the hazardous and safe areas along with a plug-in HART connector for interconnection to a separate HART Communication Board.

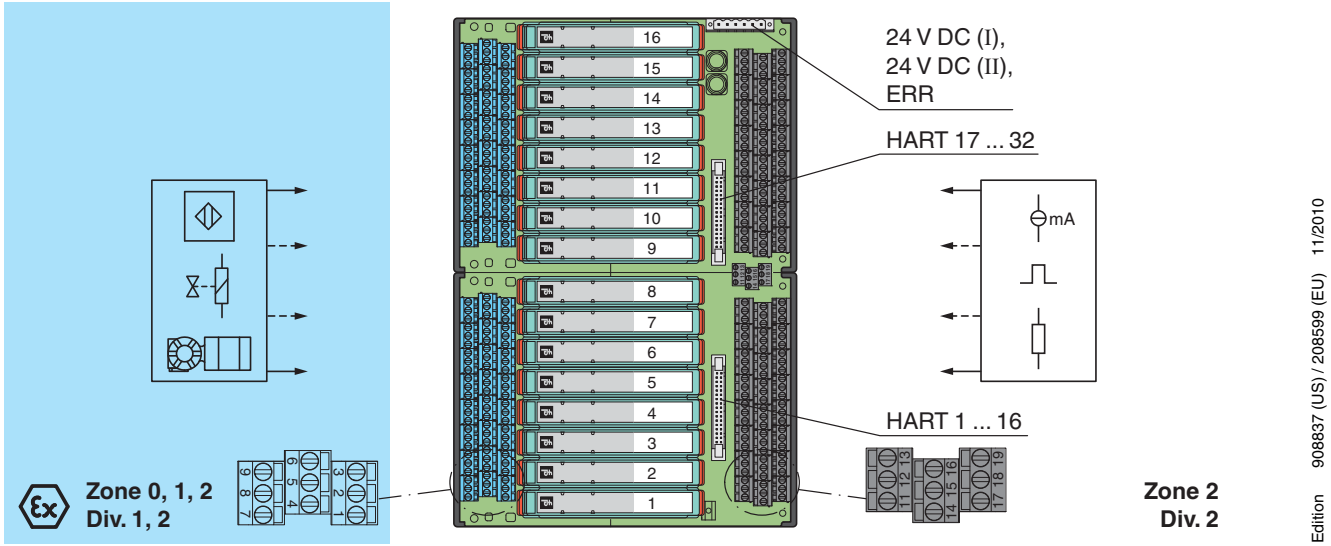
The Termination Board has a fault bus that is available at the redundant power supply terminals. The fault bus can be daisy chained and monitored by the optional Fault Indication Board. The fault bus signals are then available to the control system as a potential-free contact.

Termination Boards are supplied with a rugged fiberglass reinforced plastic housing. This design permits a fast and reliable installation in the marshalling cabinet.

Technical data

Supply	
Rated voltage	24 V DC, in consideration of rated voltage of used isolated barriers
Voltage drop	0.9 V, voltage drop across the series diode on the Termination Board must be considered
Ripple	≤ 10 %
Fusing	4 A, in each case for 16 modules
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Redundancy	
Supply	Redundancy available. The supply for the modules is decoupled, monitored and fused.
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	connection hazardous area (field side): screw terminals, blue connection safe area (process side): screw terminals
Mass	approx. 1200 g
Dimensions	300 x 200 x 163 mm (11.8 x 7.9 x 6.42 in), height including module assembly
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1) GD [Ex ia] IIC; [Ex iaD]
Accessories	
Designation	optional accessories: - Fault Indication Board HiATB01-FAULT-01 - HART Communication Board HiATB01-HART-2X16 - HART Multiplexer Master HiDMux2700 - HART connection cable HiACA-... - Label Carrier HiALC-...

