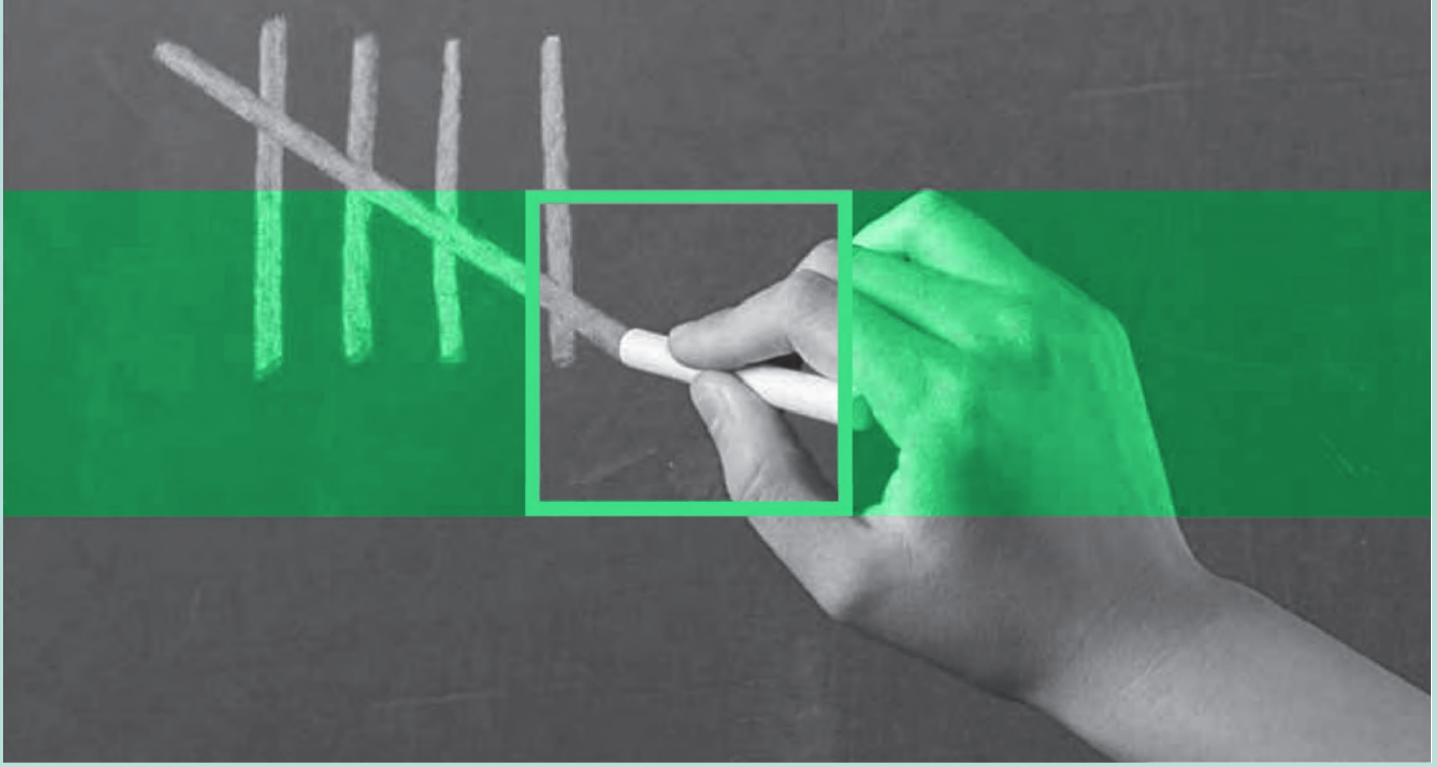
Contents

Logic Control Units



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Logic Control Units

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Functional Description

Sensor signals often need to be displayed clearly on site or further processed and used to control processes directly.

In addition to the sensors featured in the previous sections, Pepperl+Fuchs also offers a wide range of products for signal evaluation.

9.1 Displays and Counters

Visibility

Depending on the type, you can choose from four standard sizes with front measurements of 48 mm x 24 mm, 48 mm x 48 mm, 96mm x 48 mm, and 32 mm x 15 mm depending on the space available for your application.

The 96 mm x 48 mm housing design with very bright LED-display is ideal for situations where good readability is required for process visualization or if the viewer is several meters away.

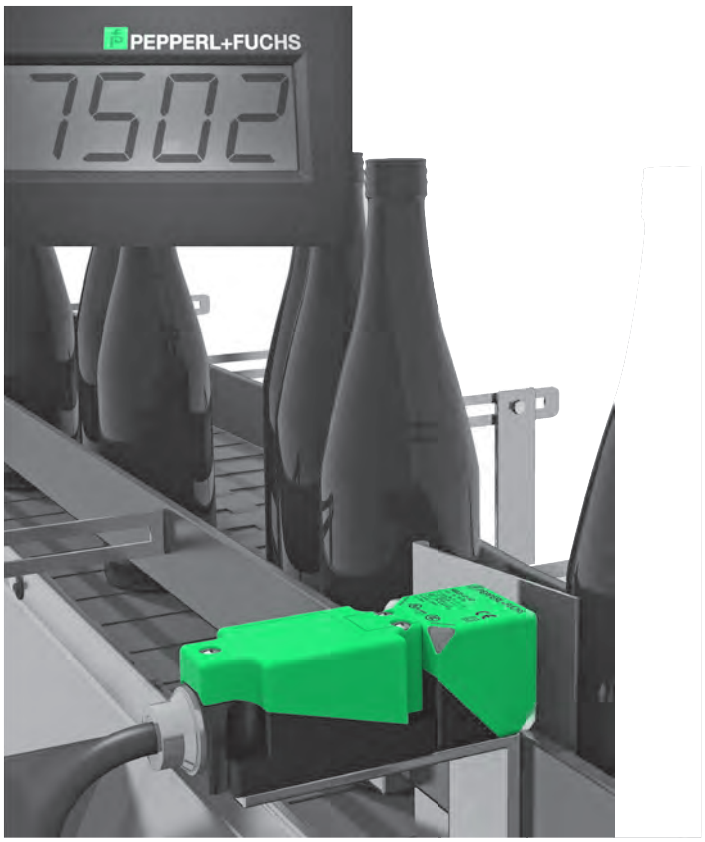
Type of Display

With the exception of electromechanical counters (cost-effective numeric displays) and pure digital display units (extremely bright LED-display), you can choose between a high-contrast liquid crystal display (LCD) and a light-emitting diode display (LED).

The LCD-display is usually more cost effective and requires less power, although it has restricted readability in low-light conditions. Therefore, you should use a large LED display wherever good readability is required.

Electromechanical Counters

Electromechanical counters are used in situations that call for cost-effective counting with or without a reset function. The KCM series is particularly well suited to this scenario.



Electronic Batch Controllers

Electronic batch controllers are used to control sequencing through switching outputs. Electronic counters with LED displays offer excellent readability even without the batch control function. The KC-L Series is best suited to this purpose.

Time Measurement

The KC-L and KCT Series multifunction devices are ideal for short- and long-term measurements as well as the measurement of operating hours. These devices can accurately measure times to the nearest millisecond. The measuring intervals can be started and stopped automatically through the two inputs. For long-term measurements, the devices can display times up to a maximum of 999,999 hours.

Measuring Speed/Frequency

Pulse intervals are measured to calculate rotational speed or frequency. The display on the KC-L and KCT Series can easily be scaled. The data is displayed directly in Hertz or rpm.

Multifunction Devices

The KC-L and KCT Series incorporating a time/counter/tachometer function can be used in all situations where a device is used to detect multiple signals and the programming needs to be quickly customizable to the specific application. These devices are also ideally equipped to deal with future changes in your plant while helping you to reduce your inventory.

