GM INTERNATIONAL TECHNOLOGY FOR SAFETY

D5032

SIL 3 Switch/Proximity Detector Repeater, Relay Output Termination Board Models D5032S, D5032D

Characteristics:

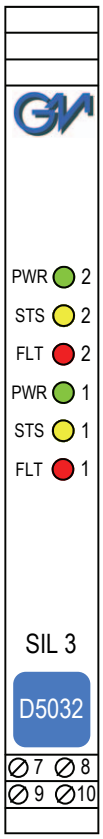
General Description:

The single and dual channel Switch/Proximity Detector Repeater, D5032S and D5032D module is a unit suitable for applications requiring SIL 3 level (according to IEC 61508) in safety related systems for high risk industries.
The unit can be configured for switch or proximity detector (EN60947-5-6, NAMUR), NO or NC and for NE or ND SPST (D5032D) or SPDT (D5032S) relay output contact.
Each channel enables a Safe Area load to be controlled by a switch, or a proximity detector, located in Hazardous Area.
Fault detection circuit (DIP switch configurable) is available for both proximity sensor and switch equipped with end of line resistors. In case of fault, when enabled it de-energizes the corresponding output relay and turns the fault LED on; when disabled the corresponding output relay repeats the input line open or closed status as configured.

D5032D is programmable via dip switches as single input and two independent outputs. Out 2 can be programmed for output duplicating Out 1 or Fault detection Out.
In case of duplication, relay actuation can be independently configured for each output.
In case of fault output, relay actuation can be programmed as normally energized or normally de-energized.

Mounting on customized Termination Boards, in Safe Area or in Zone 2.

Front Panel and Features:



- SIL 3 according to IEC 61508 for Tproof = 2 / 4 years (10 / 20 % of total SIF).
- SIL 2 according to IEC 61508 for Tproof = 20 years (10 % or more of total SIF).
- PFDavg (1 year) 4.87 E-05, SFF 96.49 %.
- 2 fully independent channels.
- Input from Zone 0 (Zone 20), installation in Zone 2.
- NO/NC switch/proximity Detector Input, NE/ND relay actuation mode.
- Field open and short circuit detection.
- Three port isolation, Input/Output/Supply.
- EMC Compatibility to EN61000-6-2, EN61000-6-4, EN61326-1, EN61326-3-1 for safety system.
- In-field programmability by DIP Switch.
- ATEX, IECEx Certifications.
- High Density, two channels per unit.
- Simplified installation using customized Termination Boards.
- 250 Vrms (Um) max. voltage allowed to the instruments associated with the barrier.

Ordering Information:

Model:	D5032	
1 channel		S
2 channels		D

Technical Data:

Supply:
24 Vdc nom (18 to 30 Vdc) reverse polarity protected,
ripple within voltage limits ≤ 5 Vpp, 2 A time lag fuse internally protected.
Current consumption @ 24 V: 35 mA for 2 channels D5032D,
18 mA for 1 channel D5032S with short circuit input and relay energized, typical.
Power dissipation: 0.85 W for 2 channels D5032D, 0.45 W for 1 channel D5032S with 24 V supply voltage, short circuit input and relay energized, typical.

Isolation (Test Voltage):
I.S. In/Out 2.5 KV; I.S. In/Supply 2.5 KV; I.S. In/ I.S In 500 V;
Out/Supply 500 V; Out/Out 500 V.

Input switching current levels:
ON ≥ 2.1 mA (1.9 to 6.2 mA range), OFF ≤ 1.2 mA (0.4 to 1.3 mA range),
switch current ≈ 1.65 mA ± 0.2 mA hysteresis.
Fault current levels: open fault ≤ 0.2 mA, short fault ≥ 6.8 mA
(when enabled both faults de-energize channel relay with single channel unit D5032S or de-energize channel relay with D5032D used as dual channel unit or actuate the fault relay out with D5032D used as fault signaling unit).
Input equivalent source: 8 V 1 KΩ typical (8 V no load, 8 mA short circuit).

Output:
voltage free SPST (D5032D) or SPDT (D5032S) relay contact.
Contact material: Ag Alloy (Cd free).
Contact rating: 100 mA 50 Vac 5 VA, 100 mA 50 Vdc 5 W (resistive load).
Mechanical / Electrical life: 5 * 10^6 / 1 * 10^6 operation, typical.
Operate / Release time: 8 / 4 ms typical.
Bounce time NO / NC contact: 3 / 8 ms typical.
Frequency response: 10 Hz maximum.

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

Environmental conditions:
Operating: temperature limits – 40 to + 70 °C, relative humidity 95 %, up to 55 °C.
Storage: temperature limits – 45 to + 80 °C.