Diagrams



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Technical data

Supply	
Rated voltage	24 V DC, in consideration of rated voltage of used isolated barriers
Voltage drop	0.9 V, voltage drop across the series diode on the Termination Board must be considered
Ripple	≤ 10 %
Fusing	2 A, in each case for 8 modules
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Redundancy	
Supply	Redundancy available. The supply for the modules is decoupled, monitored and fused.
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	connection hazardous area (field side): screw terminals, blue safe area connection (process side): 37-pin Sub-D connector (male)
Mass	approx. 600 g
Dimensions	150 x 200 x 163 mm (5.9 x 7.9 x 6.42 in), height including module assembly
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1) GD [Ex ia] IIC; [Ex iaD]
Accessories	
Designation	optional accessories: - Fault Indication Board HiATB01-FAULT-01 - HART Communication Board HiATB01-HART-2X16 - HART Multiplexer Master HiDMux2700 - HART connection cable HiACA-... - Label Carrier HiALC-...

Features

- **8 plug-in positions**
- **24 V DC supply voltage**
- **Universal use**
- **Hazardous area: screw terminals, blue**
- **Safe area: Sub-D connector (male), 37-pin**

Function

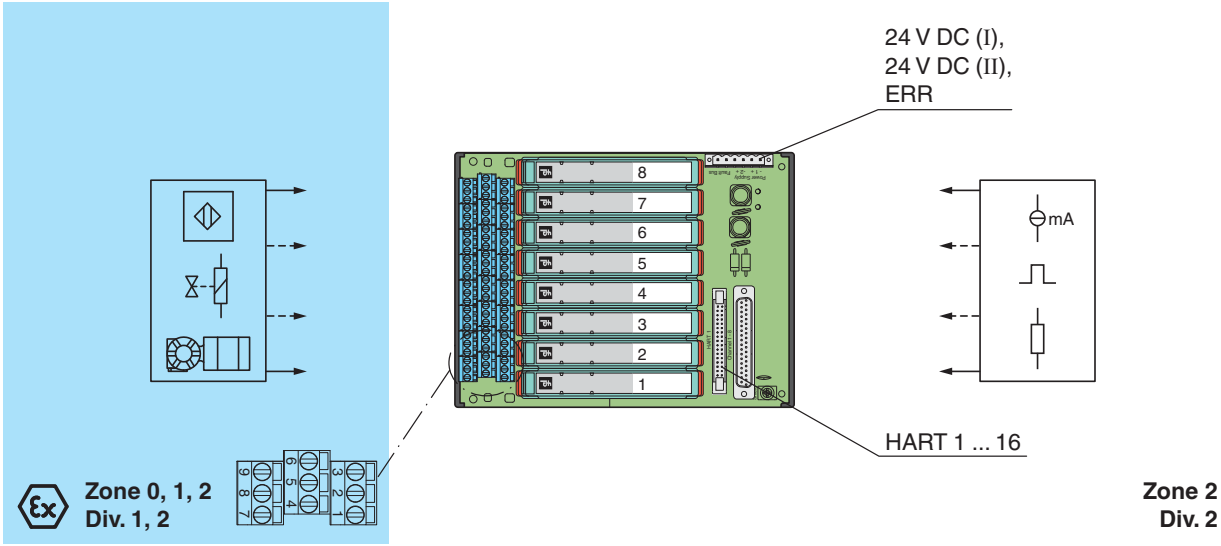
This Termination Board has 8 plug-in slots. Any HiD module can be inserted into any slot, enabling a mixture of I/O types on one Termination Board.

The Termination Board features fixed screw terminals for the hazardous and a 37-pin Sub-D connector for the safe area along with a plug-in HART connector for interconnection to a separate HART Communication Board.

The Termination Board has a fault bus that is available at the redundant power supply terminals. The fault bus can be daisy chained and monitored by the optional Fault Indication Board. The fault bus signals are then available to the control system as a potential-free contact.

Termination Boards are supplied with a rugged fiberglass reinforced plastic housing. This design permits a fast and reliable installation in the marshalling cabinet.

Diagrams



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HiDTB08-UNI-DA32-SD37-SC

Termination Board

Features

- **8 plug-in positions**
- **24 V DC supply voltage**
- **Universal use**
- **Hazardous area: screw terminals, blue**
- **Safe area: Sub-D connector (male), 37-pin**

Function

This Termination Board has 8 plug-in slots. Any HiD module can be inserted into any slot, enabling a mixture of I/O types on one Termination Board.