Displaying Analog Values

DA5 Series display units display measured analog values such as pressure, temperature, or distance. These devices provide excellent readability and feature a scalable numeric display of the measured values. You can choose between a purely digital display in 48 mm x 24 mm format and a process display in 96 mm x 48 mm format with two relay outputs and linearization for sequential control. Thanks to the power supply provided, you can supply the sensors used in the application directly using these displays without using an auxiliary power supply.

Operation

The requirements for an optimal operational philosophy differ depending on the application. These requirements are as follows:

- *No preset function or just a reset function*
- *Very easy and clear operation with limited functionality*
- *Menu-driven operation with a high level of flexibility for the application.*
- *These requirements are fulfilled in this order by the series:*
- *KCM (no adjustment option)*
- *KCY (simple adjustment of preset values using one button per digit)*
- *KC-L and KCT (menu-driven operation and connection via RS232-interface, keylock can be activated).*

9.2 Tachometers

Tachometers are pulse-controlled time measurement devices. In contrast to standard tachometers (KCT Series) that count the incoming pulses within a gate time, TC-type tachometers evaluate the duration of a period between two subsequent input pulses (cycle method).

The period duration is allocated an adjustable multiplication factor and is converted into a rotational speed or speed depending on the operating mode.

Benefit

The cycle method requires only one pulse per revolution and a maximum of two revolutions to detect the rotational speed with high accuracy.

Rotational speed = 1/T x 60 min^{-1}

T = time between two pulses

min-1 = revolutions/minute

9.3 Sensor Output Adapters

Sensor output converters form the interface between the sensor and the system controller or actuator if the output signal of the sensor cannot be used directly. Sensor output converters are useful for connecting three-wire sensors. If the current load for the sensor-specific output stage is insufficient for the connected load, or if a semiconductor output needs to be converted to a relay contact output.

9.4 Rotation Speed Monitors

Rotation speed monitors display and monitor periodic signals, i.e., pulse frequencies which represent some rotational speed. These periodic signals occur in almost all areas of automation and process technology.

The input signals are evaluated depending on the cycle method, i.e., through period duration measurement, and are converted into frequency or rotational speed.

Particular attention was paid to rotation speed monitoring during the development of these devices. Displays and data can be provided in either Hz or 1/min.

The monitoring function operates using a trip value for which the upper and lower hysteresis value can be freely selected within the respective measurement and display range. The output signal is generated when the predefined limits are exceeded or not met.

In addition to the ON delay and OFF delay, pulse function, and OFF delay timer, it is possible to select the direction of operation for the output, i.e., for underspeed or overspeed monitoring. A built-in start-up override prevents false signals during start-up of the monitored system.

All common two-, three-, or four-wire proximity sensors and incremental rotary encoders can be used as signal sources. Terminals are also available for connecting proximity switches in accordance with DIN 19 234 (NAMUR).

9.5 Frequency Voltage Current Converters

Frequency voltage current converters function in the same way as rotation speed monitors. The difference is that a voltage or current value that is proportional to the input frequency is generated as the output signal:

- *0 V ... 10 V*
- *2 V ... 10 V*
- *0 mA ... 20 mA*
- *4 mA ... 20 mA*

A pulse output is available as a function of the input frequency divided by an adjustable factor (1 to 1200).

Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

General Data	
Function	Electromechanical counter
Type	digital display
Display value	digit height 4 mm
Electrical specifications	
Operating voltage	24 V_{DC}
Power consumption	0.6 W
Input	
Pulse length/pulse interval	50 ms / 50 ms
Counting frequency	10 Hz
Ambient temperature	-10 ... 50 °C (14 ... 122 °F)
Storage temperature	-40 ... 90 °C (-40 ... 194 °F)
Relative humidity	≤ 80 % (noncondensing)
Connection	flexible leads AWG 22 150 mm long
Mounting	latch fastener

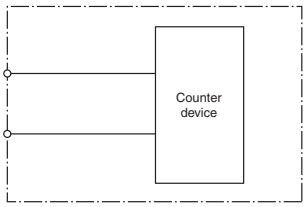
Model Number		KCM-51-C	KCM-70-C
Number of digits	5	●	
	7		●
Reset	manual	●	
Dimensions	48 mm x 24 mm x 54 mm		●
	48 mm x 24 mm x 59 mm	●	

Properties

- Electromechanical counters
- 24 V_{DC} supply voltage
- 5 and 7 digit version
- Manual reset version

Electrical Connection

DC Supply



CE

Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

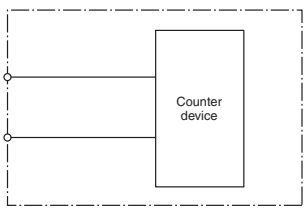
Model Number	**KCM-70A-C**
Function	Electromechanical counters
Type	digital display
Number of digits	7
Display value	digit height 4 mm
Electrical specifications	
Operating voltage	24 V_{DC}
Power consumption	0.3 W
Input	
Pulse length/pulse interval	20 ms / 20 ms
Counting frequency	25 Hz
Ambient temperature	-10 ... 60 °C (14 ... 140 °F)
Storage temperature	-40 ... 90 °C (-40 ... 194 °F)
Relative humidity	≤ 80 % (noncondensing)
Connection	flexible leads AWG 22 150 mm long
Dimensions	32 mm x 15 mm x 36 mm
Mounting	Locating springs

Properties

- **Electromechanical counter**
- **24 V_{DC} supply voltage**
- **7 digits**
- **Manual reset**

Electrical Connection

DC Supply



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Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

General Data	
Type	7-segment LED display, red
Number of digits	6
Reset	manual or external
Storage temperature	-25 ... 70 °C (-13 ... 158 °F)
Relative humidity	≤ 80 % (noncondensing)
Mounting	latch fastener

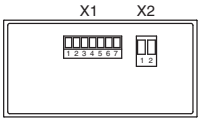
Model Number		KCT-6S-C	KCT-6ST-C	KCT1-6ST-V	KCT2-6ST-V
Function	Counter	●	●	●	●
	Timer				●
	Tachometer				●
Display value	digit height 14 mm				●
	digit height 8 mm	●	●	●	
Operating voltage	10 ... 30 V_{DC}	●	●		
	90 ... 250 V_{AC}			●	●
Power consumption	max. 6 VA				●
	max. 7 VA			●	
	1.5 W	●	●		
Counting frequency	20 kHz			●	
	30 Hz / 20 kHz	●	●		
	30 Hz / 20 kHz (max. 11 kHz in quadrature mode)				●
Output type	Transistor switching output		●	●	●
Sensor supply	4			●	●
Ambient temperature	-10 ... 50 °C (14 ... 122 °F)	●	●	●	
	-20 ... 65 °C (-4 ... 149 °F)				●
Connection	7-pin screw terminal , max. core cross-section 0.34 ... 1.5 mm^2		●		
	2 plug-in 7-pin screw terminals max. core cross-section 0.34 ... 1.5 mm^2			●	
	2-pin and 7-pin plug-in connection terminals, core cross-section ≤ 1.5 mm^2				●
	5-pin screw terminal , max. core cross-section 0.34 ... 1.5 mm^2	●			
Dimensions	48 mm x 24 mm x 65 mm	●	●		
	48 mm x 48 mm x 106 mm			●	
	96 mm x 48 mm x 90 mm				●

Properties

- **LED Counter and LED Counter/ Timer/Tachometer versions**
- **10 - 30 V_{DC} and 90 - 250 V_{AC} supply voltage versions**
- **6 digits**
- **Manual and external reset**

Electrical Connection

KCT2-6ST-V



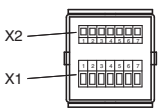
Connection assignment X2

Terminal No.	AC version
1	Power supply 90 ... 260 V AC
2	Power supply 90 ... 260 V AC

