

F3S-TGR-N_X

Explosion proof reed non-contact switches monitor the status of guarding doors in petro-chemical and food applications with explosive atmospheres.

- Based on reed technology
- Connect up to 6 switches in series
- Operates with all Omron safety controllers
- Operates behind stainless steel fittings
- Non-contact - no abrasion - no particles
- Compensation of mechanical tolerances
- Suitable for high pressure cleaning, CIP/SIP processes
- Conforms to safety categories up PLe acc. EN ISO13849-1
- For use in hazardous areas IECEx and ATEX EExd IIC T6 (Gas and Dust). Designed for Petro-chemical and food applications where explosive atmospheres are present.



Model number structure

F3S-TGR-N₁MX-21-₂

1. Type:


- L: Elongated Sensor
- B: Barrel Sensor

2. Cable length


- 05: 5 m Cable
- 10: 10 m Cable

Ordering information

Elongated sensors

| Type | Cable connection | Contact configuration | Order code |
|---|------------------|-----------------------|--------------------|
|  | 5 m pre-wired | 2NC/1NO | F3S-TGR-NLMX-21-05 |
| | 10 m pre-wired | 2NC/1NO | F3S-TGR-NLMX-21-10 |

Barrel sensors

| Type | Cable connection | Contact configuration | Order code |
|---|------------------|-----------------------|--------------------|
|  | 5 m pre-wired | 2NC/1NO | F3S-TGR-NBMX-21-05 |
| | 10 m pre-wired | 2NC/1NO | F3S-TGR-NBMX-21-10 |

Accessories

| | | Order code |
|---|---|---------------------------|
| Actuators | for F3S-TGR-NLMX | F39-TGR-NLMX-A |
| | for F3S-TGR-NBMX | F39-TGR-NBMX-A |
| Mounting screws | Set of Torx safety screws (M4, 4 × 30 mm, 4 × 20 mm, 4 × 10 mm; incl. washers and Torx bit) | F39-TGR-N-SCREWS |
| Spacer (8 mm, Set of 2pcs.)^{†1} | for F3S-TGR-NLMX | F39-TGR-NLR-SPACER |

^{†1} Spacers are needed to prevent influences if switch is mounted on ferromagnetic background (e. g. reduced switching distance, EMC influences)

Control units

| | | Order code |
|--|--|--|
| Safety relay units | G9SA  | G9SA-301 G9SA-501 G9SA-321-T075 G9SA-321-T15 G9SA-321-T30 |
| | G9SB  | G9SB-2002-C G9SB-2002-A G9SB-200-B G9SB-200-D G9SB-3012-A G9SB-301-B G9SB-3012-C G9SB-301-D |
| | G9SX  | G9SX-BC202-R_ G9SX-AD322-T15-R_ G9SX-AD322-T150-R_ G9SX-ADA222-T15-R_ G9SX-ADA222-T150-R_ |
| Programmable standalone controllers | G9SP-N  | G9SP-N10S G9SP-N10D G9SP-N20S |
| Programmable network controllers | NE1A  | NE1A-SCPU01-V1 NE1A-SCPU02 |

Specifications

Mechanical data

| | | Elongated sensors | Barrel sensors |
|-----------------------------------|----------------|--|----------------|
| Indicator | – | None | |
| Operating distance | OFF → ON (Sao) | 10 mm close | |
| | ON → OFF (Sar) | 22 mm open | |
| Actuator approach speed | Min. | 4 mm/s | |
| | Max. | 1000 mm/s | |
| Recommended setting gap | – | 5 mm | |
| Mounting position | – | any | |
| Mounting bolts | – | 2 × M4 recommended | |
| Tightening torque | Max. | 1 Nm | |
| Operating temperature | – | –20 to +80°C (or +60°C at 2A) | |
| Enclosure protection | – | IP 67 (Certification for IP67 but can be used for SIP/CIP and high pressure cleaning like IP69K) | |
| Shock resistance (IEC 68-2-27) | – | 11 ms, 30 g | |
| Vibration resistance (IEC 68-2-6) | – | 10 to 55 Hz, 1 mm | |
| Material | – | Stainless steel 316 | |

Electrical data

| | | Elongated sensors | Barrel sensors |
|----------------------------|-------------|---|----------------|
| Sensor technology | – | reed | |
| Serial switching | – | up to 6 pcs. in series | |
| Initial contact resistance | Max. | 500 mΩ | |
| Contact release time | Max. | 2 ms | |
| Switching current | Min. | 1 mA, 10 VDC | |
| Rated loads | NC contacts | 0.6 A, 230 VAC/24 VDC (internally fused) 0.2 A, 230 VAC/24 VDC | |
| | NO contact | | |