The Termination Board features fixed screw terminals for the hazardous and a 37-pin Sub-D connector for the safe area along with a plug-in HART connector for interconnection to a separate HART Communication Board.

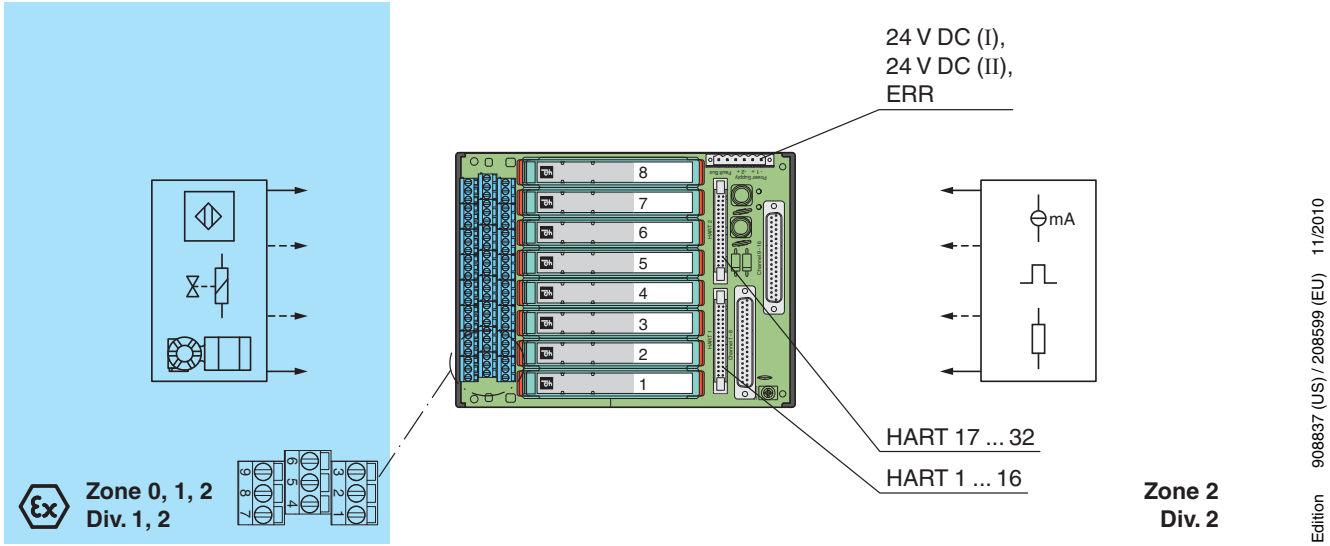
The Termination Board has a fault bus that is available at the redundant power supply terminals. The fault bus can be daisy chained and monitored by the optional Fault Indication Board. The fault bus signals are then available to the control system as a potential-free contact.

Termination Boards are supplied with a rugged fiberglass reinforced plastic housing. This design permits a fast and reliable installation in the marshalling cabinet.

Technical data

Supply	
Rated voltage	24 V DC, in consideration of rated voltage of used isolated barriers
Voltage drop	0.9 V, voltage drop across the series diode on the Termination Board must be considered
Ripple	≤ 10 %
Fusing	2 A, in each case for 8 modules
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Redundancy	
Supply	Redundancy available. The supply for the modules is decoupled, monitored and fused.
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	connection hazardous area (field side): screw terminals, blue safe area connection (process side): 37-pin Sub-D connector (male)
Mass	approx. 600 g
Dimensions	150 x 200 x 163 mm (5.9 x 7.9 x 6.42 in), height including module assembly
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1) GD [Ex ia] IIC; [Ex iaD]
Accessories	
Designation	optional accessories: - Fault Indication Board HiATB01-FAULT-01 - HART Communication Board HiATB01-HART-2X16 - HART Multiplexer Master HiDMux2700 - HART connection cable HiACA-... - Label Carrier HiALC-...