Safety Description:
ATEX: II 3(1) G Ex nA nC [ia Ga] IIC T4 Gc, II (1) D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I
IECEx: Ex nA nC [ia Ga] IIC T4 Gc, [Ex ia Da] IIIC, [Ex ia Ma] I,
associated apparatus and non-sparking electrical equipment.
Uo/Voc = 10.5 V, Io/Isc = 22 mA, Po/Po = 56 mW at terminals 7-8, 9-10.
Um = 250 Vrms, -40 °C ≤ Ta ≤ 70 °C.
Approvals:
BVS 10 ATEX E 113 X conforms to EN60079-0, EN60079-11, EN60079-15, EN60079-26, EN61241-11, EN50303,
IECEx BVS 10.0072 X conforms to IEC60079-0, IEC60079-11, IEC60079-15, IEC60079-26, IEC1241-11.
Russia according to GOST 12.2.007.0-75, R 51330.0-99, R 51330.10-99, R 51330.14-99 2ExnAnC[ia]IICT4 X.
Ukraine according to GOST 12.2.007.0, 22782.0, 22782.3, 22782.5 2Exs[ia]IICT4 X.
TUV Certificate No. C-IS-204194-01, SIL 2 / SIL 3 conforms to IEC61508.

Mounting:
on customized Termination Board.
Weight: about 135 g D5032D, 110 g D5032S.
Connection: by polarized plug-in disconnect screw terminal blocks to accomodate terminations up to 2.5 mm^2.
Location: Safe Area/Non Hazardous Locations or Zone 2, Group IIC T4 installation.
Protection class: IP 20.
Dimensions: Width 12.5 mm, Depth 123 mm, Height 120 mm.

Parameters Table:

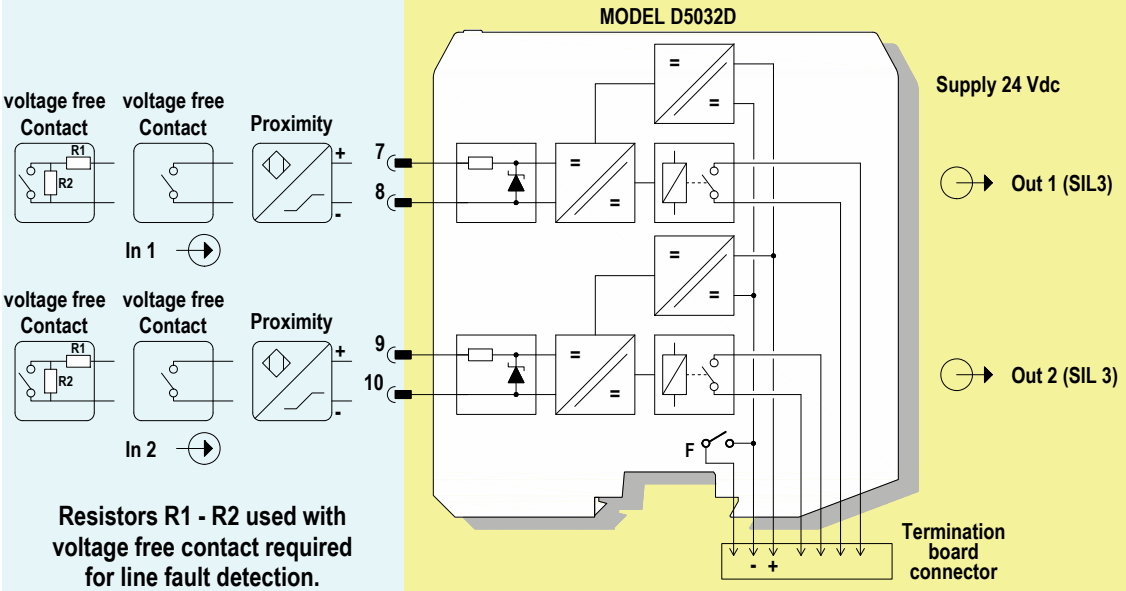
Safety Description	Maximum External Parameters			
	Group Cenelec	Co/Ca (µF)	Lo/La (mH)	Lo/Ro (µH/Ω)
Terminals 7-8, 9-10	IIC	2.41	78.3	635.9
Uo/Voc = 10.5 V	IIB	16.80	313.4	2543.9
Io/Isc = 22 mA	IIA	75.00	626.9	5087.9
Po/Po = 56 mW	I	66.00	1028.6	8347.4
	iaD	16.80	313.4	2543.9

Image:

Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4



Resistors R1 - R2 used with voltage free contact required for line fault detection.

