D1010-054
D1010-056
D1010-057

SIL 3 mV to mA Converter DIN-Rail Models D1010S-054, D1010S-056, D1010S-057

Characteristics:

General Description:
The single channel DIN Rail mV to mA converters, D1010S-054, D1010S-056, D1010S-057, convert a mV signal from sensors located in Hazardous Area, and repeat the current in floating circuit to drive a Safe Area load.

Function:
1 channel I.S. analog input, provides 3 port isolation (input/output/supply) and current (source) output signal.

Signalling LED:
Power supply indication (green).

EMC:
Fully compliant with CE marking applicable requirements.

Front Panel and Features:

- SIL 3 according to IEC 61508 for Tproof = 1 year (20 % of total SIF).
- SIL 2 according to IEC 61508 for Tproof = 5 / 10 years (10 / 20 % of total SIF).
- PFDavg (1 year) 1.58 E-04, SFF 90.07 %.
- Input from Zone 0 (Zone 20), installation in Zone 2.
- -5 to +55 mV Input / 4 to 20 mA Output.
- Input and Output short circuit proof.
- High Accuracy.
- Three port isolation, Input/Output/Supply.
- EMC Compatibility to EN61000-6-2, EN61000-6-4.
- ATEX, IECEx Certifications.
- High Reliability, SMD components.
- Simplified installation using standard DIN Rail and plug-in terminal blocks.
- 250 Vrms (Um) max. voltage allowed to the instruments associated with the barrier.

Ordering Information:

Model:	D1010S	
1 ch. range –5 to +55 mV	-054	
1 ch. range –5 to +35 mV	-056	
1 ch. range –5 to +10 mV	-057	
Power Bus enclosure		/B

Technical Data:

Supply:
24 Vdc nom (20 to 30 Vdc) reverse polarity protected,
ripple within voltage limits ≤ 5 Vpp.
Current consumption @ 24 V: 40 mA with 20 mA output typical.
Power dissipation: 0.9 W with 24 V supply voltage and 20 mA output typical.
Max. power consumption: at 30 V supply voltage and overload condition 1.2 W.

Isolation (Test Voltage):
I.S. In/Out 1.5 KV; I.S. In/Supply 1.5 KV; Out/Supply 500 V.

Input:
-5 to +55 mV for D1010S-054;
-5 to +35 mV for D1010S-056;
-5 to +10 mV for D1010S-057;

Output:
4 to 20 mA, on 250 Ω load in source mode.
Response time: 25 ms (10 to 90 % step change) with 8.6 dB of NMRR.
Common mode rejection: better than 80 dB.
Output ripple: ≤ 20 mVrms on 250 Ω load.
Burnout: Upscale in 25 ms.

Performance:
Ref. Conditions 24 V supply, 250 Ω load, 23 ± 1 °C ambient temperature.
Calibration accuracy: ≤ ± 0.1 % of full scale.
Linearity error: ≤ ± 0.1 % of full scale.
Supply voltage influence: ≤ ± 0.02 % of full scale for a min to max supply change.
Load influence: ≤ ± 0.02 % of full scale for a 0 to 100 % load resistance change.
Stability: estimated degradation in 3 years ≤ ± 0.47 % least sensitive range.

Compatibility:
CE mark compliant, conforms to 94/9/EC Atex Directive and to 2004/108/CE EMC Directive.

Environmental conditions:
Operating: temperature limits -20 to + 60 °C,
relative humidity max 90 % non condensing, up to 35 °C.
Storage: temperature limits – 45 to + 80 °C.

Safety Description:
II (1) G [Ex ia Ga] IIC, II (1) D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I, II 3G Ex nA II T4, [Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I associated electrical apparatus.
Uo/Voc = 1.1 V, Io/Isc = 38 mA, Po/Po = 11 mW at terminals 15-16.
Ui/Vmax = 30 V, Ii/Imax = 104 mA, Ci = 1.05 nF, Li = 0 nH at terminals 15-16.
Um = 250 Vrms, -20 °C ≤ Ta ≤ 60 °C.
Approvals:
DMT 01 ATEX E 042 X conforms to EN60079-0, EN60079-11, EN60079-26, EN61241-0, EN61241-11, IECEx BVS 07.0027X conforms to IEC60079-0, IEC60079-11, IEC60079-26, IEC61241-0, IEC61241-11,
IMQ 09 ATEX 013 X conforms to EN60079-0, EN60079-15,
TUV Certificate No. C-IS-183645-01, SIL 2 / SIL 3 according to IEC 61508.
Please refer to Functional Safety Manual for SIL applications.

Mounting:
T35 DIN Rail according to EN50022.
Weight: about 110 g.
Connection: by polarized plug-in disconnect screw terminal blocks to accomodate terminations up to 2.5 mm².
Location: Safe Area or Zone 2, Group IIC T4 installation.
Protection class: IP 20.
Dimensions: Width 22.5 mm, Depth 99 mm, Height 114.5 mm.

Parameters Table:

Safety Description	Maximum External Parameters			
	Group Cenelec	Co/Ca (µF)	Lo/La (mH)	Lo/Ro (µH/Ω)
Terminals 15-16				
Uo/Voc = 1.1 V	IIC	100	11.3	3490
Io/Isc = 38 mA	IIB	1000	45.3	13963
Po/Po = 11 mW	IIA	1000	90.7	27927

Image:

Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20), GROUP IIC

SAFE AREA, ZONE 2, GROUP IIC T4