

Characteristics:

General Description:

The single and dual channel Switch/Proximity Detector Repeater, D5036S and D5036D module is a unit suitable for applications requiring SIL 2 level (according to IEC 61508:2010 Ed. 2) 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 (D5036D) or SPDT (D5036S) relay output contact. Each channel enables a Safe Area load to be controlled by a switch, or a proximity detector, located in Hazardous Area.

A fault detection circuit (DIP switch enabled) 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.

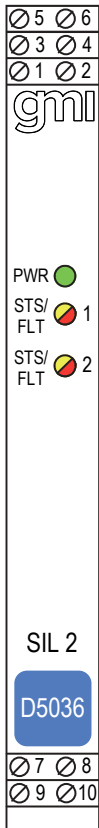
Mounting on standard DIN-Rail, with or without Power Bus, in Safe Area or in Zone 2.

Functional Safety Management Certification:

G.M. International is certified by TUV to conform to IEC61508:2010 part 1 clauses 5-6 for safety related systems up to and included SIL3.



Front Panel and Features:



- SIL 2 according to IEC 61508:2010 Ed. 2 for T_{proof} = 4 / 20 years (≤10% / >10 % of total SIF) for D5036S and D5036D.
- PFDavg (1 year) 2.25 E-04, SFF 70.87 % for D5036S.
- PFDavg (1 year) 2.25 E-04, SFF 71.76 % for D5036D.
- Systematic capability SIL 3.
- 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, UL & C-UL, EAC-EX, UKR TR n. 898, TÜV Certifications.
- TÜV Functional Safety Certification.
- High Density, two channels per unit.
- Simplified installation using standard DIN-Rail and plug-in terminal blocks, with or without Power Bus.
- 250 Vrms (Um) max. voltage allowed to the instruments associated with the barrier.

Ordering Information:

Model:	D5036	
1 channel		S
2 channels		D

Power Bus and DIN-Rail accessories:
 Connector JDFT049 Cover and fix MCHP196
 Terminal block male MOR017 Terminal block female MOR022

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 D5036D, 18 mA for 1 channel D5036S with short circuit input and relay energized, typical.

Power dissipation: 0.85 W for 2 channels D5036D, 0.45 W for 1 channel D5036S with 24 V supply voltage, short circuit input and relay energized, typical.

Isolation (Test Voltage):

I.S. In/Out 1.5 KV; I.S. In/Supply 1.5 KV; I.S. In/ I.S In 500 V; Out/Supply 1.5 KV; Out/Out 1.5 KV.

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

Input equivalent source: 8 V 1 KΩ typical (8 V no load, 8 mA short circuit).

Output:

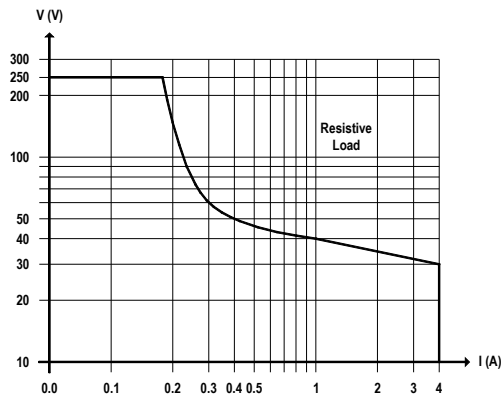
voltage free SPST (D5036D) or SPDT (D5036S) relay contact.

Contact material: Ag Alloy (Cd free), gold plated.

Contact rating: 4 A 250 Vac 1000 VA, 4 A 250 Vdc 120 W (resistive load).

Min. switching current 1 mA.

DC Load breaking capacity:



Mechanical / Electrical life: 5 * 10⁶ / 3 * 10⁴ 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 Directive: 2014/34/EU ATEX, 2014/30/EU EMC, 2014/35/EU LVD, 2011/65/EU RoHS.

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,

UL: NI / I / 2 / ABCD / T4, AIS / I, II, III / 1 / ABCDEFG, AEx nA nC [ia Ga] IIC T4 Gc

C-UL: NI / I / 2 / ABCD / T4, AIS / I, II, III / 1 / ABCDEFG, Ex nA nC [ia Ga] IIC T4 Gc

EAC-EX: 2Ex nA nC [ia Ga] IIC T4 Gc X, [Ex ia Da] IIIC X, [Ex ia Ma] I X

UKR TR n. 898: 2ExnAnCialICT4 X, Exial X

associated apparatus and non-sparking electrical equipment.

U₀/V_{oc} = 10.5 V, I₀/I_{sc} = 22 mA, P_o/P_o = 56 mW at terminals 7-8, 9-10.

U_m = 250 Vrms, -40 °C ≤ T_a ≤ 70 °C.

Approvals:

BVS 10 ATEX E 113 X conforms to EN60079-0, EN60079-11, EN60079-15,

IECEx BVS 10.0072X conforms to IEC60079-0, IEC60079-11, IEC60079-15,

UL & C-UL E222308 conforms to UL913, UL 60079-0, UL60079-11, UL60079-15,

ANSI/ISA 12.12.01 for UL and CSA-C22.2 No.157-92, CSA-E60079-0, CSA-E60079-11,

CSA-C22.2 No. 213 and CSA-E60079-15 for C-UL.

C-IT.ME62.B.04182 conforms to GOST R IEC 60079-0, GOST R IEC 60079-11,

GOST R IEC 60079-15.

CL 16.0036 X conforms to DCTY 7113, GOCT 22782.5-78, DCTY IEC 60079-15.