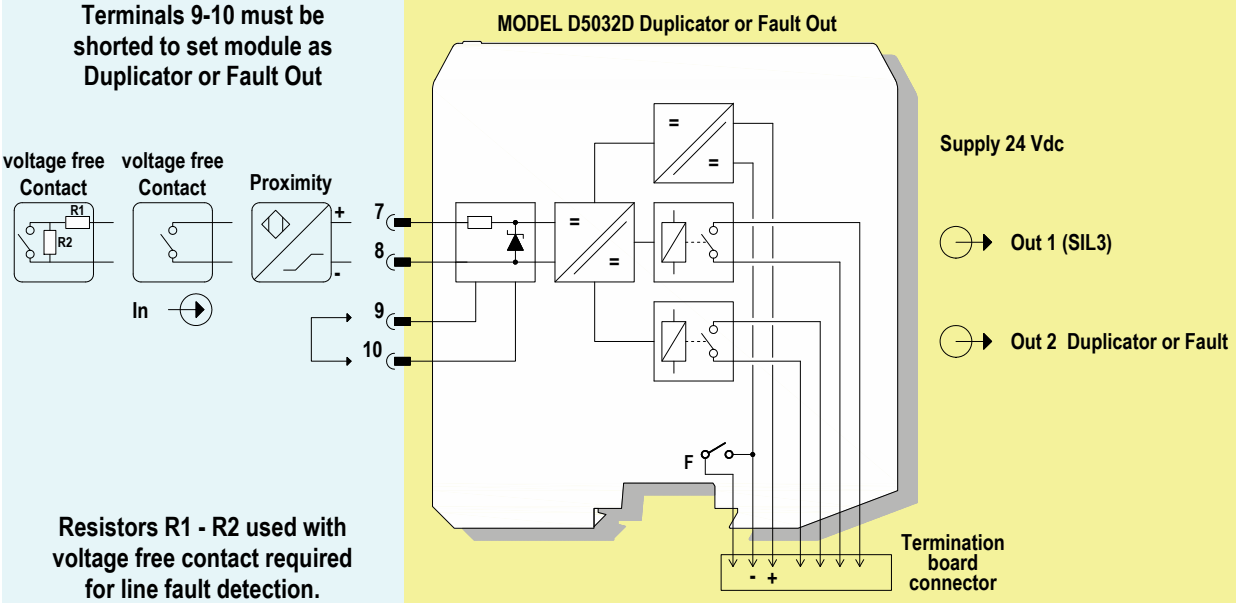
Relay contact shown in de-energized position.

Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4

Terminals 9-10 must be shorted to set module as Duplicator or Fault Out



Resistors R1 - R2 used with voltage free contact required for line fault detection.

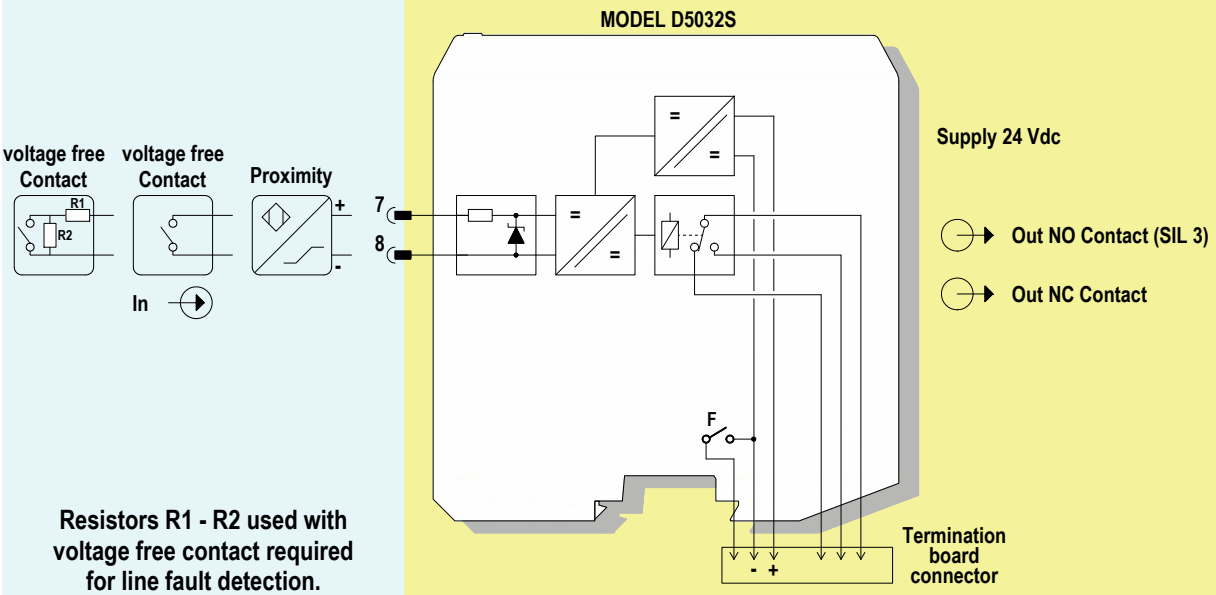
Internal Dip switches programmable

Relay contact shown in de-energized position.

Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4



Resistors R1 - R2 used with voltage free contact required for line fault detection.

Relay contact shown in de-energized position.