D5244

SIL 2 - SIL 3 Digital Relay Output Loop Powered DIN-Rail and Termination Board Models D5244S, D5244D

Characteristics:

General Description:

The single and dual channel DIN Rail and Termination Boards Digital Relay Output, models D5244S and D5244D, are loop powered digital output modules enabling a Safe Area loop voltage signal, to control a device in Hazardous Area, providing 2 port isolation (input/output). Outputs are galvanically isolated.

Typical applications include switching of Hazardous Area circuits, changing of polarities and sounder tones, calibrating of strain gauge bridges, resetting of field devices, testing of fire detectors.

Each output channel provides a SPDT relay, with two contacts defined NO (Normally Open) and NC (Normally Close) when the output relay is de-energized. Considering each channel NE (Normally Energized), the output relay is energized,so that NO contact is closed (useful for NE loads or Hazardous Area circuits) and NC contact is open (useful for ND loads or Hazardous Area circuits). The safe state is reached when the channel and the output relay are de-energized, so that NO contact is open (de-energizing loads or Hazardous Area circuits) and NC contact is closed (energizing loads or Hazardous Area circuits).

Function:

1 or 2 channels I.S. relay output, provides 2 port isolation (input/output).

D5244S (Loop Powered mode) or **D5244D (Loop Powered mode with independent channels)**, as shown in function diagrams:

SIL 2 Safety Function for NE load (de-energized in safe state) is available at Terminal Blocks 14-15/16 and Terminal Blocks 18-19/20.

SIL 2 Safety Function for ND load (energized in safe state) is available at Terminal Blocks 13-15/16 and Terminal Blocks 17-19/20.

D5244D (Loop Powered mode with 1oo2 channel architecture), as shown in function diagram:

SIL 3 Safety Function for NE load (de-energized in safe state) is available at Terminal Blocks 14-19/20.

SIL 3 Safety Function for ND load (energized in safe state) is available at Terminal Blocks 13-15/16 (or 17-19/20 because externally connected in parallel).

Signalling LEDs: Output status (yellow).

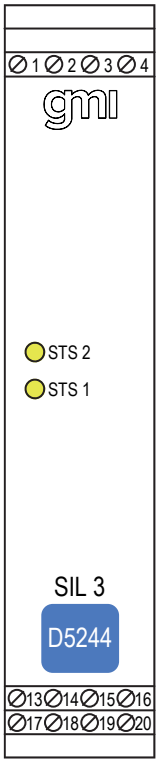
EMC: Fully compliant with CE marking applicable requirements.

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.

FSM SIL 3

Front Panel and Features:



- SIL 2 according to IEC 61508:2010 Ed. 2 for Tproof = 6 / 20 yrs (≤10% / >10 % of total SIF), for each channel of D5244S / D.
- SIL 3 according to IEC 61508:2010 Ed. 2 for Tproof = 12 / 20 yrs (≤10% / >10 % of total SIF), D5244D with 1oo2 channel architecture.
- PFDavg (1 year) 1.55 E-04, SFF 75.70 % with independent channel architecture.
- PFDavg (1 year) 7.73 E-06, SFF 99.20 % with 1oo2 channel architecture.
- SIL 3 Systematic capability.
- Output to Zone 0 (Zone 20), installation in Zone 2.
- Voltage level input.
- Two SPDT Relay Output Signals.
- Two port isolation, Input/Output/Supply.
- EMC Compatibility to EN61000-6-2, EN61000-6-4, EN61326-1, EN61326-3-1 for safety systems.
- ATEX, IECEx, TÜV Certification.
- TÜV Functional Safety Certification.
- High Reliability, SMD components.
- High Density, two channels per unit.
- Simplified installation using standard DIN Rail and plug-in terminal blocks or customized Termination Boards.
- 250 Vrms (Um) max. voltage allowed to the instruments associated with the barrier.

Ordering Information:

Model:	D5244	
1 channel		S
2 channels		D

DIN-Rail accessories: Cover and fix MCHP196

Technical Data:

Input: 24 Vdc nom (18 to 30 Vdc) reverse polarity protected, ripple within voltage limits ≤ 5 Vpp.