Connection assignment X1

Terminal No.	AC version
1	Optocoupler collector output
2	Optocoupler emitter output
3	SET
4	INP B
5	INP A
6	GND
7	+24 V out

KCT1-6ST-V



Connector assignment X1

supply voltage and outputs

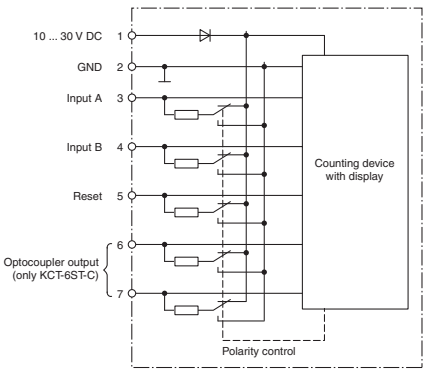
Terminal No.	AC version	10 ... 30 V DC version
1	Optocoupler output 1 collector	
2	Optocoupler output 1 emitter	
3	Optocoupler output 2 emitter	
4	n.c.	
5	Optocoupler output 2 collector	
6	supply voltage 90 ... 250 V AC	operating voltage 10 ... 30 V DC
7	supply voltage 90 ... 250 V AC	0 V DC (GND)

Connector assignment X2

inputs

Terminal No.	Name	AC version	10 ... 30 V DC version
1	+24 VDC	Sensor Supply voltage	n.c.
2	0 VDC (GND)	Reference voltage	n.c.
3	INP A	Counter input A	
4	INP B	Counter input B	
5	RESET	Reset input	
6	GATE	Gate circuit	
7	KEY	Input for key locking	

KCT-6S-C
KCT-6ST-C



CE

Properties

- LED batch controller
- 10 - 30 V_{DC} and 90 - 250 V_{AC} supply voltage version
- 7 digits
- Manual and external reset

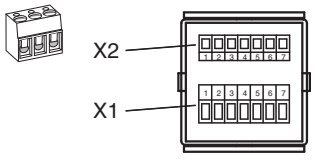
Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

General Data	
Function	Counter Timer Tachometer
Type	7-segment LED display, red
Number of digits	6
Display value	digit height 8 mm
Reset	manual or external
Counting frequency	20 kHz
Output type	Relay output
Sensor supply	✔
Ambient temperature	-10 ... 50 °C (14 ... 122 °F)
Storage temperature	-25 ... 70 °C (-13 ... 158 °F)
Relative humidity	≤ 80 % (noncondensing)
Connection	2 plug-in 7-pin screw terminals max. core cross-section 0.34 ... 1.5 mm²
Dimensions	48 mm x 48 mm x 106 mm
Mounting	latch fastener (dimension 50.5 mm x 54.5 mm)

Model Number		KCT1-6SR-C	KCT1-6SR-V
Operating voltage	10 ... 30 V DC	●	
	90 ... 250 V AC		●
Power consumption	max. 1.2 VA	●	
	max. 7 VA		●

Electrical Connection



Connector assignment X1

supply voltage and outputs

Terminal No.	AC version	10 ... 30 V DC version
1	n.c.	
2	n.c.	
3	output relay common contact (C)	
4	output relay normally open contact (NO)	
5	output relay normally closed contact (NC)	
6	supply voltage 90 ... 250 V AC	operating voltage 10 ... 30 V DC
7	supply voltage 90 ... 250 V AC	0 V DC (GND)

Connector assignment X2

inputs

Terminal No.	Name	AC version	10 ... 30 V DC version
1	+24 VDC	Sensor Supply voltage	not connected
2	0 VDC (GND)	Reference voltage	not connected
3	INP A	Counter input A	
4	INP B	Counter input B	
5	RESET	Reset input	
6	GATE	Gate circuit	
7	KEY	Input for key locking	

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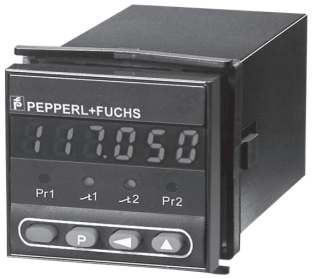


CE

Technical Data

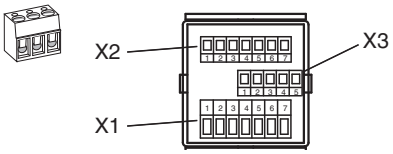
For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

Model Number	KCT1-6WR/RS232-V
Function	Counter
	Timer
	Tachometer
Type	7-segment LED display, red
Number of digits	6
Display value	digit height 8 mm
Reset	manual or external
Operating voltage	90 ... 250 V_{AC}
Power consumption	max. 7 VA
Counting frequency	20 kHz
Output type	Relay output
Sensor supply	✔
Ambient temperature	-10 ... 50 °C (14 ... 122 °F)
Storage temperature	-25 ... 70 °C (-13 ... 158 °F)
Relative humidity	≤ 80 % (noncondensing)
Connection	2 plug-in 7-pin screw terminals
Dimensions	48 mm x 48 mm x 106 mm
Mounting	latch fastener (dimension 50.5 mm x 54.5 mm)

Properties

- **LED Counter/Timer/Tachometer**
- **90 - 250 V_{AC} supply voltage**
- **6 digits**
- **Manual and external reset**

Electrical Connection



Connection assignment X1

Supply voltage and outputs

Terminal No.	AC version
1	Output 1 relay contact
2	Output 1 relay contact
3	Output 2 relay common contact (C)
4	Output 2 relay normally open contact (NO)
5	Output 2 relay normally closed contact (NC)
6	Power supply 90 ... 250 V AC
7	Power supply 90 ... 250 V AC

Connection assignment X2

Inputs

Terminal No.	Name	AC version
1	+24 V DC	Sensor supply voltage
2	0 VDC (GND)	Reference voltage
3	INP A	Counter input A
4	INP B	Counter input B
5	RESET	Reset input
6	GATE	Gate input
7	KEY	Input of push-button lock

CE

Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

Model Number	KCY1-6SR-B
Function	Addition/Subtraction pre-select counter
Type	2-line, 7-segment LC display with signs
Number of digits	6
Display value	digit height 7 mm
Reset	manual or external
Operating voltage	2 x 3.6 V batteries
Counting frequency	25 Hz
Output type	Relay output
Ambient temperature	-10 ... 50 °C (14 ... 122 °F)
Storage temperature	-20 ... 60 °C (-4 ... 140 °F)
Relative humidity	≤ 80 % (noncondensing)
Dimensions	48 mm x 48 mm x 85 mm
Mounting	latch fastener (dimension 50.5 mm x 54.5 mm)

Properties

- LCD batch controller
- Battery operated
- 6 digits
- Addition/subtraction pre-select counter
- Battery voltage operation
- Relay output
- Input for keypad locking
- Manual or external reset

Benefits

- Simple pre-selection setting via one button per decade
- Easy-to-read 2-line LCD indicator
- PNP and NPN sensors can be connected

Electrical Connection

Terminal No.	
1	+3 V DC for terminal 2
2	Input of push-button lock
3	Relay contact
4	Relay contact
5	AC/DC optocoupler count input
6	AC/DC optocoupler reset input
7	Common AC/DC input for terminals 5 and 6

CE

Properties

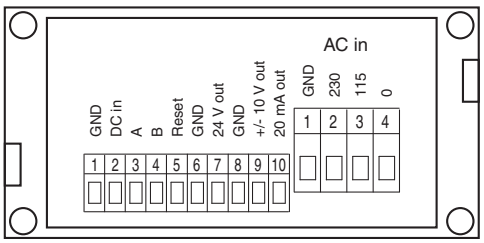
- **LED Counter/Timer/Tachometer with analog voltage and current output**
- **16 - 35 V_{DC} and 115 - 230 V_{AC} supply voltage**
- **6 digits**

Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

Model Number	TC-6A-V
Function	Counter Timer Tachometer
Type	7-segment LED display, red
Number of digits	6
Display value	digit height 15 mm
Reset	manual/external/automatical
Operating voltage	115 ... 230 V_{AC} 16 ... 35 V_{DC}
Power consumption	7.5 VA
Counting frequency	25 kHz (Timer function 1 kHz)
Output type	1 Analog output, configurable voltage output: -10 V ... 10 V current output: 0/4 ... 20 mA
Sensor supply	✔
Ambient temperature	0 ... 45 °C (32 ... 113 °F)
Storage temperature	-25 ... 70 °C (-13 ... 158 °F)
Relative humidity	45 ... 90 % (noncondensing)
Connection	screw terminals, removable max. core cross-section 0.34 ... 1.5 mm^2 (AC max. 2.5 mm^2)
Dimensions	96 x 48 x 140 mm

Electrical Connection



CE

Properties

- LCD batch controller with 1 pre-selection
- 10 - 30 V_{DC} supply voltage
- 2 x 6 digits

Benefits

- Adding/subtracting via 2 separate inputs
- Easy-to-read, 2-line LCD display with symbols for indicated pre-selection and output status
- PNP and NPN sensors can be connected

Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

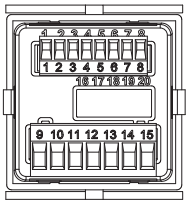
General Data

Function	Counter
	Timer
	Tachometer
Display value	digit height 9 mm
Reset	manual or external
Sensor supply	✔
Storage temperature	-25 ... 75 °C (-13 ... 167 °F)
Relative humidity	≤ 93 % at 40 °C (noncondensing)
Dimensions	48 mm x 48 mm x 109.8 mm

Model Number		KC-LCD-48-1R-24VDC	KC-LCDL-48-2R-24VDC	KC-LCDC-48-2T-24VDC	KC-LCDC-48-2R-24VDC	KC-LCDC-48-6T-24VDC
Type	2-line, 2 x 6-digit LC display with sign	●				
	2-line, 2 x 6-digit LC display with sign backlighted		●			
	2-line, 2 x 6-digit LC display with sign Multicolor, backlit			●	●	●
Operating voltage	10 ... 30 V_{DC}		●	●	●	●
	11 ... 30 V_{DC}	●				
Power consumption	max. 1.5 W		●	●	●	●
	max. 4 W	●				
Counting frequency	max. 50 kHz					●
	30 Hz / 5 kHz	●				
	30 Hz / 55 kHz		●	●	●	
Output type	1 relay output	●				
	2 relay outputs		●		●	
	2 transistor switching outputs			●		
	6 transistor switching outputs					●
Ambient temperature	-10 ... 50 °C (14 ... 122 °F)	●				
	-20 ... 65 °C (-4 ... 149 °F)		●	●	●	●

Electrical Connection

KC-LCDL-48-2R-24VDC
KC-LCDC-48-2R-24VDC



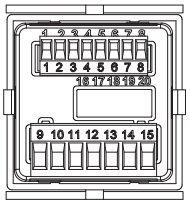
Signal and control inputs

1	Sensor supply voltage
2	GND (0V)
3	INP A (Signal input A)
4	INP B (Signal input B)
5	RESET (Reset input)
6	LOCK (Input Keypad lock)
7	GATE (Gate input)
8	MPI (User input)

Supply voltage and outputs

9	Relay contact C.	Output 1
10	Relay contact N.O.	
11	Relay contact C.	Output 2
12	Relay contact N.O.	
13	Relay contact N.C.	
14	10 ... 30 V DC	Supply voltage
15	GND (0V)	

KC-LCDC-48-2T-24VDC



Signal and control inputs

1	Sensor supply voltage
2	GND (0V)
3	INP A (Signal input A)
4	INP B (Signal input B)
5	RESET (Reset input)
6	LOCK (Input Keypad lock)
7	GATE (Gate input)
8	MPI (User input)

Supply voltage and outputs

9	Collector	Output 1
10	Emitter	
11	Collector	Output 2
12	not connected	
13	Emitter	
14	10 ... 30 V DC	Supply voltage
15	GND (0V)	

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Properties

- LCD batch controller with 2 pre-selections
- 230 V_{AC} supply voltage
- 2 x 6 digits

Benefits

- Adding/subtracting via 2 separate inputs
- Easy-to-read backlit 2-line LCD display with icons for the displayed preselection and the status of both outputs
- PNP and NPN sensors can be connected

Technical Data

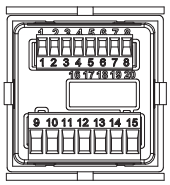
For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

General Data	
Display value	digit height 9 mm
Reset	manual or external
Sensor supply	✔
Storage temperature	-25 ... 75 °C (-13 ... 167 °F)
Relative humidity	≤ 93 % at 40 °C (noncondensing)
Dimensions	48 mm x 48 mm x 109.8 mm

Model Number		KC-LCD-48-1R-230VAC	KC-LCDL-48-2R-230VAC	KC-LCDC-48-2T-230VAC	KC-LCDC-48-2R-230VAC	KC-LCDC-48-6T-230VAC
Type	2-line, 2 x 6-digit LC display with sign	●				
	2-line, 2 x 6-digit LC display with sign backlighted		●			
	2-line, 2 x 6-digit LC display with sign Multicolor, backlit			●	●	●
Operating voltage	230 V_{AC}	●				
	90 ... 260 V_{AC}		●	●	●	●
Power consumption	max. 6.5 VA	●				
	max. 8 VA		●	●	●	●
Counting frequency	max. 50 kHz					●
	30 Hz / 5 kHz	●				
	30 Hz / 55 kHz		●	●	●	
Output type	1 relay output	●				
	2 relay outputs		●		●	
	2 transistor switching outputs			●		
	6 transistor switching outputs					●
Ambient temperature	-10 ... 50 °C (14 ... 122 °F)	●				
	-20 ... 65 °C (-4 ... 149 °F)		●	●	●	●

Electrical Connection

KC-LCD-48-1R-230VAC



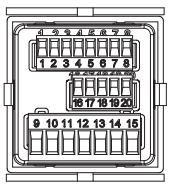
Signal and control inputs

1	Sensor supply voltage
2	GND (0V)
3	INP A (Signal input A)
4	INP B (Signal input B)
5	RESET (Reset input)
6	LOCK (Input Keypad lock)
7	not connected
8	not connected

Supply voltage and outputs

9	not connected	
10	not connected	
11	Relay contact C.	Output
12	Relay contact N.O.	
13	Relay contact N.C.	
14	230 V AC N~	Supply voltage
15	230 V AC L~	

KC-LCDC-48-6T-230VAC



Signal and control inputs

1	Sensor supply voltage
2	GND (0V)
3	INP A (Signal input A)
4	INP B (Signal input B)
5	RESET (Reset input)
6	LOCK (Input Keypad lock)
7	GATE (Gate input)
8	MPI (User input)

Supply voltage and outputs

9	Collector	Output 1
10	Emitter	
11	Collector	Output 2
12	not connected	
13	Emitter	
14	10 ... 30 V DC	Supply voltage
15	GND (0V)	
16	Common Emitter	Output 3 - 6
17	Collector 6	Output 6
18	Collector 5	Output 5
19	Collector 4	Output 4
20	Collector 3	Output 3

CE

Properties

- LCD pulse counter
- 10 - 30 V_{DC} supply voltage
- Manual and external reset

Technical Data

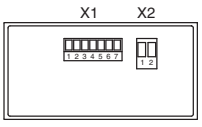
For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

