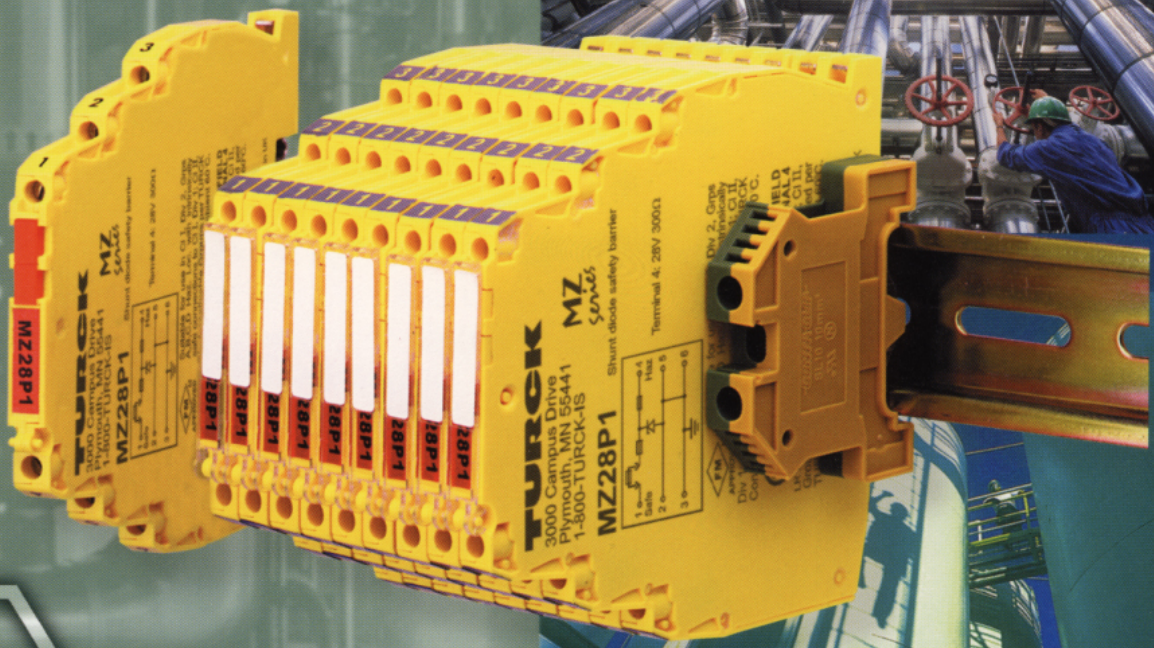
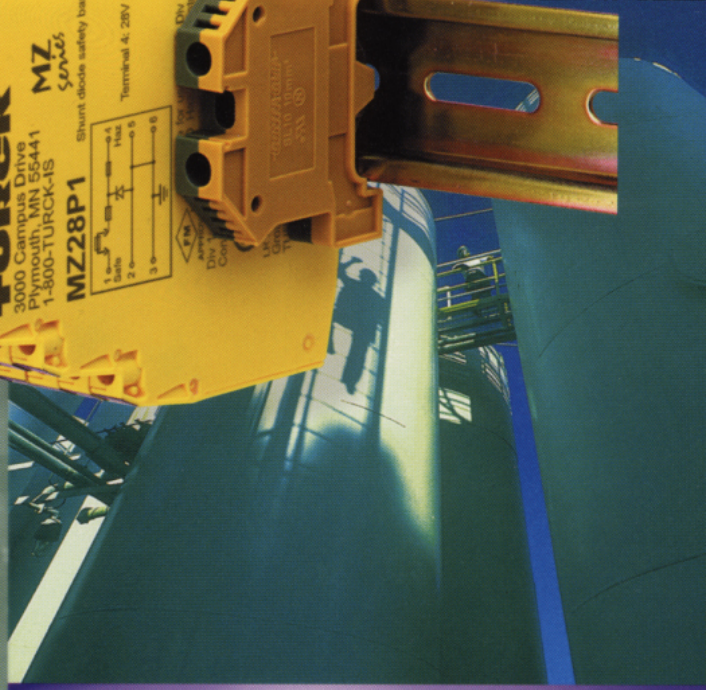
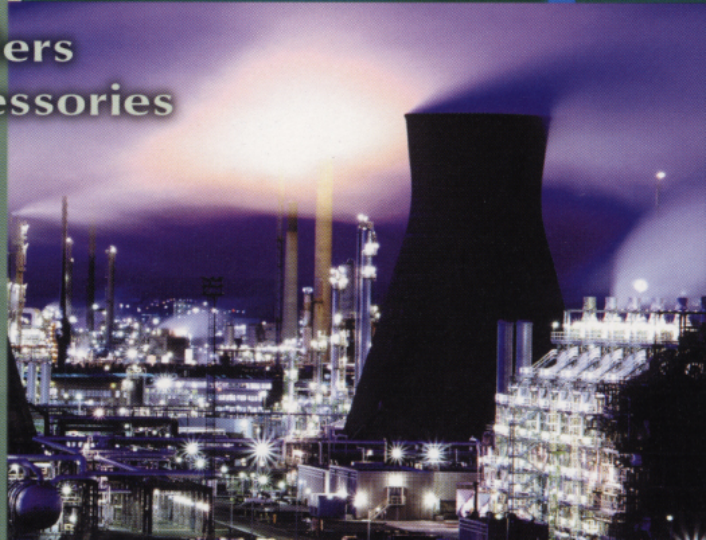
MZ series Safety Barriers



IS



Shunt-diode Safety Barriers and Intrinsic Safety Accessories



TURCK works

MZ series

For Safe Measurement and

Certified for Worldwide Standards

TURCK's MZ-Series shunt-diode intrinsic safety barriers protect electrical devices in all hazardous (classified) atmospheres, including flammable gases, dusts and fibers. MZ-Series barriers are approved by Factory Mutual in the USA, CSA in Canada, and by BASEEFA in the UK to CENELEC standards.

Exceptionally High Density

With a width of only 7 mm for one-, two-, and three-channel barriers, the MZ-Series achieves a very high density. These ultra-slim barriers also duplicate and replace many functions of conventional terminals, saving even more space.

Simple Installation

MZ-Series barriers clamp simply and securely onto a standard 35 mm DIN rail, simultaneously making a reliable ground connection. Extra terminals on each side of the barrier allow cable shields and ground returns to be terminated on the barrier. 'Dummy' barriers are available to secure and ground spare hazardous area conductors, as well as to provide feed-through connections for the optional power comb.

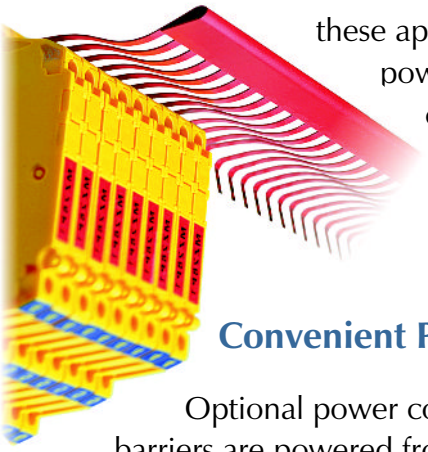
Secondary Replaceable Fuses

Secondary replaceable fuses are available on many models. These fuses provide protection against faults that could occur during commissioning that would otherwise blow the internal, non-replaceable safety fuse. The fuses can also be latched in a disconnect position, thus avoiding the need for additional disconnect terminals. Models in which a fuse is less likely to be necessary use a simple link that retains the loop-disconnect feature.

Control in Hazardous Areas

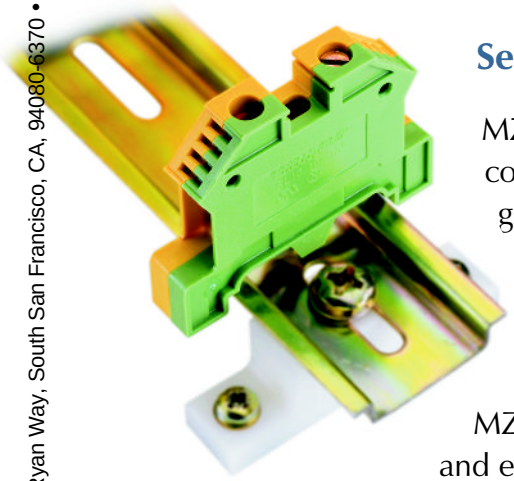
Overvoltage Protection

Models MZ06R2, MZ07P2, MZ08P2 are active barriers designed for use with transmitters, switches or solenoids. Barriers in these applications are often connected directly to a power supply. These models have built-in overvoltage protection circuits that allow their use with unregulated power supplies up to 35 V.



