**D5030, D5031, D5032 series** are isolated Intrinsically Safe Associated Apparatus located in Non Hazardous Locations or Class I, Division 2, Groups A, B, C, D, Temperature Code T4 and Class I, Zone 2, Group IIC, IIB, IIA Temperature Code T Hazardous Locations (according to FM3600, FM3610, FM3611, ANSI/ISA 60079-0, ANSI/ISA 60079-11, ANSI/ISA 60079-15, ANSI/ISA 61241-10, ANSI/ISA 61241-11, CSA-C22.2 NO. 157, CSA-C22.2 NO. 213, CSA-C22.2 NO. 0079.3, CSA-C22.2 NO. 0079.11, CSA-C22.2 NO. 0079.15) within the specified operating temperature limits Tamb –40 to + 70 °C, and connected to equipment with a maximum limit for AC power supply of 250 Vrms. When installed in Class I, Division 2 or Class I, Zone 2 Hazardous Locations, the module must be mounted in supplemental enclosure meeting at least IP54 degree protection.

Not to be connected to control equipment that uses or generates more than 250 Vrms or Vdc with respect to earth ground. D5030, D5031, D5032 series must be installed, operated and maintained only by qualified personnel, in accordance to the relevant national/international installation standards (e.g. IP54 to IP65 or NEMA type 12-13) consistent with the effective operating environment of the specific installation.

Units must be protected against dirt, dust, extreme mechanical (e.g. vibration, impact and shock) and thermal stress, and casual contacts. End user needs to be cleaned use only a cloth lightly moistened by a mixture of detergent in water. Electrostatic Hazard: to avoid electrostatic hazard, the enclosure of D5030, D5031, D5032 must be cleaned only with a damp or antistatic brush. Any penetration of cleaning liquid must be avoided to prevent damage to the unit. Failure to properly install or use of the equipment may risk to damage the unit or severe personal injury. The unit cannot be repaired by the end user and must be returned to the manufacturer or his authorized representative. Any unauthorized modification must be avoided. If calibration requires the use of an adjustable power supply, current meter, or voltmeter, it should be only be performed by an authority who knows how to be nonhazardous or with equipment suitable for the area classification.

### Technical Data

#### D5030

- **Supply:** 24 Vdc nom (18 to 30 Vdc) reverse polarity protected, ripple within voltage limits ± 5 Vp, 2 A time lag fuse internally protected.
- **Current consumption @ 24 V:** 35 mA for 2 channels D5030D, 18 mA for 1 channel D5030S with short circuit input and relay energized, typical.
- **Power dissipation:** 0.85 W for 2 channels D5030D, 0.45 W for 1 channel D5030S with 24 V supply voltage, short circuit input and relay energized, typical.
- **Isolation (Test Voltage):** I.S. In/Out 2500 V dc, I.S. In/Supply 2500 V dc, I.S. In/500V Out, Supply/2500 V dc, Out/500 V dc.
- **Input switching current limits:** ON ≥ 2.1 mA (1.9 to 6.2 mA range), OFF ≤ 1.2 mA (0.4 to 1.3 mA range), Typeswitching current, switch current = 1.65 mA ± 0.2 mA hysteresis.
- **Fault current limits:** open fault ≤ 0.2 mA, short fault ≤ 6.8 mA (when enabled both faults de-energize channel relay with single channel unit D5030S or de-energize channel relay with D5030D used as dual channel unit and actuate the fault relay out with D5030D used as fault signaling unit).
- **Input equivalent source:** 8 V 1 KΩ typical (8 V no load, 8 mA sourced).
- **Output:** voltage free SPST (D5030D) or SPDT (D5030D) relay contact.
- **Contact material:** Ag Alloy (Cd free).
- **Contact rating:** 4 A 250 Vac 1000 VA, 4 A 250 Vdc 120 W (resistive load), limit current to 100 mA maximum for 5 SL 3 app!.
- **DC Load breaking capacity:** 300 W (10 ms, 100 Vac, 100 Vdc).
- **Mechanical / Electrical life:** ≥ 5 * 10^9 / 3 * 10^9 operation, typical.
- **Operate / Release time:** 8 / 4 ms typical.
- **Bounce time NO / NC contact:** 3 / 6 ms typical.
- **Response time:** 10 Hz maximum.
- **Environmental conditions:**
  - **Operating:** temperature limits – 40 to + 70 °C, relative humidity 95%, up to 55 °C.
  - **Storage:** temperature limits – 40 to + 80 °C.