General Data	
Function	Counter
Reset	manual or external
Operating voltage	10 ... 30 V DC
Ambient temperature	-20 ... 65 °C (-4 ... 149 °F)

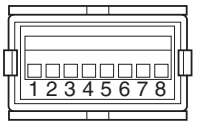
Model Number		KC-LCD-24-24VDC	KC-LED-96-1T-24VDC
Type	6-digit 7-segment LED display, red		●
	7-digit 7-segment LC display	●	
Display value	digit height 14 mm		●
	digit height 8 mm	●	
Counting frequency	30 Hz / 60 kHz with position display max. 25 kHz		●
	8 kHz, pnp input max. 48 Hz, npn input	●	
Output type	1 transistor switching output		●
Storage temperature	-25 ... 70 °C (-13 ... 158 °F)		●
	-25 ... 75 °C (-13 ... 167 °F)	●	
Dimensions	48 mm x 24 mm x 53.5 mm	●	
	96 mm x 48 mm x 89.4 mm		●

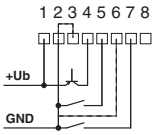
Electrical Connection

KC-LED-96-1T-24VDC



KC-LCD-24-24VDC





Connection assignment X2

Terminal No.	DC version
1	Power supply 0 V DC (GND)
2	Power supply 10 ... 30 V DC

Connection assignment X1

Terminal No.	DC version
1	Optocoupler collector output
2	Optocoupler emitter output
3	SET
4	INP B
5	INP A
6	n.c
7	n.c.

Function and terminal assignment

Terminal	Text on device	Function
1	10 - 30 V DC	Supply voltage +Ub
2	GND	0 V DC
3	GND	0 V DC
4	INP PNP	fast counting input
5	INP NPN	slow counting input
6	RESET ENABLE	Reset key enable input
7	RESET	Reset input
8	n.c.	not used

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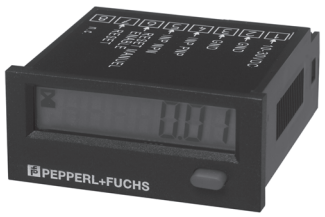


Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

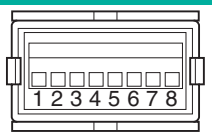
Model Number	KH-LCD-24-24VDC
Function	Operating hours counter
Type	7-digit 7-segment LC display Hourglass as operating indicator
Display value	digit height 8 mm
Reset	manual or external
Operating voltage	10 ... 30 V DC
Ambient temperature	-20 ... 65 °C (-4 ... 149 °F)
Storage temperature	-25 ... 75 °C (-13 ... 167 °F)
Dimensions	48 mm x 24 mm x 53.5 mm

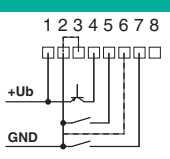
CE

Properties

- LCD hours counter
- 10 - 30 V_{DC} supply voltage
- 7 digits
- Manual and external reset

Electrical Connection





Function and terminal assignment

Terminal	Text on device	Function
1	10 - 30 V DC	Supply voltage +Ub
2	GND	0 V DC
3	GND	0 V DC
4	INP PNP	fast counting input
5	INP NPN	slow counting input
6	RESET MANUEL ENABLE	Reset key enable input
7	RESET	Reset input
8	n.c.	not used

CE

Properties

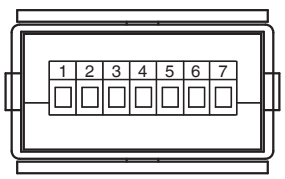
- Bright, high contrast 5-digit LED display
- 10 - 30 V_{DC} supply voltage
- Analog Voltage or Current
- Leading zero suppression
- Adjustable decimal point
- Maximum and Minimum value display

Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

Model Number	DA5-IU-C
Pre-selection	none
Data storage	10^6 storage cycles or 10 years, EEPROM
Programming	keypad-driven menu
Type	7-segment LED display, red
Number of digits	5
Display value	digit height 8 mm
Display range	-19999 ... 99999
Operating voltage	10 ... 30 V_{DC}
Power consumption	1.5 VA
Impedance	1 MOhm
Voltage	max. 30 V_{DC}
Analog voltage input	0 ... 10 V / 2 ... 10 V_{DC}
Analog current input	0 ... 20 mA / 4 ... 20 mA
Ambient temperature	-10 ... 50 °C (14 ... 122 °F)
Storage temperature	-25 ... 70 °C (-13 ... 158 °F)
Relative humidity	≤ 80 % (noncondensing)
Connection	7-pin screw terminal max. core cross-section 0.34 ... 1.5 mm^2
Dimensions	48 mm x 24 mm x 65 mm
Mounting	latch fastener/mounting frame
Protection degree	IP65 (front)

Electrical Connection



Terminal No.	
1	10 ... 30 V DC
2	0 V (GND)
3	0 V LATCH
4	LATCH
5	Current input
6	0 V input signal
7	Voltage input

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CE

Properties

- LED display
- Process control and indication unit
- 10 - 30 V_{DC} and 90 - 260 V_{AC} supply voltage version
- 5 digits
- Analog Voltage or Current
- 2 adjustable limit values
- 2 relay outputs
- Configurable
- Auxiliary power output for sensors

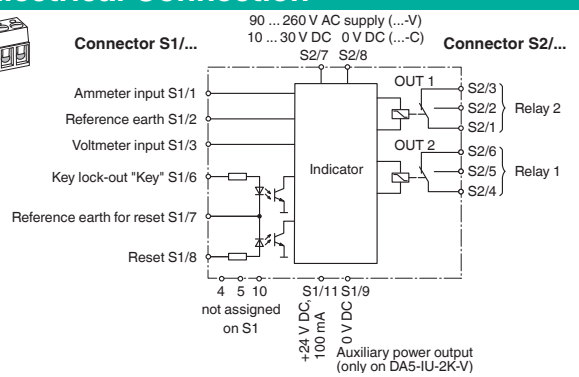
Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

General Data	
Pre-selection	2
Data storage	10^6 storage cycles or 10 years, EEPROM
Programming	keypad-driven menu
Type	7-segment LED display, red
Number of digits	5
Display value	digit height 14.2 mm
Pre-selection	digit height 14.2 mm
Display range	-19999 ... 99999
Impedance	> 1 MΩ for voltage measurement < 50 Ω for current measurement
Analog voltage input	0 ... 10 V / 2 ... 10 V DC, -10 ... 10 V DC
Analog current input	0 ... 20 mA / 4 ... 20 mA
Relay output	2 x 250 V AC/ 300 V DC, 3 A, form C
Ambient temperature	-10 ... 50 °C (14 ... 122 °F)
Storage temperature	-25 ... 70 °C (-13 ... 158 °F)
Relative humidity	≤ 80 % (noncondensing)
Connection	8-pin and 11-pin connectors with plug-in screw terminals
Dimensions	96 mm x 48 mm x 90 mm
Mounting	mounting frame with latch fastener

Model Number		DA5-IU-2K-C	DA5-IU-2K-V
Operating voltage	10 ... 30 V_{DC}	●	
	90 ... 260 V_{AC}		●
Power consumption	2 W	●	
	7 VA		●
Sensor supply	24 V DC , 100 mA		●

Electrical Connection



CE

Properties

- LED temperature display
- 10 - 30 V_{DC} supply voltage
- 5 digits

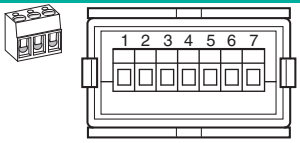
Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

General Data	
Data storage	EEPROM
Programming	keypad-driven menu
Type	5-digit 7-segment LED display, red
Display value	digit height 8 mm
Operating voltage	10 ... 30 V_{DC} galvanically isolated
Ambient temperature	-20 ... 65 °C (-4 ... 149 °F)
Storage temperature	-25 ... 70 °C (-13 ... 158 °F)
Relative humidity	≤ 85 % (noncondensing)
Dimensions	48 mm x 24 mm x 68.3 mm
Protection degree	IP65 (front)

