

Transmitter Barrier

Features

- High accuracy – Short circuit protected
- Simple installation – Low cost installation material. “Snap-on” to a DIN-rail
- Easy earthing

Description

Application and general description

In many applications on board vessels and in industrial processes it is necessary to measure pressures, temperatures etc. in hazardous areas by means of transmitters with an output signal of 4 to 20 mA.

By applying the DZ-110 Transmitter Barrier these installations are made intrinsically safe.

General information

The DZ-110 Transmitter is a single channel shunt diode safety barrier intended for energising a 2-wire, 2 to 20 mA signal transmitter in hazardous areas. Powered from an uncritical 24 VDC supply (18 to 35 V) the barrier will repeat the transmitter current into safe side grounded circuit. As no return channel is required, voltage available for the transmitter and lines is a full 16 V at 20 mA, provided the V_{supply} is 24 V or above. Voltage available for load (at 20 mA) is only 5 V less than V_{supply} .

Electrical description

A “current mirror” amplifier repeats the transmitter current into an equal magnitude safe side current. To prevent leakage through the zener diodes, the voltage applied to the barrier section is regulated and limited to a suitable level. Active current limiting is also incorporated to prevent fuse blow-out during accidental shorting of the transmitter circuit.



Though primarily intended for 4 to 20 mA, the linear current range extends down to virtually zero (below 100 μA) and up to 22 mA, allowing transfer of actual over- and under-range conditions.

High accuracy combined with over-voltage, reverse polarity and short-circuit protection (both sides) makes the DZ-110 an excellent alternative for demanding applications.

Mounting, see Fig. 1

Mounting is based on the snap-on principle. The DZ-110 is suitable for TS-32 and TS-35 support rails with DIN46277. End stoppers are used as supporting and fixing devices.

Connection, see Fig. 2

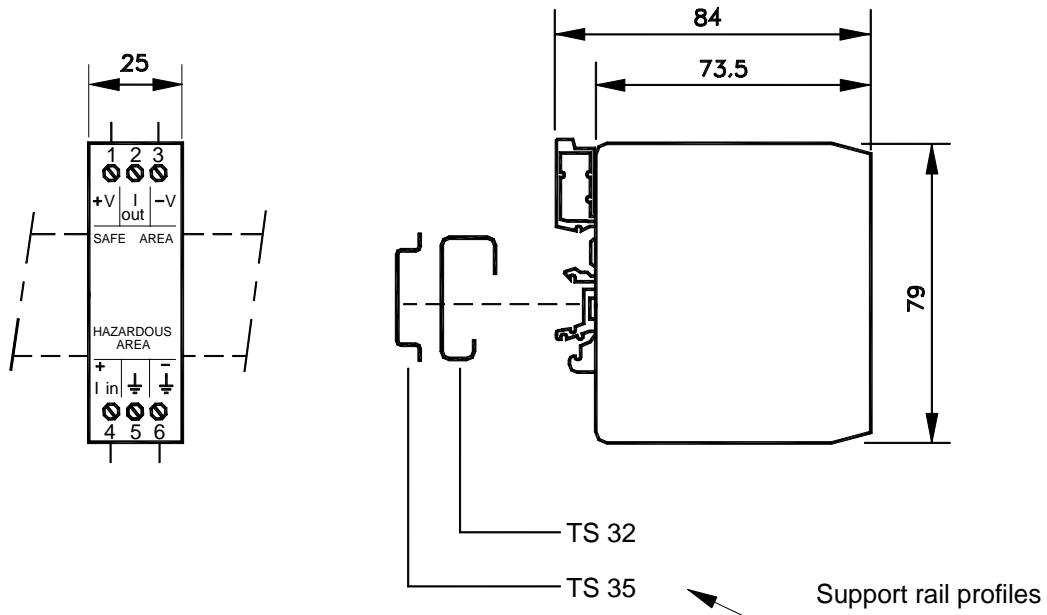
Cable channels are often convenient to use for separation of intrinsically safe and non-intrinsically safe cables. The distance between intrinsically and non-intrinsically safe cables must be at least 50 mm. The cable channels intended for intrinsically safe cables must be marked with a pale blue colour.

A grounding/earthing bar must be mounted at the intrinsically safe side of the barrier. Terminal point 6 on each barrier must be connected to this bar by means of a 1.5 mm² (minimum) Cu-cable.

