# GH04148 Proximity Switch

## Safety instructions

Please read these safety warnings, cautions, and instructions carefully before using the product. These instructions cannot cover every installation and situation. Do not install, operate, or maintain this product without being fully trained and qualified in valve, actuator and accessory installation, operation and maintenance. **To avoid personal injury or property damage it is important to carefully read, understand, and follow all of the contents of instruction manual including all safety cautions and warnings.** If you have any questions about these instructions, contact your Emerson sales office before proceeding.

## Special Instructions for Safe Use and Installations in Hazardous Locations

Certain nameplates may carry more than one approval, and each approval may have unique installation requirements and/or conditions of safe use. Special instructions are listed by agency/approval. To get these instructions, contact your Emerson sales office. Read and understand these special conditions of use before installing.

**⚠ WARNING**

**Failure to follow conditions of safe use could result in personal injury or property damage from fire or explosion, or area re-classification.**

## Description

This proximity switch provides a set of solid-state relays for controlling external circuits. The relays are driven between open and closed states by sensing the position of a magnetic plunger.

To determine that the switching device is working correctly, the external circuits and controlled processes must be monitored by independent measurements. The safety of any system incorporating the equipment is the responsibility of the assembler of the system.

Table 1. Specifications

**Equipment Ratings**

Operating Ambient Temperature Range: -40°C to 85°C (-40 to 185°F)

Maximum Altitude: 2000 m (6562 feet)

**Contact Electrical Ratings(1)**

1 amp resistive, 0.5 amp inductive at 28 VDC

"Contacts" are not polarity sensitive

A bi-directional transient voltage suppressor (TVS) rated at a clamping voltage of 59 V protects each Solid State Switch from electrostatic discharge (ESD) and inductive back-EMF. An additional such TVS is installed across the NC to NO connections. The TVS has a reverse standoff voltage of 33 V, so misapplication of the switch in a circuit with voltage above the 28 VDC rating could result in conduction across an "open" set of switch leads.

Switch behavior during inadequate supply power conditions for the electronic: both switches in the open state

**Process Seal**

Single Seal

Internal O-ring material: see Construction Materials

Maximum seal pressure: 6.9 bar (100 psi)

Seal temperature range: -40 to 204°C (-40 to 400°F)

The switch is not exposed to process fluids during normal operation.

**Electrical Connections**

Electrical 1/2-14 NPT external conduit connection with 0.5 m (greater than 18 inches) of 18 AWG lead wires. Install conduit seal within 18 inches.

Safety ground wire is 16 AWG

| Wire Color | Circuit Description |
|---|---|
| White/Red | DC Supply + |
| White/Black | DC Supply – |
| Red | Normally Closed Contact |
| Brown | Common Contact |
| Blue | Normally Open Contact |
| Green | Ground (Housing, Safety) |

Insulation Requirements: Should be consistent with switched equipment rating and power supply rating, as well as local code wiring requirements.

See block diagram in figure 1

**Power Requirements for Electronics**

Excitation Voltage Range for Electronics: 9 - 30 VDC

Maximum Input Voltage Ripple: 400 mV

Current Draw
*Steady state*: Less than 15 mA

*Transient (startup or switching)*: Less than 500 mA peak

*Maximum quiescent steady state power draw of electronics during normal operation within design parameters:*
Pmax_quiescent: 450 mW

*Maximum transient power draw of electronics during normal operation within design parameters:*
Pmax_transient: 15 W

The supply terminals are protected against reverse polarity.

With excessive voltage present on the supply terminals, a protective bi-directional TVS will conduct.

The guaranteed standoff voltage of the TVS is 26 V. Breakdown occurs between 21.9 and 31.9 V. Clamping Voltage is 42.1 V.
Peak Pulse Power rating is 5000 W.

A common-mode choke protects against conducted EMI.

**Construction Materials**

Switch body & cover: Aluminum 6061 T6, chromate conversion coated

Internal O-ring: Fluorosilicone rubber

-continued-

Table 1. Specifications (continued)

| **Hazardous Area Classifications Available** | **Special Conditions of Safe Use** |
|---|---|
| cCSAus<br>Explosion-proof Class I Division 1, Groups ABCD<br>Dust Ignition-proof Class II Division 1 2, Groups EFG<br>Single Seal<br>ATEX II 2 GD<br>Flameproof Ex d IIC T5(Ta ≤ @85°C) / T6 (Ta≤ @ 78°C)<br>Dust Ex tb IIIC T92°C / T85°C Db IP6X<br>1 A Max<br>IECEx<br>Flameproof Ex d IIC T6 T5 (Ta ≤ @85°C) /<br>T6 (Ta≤ @ 78°C)<br>Dust Ex tb IIIC T T92°C / T85C Db IP6X<br>1 A Max<br>Ingress Protection Rating per IEC 60529: IP66 | 1. 1/2-14 NPT conduit connection which is integral to the body of the switch to be sealed within 18 inches.<br>2. Flame proof joints are not intended to be repaired.<br>3. Keep cover tight while circuits are alive.<br>Garder le couvercle bien fermé tant que les circuits sont sous tension. |

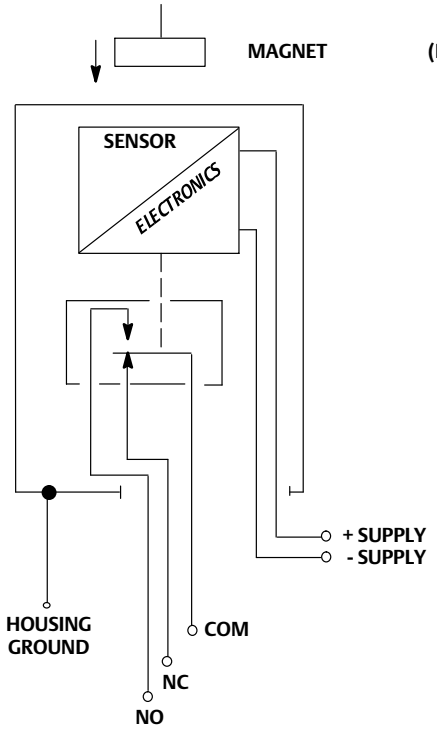
1. Contacts are solid state switches.

# Symbols used

| Symbol | Description |
|---|---|
|  | Direct Current |
|  | Protective Earth Ground |
|  | Caution: indicates that the manual has more information |

# Block Diagram

Figure 1. Block Diagram




NOTES
1. COMPONENTS NOT SHOWN: TRANSIENT VOLTAGE SUPPRESSORS ACROSS LINES.
2. THE NO/NC DESIGNATIONS ARE VALID WHEN ELECTRONICS ARE POWERED. OTHERWISE BOTH CONTACTS ARE OPEN.

# Maintenance

The GH04148 Switch is not intended to be serviced.

**⚠ WARNING**

**De-energize prior to instrument maintenance or replacement of parts.**



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