Model Number		KT-LED-24-PT100-24VDC	KT-LED-24-TC-24VDC
Display range	-1999.9 ... 9999.9	●	
	-999.9 ... 1999.9		●
Suitable Sensors	Pt100/Ni100 resistance thermometer, with sensor breakage monitoring	●	
	Thermocouple J, K, N, with sensor breakage monitoring		●

Electrical Connection

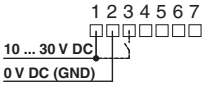


Connections

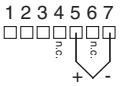
Pin	Function
1	10 - 30 V DC Supply voltage
2	0 V DC (GND)
3	Latch input
4	not connected
5	Thermocouple "+"
6	not connected
7	Thermocouple "-"

Electrical connection

Connection supply Voltage / Latch input



Thermocouple Sensor



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Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

General Data	
Data storage	10^6 storage cycles or 10 years, EEPROM
Programming	keypad-driven menu
Type	5-digit 7-segment LED display, red
Display value	digit height 14.2 mm
Display range	-19999 ... 99999 with suppression of leading zeros
Output type	2 Relay changeover outputs
Input type	
Input 1	Measurement input for thermoelements B, E, J, K, N, R, S, T
Input 2	Measurement input for resistance thermometer type Pt100, Pt1000
Input 3	Measurement input for resistance measurement
Sensor supply	✔
Ambient temperature	-20 ... 65 °C (-4 ... 149 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Relative humidity	≤ 75 % (noncondensing)
Dimensions	96 mm x 48 mm x 90.7 mm
Protection degree	IP65 (front)

Model Number		KT-LED-96-2R-24VDC	KT-LED-96-2R-230VAC
Operating voltage	10 ... 30 V_{DC} galvanically isolated	●	
	90 ... 260 V_{AC}		●
Power consumption	max. 2 W	●	
	max. 6 VA		●
Suitable Sensors	Pt100/Ni100 resistance thermometer, with sensor breakage monitoring	●	
	Thermocouple J, K, N, with sensor breakage monitoring		●

Properties

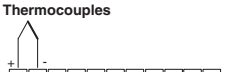
- LED display
- Temperature control unit
- 10 - 30 V_{DC} and 90 - 260 V_{AC} supply voltage version
- 5 digits

Electrical Connection

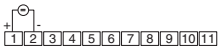
KT-LED-96-2R-230VAC
KT-LED-96-2R-24VDC

Electrical connection X2

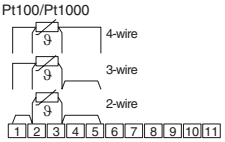
Thermocouples



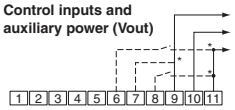
Voltage measurement



Resistance thermometer
Pt100/Pt1000



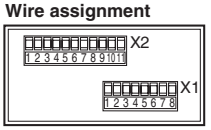
Control inputs and auxiliary power (Vout)



* Alternatively connect directly to DC power supply (galvanic isolation of control and measurement inputs

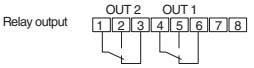
KT-LED-96-2R-24VDC

Wire assignment



X1: Pin Function

Power supply and alarm outputs



7 + 10 ... 30 V DC
8 GND4 (0 V DC)

X2: Pin Function

Thermocouples
1 Positive sensing arm
2 Negative sensing arm

Resistance thermometer
1 Pt100 or 0 ... 400 Ω
2 Pt1000 or 0 ... 4000 Ω

Voltage measurement
1 Voltage input (V)
2 GND 1 (analog)

Control inputs and auxiliary power (Vout)
6 Keypad lock-out "Key"
7 GND2 Key/MPI
8 MP-input "Reset-alarm-latch/ Display-Hold"
9 GND3 (for Vout)
10 Vout + 10 V/30 mA
11 n.c.

Technical Data

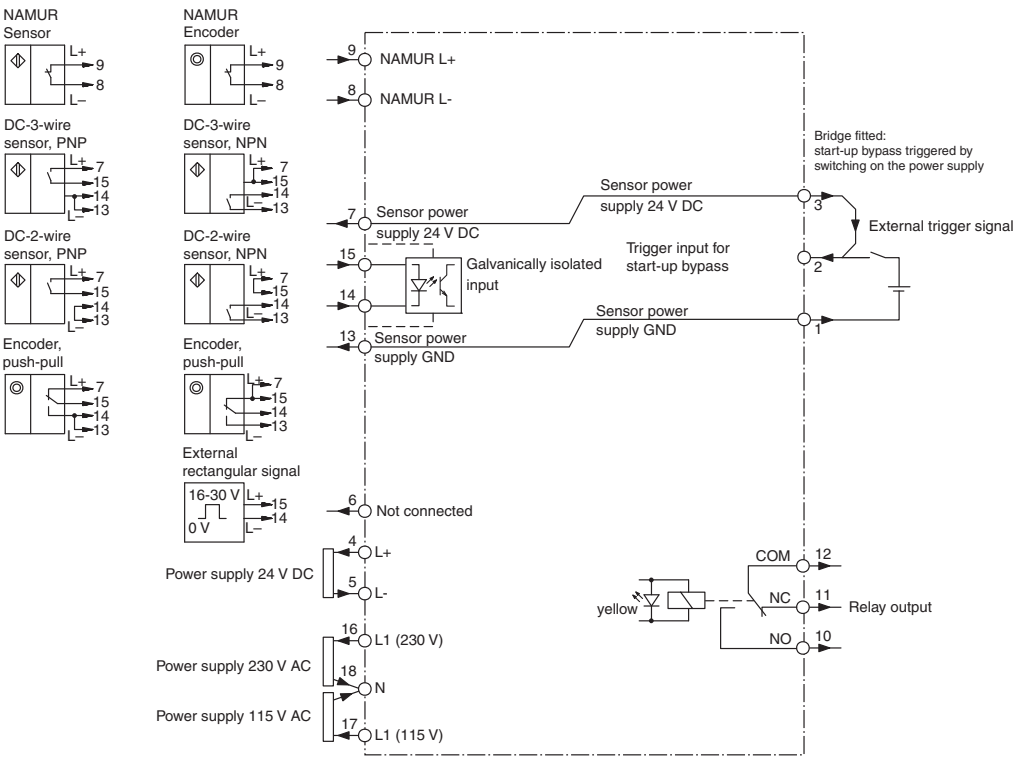
For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

Model Number	KFU8-DW-1.D
Rated voltage	196 ... 250 V AC ; 98 ... 127 V AC; 47 ... 63 Hz 20.4 ... 28 V DC
Power consumption	AC: < 5 VA DC: < 5 W
Type	4-digit, 7-segment red display, 7 mm digit height
Display range	0.002 ... 9999 Hz or 0.01 ... 9999 min^{-1}
Parameter assignment	keypad-driven menu
Switching state	LED yellow, 3 mm
Input 1	
Connection	terminals 8-, 9+
Connectable sensor types	NAMUR sensors according to DIN EN 60947-5-6
Input frequency	0.002 ... 40000 Hz, pulse length/duration: ≥ 12µs
Input 2	
Connection	terminals 7+, 13- sensor supply terminals 14, 15 NPN/PNP input (galvanically isolated)
Connectable sensor types	Two, three, or four-wire proximity switch, incremental rotary encoder, or externally generated pulses 16 ... 30 V
Start-up override	External input or jumper configurable
Jumpering time	0.1 ... 999.9 s (External trigger signal)
Relay	1 changeover contact NO, NC, COM
Sensor supply	24 V DC ± 10 %, 30 mA , short-circuit protected
Delay	≤ 20 ms (incl. calculation time)
Ambient temperature	-25 ... 50 °C (-13 ... 122 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Protection degree	IP20
Connection	coded, removable terminals , max. core cross-section 0.34 ... 2.5 mm^2
Mounting	Snap onto 35 mm standard rail compliant with DIN EN 50022 or Screw fastening using slide-on straps in a 90 mm net