Diagrams



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Technical data

Supply	
Rated voltage	24 V DC, in consideration of rated voltage of used isolated barriers
Voltage drop	0.9 V, voltage drop across the series diode on the Termination Board must be considered
Ripple	≤ 10 %
Fusing	4 A, in each case for 16 modules
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Redundancy	
Supply	Redundancy available. The supply for the modules is decoupled, monitored and fused.
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	connection hazardous area (field side): screw terminals, blue safe area connection (process side): 37-pin Sub-D connector (male)
Mass	approx. 1200 g
Dimensions	300 x 200 x 163 mm (11.8 x 7.9 x 6.42 in), height including module assembly
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1) GD [Ex ia] IIC; [Ex iaD]
Accessories	
Designation	optional accessories: - Fault Indication Board HiATB01-FAULT-01 - HART Communication Board HiATB01-HART-2X16 - HART Multiplexer Master HiDMux2700 - HART connection cable HiACA-... - Label Carrier HiALC-...

Features

- **16 plug-in positions**
- **24 V DC supply**
- **Universal use**
- **Hazardous area: screw terminals, blue**
- **Safe area: Sub-D connector (male), 37-pin**

Function

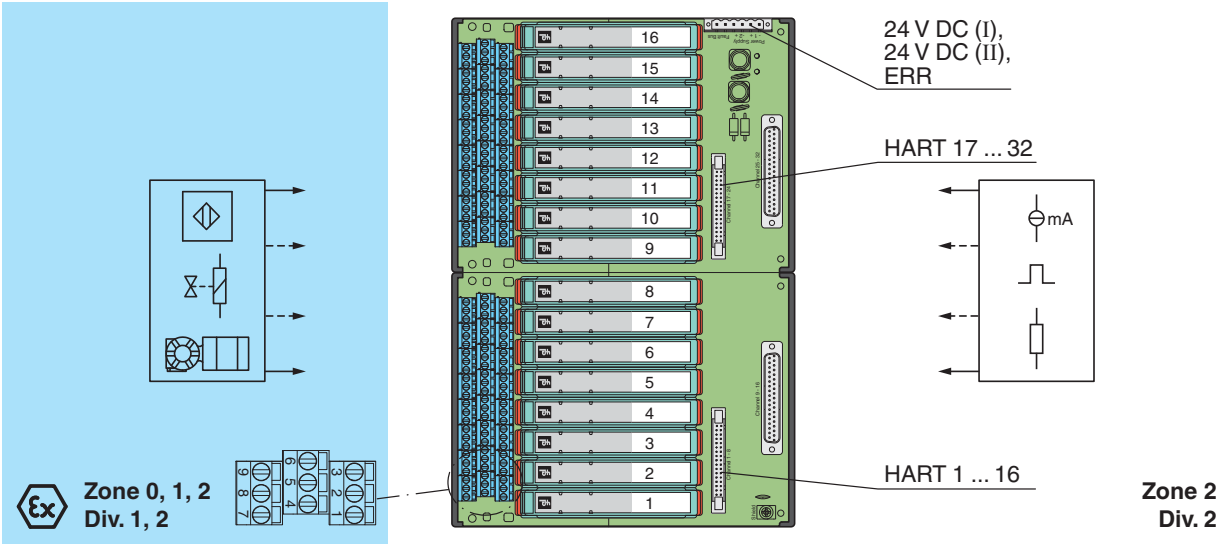
This Termination Board has 16 plug-in slots. Any HiD module can be inserted into any slot, enabling a mixture of I/O types on one Termination Board.

The Termination Board features fixed screw terminals for the hazardous and 37-pin Sub-D connectors for the safe area along with a plug-in HART connector for interconnection to a separate HART Communication Board.

The Termination Board has a fault bus that is available at the redundant power supply terminals. The fault bus can be daisy chained and monitored by the optional Fault Indication Board. The fault bus signals are then available to the control system as a potential-free contact.

Termination Boards are supplied with a rugged fiberglass reinforced plastic housing. This design permits a fast and reliable installation in the marshalling cabinet.

Diagrams



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HiDTB16-UNI-DA64-SD37-SC

Termination Board

Features

- **16 plug-in positions**
- **24 V DC supply**
- **Universal use**
- **Hazardous area: screw terminals, blue**
- **Safe area: Sub-D connector (male), 37-pin**

Function

This Termination Board has 16 plug-in slots. Any HiD module can be inserted into any slot, enabling a mixture of I/O types on one Termination Board.