Convenient Power Comb

Optional power comb simplifies installations in which multiple barriers are powered from a common source. The comb replaces an individual power supply connection to each barrier, yet allows single barriers to be removed without affecting the others.
The power comb distributes power to as many as 40 barriers and can be cut to power smaller numbers of barriers.



Secure Ground Terminals

MZGT ground terminals provide for connection of the DIN rail to an appropriate ground electrode. Two are recommended per discrete length of DIN rail.

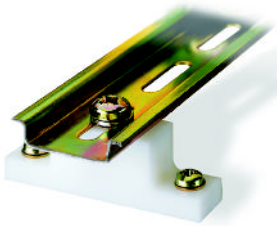
Insulating Spacers

MZSP insulating spacers provide a simple and effective means of isolating the IS ground from panel ground.

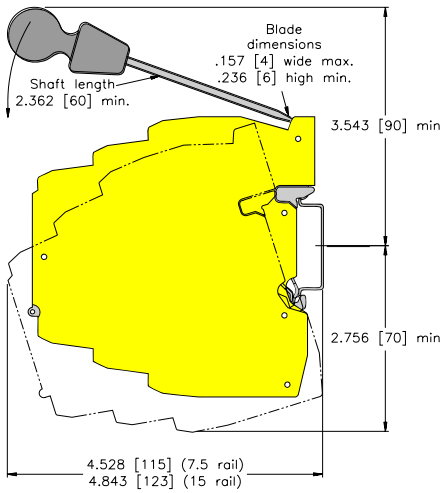
Simple Identification

Barrier identification is provided by label carriers that snap onto the top of individual barriers. The label carriers hinge, allowing easy access to the barrier fuses / links while providing maximum label space. Self-adhesive labels are supplied on sheets of 120 for pre-printing.

Safety Barriers



Clearances for mounting and removing barriers



Mounting details

TURCK MZ Series barriers pack closely together on DIN rails, permitting up to 132 barriers per meter of rail. A few factors need to be considered when calculating how many barriers will fit onto a given length of rail:

On the DIN rail, allow space for:

Barrier packing pitch: 7.4 mm

MZGT ground terminals: 10 mm each

MZSP insulating spacer: 14.7 mm (minimum of 2)

1) barriers and accessories cannot be mounted directly above an MZSP spacer when using a 7.5 mm rail. If the space above the spacer is needed, use a high-profile (15 mm) rail or low-profile screws, M6 x 16 with 1 mm heads.

2) to maintain rigidity of the DIN-rail when using MZSP spacers, the distance between spacers should not exceed 500 mm for 15 mm high-profile rail and 333 mm for 7.5 mm low-profile rail.

There is a provision to terminate a cable screen or ground return on the third terminal (6 or 3) on MZ Series barriers. Spare cores may be secured on the MZDB dummy barrier.

Grounding

MZ Series barriers must be securely grounded in order to perform their intended function. One connection is required, two are recommended using a 12 AWG minimum conductor. The resistance of the connection between barrier ground and ground electrode must be < 1 ohm. "Ground Electrode" is defined in the NEC, Article 250, or by other appropriate jurisdictional authority.

Specifications

Ambient temperature limits

-20° to 60°C (FM/CSA) continuous working
-20° to 40°C (BASEEFA) continuous working

Humidity limits

5 to 95% RH

Case flammability

UL94: V-2

Terminations

Terminals accommodate conductors up to 2.5 mm^2
Hazardous-area terminals are identified as dark blue

Color coding of barrier type (label on top surface)

Red . . . . . Positive polarity (+)
Black . . . . . Negative polarity (-)
Grey . . . . . Non-polarized
White . . . . . MZDB dummy barrier

Weight

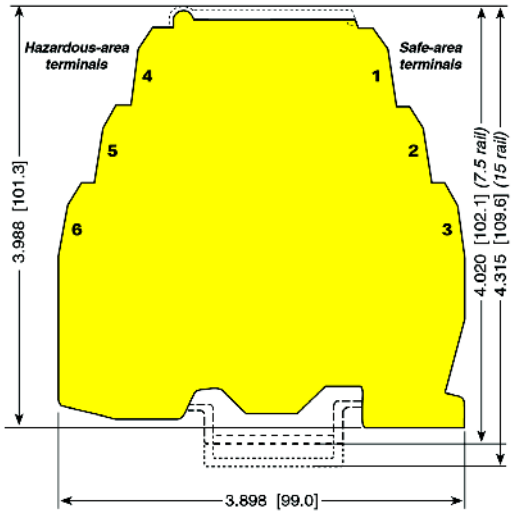
100 g approximately

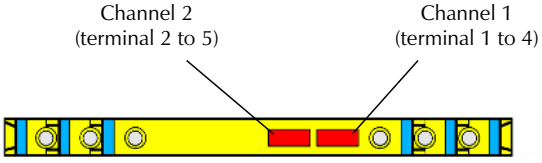
Mounting and grounding

Achieved by clamping onto standard 35 mm "top-hat" DIN-rail: 7.5 mm (low profile) or 15 mm (high profile).

EMC compliance

EN 50 081-2/EN 50 082-2, generic emission/ immunity standards. These refer to appropriate IEC/CISPR standards.





Shunt-Diode Safety Barriers

Specifications

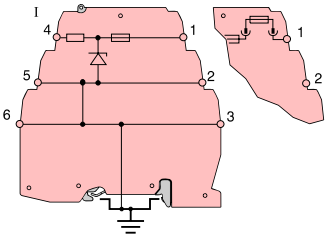
Type	Application Number*	Channel Number	V_{WKG} @10 A leakage (V)	V_{MAX} (V)	Maximum end-to-end resistance ( )	Fuse / (fuse disc.) rating (mA)	Approval: Cl I, II, II: Division 1; Groups -	Wiring Diagram**	ID Number
Single Channel, Positive Supply									
MZ22P1	–	–	19.0	21.7	189	(50)	A-G	1	K1004
MZ28P	9,11	–	26.0	27.0	332	50	A-G	1	K1007
MZ28P1	9,11	–	26.0	27.6	342	(50)	A-G	1	K1008
MZ28PX1	9,11	–	26.0	27.5	275	(50)	FM: A-G, CSA: C-G	1	K1009
MZ29PX1	9,11	–	25.0	26.5	211	(50)	C-G	1	K1010
* Applications begin on page 10							** Wiring Diagrams located on facing page		
Single Channel, Negative Supply									
MZ28N	–	–	26.0	27.0	332	50	A-G	2	K1005
MZ28N1	–	–	26.0	27.0	342	(50)	A-G	2	K1006
Dual Channel, Positive Supply									
MZ62P1	–	I	8.0	9.1	87	(50)	A-G	3	K1018
		II	8.0	9.1	87	(50)			
MZ64P1	–	I	9.0	10.0	1058	(50)	A-G	3	K1019
		II	9.0	10.0	1058	(50)			
MZ67P1	–	I	13.0	14.2	140	(50)	A-G	3	K1024
		II	13.0	14.2	140	(50)			
Dual Channel, Negative Supply									
Type	**Application Number***	**Channel Number**	**V_{WKG} @10 A leakage (V)**	**V_{MAX} (V)**	**Maximum end-to-end resistance ( )**	**Fuse / (fuse disc.) rating (mA)**	**Approval: Cl I, II, II: Division 1; Groups -**	**Wiring Diagram****	**ID Number**
MZ96N	2	I	23.5	24.4	332	50	A-G	4	K1030
		II	18.5	19.2	424	50			
MZ96N1	2	I	23.5	24.6	342	(50)	A-G	4	K1031
		II	18.5	19.3	434	(50)			
* Applications begin on page 10							** Wiring Diagrams located on facing page		
Dual Channel, Positive Supply, Diode Return									
MZ87P	1,9,10,11	I	26.0	26.8	332	50	A-G	5	K1026
		II	26.0	26.8	33 + 0.9 V	50			
MZ87PX	1,9,11	I	26.0	27.2	261	80	FM: A-G, CSA: C-G	5	K1028
		II	26.0	27.2	30 + 0.9 V	80			
MZ87P1	1,9,10,11	I	26.0	27.3	342	(50)	A-G	5	K1027
		II	26.0	27.3	43 + 0.9 V	(50)			
MZ87PX1	1,9,11	I	26.0	27.3	274	(50)	FM: A-G, CSA: C-G	5	K1029
		II	26.0	27.3	43 + 0.9 V	(50)			
Dual Channel, Low Level Alternating Potential									
MZ55A	6	I	0.6 (1 µA)	3.0	24[a]	100	A-G	6	K1011
		II	0.6 (1 µA)	3.0	24[a]	100			
[a] 24 Ω ± 0.15 Ω at 20°C, channels track within 0.15 Ω from -20° to 60°C.									