Properties

- **Overspeed / underspeed monitor**
- **DC and AC supply voltage**
- **4 digits display**
- **Speed monitor up to 40Khz**
- **2-,3-,4-and NAMUR sensor compatible**
- **Start-up delay feature**
- **Menu driven operation**

Electrical Connection



Technical Data

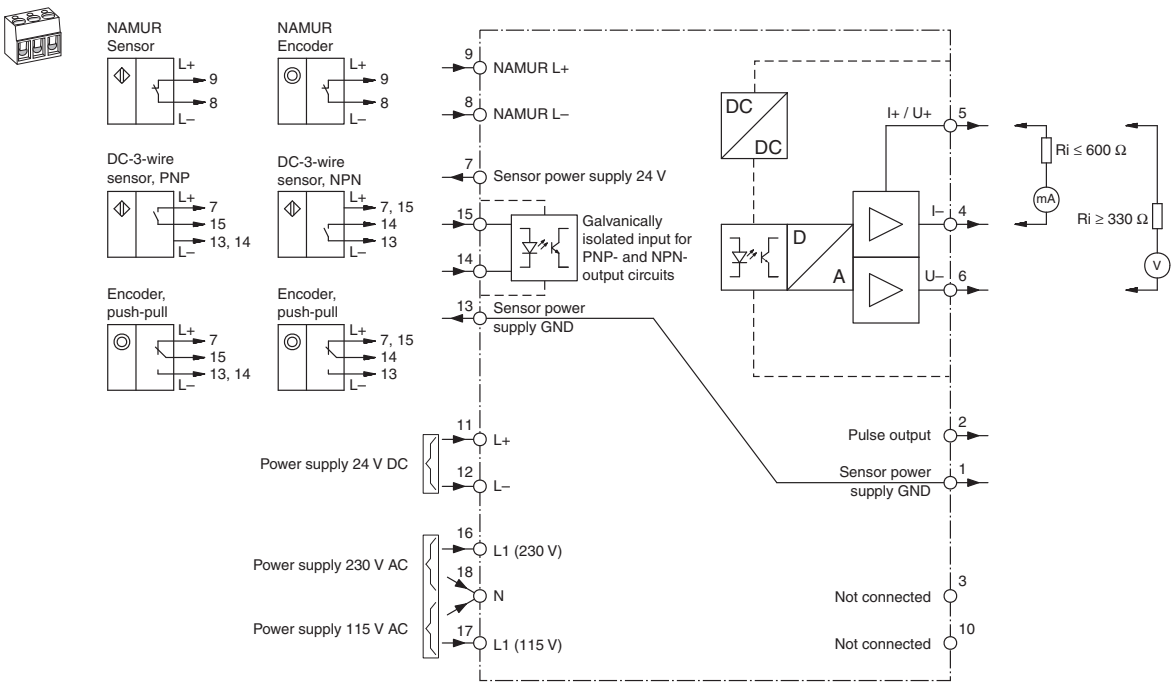
For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

Model Number	KFU8-FSSP-1.D
Rated voltage	196 ... 250 V AC ; 98 ... 127 V AC; 47 ... 63 Hz 20.4 ... 27.6 V DC
Power consumption	AC: < 5 VA DC: < 5 W
Type	4-digit, 7-segment red display, 7 mm digit height
Display range	0.002 ... 9999 Hz or 0.01 ... 9999 min^{-1}
Input 1	
Connection	terminals 8-, 9+
Connectable sensor types	NAMUR sensors according to DIN EN 60947-5-6
Switching point	high: 16 ... 30 V DC; max.10 mA; $R_i \cong 3$ kΩ low: 0 ... 6 V DC
Input 2	
Connection	terminals 7+, 13- sensor supply terminals 14, 15 NPN/PNP input (galvanically isolated)
Connectable sensor types	2-, 3-, or 4-wire proximity switches and incremental rotary encoder
Output	
Analog voltage output	0 ... 10 V DC; 2 ... 10 V DC; 30 mA max.; resolution: 12 mV; $R_i \geq 330$ Ω (terminal 5+, 6-)
Analog current output	0 ... 20 mA; 4 ... 20 mA; resolution: 25 µA; $R_i \leq 600$ Ω (terminal 4-, 5+)
Ambient temperature	-25 ... 50 °C (-13 ... 122 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Protection degree	IP20
Connection	coded, removable terminals , max. core cross-section 0.34 ... 2.5 mm^2
Mounting	snap-on to 35 mm standard rail or screw fixing

Properties

- **Frequency voltage current converter**
- **DC and AC supply voltage**
- **4 digits display**
- **Input Frequency up to 40Khz**
- **2-,3-,4-wire and NAMUR sensor compatible**
- **Multi-range power input**
- **Auxiliary power output for sensors**
- **Voltage or current output signal**

Electrical Connection



Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

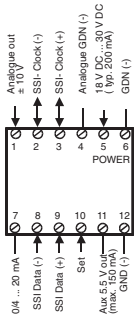
Model Number	K23-SSI/R2/IU-C
Rated operational voltage	18 ... 30 V DC
Rated operational current	≤ 170 mA at 18 V DC (5.5 V not connected) ≤ 120 mA at 30 V DC
Supply	Encoder: 5.5 V ±5 %, max. load 150 mA
Input 1	
Input type	SSI
Input format	Gray code, binary code
Resolution	13, 21, or 25 bit
Input 2	
Input type	Set
Output	
Number/Type	analog
Output rated operating current	0/4 ... 20 mA (< 150Ω) at ±10 V DC (> 5 kΩ)
Ambient temperature	0 ... 45 °C (32 ... 113 °F)
Connection	screw terminals , max. core cross-section 0.34 ... 2.5 mm^2

Properties

- **Signal converter**
- **DC supply voltage**
- **SSI to Analog/RS232/RS485 output, SSI can be configured as master or slave**

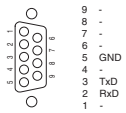
Electrical Connection

Terminals

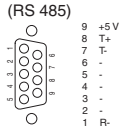


Sub-D 9-pin
(RS 232)

Only connect PINS 2, 3 and 5.
The connection of other PINs leads to interference with the RS 485 signal.



(RS 485)



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Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

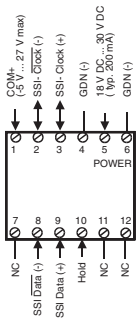
Model Number	K23-SSI/R2/25B-C
Rated operational voltage	18 ... 30 V DC
Rated operational current	≤ 200 mA
Input 1	
Input type	SSI
Input format	Gray code, binary code
Resolution	13, 21, or 25 bit
Input 2	
Input type	HTL (Hold)
Output	
Number/Type	Parallel
Output rated operating current	Gray-Code, Binary-Code, BCD-Code
Ambient temperature	0 ... 45 °C (32 ... 113 °F)
Connection	screw terminals , max. core cross-section 0.34 ... 2.5 mm^2

Properties

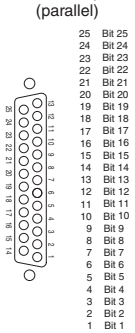
- **Signal converter**
- **DC supply voltage**
- **SSI to RS232/parallel output, SSI can be configured as master or slave**

Electrical Connection

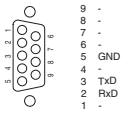
Terminals



Sub-D 25-pin (parallel)