Technical specifications

Power supply:	24 VDC (18 to 35 V)
Input and output current range:	0 to 22 mA
Voltage available for transmitter and lines:	$V_{\text{supply}} - 8\text{V}$ at 20 mA
Voltage available for load:	$V_{\text{supply}} - 5\text{V}$ at 20 mA
Output impedance to load:	$>2 \text{ M}\Omega$
Accuracy at 20 °C (non-linearity, hysteresis & repeatability):	$<0.05 \%$ of FRO*
Zero temperature drift:	$<0.005 \%/^{\circ}\text{C}$ of FRO*
Span temperature drift:	$<0.005 \%/^{\circ}\text{C}$ of FRO*
Ambient temperature range:	-20 to +55 °C
Current consumption (normal transmitter):	55 mA maximum
Current consumption (shorted transmitter):	85 mA maximum
Quality standard:	ISO 9001
Generic EMC standard:	
Emission:	IEC 60945
Immunity:	IEC 61000-4
EX standards	EN 60079-0:2012, IEC 60079-0:2011 EN 60079-11:2012, IEC 60079-11:2011
EX certification	Presafe 14 ATEX 4368 IECEX PRE 14.0005
EX classification	Ⓔ II (1) G [Ex ia Ga] IIC
Performance degradation during immunity test:	$<0.5 \%$ of FRO*
Housing:	Polyamide terminal block
Connection:	Terminals 2.5 mm ²
Protection, mechanical:	IP20
Vibration:	4 g maximum at 2 to 100 Hz
Weight:	0.1 kg
Dimensions (H x W x D) in mm:	79 x 25 x 73.5
Mounting:	Snap-on (DIN-rail TS-32, TS-35)
* FRO = Full Range Output, 4 to 20 mA swing	
Safety Data:	
Maximum output voltage:	$U_o = 25.5 \text{ V}$
Maximum output current:	$I_o = 122 \text{ mA}$
Maximum output power:	$P_o = 0.78 \text{ W}$
Maximum external capacitance:	$C_o = 104 \text{ nF}$
Maximum external inductance:	$L_o = 2.2 \text{ mH}$
Maximum external inductance/resistance ratio:	$L_o/R = 45.9 \mu\text{H}/\text{ohm}$
Maximum connected voltage:	$U_m = 250 \text{ VAC}$