Wiring Diagrams

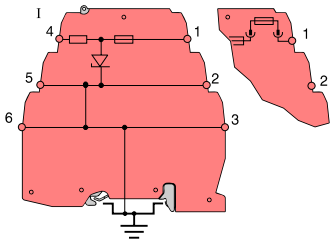
Note:
The *represented* color of each unit is not the actual color of the safety barrier.
MZ barriers are only available in yellow.

Note:
Roman numerals refer to the channel number while the English numbers refer to the wiring ports.

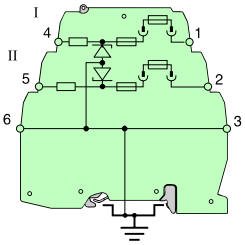
1) Single Channel, Positive Supply



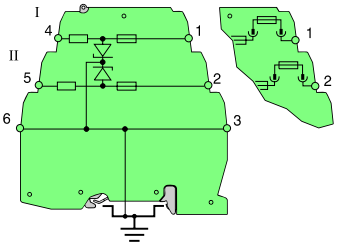
2) Single Channel, Negative Supply



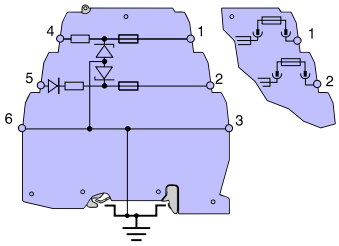
3) Dual Channel, Positive Supply



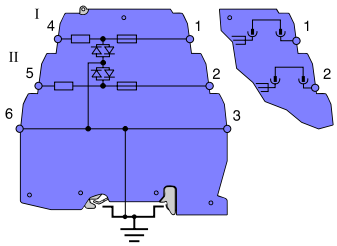
4) Dual Channel, Negative Supply



5) Dual Channel, Positive Supply, Diode Return



6) Dual Channel, Low Level Alternating Potential



Approvals

		Factory Mutual				Canadian Standards Association					
		Entity Parameters				Entity Parameters				Safety Description	
Model	Channel	Voc (Vt)	Isc (It)	Ca AB/CE/DFG	La AB/CE/DFG	Voc (Vt)	Isc (It)	Ca AB/CE/DFG	La AB/CE/DFG	Voc max	min
MZ22P1	I	22	147	0.26/0.78/2.08	1.75/5.25/14.0	22	147	0.26/0.78/2.08	1.75/5.25/14.0	22	150
MZ28P	I	28	93	0.13/0.39/1.04	4.2/12.6/33.6	28	93	0.13/0.39/1.04	4.2/12.6/33.6	28	300
MZ28P1	I	28	93	0.13/0.39/1.04	4.2/12.6/33.6	28	93	0.13/0.39/1.04	4.2/12.6/33.6	28	300
MZ28PX1	I	28	120	0.13/0.39/1.04	2.47/7.41/19.7	28	120	---/0.39/1.04	---/7.41/21.0	28	234
MZ29PX1	I	28	171	---/0.39/1.04	---/5.0/11.4	28	171	---/0.39/1.04	---/5.0/11.0	28	164
MZ28N	I	28	93	0.13/0.39/1.04	4.2/12.6/33.6	28	93	0.13/0.39/1.04	4.2/12.6/33.6	28	300
MZ28N1	I	28	93	0.13/0.39/1.04	4.2/12.6/33.6	28	93	0.13/0.39/1.04	4.2/12.6/33.6	28	300
MZ62P1	Each	10	200	3.0/9.0/24.0	0.52/4.3/7.6	10	200	3.0/9.0/24.0	0.52/4.3/7.6	10	50
	I & II	(11)	(400)	2.0/6.0/16.0	0.15/0.79/1.99	11	400	2.0/6.0/16.0	0.15/0.79/1.99	–	–
MZ64P1	Each	10	10	3.0/9.0/24.0	328/690/1040	10	10	3.0/9.8/24.8	328/690/1040	10	1000
	I & II	(11)	(20)	2.0/6.0/16.0	84/298/742	11	20	2.0/6.0/16.0	84/298/742	–	–
MZ67P1	Each	15	150	0.75/2.25/6.0	1.39/4.95/13.2	15	150	0.75/2.25/6.0	1.39/4.95/13.2	15	100
	I & II	(17)	(300)	0.5/1.5/4.0	0.21/0.96/2.56	17	300	0.5/1.5/4.0	0.21/0.96/2.56	–	–
MZ96N, MZ96N1	I	26	87	0.15/0.45/1.20	4.75/14.2/38.0	26	87	0.15/0.45/1.20	4.75/14.2/38.0	28	300
	II	20	51	0.35/1.05/2.8	4.75/14.2/38.0	20	51	0.35/1.05/2.8	4.75/14.2/38.0	20	390
	I & II	(28)	(136)	0.14/0.43/1.14	1.71/8.4/16.0	28	136	0.14/0.43/1.14	1.71/8.4/16.0	–	–
MZ87P, MZ87P1	I	28	93	0.13/0.39/1.04	4.2/12.6/33.6	28	93	0.13/0.39/1.04	4.2/12.6/33.6	28	300
	II	28	0	0.13/0.39/1.04	61.5/227/506	28	0	0.13/0.39/1.04	61.5/227/506	28	diode
	I & II	(30)	(93)	0.12/0.36/0.97	4.2/12.6/33.6	30	93	0.12/0.36/0.97	4.2/12.6/33.6	–	–
MZ87PX, MZ87PX1	I	28	120	0.13/0.39/1.04	2.47/7.41/21.0	28	120	---/0.39/1.04	---/7.41/21.0	28	234
	II	28	0	0.13/0.39/1.04	61.5/227/506	28	0	---/0.39/1.04	---/227.0/506.0	28	diode
	I & II	(31)	(120)	0.11/0.33/0.90	2.47/7.41/21.0	31	120	---/0.33/0.88	---/7.41/21.0	–	–
MZ55A	Each	3	300	1000/3000/800	0.24/1.38/3.68	3	300	1000/3000/8000	0.24/1.38/3.68	3	10
	I & II	(6)	(600)	116/349/932	0.09/0.13/1.0	6	600	116/349/932	0.09/0.13/1.0	–	–

Shunt-Diode Safety Barriers

Specifications

Three Channel, Alternating Potential, Low Level

Type	Application Number*	Channel Number	V_{WKG} @10 A leakage (V)	V_{MAX} (V)	Maximum end-to-end resistance (	Fuse / (fuse disc.) rating (mA)	Approval: Cl I, II, II: Division 1; Groups -	Wiring Diagram**	ID Number
MZ56A	6	I	0.3 (1 µA)	2.3	24	100	A-G	1	K1012
		II	0.3 (1 µA)	2.3	24[a]	100	A-G		
		III	0.3 (1 µA)	2.3	24[a]	100	A-G		

* Applications begin on page 10 ** Wiring Diagrams located on facing page

[a] 24 Ω ± 0.15 Ω at 20°C, channels track within 0.15 Ω from -20° to 60°C.