Sub-D 9-pin (RS 232)



CE

Properties

- Sensor output interface terminal
- Converts Namur to 3-wire DC converter
- Short circuit proof output

Technical Data

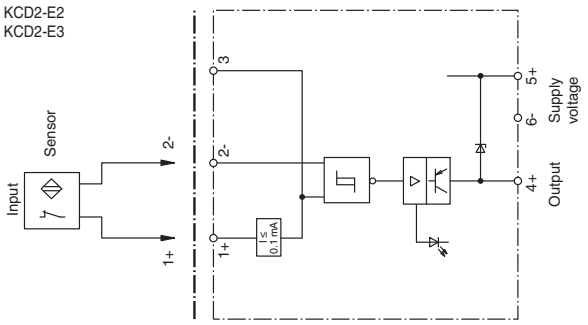
For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

General Data		
LED yellow		Output state
Operating voltage	U_B	10 ... 30 V DC
Operating current		approx. 22 mA
Sensor supply		8 V DC
Input		
Connection		terminals 1+, 2-
Connectable sensor types		NAMUR
Output		
Current		200 mA short-circuit protected
Ambient temperature		-25 ... 70 °C (-13 ... 158 °F)
Storage temperature		-25 ... 85 °C (-13 ... 185 °F)
Connection		self-opening apparatus connection terminals, max. core cross-section 0.34 ... 2.5 mm^2
Dimensions		20 x 60 x 40 (in mm)

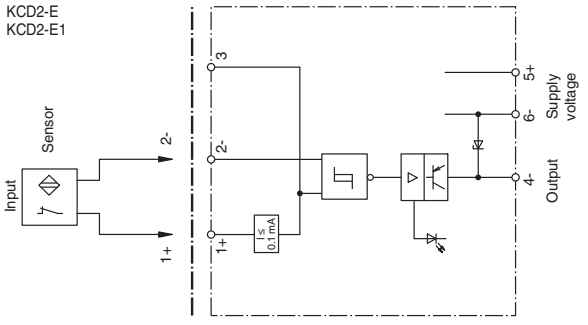
Model Number		KCD2-E	KCD2-E1	KCD2-E2	KCD2-E3
Output					
Output type	1 NPN, NO	●			
	1 NPN, NC		●		
	1 PNP, NO			●	
	1 PNP, NC				●
Connection	terminal 4+			●	●
	terminal 4-	●	●		
Signal level	U_B - 1.1V			●	●
	U_B - 1.8V	●	●		

Electrical Connection

KCD2-E2
KCD2-E3



KCD2-E
KCD2-E1



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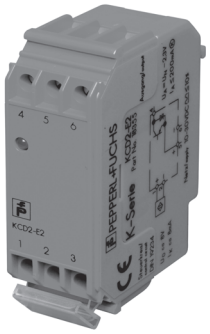


CE

Properties

- Sensor output interface terminal
- DC supply voltage
- Converts Namur to 3-wire DC
- Short circuit proof output
- Lead break detection

Technical Data

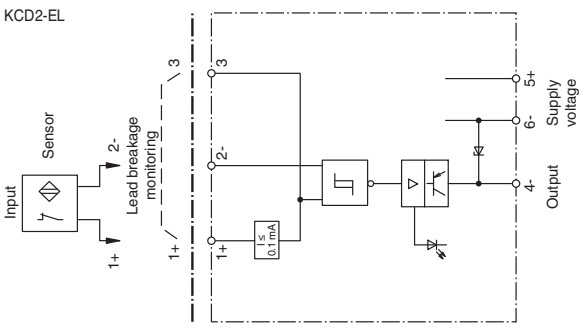
For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

General Data	
LED yellow	Output state lead breakage: LED off, output locked
Operating voltage	10 ... 30 V DC
Operating current	approx. 22 mA
Sensor supply	8 V DC
Input	
Connection	terminals 1+, 2-
Connectable sensor types	NAMUR
Output	
Current	200 mA short-circuit protected
Ambient temperature	-25 ... 70 °C (-13 ... 158 °F)
Storage temperature	-25 ... 85 °C (-13 ... 185 °F)
Connection	self-opening apparatus connection terminals, max. core cross-section 0.34 ... 2.5 mm^2
Dimensions	20 x 60 x 40 (in mm)

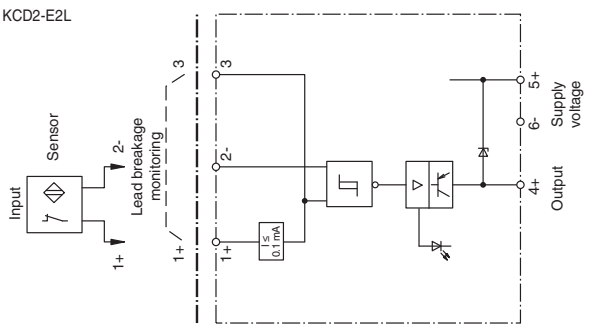
Model Number		KCD2-EL	KCD2-E2L
Output			
Output type	1 NPN, NO	●	
	1 PNP, NO		●
Connection	terminal 4+		●
	terminal 4-	●	
Signal level	U_B - 1.1V		●
	U_B - 1.8V	●	

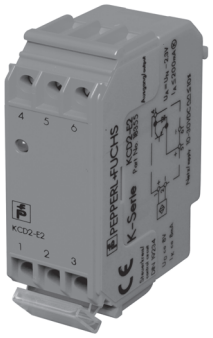
Electrical Connection

KCD2-EL



KCD2-E2L





Technical Data

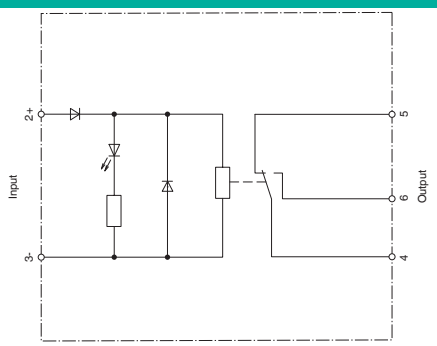
For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

Model Number	KCD2-R
LED yellow	Output state
Operating voltage	24 V DC ± 15 %
Operating current	16 mA
Input	
Connection	terminals 2+, 3-
Connectable sensor types	PNP or NPN 3-wire sensors
Output	
Relay	Form C contact
Contact load	30 VDC / 2 A
Switching frequency	≤ 10 Hz
Ambient temperature	-25 ... 60 °C (-13 ... 140 °F)
Storage temperature	-25 ... 85 °C (-13 ... 185 °F)
Connection	self-opening apparatus connection terminals, max. core cross-section 0.34 ... 2.5 mm^2
Dimensions	20 x 60 x 40 (in mm)

Properties

- **Sensor output interface terminal**
- **DC supply voltage**
- **Converts 3-wire outputs to Relay output**

Electrical Connection



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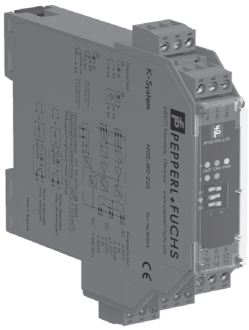

Technical Data

For detailed data and product description refer to the data sheets at ***www.pepperl-fuchs.us***

Model Number	KFD2-SR2-2.W.SM
Signal type	Digital input
Rated voltage	20 ... 30 V DC
Power consumption	≤ 1.5 W
LED yellow	Switching state
Relay	2 changeover contacts
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Protection degree	IP20
Mounting	on 35 mm DIN mounting rail acc. to EN 60715:2001

Properties

- 2-channel signal conditioner
- DC supply voltage
- PNP/push-pull, dry contacts or NAMUR inputs
- Selectable frequency trip values and mode of operation
- 2 relay contact outputs

Electrical Connection