#### D5031

- **Supply:** 24 Vdc nom (18 to 30 Vdc) reverse polarity protected, ripple within voltage limits ± 5 Vp, 2 A time lag fuse internally protected.
- **Current consumption @ 24 V:** 22 mA for 2 channels D5031, 12 mA for 1 channel D5031S with short circuit input and transistor closed, typical.
- **Power dissipation:** 0.53 W for 2 channels D5031D, 0.30 W for 1 channel D5031S with 24 V supply voltage, short circuit input and transistor closed, typical.
- **Isolation (Test Voltage):** I.S. In/Out 2500 V dc, I.S. In/Supply 2500 V dc, I.S. In/500V Out, Supply/500 V dc, Out/500 V dc.
- **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 limits:** open fault ≤ 0.2 mA, short fault ≤ 6.8 mA (when enabled both faults de-energize channel transistor with single channel unit D5031S or de-energize channel transistor with D5031D used as dual channel unit or actuate the fault transistor out with D5031D 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 optocoupled open-collector transistor.
- **Open-collector rating:** 100 mA at 35 Vdc (± 1.5 V voltage drop).
- **Leakage current:** ≤ 50 µA at 35 Vdc.
- **Response time:** ≤ 100 µs.
- **Frequency response:** ≥ 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 single channel unit or actuate the fault relay out with D5032D used as fault signaling unit).
- **Environmental conditions:**
  - **Operating:** temperature limits – 40 to + 70 °C, relative humidity 95%, up to 55 °C.
  - **Storage:** temperature limits – 40 to + 80 °C.

#### D5032

- **Supply:** 24 Vdc nom (18 to 30 Vdc) reverse polarity protected, ripple within voltage limits ± 5 Vp, 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 2500 V dc, I.S. In/Supply 2500 V dc, I.S. In/500V Out, Supply/500 V dc, Out/500 V dc.
- **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 limits:** 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 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 * 10^9 / 1 * 10^9 operation, typical.
- **Operate / Release time:** 8 / 4 ms typical.
- **Bounce time NO / NC contact:** 3 / 8 ms typical.
- **Frequency response:** 10 Hz maximum.
- **Environmental conditions:**
  - **Operating:** temperature limits – 40 to + 70 °C, relative humidity 95%, up to 55 °C.
  - **Storage:** temperature limits – 40 to + 80 °C.
Connections for Proximity or Voltage free contacts

D5030, D5031, D5032

- SIL 3 Switch / Proximity Detector Repeater Relay Output

NOTE: when installed in Class I, Division 2 or Class I, Zone 2 Hazardous Locations, the module must be mounted in supplemental enclosure meeting at least IP54 degree protection.

The output current of this associated apparatus is limited by a resistor such that the output voltage-current plot is straight line drawn between open-circuit voltage and short-circuit current.

D5030, D5031, D5032

- Associated Apparatus Parameters
  - Must be
  - Hazardous Area/ Hazardous Locations Device Parameters

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Associated Apparatus Parameters</th>
<th>Must be</th>
<th>Hazardous Area/ Hazardous Locations Device + Cable Parameters</th>
</tr>
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<tbody>
<tr>
<td>Ch1</td>
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<td>Co / Ca = 2.41 µF</td>
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<td></td>
<td></td>
<td>Co / Ca = 16.8 µF</td>
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<td></td>
<td></td>
<td></td>
<td>Co / Ca = 75.0 µF</td>
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<td>Co / Ca = 16.8 µF</td>
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<td>Ch2</td>
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<td>Lo / La = 78.3 mH</td>
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<td>Lo / La = 313.4 mH</td>
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<td>Lo / La = 626.9 mH</td>
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<td>Lo / Ro = 2543.9 µHΩ</td>
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</table>

NOTE: for installations in which both the Ci and Li of the Intrinsically Safe apparatus exceed 1 % of the Co and Lo parameters of the Associated Apparatus (excluding the cable), then 50 % of Co and Lo parameters are applicable and shall not be exceeded (50 % of the Co and Lo become the limits which must include the cable such that Ci device + C cable ≤ 50 % of Co and Li device + L cable ≤ 50 % of Lo).

Capacitance and inductance of the field wiring from the intrinsically safe equipment to the associated apparatus shall be calculated and must be included in the system calculations as shown in the entity parameters table.

If the cable parameters are unknown, the following may be used:
- Capacitance 60pF per foot (180pF per meter).
- Inductance 0.20µH per foot (0.60µH per meter).