Dual Channel, Alternating Potential, Higher Level

MZ61AV	8	I	7.2	8.5	384	50	A-G	2	K1016
		II	7.2	8.5	384	50			
MZ61AV1	7, 8	I	7.2	8.8	393	(50)	A-G	2	K1017
		II	7.2	8.8	393	(50)			
MZ61A2	7	I	7.2	8.3	115	80	A-G	2	K1015
		II	7.2	8.3	115	80			
MZ64A2	7	I	10.0	11.1	1048	50	A-G	2	K1020
		II	10.0	11.1	1048	50			
MZ66AV	8	I	9.8	10.9	97.2	80	A-G	2	K1022
		II	9.8	10.9	97.2	80			
MZ66AV1	7	I	9.8	11.2	110.1	(50)	A-G	2	K1023
		II	9.8	11.2	110.1	(50)			

Dual Channel, Alternating Potential, Star Connected

MZ60A	3, 4, 5, 6	I	7.2	8.5	101	50	A-G	3	K1013
		II	7.2	8.5	101	50			
MZ60A1	3, 4, 5, 6	I	7.2	8.8	110.1	(50)	A-G	3	K1014
		II	7.2	8.8	110.1	(50)			
MZ65A2	- - -	I	12.0	13.0	131	50	A-G	3	K1021
		II	12.0	13.0	131	50			
MZ78A2	- - -	I	+24.0/-22.3	+25.9/-23.8	640	50	A-G	3	K1025
		II	+24.0/-22.3	+25.9/-23.8	640	50			

Active Barrier for 2-wire 4-20 mA Loops and "Smart" Transmitters

Type	Supply Voltage	Channel Number	Supply current @ 20 mA loop current	Voltage available to transmitter and lines	Safe area load	Output Current	Accuracy	Wiring Diagram**	ID Number
MZ06R1	20-35 VDC	- - -	40 mA with 28 V supply 45 mA with 24 V supply 60 mA with 20 V supply	16.0 V @ 20 mA with 250 Ω load 11.25 V @ 20 mA with 500 Ω load	0-500 Ω	0-23.6 mA	±2 µA (4-20 mA)	4	K1000
MZ06R2								4	K1001

* Applications begin on page 10 ** Wiring Diagrams located on facing page

Active Barrier for Discrete Inputs

Type/ID Number	Supply Voltage	Channel Number	Supply Current	Voltage drop	Output Current	Leakage to ground	Wiring Diagram**	ID Number
MZ07P2	10-35 VDC	I	At V_S < 26 V: I_{out} + 1.5 mA At V_S > 28 V: Limited to 50 mA	Terminals 1 to 4: [(I_{out} x 348 Ω) + 1.2]V	Up to 35 mA	1.5 mA max.	5	K1002
		II		Terminals 2 to 5: [(I_{out} x 31 Ω) + 0.9]V				

** Wiring Diagrams located on facing page

Active Barrier for Discrete Outputs

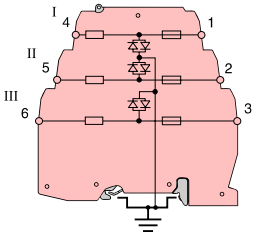
MZ08P2	10-35 VDC	- - -	At V_S < 26 V: I_{out} + 1.5 mA At V_S > 28 V: Limited to 50 mA	Terminals 1 to 4: [(I_{out} x 348 Ω) + 1.2]V	Up to 35 mA	1.5 mA max.	6	K1003

Wiring Diagrams

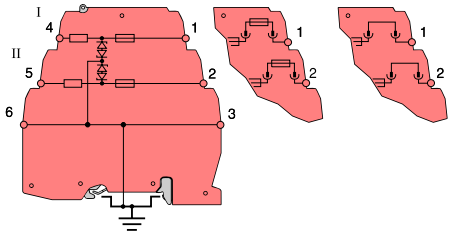
Note:
The *represented* color of each unit is not the actual color of the safety barrier.
MZ barriers are only available in yellow.

Note:
Roman numerals refer to the channel number while the English numbers refer to the wiring ports.

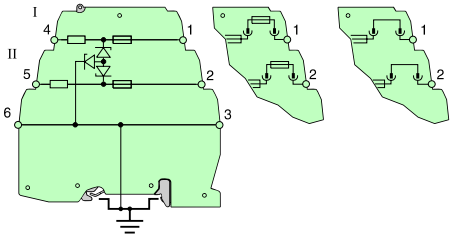
1) Three Channel - Low Level



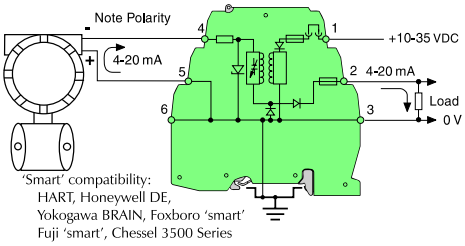
2) Dual Channel - High Level



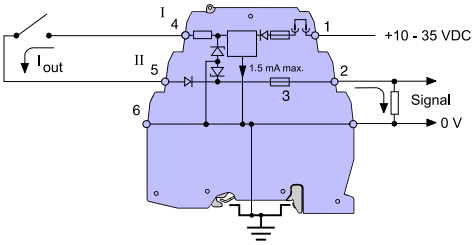
3) Dual Channel - Star Connected



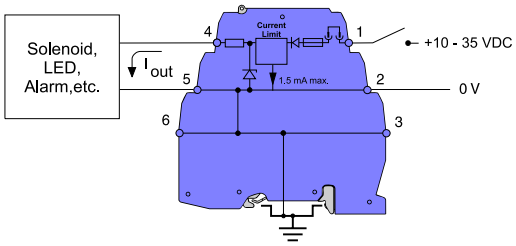
4) Active Barrier for 2-wire mA Loops



5) Active Barrier for Discrete Inputs



6) Active Barrier for Discrete Outputs



Approvals

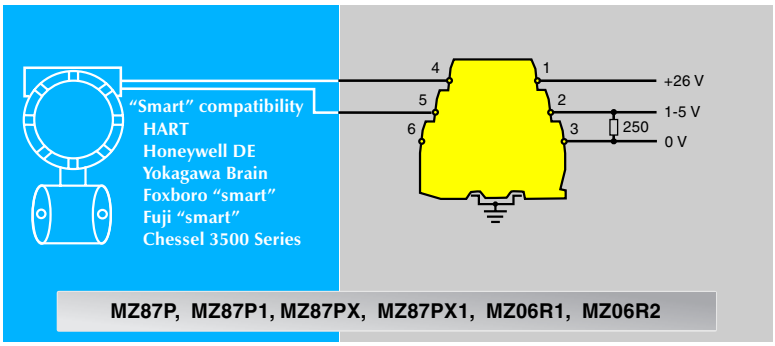
		Factory Mutual				Canadian Standards Association					
		Entity Parameters				Entity Parameters				Safety Description	
Model	**Channel**	**Voc (Vt)**	**Isc (It)**	**Ca AB/CE/DFG**	**La AB/CE/DFG**	**Voc (Vt)**	**Isc (It)**	**Ca AB/CE/DFG**	**La AB/CE/DFG**	**Voc max**	**min**
MZ56A	I	2	173	1000/3000/8000	0.75/5.4/9.99	2	173	1000/3000/8000	0.75/5.4/9.99	2	11.56
	Any 2	(4)	(346)	404/1214/3239	0.34/1.42/2.52	4	346	404/1214/3239	0.34/1.42/2.52	–	–
	I, II, III	(4)	(519)	404/1214/3239	0.15/0.66/1.12	4	519	404/1214/3239	0.15/0.66/1.12	–	–
MZ61A2	Each	9	100	5.0/15.0/40.0	3.6/10.8/28.8	9	100	5.0/15.0/40.0	3.6/10.8/28.8	9	90
	I & II	(18)	(200)	0.42/1.26/3.36	0.52/4.20/7.6	18	200	0.42/1.26/3.36	0.52/4.20/7.6	–	–
MZ61AV, MZ61AV1	Each	9	25	4.6/13.8/36.8	52.0/156/416	9	25	4.6/13.8/36.8	52.0/156/416	9	350
	I & II	(18)	(52)	0.42/1.26/3.36	13.0/39.0/104	18	52	0.42/1.26/3.36	13.0/39.0/104	–	–
MZ64A2	Each	12	12	1.6/4.8/12.8	230/690/1840	12	12	1.6/4.8/12.8	230/690/1840	12	1000
	I & II	(24)	(24)	0.2/0.6/1.6	60/180/480	24	24	0.2/0.6/1.6	60/180/480	–	–
MZ66AV, MZ66AV1	Each	12	148	1.8/5.4/14.4	1.27/4.8/12.8	12	148	1.8/5.4/14.4	1.27/4.8/12.8	12	75
	I & II	22.3	296	0.2/0.6/1.6	0.2/1.02/2.72	22.3	296	0.2/0.6/1.6	0.2/1.02/2.72	–	–
MZ65A2	Each	15	150	0.75/2.25/6.0	1.39/4.95/13.2	15	150	0.75/2.25/6.0	1.39/4.95/13.2	15	100
	I & II	15	300	0.75/2.25/6.0	0.2/0.96/2.56	15	300	0.75/2.25/6.0	0.2/0.96/2.56	–	–
MZ78A2	Each	28	47	0.13/0.39/1.04	16/48/128	28	47	0.13/0.39/1.04	16/48/128	28	600
	I & II	(28)	(94)	0.13/0.39/1.04	4.2/12.6/33.6	28	94	0.13/0.39/1.04	3.0/9.0/24.0	–	–
MZ60A, MZ60A1	Each	9	120	4.5/13.5/36.0	2.5/7.5/20.0	9	120	4.5/13.8/36.0	2.5/7.5/20.0	9	75
	I & II	(9)	(240)	4.5/13.5/36.0	0.29/1.95/5.2	9	240	4.5/13.5/36.0	0.29/1.95/5.2	–	–
MZ06R1, MZ06R2	I	27.8	92	0.14/0.43/1.16	4.27/17.1/34.9	28	93	0.13/0.39/1.04	4.2/12.6/33.6	28	300
MZ07P2	I	28	93	0.13/0.39/1.04	4.2/12.6/33.6	28	93	0.13/0.39/1.04	3.0/9.0/24.0	28	300
	II	28	0	0.13/0.39/1.04	61.5/227/506	28	0	0.13/0.39/1.04	61.5/227/506	28	diode
	I & II	(30)	(93)	0.12/0.36/0.97	4.2/12.6/33.6	30	93	0.12/0.36/0.97	3.0/9.0/24.0	–	–
MZ08P2	I	28	93	0.13/0.39/1.04	4.2/12.6/33.6	28	93	0.13/0.39/1.04	3.0/9.0/24.0	28	93