The Termination Board features fixed screw terminals for the hazardous and 37-pin Sub-D connectors for the safe area along with a plug-in HART connector for interconnection to a separate HART Communication Board.

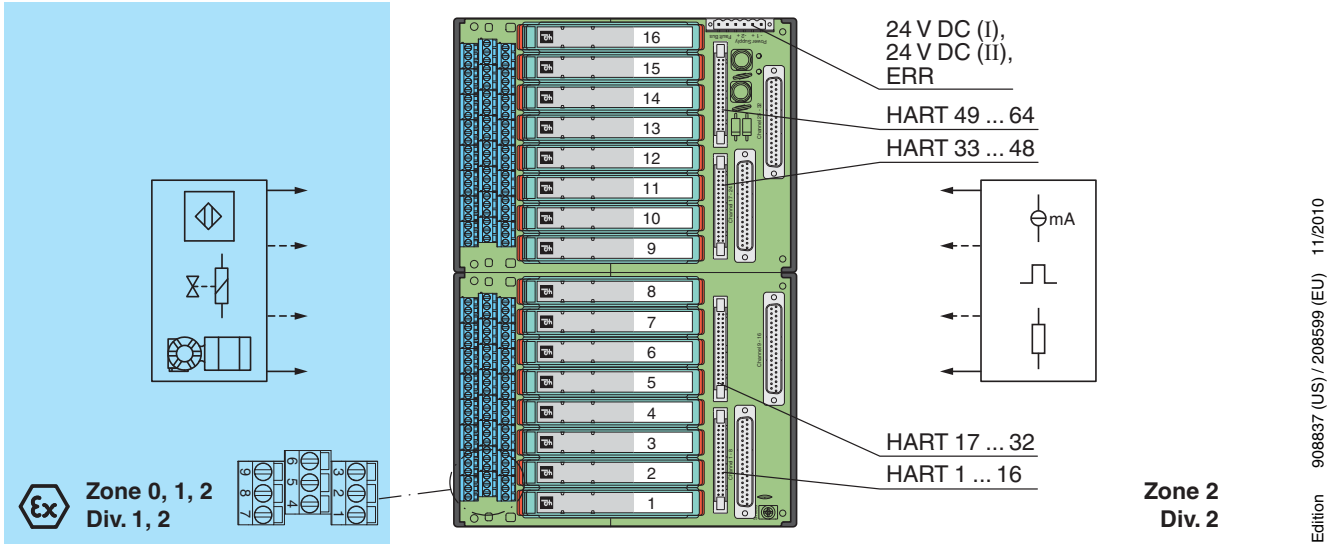
The Termination Board has a fault bus that is available at the redundant power supply terminals. The fault bus can be daisy chained and monitored by the optional Fault Indication Board. The fault bus signals are then available to the control system as a potential-free contact.

Termination Boards are supplied with a rugged fiberglass reinforced plastic housing. This design permits a fast and reliable installation in the marshalling cabinet.

Technical data

Supply	
Rated voltage	24 V DC, in consideration of rated voltage of used isolated barriers
Voltage drop	0.9 V, voltage drop across the series diode on the Termination Board must be considered
Ripple	≤ 10 %
Fusing	4 A, in each case for 16 modules
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Redundancy	
Supply	Redundancy available. The supply for the modules is decoupled, monitored and fused.
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	connection hazardous area (field side): screw terminals, blue safe area connection (process side): 37-pin Sub-D connector (male)
Mass	approx. 1200 g
Dimensions	300 x 200 x 163 mm (11.8 x 7.9 x 6.42 in), height including module assembly
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	CESI 02 ATEX 086
Group, category, type of protection	⟨Ex⟩ II (1) GD [Ex ia] IIC; [Ex iaD]
Accessories	
Designation	optional accessories: - Fault Indication Board HiATB01-FAULT-01 - HART Communication Board HiATB01-HART-2X16 - HART Multiplexer Master HiDMux2700 - HART connection cable HiACA-... - Label Carrier HiALC-...

