SIL 3 Digital Output Driver, NE Loads, Loop Powered, DIN-Rail and Termination Board, Model D5048S

Characteristics:

General Description:
The single channel Loop Powered Digital Output Isolator, D5048S, is suitable for driving solenoid valves, visual or audible alarms to alert a plant operator, or other process control devices in Hazardous Area from a driving signal in Safe Area. It can also be used as a controllable supply to power measuring or process control equipment.

Its use is allowed in applications requiring up to SIL 3 level (according to IEC 61508:2010 Ed. 2) in safety related systems for high risk industries.

The Safety PLC or DCS driving signal powers the field device through the D5048S, which provides isolation and is capable of monitoring the conditions of the line.

Short and open circuit diagnostic monitoring, dip-switch selectable and active when input power is present, provides LED indication and NC transistor output signalling. When fault is detected output is de-energized until normal condition is restored.

Line short and open output circuit fault detection is also reflected on the PLC / DCS which provides isolation and is capable of monitoring the conditions of the line.

When fault is detected output is de-energized until normal condition is restored.

Override Input:
override the control signal. When enabled, a low input voltage always de-energizes the field device regardless of the input signal.

Three basic output circuits are selectable, with different safety parameters, to interface the majority of devices on the market. The selection among the three output characteristics is obtained by connecting the field device to a different terminal block.

Mounting on standard DIN-Rail, with or without Power Bus to provide fault signal, or on customized Termination Boards, in Safe Area / Non Hazardous Location or in Zone 2 / Class I, Division 2 or Class I, Zone 2.

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

Front Panel and Features:

- SIL 3 according to IEC 61508:2010 Ed. 2 for ≤ 20 years.
- PF: 50 (1 year) 0.00 E+00, SFP 100 %.
- SIL 3 Systematic capability.
- Output to Zone 0 (Zone 20) / Division 1, installation in Zone 2 / Division 2.2.
- Loop powered for NE loads.
- Short and open circuit line diagnostic monitoring with LED, transistor output and current level on input.
- Output short circuit proof and current limited.
- Three port isolation, Input/Output/Fault.
- 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, FM, FMC, INMETRO, NEPSI, ExaT, TRex, CEI, IEC 60079-0, IEC 60079-11, IEC 60079-15.
- TÜV Certifications.
- TÜV Functional Safety Certification.
- Type Approval Certificate DIN and KR for maritime applications.
- Simplified installation using standard DIN-Rail and plug-in terminal blocks, with or without Power Bus, or customized Termination Boards.
- 250 Vrms (Um) max. voltage allowed to the instruments associated with the barrier.

Ordering Information:

Model: D5048S

Technical Data:

Loop Input:
loop powered control signal

Loop Supply:
24 Vdc (20 to 30 Vdc) reverse polarity protected.

Fault detection: field device and wiring open circuit or short circuit detection dip-switch selectable. When fault is detected, output is de-energized until normal condition is restored.

Output short circuit: load resistance ≤ 50 Ω (2 mA forcing fault to detect).

Open output detection: load resistance > 10 kΩ.

Fault signalling: voltage free NE SPST optocoupled open-collector transistor (output-de-energized in fault condition and when input power not present).

Open-collector rating: 100 mA at 35 Vdc (± 1.5 V voltage drop).

Leakage current: ≤ 50 µA at 35 Vdc.

Input impedance: ≤ 10 mA when fault detected or ≤ 2 kΩ.

Response time: ≤ 75 ms.

Fault isolation:
max. 10 s maximum time allowed for field devices to detect fault.

Open output isolation: max. 10 s maximum time allowed for field devices to detect fault.

Leakage current: ≤ 50 µA at 35 Vdc.

Power dissipation:
≤ 1 W with 24 V supply, output energized at 45 mA nominal load.

Current consumption @ 24 V:
≤ 28 mA (Out A) ≤ 27.68 mA (Out B) ≤ 12.8 mA (Out C).

Response time:
≤ 75 ms.