Shunt-Diode Safety Barrier Applications

Application 1

2-Wire Transmitters, 4-20 mA

The MZ87P / MZ87P1, or the higher power MZ87PX / MZ87PX1, are recommended for use with conventional or 'smart' 4-20 mA transmitters supplied by a closely regulated supply. These provide up to 14.2 V at 20 mA to a transmitter and field wires as well as 5 V for the typical 250 Ω load. The MZ06R1/MZ60R2 is recommended for applications supplied by an unregulated supply (up to 35 V). It provides 16 V to the transmitter and field wires at 20 mA as well as 5 V to the measurement load.

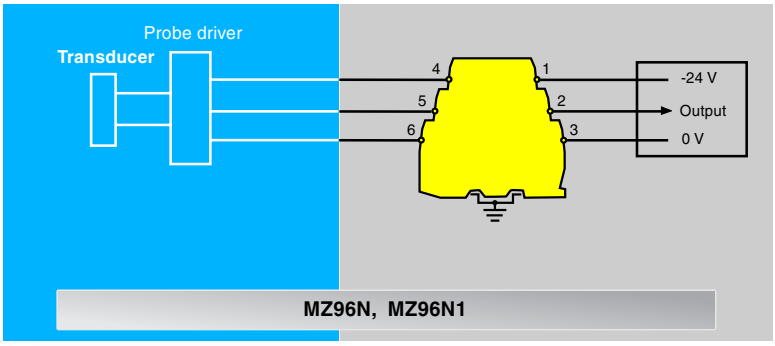


Application 2

Vibration Probes

Vibration monitoring equipment is almost exclusively powered by a -24 VDC power supply.

The negatively polarized dual channel MZ96N / MZ96N1 is recommended for use in these applications.

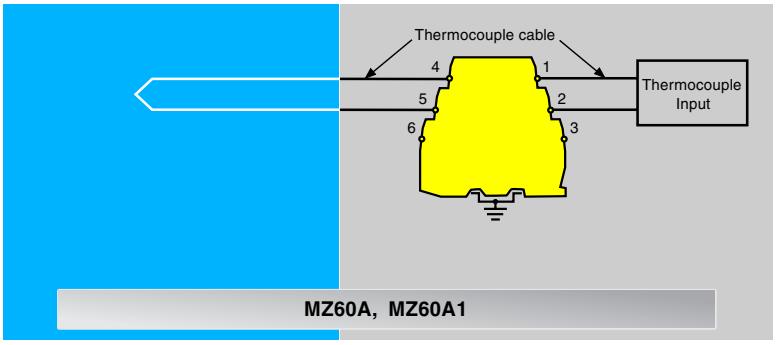


Application 3

Thermocouples and mV Sources

The MZ60A / MZ60A1 is recommended for use with thermocouples and other mV sources.

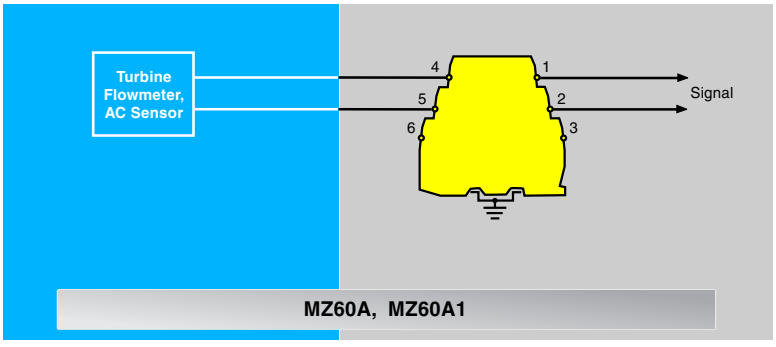
This dual- channel alternating potential barrier provides at least 7 V of 'float' for these low-level signals.

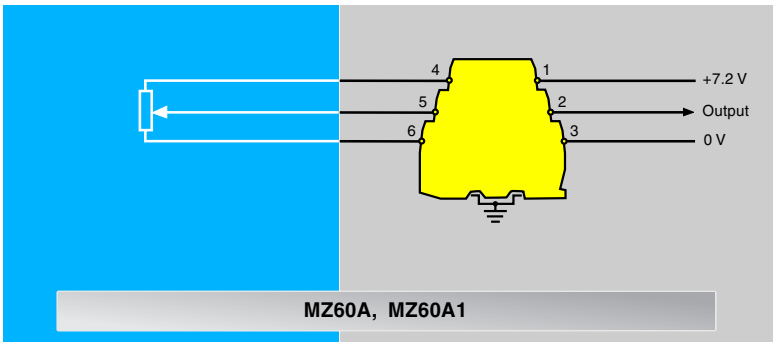


Application 4

Turbine Flowmeters and AC Sensors

The MZ60A / MZ60A1 is recommended for use with many low-level AC sensors, turbine flowmeters, photocells, etc.

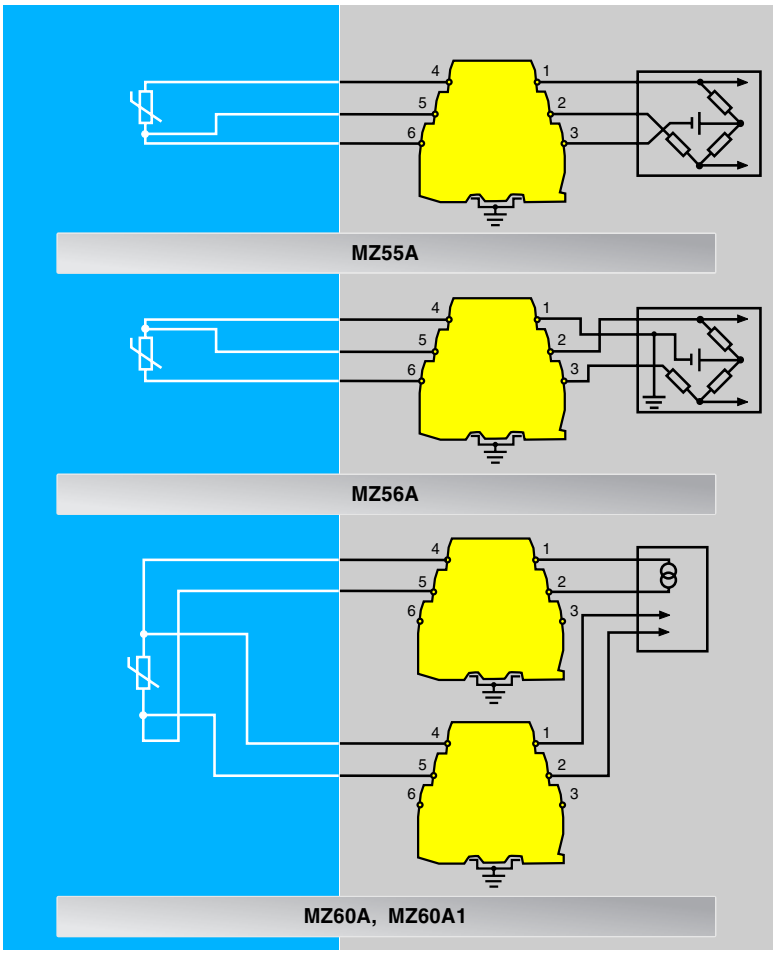




Application 5

Potentiometers

The MZ60A / MZ60A1 is the simplest choice for use with slidewire displacement transducers and other devices that are essentially potentiometers.