TÜV Certificate No. C-IS-236198-04, SIL 2 conforms to IEC61508:2010 Ed. 2.

TÜV Certificate No. C-IS-236198-09, SIL 3 Functional Safety Certificate conforms to

IEC61508:2010 Ed.2, for Management of Functional Safety.

Mounting:

T35 DIN-Rail according to EN50022, with or without Power Bus.

Weight: about 135 g D5036D, 120 g D5036S.

Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm².

Location: installation in Safe Area or Zone 2, Group IIC T4.

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 ($\mu\text{H}/\Omega$)
Terminals 7-8, 9-10	IIC	2.41	78.3	635
Uo/Voc = 10.5 V	IIB	16.8	313.4	2543
Io/Isc = 22 mA	IIA	75	626.9	5087
Po/Po = 56 mW	I	66	1028.6	8347
	IIIC	16.8	313.4	2543

NOTE for USA and Canada:

IIC equal to Gas Groups A, B, C, D, E, F and G

IIB equal to Gas Groups C, D, E, F and G

IIA equal to Gas Groups D, E, F and G

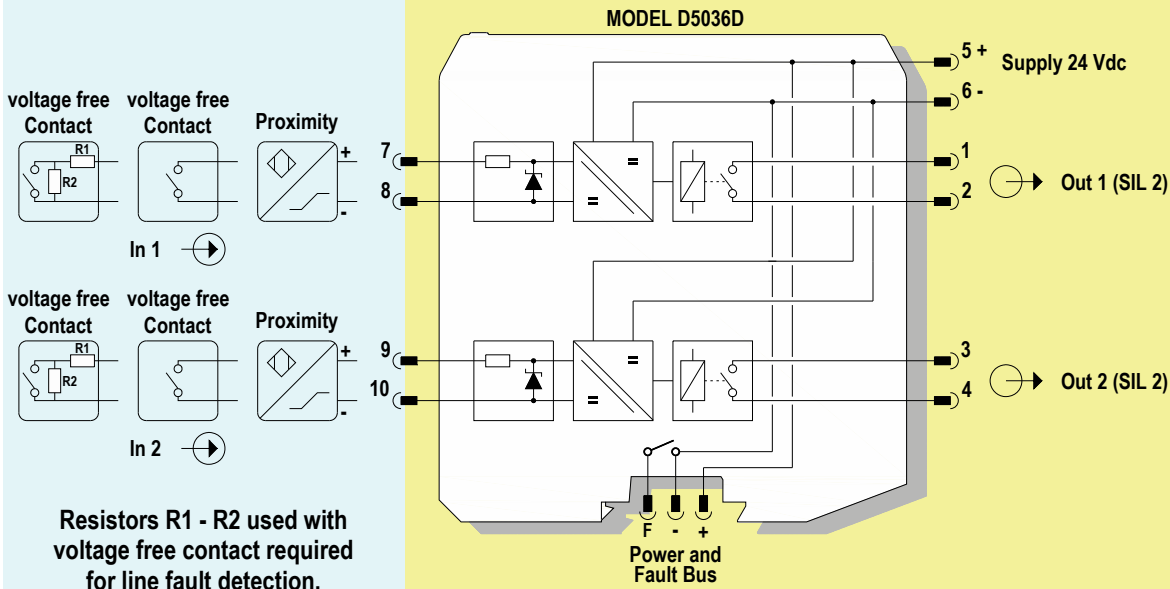
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Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20)
GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4

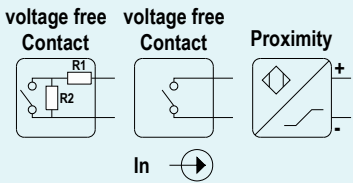


Relay contact shown in de-energized position.
Terminals 1-2 and 3-4 open.

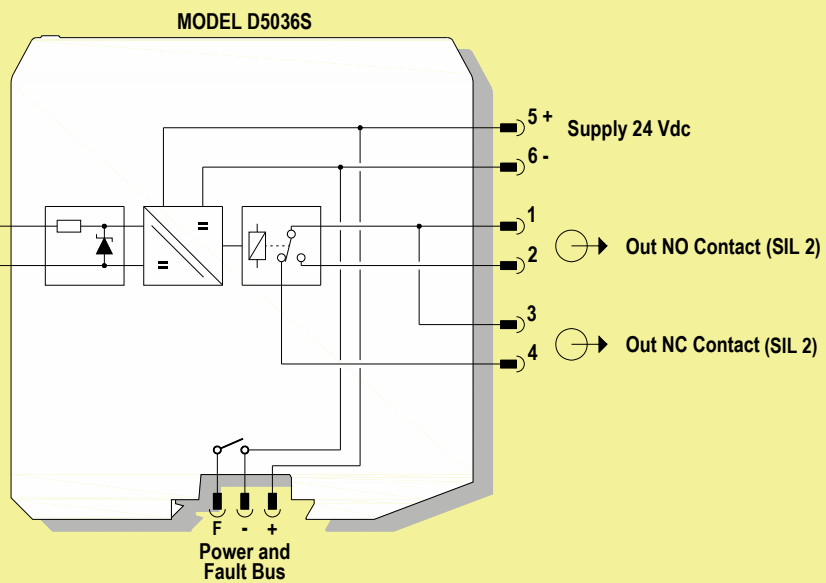
Function Diagram:

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.
Terminals 1-2 open, terminals 3-4 closed.