Diagrams



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Technical data

Supply	
Rated voltage	19.6 ... 30 V DC
Ripple	≤ 10 %
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Electrical specifications	
Potential free fault signal contact	max. 30 V AC, 40 V DC, 2 A
Redundancy	
Supply	Redundancy available. Each supply is decoupled.
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	screw terminal for max. 2.5 mm^2, fixed
Mass	approx. 150 g
Dimensions	50 x 200 x 60 mm (1.97 x 7.9 x 2.36 in), height including module assembly
Mounting	DIN rail mounting

Features

- **1-channel**
- **24 V DC supply**
- **Monitors HiD/HiC Termination Boards**
- **Relay contact output**
- **LEDs for supply and fault status**

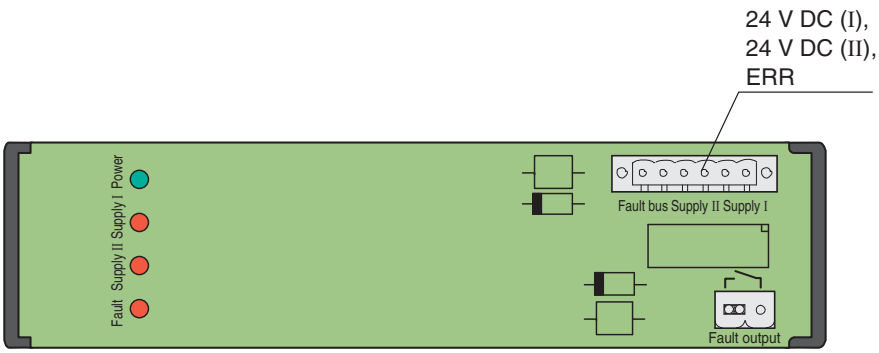
Function

This Fault Indication Board is designed to monitor an unlimited number of H-System Termination Boards.

The fault bus signal can be wired in a ring (daisy chain) or redundant in a star.

A failed power supply or line faults in the field are displayed on the Fault Indication Board via an LED and are made available through a potential-free contact.

Diagrams



Zone 2
Div. 2

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Features

- **2 x 16-channel**
- **24 V DC supply**
- **Suitable for HART communication**
- **Dual RS 485 connections**
- **Used with HiD/HiC Termination Boards**
- **LED indicator for supply status**

Function

This HART Communication Board can interface with two, 16-channel H-System Termination Boards.

It contains one slot to mount the 32-channel HART Multiplexer Master type HiD Mux2700.

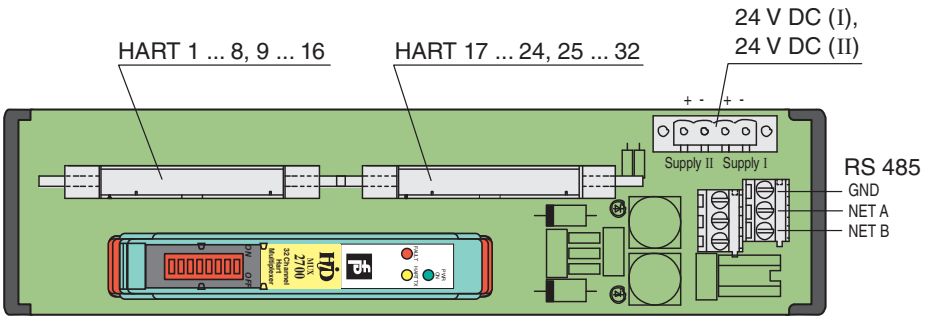
HART interface cables provide easy connection between the HiD/HiC Termination Boards and the HART Communication Board.

It offers fused redundant power supply connections with LED indication. RS 485 terminals are redundant and can be daisy chained.