Application 6

RTDs

A dual-channel MZ55A is the most economical choice for 3-wire RTDs. This barrier is suitable for use with a floating bridge - the two leads from the bridge arms are protected by the barrier with the third lead (supply return) being grounded by the barrier. The barrier has a low end-to-end resistance of only 24 Ω/channel to minimize span changes. Its channels track within 0.15 Ω between -20 and +60°C to minimize zero shift with temperature.

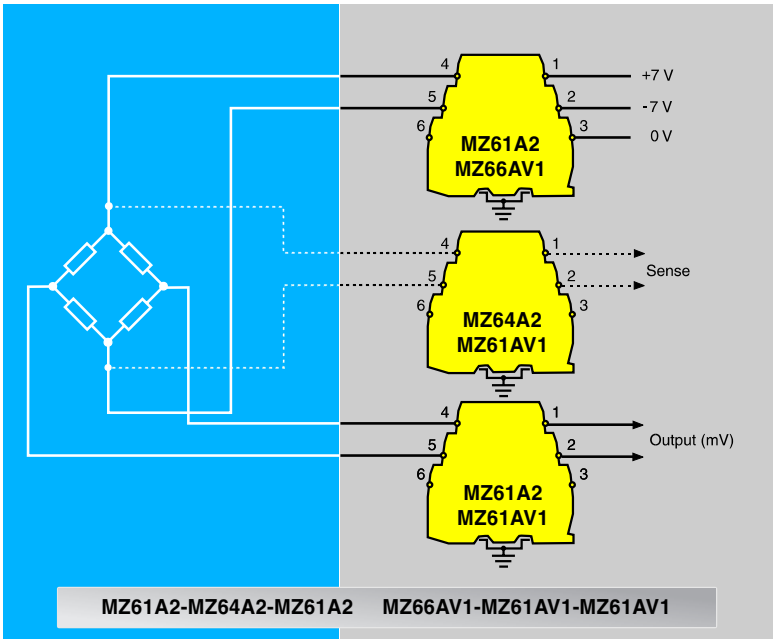
If the bridge circuit is grounded, a third barrier channel is needed. The three-channel MZ56A provides this configuration. This barrier also provides additional accuracy when used with an ungrounded bridge, a configuration that cancels the small errors due to barrier leakage. Channels 2 (terminals 2-5) and 3 (terminals 3-6) track within 0.15 Ω between -20° and +60°C. 4-wire constant-current circuits do not need matched barrier resistance. These circuits can be protected more economically by two MZ60A / MZ60A1 barriers. If the loop resistance presents problems for the monitoring equipment, two MZ55A barriers may be used in the same configuration.

Applications

Application 7

Single Strain Gauge Bridges

This connection, using two or three barriers, is safe for Groups A-G. With the MZ61A2, the circuit is powered from a 14 V, 230 Ω source. If the bridge resistance is 230 Ω, the bridge voltage is 7 V. If the bridge resistance is 350 Ω, the bridge voltage is 8.4 V.
An MZ64A2 may be used to sense the bridge supply voltage.
An MZ61A2 is used for the signal return.
Alternately, if an MZ66AV1 is used for the bridge supply, the bridge voltage is 12.3 V for a 350 Ω bridge. In this case, MZ61AV1 barriers are used for the sense and signal lines.

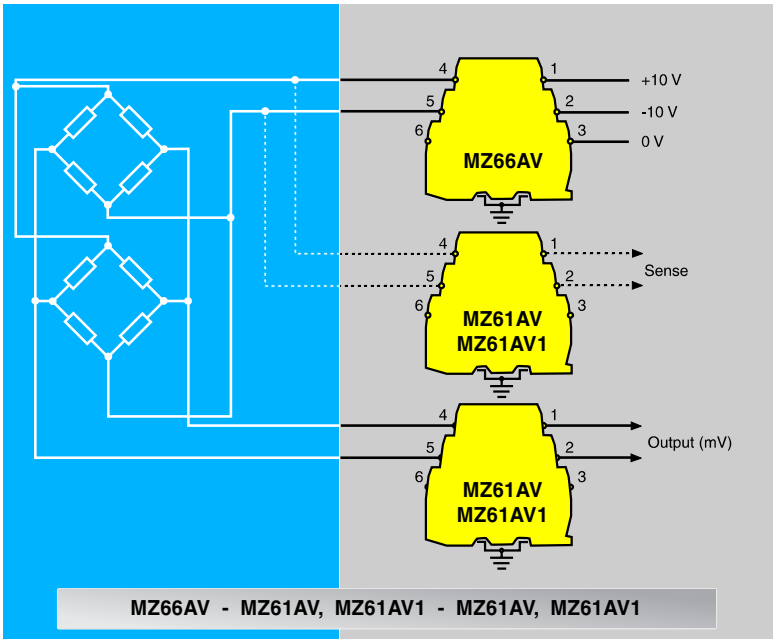


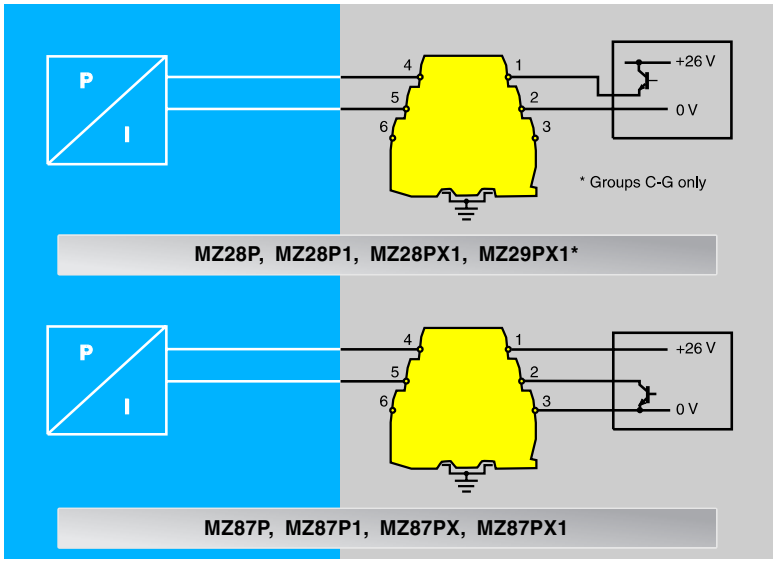
Application 8

Multiple Strain Gauge Bridges

Often there is a need to monitor two or more load cells in parallel. The resultant higher current produces higher voltage drops. The lower end-to-end resistance of the MZ66AV is an advantage in these systems.
The MZ66AV supplies power to the bridges and two MZ61AV or MZ61AV1barriers are used for the sense and signal lines.
For systems using 350 Ω bridges, the following voltages are available to the system from a +10 V supply:

1 bridge: 12.8 V
2 bridges: 9.4 V
3 bridges: 7.5 V
4 bridges: 6.2 V

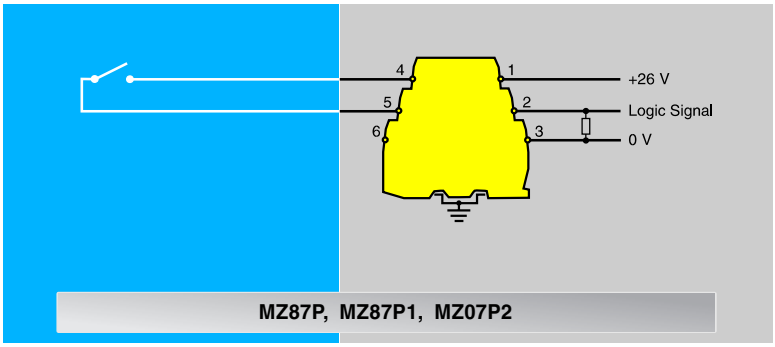




Application 9

Controller Outputs (I/P Converters)

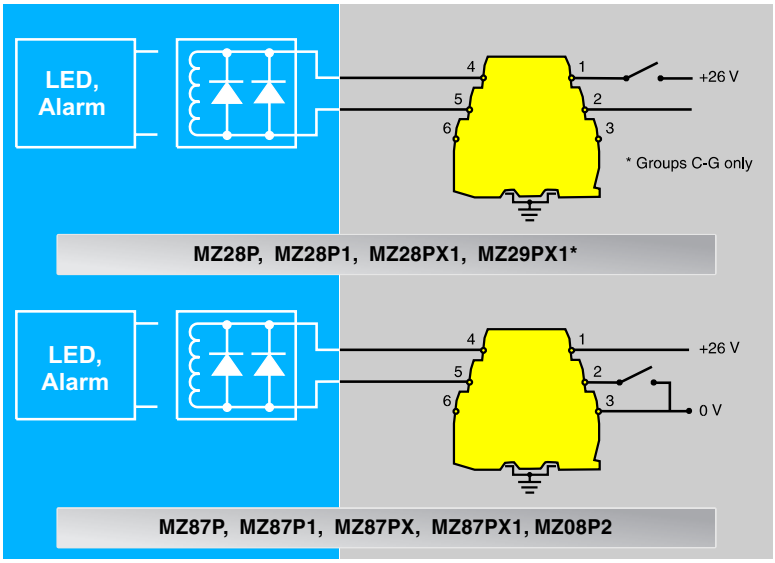
The single-channel MZ28P / MZ28P1 is the recommended choice for most controller outputs. Its end-to-end resistance of 332 / 342 Ω, producing voltage drops of 6.7 V / 6.9 V at 20 mA, is compatible with most modern equipment. Higher-power versions are also available: the MZ28PX1 (275 Ω, 5.5 V drop) is suitable for Group A-G locations; the MZ29PX1 (211 Ω, 4.2 V drop) is suitable for Group C-G locations. For controllers in which the control element is located in the return leg, the dual-channel MZ87P / MZ87P1 is recommended, as the 26 V return channel allows the control signal to be completely turned off. Its voltage drop is 8.2 V / 8.6 V at 20 mA. A higher-power version, the MZ87PX / MZ87PX1 (6.72 V / 7.24 V drop) is also available and is suitable for Group A-G locations.



Application 10

Discrete Inputs (Dry Contacts)

The dual-channel MZ87P / MZ87P1 is the recommended choice in systems with a closely regulated supply.
The active MZ07P2 is recommended when the supply is not closely regulated (up to 35 V).



Application 11

Discrete Outputs (Solenoid Valves, LEDs, Alarms, etc.)

The MZ28P / MZ28P1 is recommended for systems in which the control switch is in the supply leg.
Higher- powered versions are available: the MZ28PX1 is suitable for Group A-G locations: the MZ29PX1 is suitable for Group C-G locations.

For systems in which the control switch is in the return leg, the dual-channel MZ87P / MZ87P1 is recommended, or alternately, the higher-power MZ87PX / MZ87PX1.
For systems without closely regulated supply voltage, the MZ08P2 is recommended.

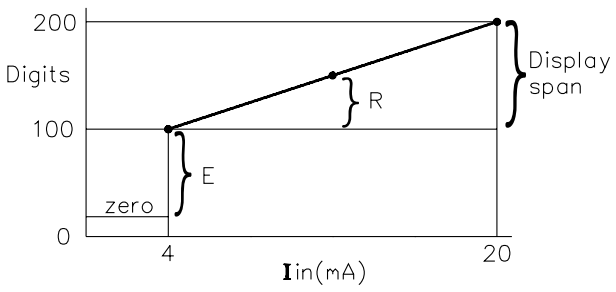
IS Indicator TD-3.5L (3½-digit)

- **3½-digit display**
- **4/20 mA loop-powered**
- **Less than 1 V drop under all conditions**
- **IEC IP 65 weatherproof enclosure rating**
- **Surface, post or panel mount**

The TD-3.5L is a loop-powered 4/20 mA indicator needing less than 1 V. The unit features linear or square-root extraction options. The latter is set by a link and directly indicates the flow from a differential pressure measurement loop using an orifice plate, Dall tube, venturi, etc. This mode is precise, being based on a pulse-width/pulse-height squaring circuit in a feedback loop.

Considered simple apparatus, TD-3.5L indicators can be inserted directly into any IS loop without further approval. They can be mounted in Division 1, Group A areas on posts or pipes, flat surfaces, or control-room panels.

A set of labels is supplied, pre-printed with a selection of legends or, alternatively, one of two blanks also supplied can be user-labeled as required.



Specifications

Unit location . . . . . Class I, Div 1, Group A hazardous areas

Voltage requirements . . . . . <1.0 V, loop-powered

Input range . . . . . 4 to 20 mA

Over range . . . . . 200 mA maximum without damage

Display . . . . . 7 segment LCD, 3½- digit with 25 mm high characters

Range . . . . . –1999 to 1999 (3998 digits)

Zero and span

- **Setting** . . . . . Anywhere within range
- **Mode** . . . . . Set against internal references equivalent to 4 and 20 mA, selected by jumper links
- **Method** . . . . . Jumper links and 10-turn potentiometers
- **Access** . . . . . Behind front fascia

Resolution . . . . . 1 digit

Interaction . . . . . None

Scale direction . . . . . Normal / reverse; selected by jumper link

Decimal point . . . . . Any position or none; selected by jumper link

Out-of-range indication . . . . . Display of all decimal points and under-range arrow (←) if input <3.77 mA at 25°C
Display of +1 or –1 for readings>±1999

Operating modes . . . . . Linear & square root selected by jumper link

Root extraction error . . . . . ±16 μA ±1 μA / °C at input for signals between 4.16 and 20 mA

Non-linearity and hysteresis . . . . ±1 digit

Effects of temperature on accuracy

- **Zero** . . . . . ±0.1 digit / °C
- **Suppression / elevation (E*)** . . ±0.02% of E, digits / °C
- **Span** . . . . . ±0.02% of reading (R*), digits / °C
- **** See chart for E and R***

Ripple rejection . . . . . <1 digit error with 1 mA peak-to-peak ripple at 50 Hz

Electrical safety

Input terminals (nos. 1 and 2): simple apparatus (≤1.2 V, ≤0.1 A, ≤20 μJ, ≤25 mW) Ceq=0, Leq=0. Can be connected without further approval into any IS loop with open-circuit voltage <60 V and short-circuit current <200 mA (application is governed by the entity concept).

EMC compliance

EN 50 081-2/EN 50 082-2, generic emission / immunity standards. These refer to appropriate IEC / CISPR standards

IS Sounder TA-5DB

- **Up to 100 dBA output**
- **24 different sounds**
- **Two distinctive signals can be called remotely**
- **Easy to install in all hazardous areas**
- **Low power consumption offers application flexibility**
- **IEC IP 65 weatherproof enclosure rating**

TA-5DB intrinsically safe multi-tone sounders are particularly suited for use in areas of high ambient noise.

24 tones can be selected via 5-way DIP switches, with a second tone via a 'third wire' terminal. The units are polarized and a chain of them may be fitted with a terminating resistor for reverse polarity testing and to permit line monitoring. The sounders have low frequencies to conform to BS 5839: Part 1: 1980, making them ideal for fire alarm systems and other annunciator applications. In safe areas, the sounders can be powered directly from 24 VDC. The absence of any current limitation increases the output by approximately 4 dB. The sounders give a useful output down to 8 V.