Current consumption @ 24 V: 20 mA / channel with relay energized.

Power dissipation: 0.4 W / channel with 24 V loop voltage and relays energized.

Trip voltage levels: OFF status ≤ 15 V, ON status ≥ 18 V (maximum 30 V).

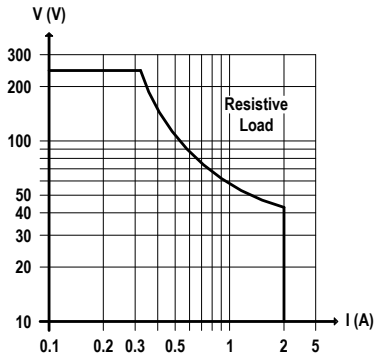
Isolation (Test Voltage): I.S. Out/In 1.5 KV; I.S. Out/I.S. Out 1.5 KV; In/In 500 V.

Output I.S.: voltage free SPDT relay contact.

Contact material: AgNi90/10.

Contact rating: 40 Vdc, 2 A for use in Intrinsic Safety applications, 2 A 250 Vac 500 VA, 2 A 250 Vdc 80 W (resistive load) for non Intrinsic Safety applications.

DC Load breaking capacity:



Mechanical / Electrical life: 15 * 10^6 / 1 * 10^5 operations, typical.

Operate / Release time: 5 / 2 ms typical.

Bounce time NO / NC contact: 1 / 5 ms.

Response time In / Out: 50 ms.

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 [Ex ia Ga] IIC T4 Gc, I (M1) [Ex ia Ma] I, II (1)D [Ex ia Da] IIIC

IECEx: Ex nA nC [Ex ia Ga] IIC, [Ex ia Ma] I, [Ex ia Da] IIIC associated apparatus and non-sparking electrical equipment.
Uo/Voc = 0 V, Io/Isc = 0 mA, Po/Po = 0 mW at terminals 13-14-15/16, 17-18-19/20 (Uo, Io, Po equal to the connected Intrinsic Safety circuit).
Ui/Vmax = 40 V, Ii/Imax = 2 A, Ci = 0 nF, Li = 0 nH at term. 13-14-15/16, 17-18-19/20.
Um = 250 Vrms, -40 °C ≤ Ta ≤ 70 °C.

Approvals:
BVS 16 ATEX E 109 X conforms to EN60079-0, EN60079-11, EN60079-15.
IECEx BVS 16.0071X conforms to IEC60079-0, IEC60079-11, IEC60079-15.
TÜV Certificate No. C-IS-236198-04 SIL 2 / SIL 3 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 or on customized Termination Board.

Weight: about 175 g D5244D, 165 g D5244S.

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.

Protection class: IP 20.

Dimensions: Width 22.5 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 13-14-15/16, 17-18-19/20	IIC	-	-	-
Uo/Voc = -	IIB	-	-	-
Io/Isc = -	IIA	-	-	-
Po/Po = -	I	-	-	-
Ui/Vmax = 40 V, Ii/Imax = 2 A	IIIC	-	-	-
Ci = 0 nF, Li = 0 nH				

(Uo, Io, Po equal to the connected Intrinsic Safety circuit)