Technical data

Supply	
Rated voltage	24 V DC, in consideration of rated voltage of used isolated barriers
Voltage drop	0.9 V, voltage drop across the series diode on the Termination Board must be considered
Ripple	≤ 10 %
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Redundancy	
Supply	Redundancy available. Each supply is decoupled and fused (500 mA).
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	screw terminal for max. 2.5 mm^2, fixed
Mass	approx. 150 g
Dimensions	50 x 200 x 163 mm (1.97 x 7.9 x 6.42 in), height including module assembly
Mounting	DIN rail mounting
Accessories	
Designation	optional accessories: - HART Multiplexer Master HiDMux2700 - HART connection cable HiACA-...

Diagrams



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Technical data

Supply	
Rated voltage	24 V DC, in consideration of rated voltage of used isolated barriers
Voltage drop	0.9 V, voltage drop across the series diode on the Termination Board must be considered
Ripple	≤ 10 %
Power loss	≤ 500 mW, without module
Reverse polarity protected	yes
Redundancy	
Supply	Redundancy available. Each supply is decoupled and fused (500 mA).
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Connection	screw terminal for max. 2.5 mm^2, fixed
Mass	approx. 150 g
Dimensions	50 x 200 x 163 mm (1.97 x 7.9 x 6.42 in), height including module assembly
Mounting	DIN rail mounting
Accessories	
Designation	optional accessories: - HART Multiplexer Master HiDMux2700 - HART connection cable HiACA-...

Features

- **4 x 8-channel**
- **24 V DC supply**
- **Suitable for HART communication**
- **Dual RS 485 connections**
- **Used with HiD/HiC Termination Boards**
- **LED for supply status**

Function

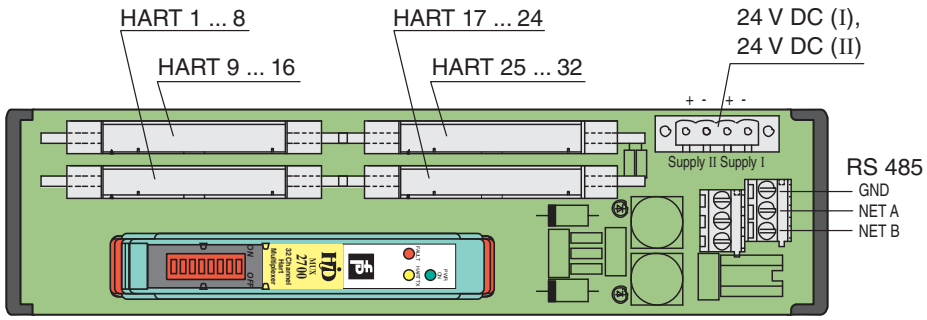
This HART Communication Board can interface with four, 8-channel H-System Termination Boards.

It contains one slot to mount the 32-channel HART Multiplexer type HiD Mux2700.

The HART interface cable provides easy connection between the HiD/HiC Termination Boards and the HART Communication Board.

It offers fused redundant power supply connections with LED indication. RS 485 terminals are redundant and can be daisy chained.

Diagrams



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Features

- **H-System place holder module**
- **Housing width 12.5 mm**
- **Blank module, non-functional**

Function

This barrier is a non functioning HiD module designed to be a place holder for system expansions.

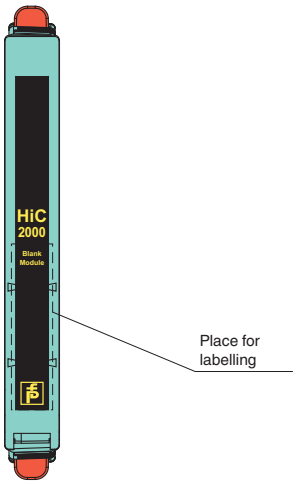
This barrier mounts on a HiC termination board.

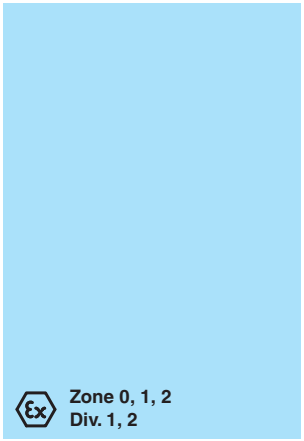
Technical data

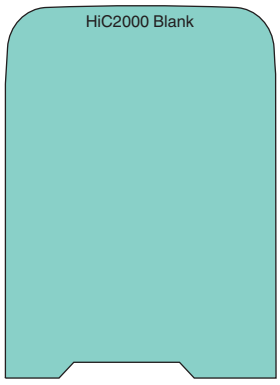
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Material	Polycarbonate
Mass	approx. 100 g
Dimensions	12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 in)