The IP 65 enclosure enables TA-5DB sounders to withstand the harsh environmental conditions found offshore as well as those of the oil, gas and chemical industries. The tough construction enhances the reliability of the solid-state piezoelectric sounder.

In addition, the low surface temperature means the unit can be used in areas where flammable dusts may be present. The twinned-pair inlet terminals and deep bases are convenient for looping to other circuits or for siting terminating resistors. The base has two knock-outs that will accommodate a 20 mm conduit, or PG13.5 or 20 mm cable glands and their appropriate sealing washers and lock nuts.

Specifications

Location . . . . . Class I, Div 1, Group A hazardous areas

Supply . . . . . Min. / max. at terminals 8–28 VDC
Current (approx.) through interface: 12 mA

Sound . . . . . 24 tones, DIP-switch programmable
Output level up to 100 dBA
Control range to 15 dB
Two sounders driven from the same IS power source reduce the individual output by
. . . . . 1.5 dB (three sounders by 2.2 dB).

Electrical safety . . . . . V_{max}: in = 28 V, I_{max}: in = 147 mA, W_{max}: in = 0.81 W, Leq & Ceq = 0

Suitable shunt-diode safety barriers MZ28P, MZ28P1, MZ22P1, MZ07P2, MZ08P2, MZ87P1, MZ87P, MZ87PX, MZ87PX1

Suitable isolating interfaces MK72-S02-Ex0/24VDC
MK72-S01-Ex0/24VDC

Terminals . . . . . For conductors up to 14 AWG

Recommended cable . . . . . 20 AWG to 14 AWG with grounded shield and insulating sheath

Protection . . . . . IEC IP 65

Ambient temperature

Operating . . . . . -4° to +131°F (-20° to +55°C)

Storage . . . . . -40° to +176°F (-40° to +80°C)

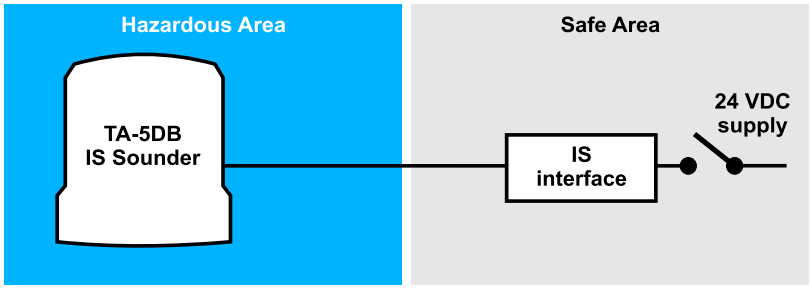
Humidity . . . . . 5 to 95% RH

Construction . . . . . ABS enclosure with encapsulated electronic module

Mounting . . . . . Surface

Weight . . . . . 9.6 oz (300 g)

EMC compliance . . . . . EN 50 081-2/EN 50 082-2, generic emission/immunity standards.
These refer to appropriate IEC / CISPR standards

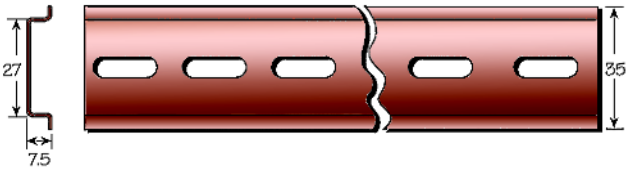


Safety Barrier Accessories

Mounting / Grounding

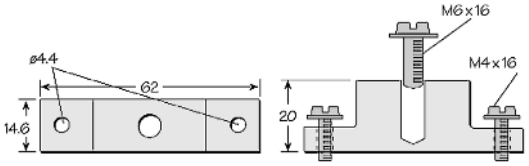
DIN 35S standard DIN rail 6943000

The MZ-series barriers mount easily and quickly onto standard DIN rails (35 X 7.5 mm), which also act as the intrinsically safe ground. Made of steel with chromated cadmium finish, the DIN rail withstands use in potentially corrosive atmospheres. Supplied in 1 meter lengths.



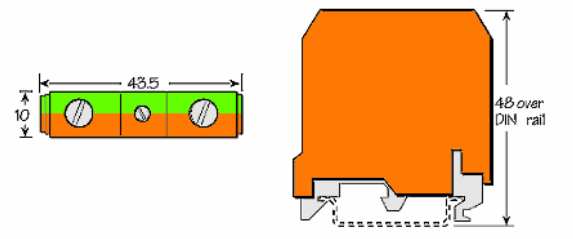
MZSP Insulating Spacer K1035

Attaches to the base of a DIN rail at either end or at intervals (depending upon DIN-rail length) to isolate the IS ground from panel ground.



MZGT Ground Terminal K1036

Provides connections for routing the IS ground from the DIN rail to an appropriate ground electrode. Two recommended per discrete length of DIN rail.



MZDB Dummy Barrier K1032

Used for securing and grounding unused cables and shields, and as feed-though connection for power comb.

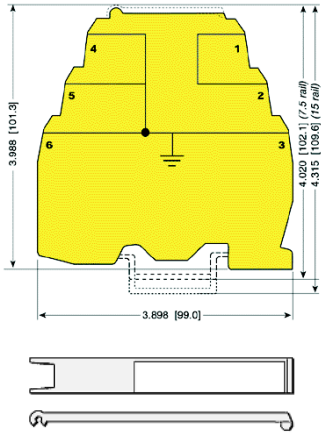
Tagging

MZIDL Labels K1038

Self-adhesive labels for pre-printing supplied on sheets of 120.

MZIDC Label Carrier K1037

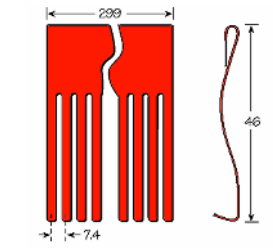
The MZIDC mounts on top of an individual barrier to identify barrier details.



Miscellaneous

MZPC Power Comb K1039

Feeds a 24 VDC supply to a maximum of 40 barriers in a single column. The comb and its teeth are shaped so that by deflecting the comb, barriers may be inserted into or removed from a column without having to disturb the remaining connections. Can be sub-divided easily to feed smaller numbers of barriers.

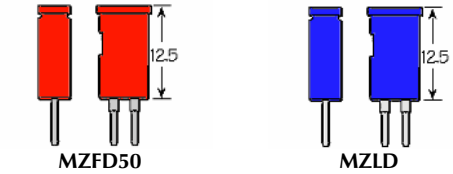


MZFD50 Replaceable Fuse K1033

Spare secondary 50 mA fuses supplied in packs of five.

MZLD Removable Links K1034

Spare “latch-out” links supplied in packs of five.



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1-800-544-PROX (1-800-544-7769)

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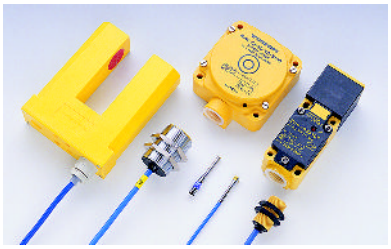
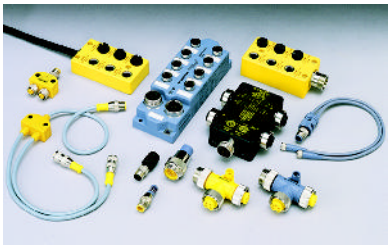


Proximity Sensors

Industry's broadest line of inductive and capacitive proximity sensors.

Flow Monitors

Monitors for sensing the flow of liquids and gases during industrial processes.

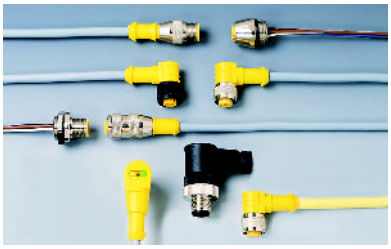


InterlinkBT

Device-level interconnect and bus products for sensors and actuators.

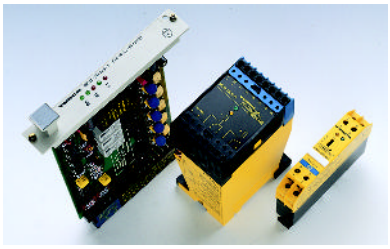
Cordsets and Junctions

Industry standard cordsets and junction boxes connect the most popular switch and sensor styles.



Interface Devices

Interface and logic products for automation and intrinsically safe environments.



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