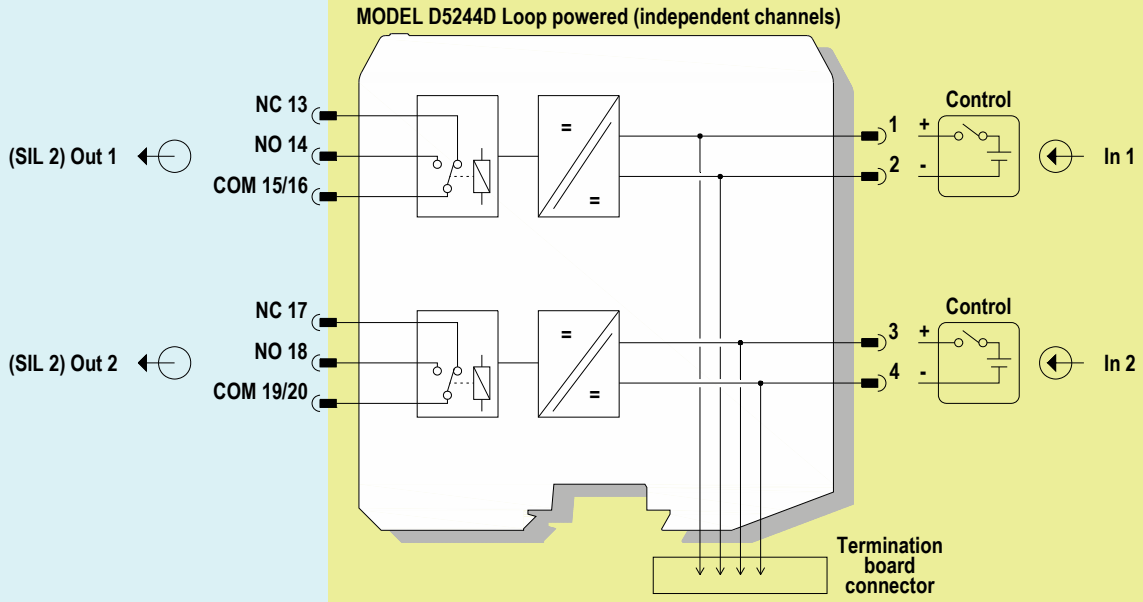
NOTE for USA and Canada:
IIC equal to Gas Groups A, B, C, D, E, F and G
IIB equal to Gas Groups C, D, E, F and G
IIA equal to Gas Groups D, E, F and G

Image:

Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4



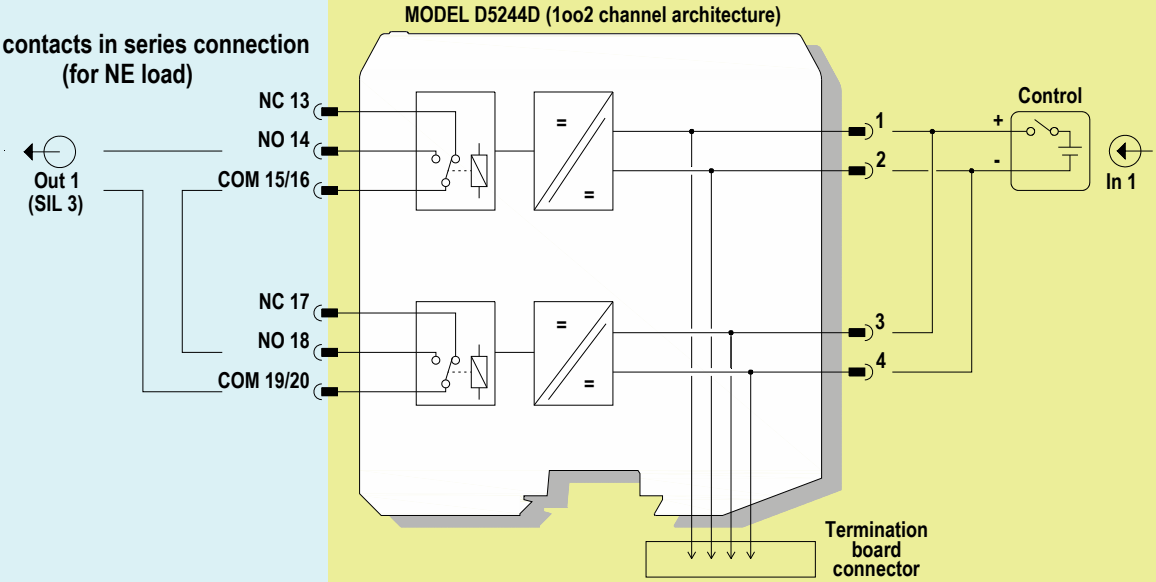
Relay contacts shown in de-energized position

Function Diagram:

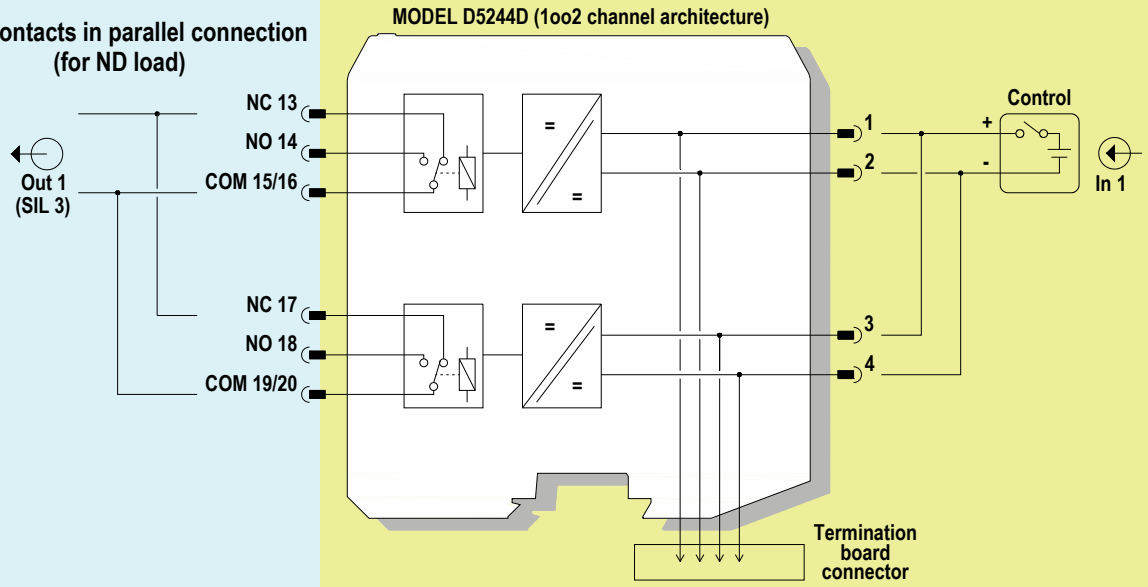
HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4

2 NO contacts in series connection (for NE load)



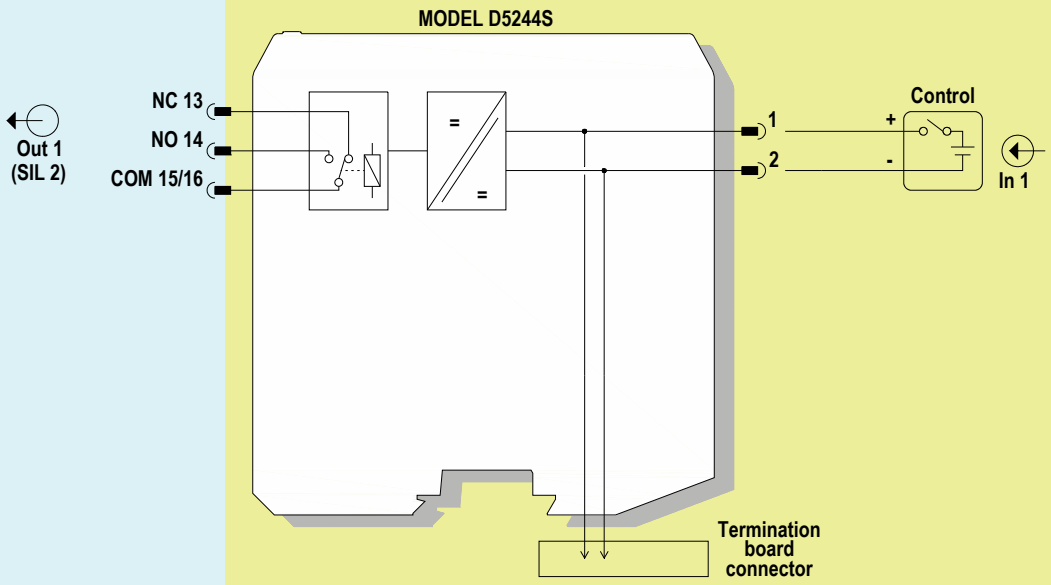
2 NC contacts in parallel connection (for ND load)



Relay contacts shown in de-energized position

Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC	SAFE AREA, ZONE 2 GROUP IIC T4



Relay contact shown in de-energized position