Drawings



Based on dwg. no.: DZ-053

Fig. 1: The DZ-110, dimensions

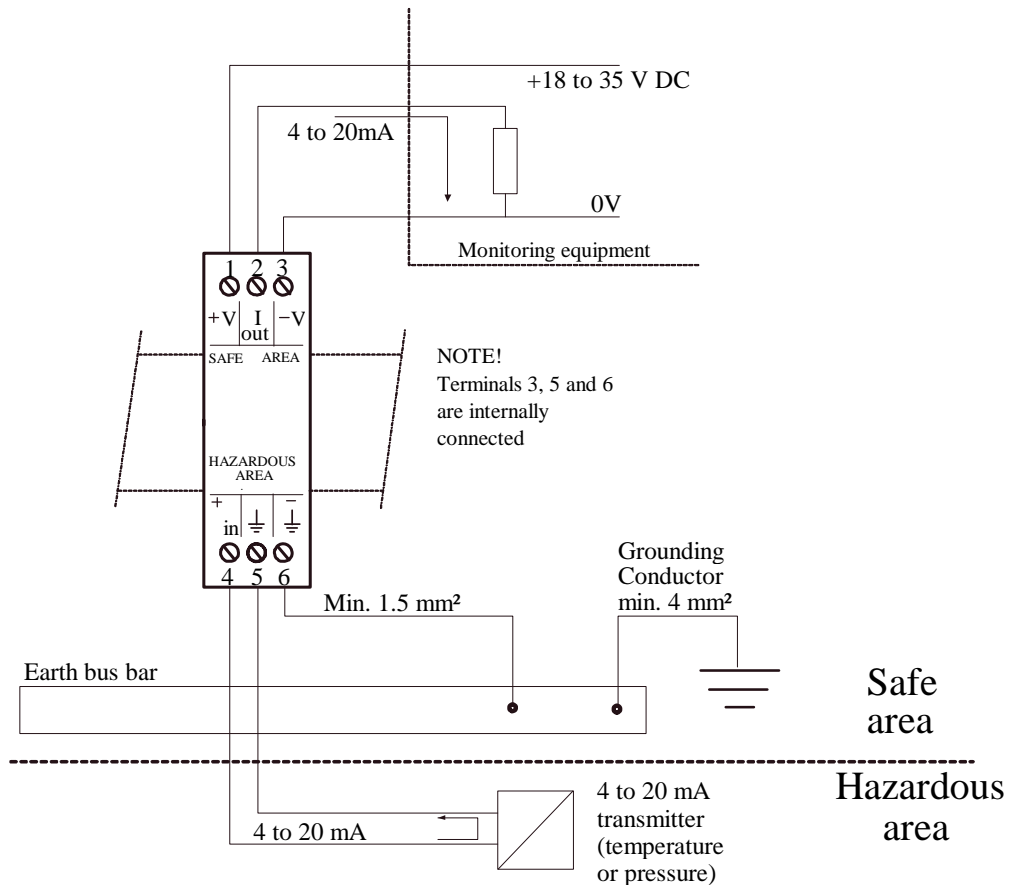
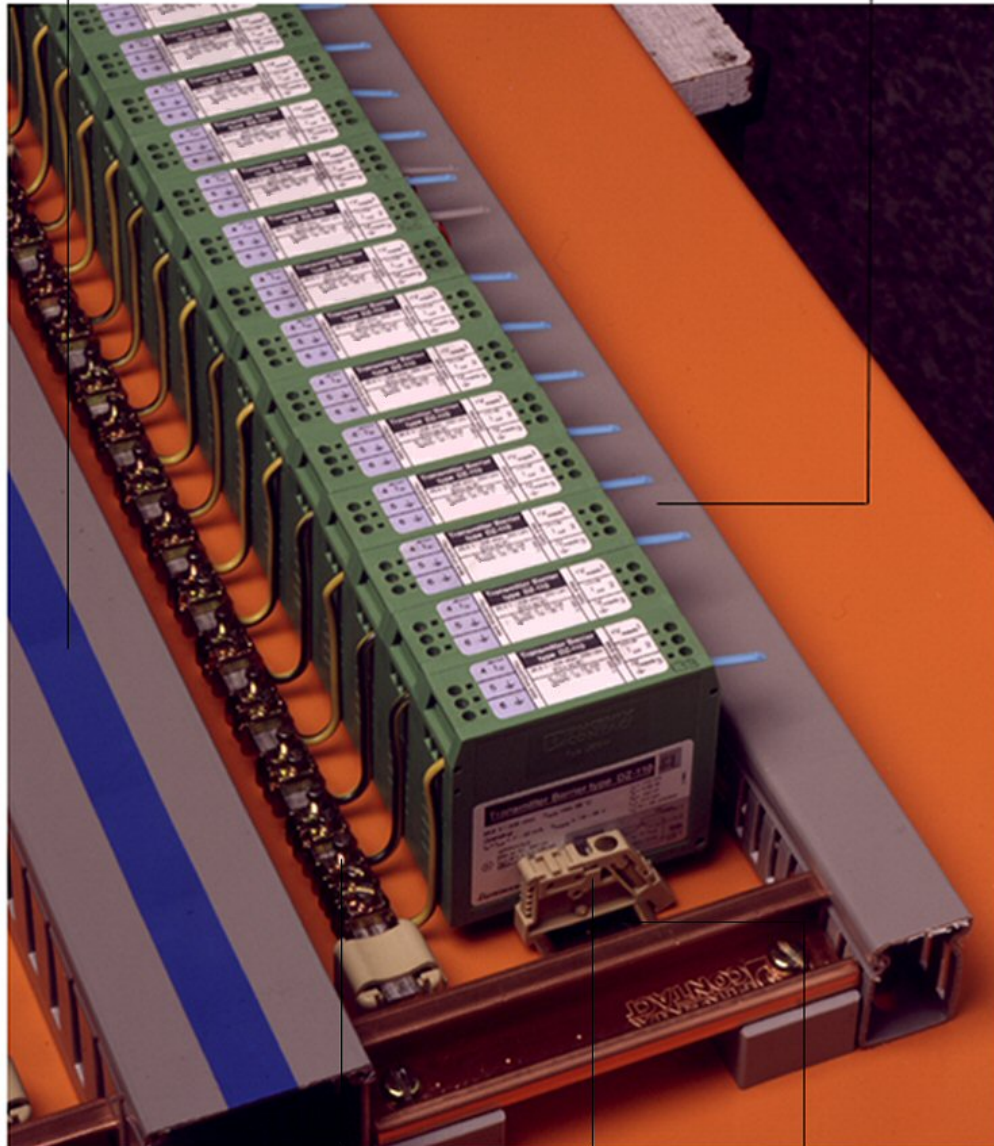


Fig. 2: The DZ-110, connections

Cable channel for intrinsically safe cables.

Cable channel for non-intrinsically safe cables to monitoring system.



Earth bus bar

"Snap-on" rail

End stopper

KONGSBERG MARITIME AS

NO-7005 Trondheim Norway km.sales@kongsberg.com

Telephone: +47 73 58 10 00 Telefax: +47 73 58 10 01 www.km.kongsberg.com



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