Compatibility:
CE mark compliant, conforms to 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:

Approval:
BVS 10 ATEX A14 X Ex ia IIC T4 Gc, 2ExnAiaIICT4 X, ExiaI X.

IECEx: II 3(1)G Ex nA [ia Ga] IIC T4 Gc, II(1)D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I.

ATEX: II 3(1)G Ex nA [ia Ga] IIC T4 Gc, II(1)D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I.

UL: 2ExnAiaIICT4 X, ExiaI X.

CSA: 2ExnAiaIICT4 X.

INMETRO: 13.0109 X conforms to ABNT NBR IEC60079-0, ABNT NBR IEC60079-11, ABNT NBR IEC60079-15, ABNT NBR IEC60079-17.

EN 60079-10:2006 conforms to UL60079-11, EN60079-15.

Safety: GOST 34630.4 for C22.2 No. 60079-11, C22.2 No. 60079-15, C22.2 No. 60079-17.

Protection class:
IP 20.

Dimensions:
Width 12.5 mm, Depth 123 mm, Height 120 mm.

Power dissipation:
≤ 1.1 W with 24 V supply, output energized at 45 mA nominal load.

Tamb: -40 °C to 70 °C.

Temperature limits – 40 to + 70 °C.

Power dissipation:
≤ 1 W with 24 V supply, output energized at 45 mA nominal load.

Current consumption @ 24 V:
≤ 28 mA (Out A) ≤ 27.68 mA (Out B) ≤ 12.8 mA (Out C).

Response time:
≤ 75 ms.

Fault isolation:
max. 10 s maximum time allowed for field devices to detect fault.

Open output isolation: max. 10 s maximum time allowed for field devices to detect fault.

Leakage current: ≤ 50 µA at 35 Vdc.

Input impedance: ≤ 10 mA when fault detected or ≤ 2 kΩ.

Response time: ≤ 75 ms.

Compatibility:
CE mark compliant, conforms to 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:

Approval:
BVS 10 ATEX A14 X Ex ia IIC T4 Gc, 2ExnAiaIICT4 X, ExiaI X.

IECEx: II 3(1)G Ex nA [ia Ga] IIC T4 Gc, II(1)D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I.

ATEX: II 3(1)G Ex nA [ia Ga] IIC T4 Gc, II(1)D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I.

UL: 2ExnAiaIICT4 X, ExiaI X.

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INMETRO: 13.0109 X conforms to ABNT NBR IEC60079-0, ABNT NBR IEC60079-11, ABNT NBR IEC60079-15, ABNT NBR IEC60079-17.

EN 60079-10:2006 conforms to UL60079-11, EN60079-15.

Safety: GOST 34630.4 for C22.2 No. 60079-11, C22.2 No. 60079-15, C22.2 No. 60079-17.

Protection class:
IP 20.

Dimensions:
Width 12.5 mm, Depth 123 mm, Height 120 mm.
### Parameters Table:

<table>
<thead>
<tr>
<th>Safety Description</th>
<th>Group Cenelec</th>
<th>Co/Ca (µF)</th>
<th>Lo/La (mH)</th>
<th>Lo/Ro (µH/Ω)</th>
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<tbody>
<tr>
<td>Out A Terminals 7-10</td>
<td>IIC</td>
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<td>0.04</td>
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<td>Uo/Voc = 24.8 V</td>
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<td>Out B Terminals 8-10</td>
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<td>1.42</td>
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<td>Uo/Voc = 24.8 V</td>
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<td>Out C Terminals 9-10</td>
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</table>

### Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC, HAZARDOUS LOCATIONS CLASS I, DIVISION 1, GROUPS A, B, C, D, CLASS II, DIVISION 1, GROUPS E, F, G, CLASS III, DIVISION 1, CLASS I, ZONE 0, GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4, NON HAZARDOUS LOCATIONS, CLASS I, DIVISION 2, GROUPS A, B, C, D T-Code T4, CLASS I, ZONE 2, GROUP IIC T4

NOTE: Use only one output at a time (Out A or Out B or Out C).