Diagrams

Front view







Zone 2
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Technical data

Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Protection degree	IP20
Material	Polycarbonate
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 in)

Features

- **H-System place holder module**
- **Housing width 18 mm**
- **Blank module, non-functional**

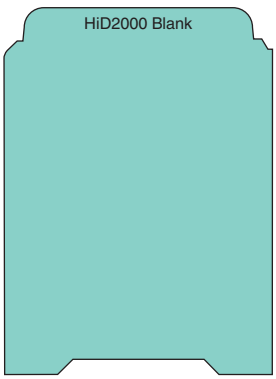
Function

This barrier is a non functioning HiD module designed to be a place holder for system expansions.

This barrier mounts on a HiD termination board.

Diagrams

Zone 0, 1, 2
Div. 1, 2



Front view

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Label Carrier
HiALC-HiCTB-SET-108

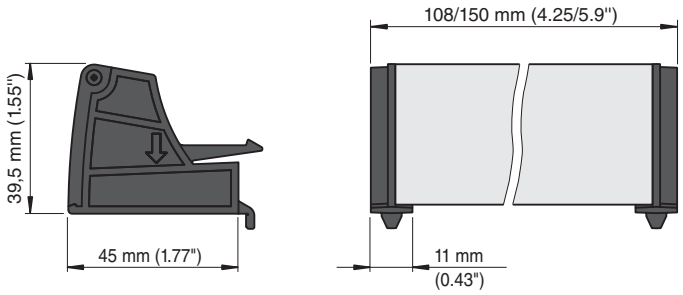
Features

- For HiC Termination Boards
- 1 piece for 8-position Termination Board
- 2 pieces for 16-position Termination Board

HiALC-HiDTB-SET-150

Features

- For HiD Termination Boards
- 1 piece for 8-position Termination Board
- 2 pieces for 16-position Termination Board



Technical data

Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Mass	HiALC-HiCTB-SET-108: approx. 100 g HiALC-HiDTB-SET-150: approx. 140 g
Dimensions	HiALC-HiCTB-SET-108: 39.5 x 45 x 108 mm (1.55 x 1.77 x 4.25 in) HiALC-HiDTB-SET-150: 39.5 x 45 x 150 mm (1.55 x 1.77 x 5.9 in)

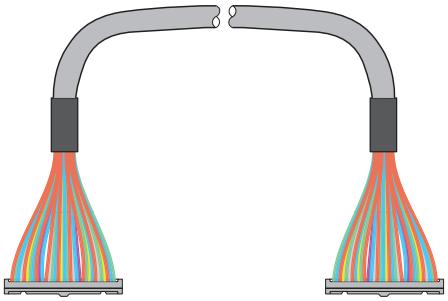
HART Interface Cables
HiACA-UNI-FLK34-FLK34-0M5
HiACA-UNI-FLK34-FLK34-2M0
HiACA-UNI-FLK34-FLK34-3M0
HiACA-UNI-FLK34-FLK34-6M0

Features

- H-System accessory
- Connection cable between HART Communication Board and Termination Board
- 34-pin cable

Function

The HART connection cable is used for connection of a HART Communication Board to a H-System Termination Board.



Technical data

Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications	
Connection	34-pin FLK connector (female)
Mass	HiACA-UNI-FLK34-FLK34-0M5: approx. 150 g HiACA-UNI-FLK34-FLK34-2M0: approx. 600 g HiACA-UNI-FLK34-FLK34-3M0: approx. 900 g HiACA-UNI-FLK34-FLK34-6M0: approx. 1800 g
Cable length	HiACA-UNI-FLK34-FLK34-0M5: 0.5 m HiACA-UNI-FLK34-FLK34-2M0: 2 m HiACA-UNI-FLK34-FLK34-3M0: 3 m HiACA-UNI-FLK34-FLK34-6M0: 6 m

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