Ex specification

| |
|--|
| 2G Ex mb IIC T6Gb, II 2D Ex mb IIC T80 Db IP67* (*Product is fully encapsulated which is considered to provide Ingress Protection to at least IP67) |
| Zones 0, 1, 2 (Gas) Zones 20, 21, 22 (Dust) (An area where Gas and Dust is likely to occur in use) |
| IEC/EN 60079-0, IEC/EN 60079-18 |

Reliability Data

| | |
|----------------|---|
| EN ISO 13849-1 | up to PLe depending upon system architecture |
| EN 62061 | up to SIL3 depending upon system architecture |
| B10d | 3.3 × 10 ⁶ cycles at 100 mA load |

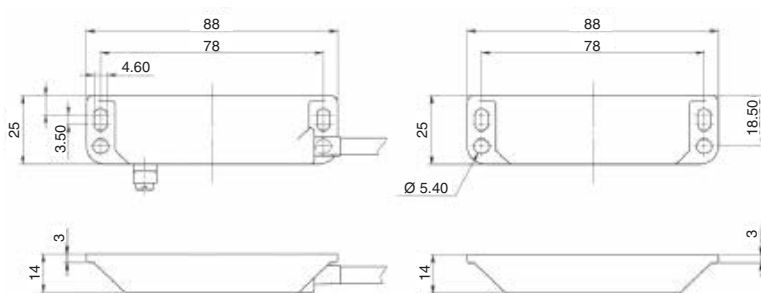
Standards

| EN standards certified by TÜV Rheinland |
|---|
| EN ISO13849-1 |
| EN 60204-1 |
| EN ISO 14119 |
| EN/IEC 60947-5-3 |
| CSA C22.2 |
| BS 5304 |
| EN 1088 conformance |

Dimensions

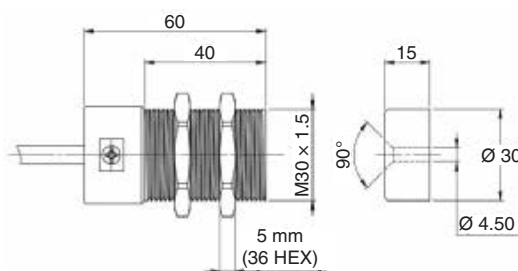
Elongated sensor (Sensor/Actuator)

F3S-TGR-NLMX



Barrel sensor (Sensor/Actuator)

F3S-TGR-NBMX



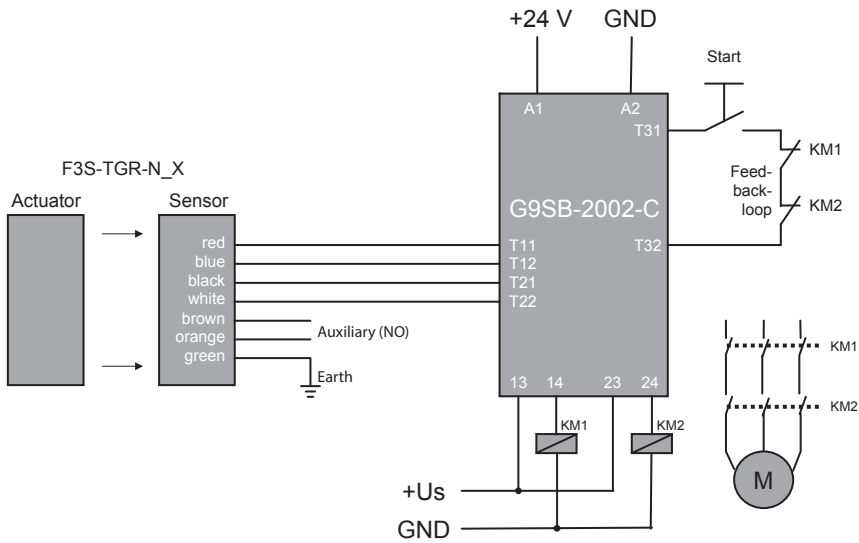
Connection diagram

| Wire | Signal |
|--------|-----------------|
| red | NC Channel 1 |
| blue | NC Channel 1 |
| black | NC Channel 2 |
| white | NC Channel 2 |
| brown | NO Aux. Channel |
| orange | NO Aux. Channel |
| green | Earth |

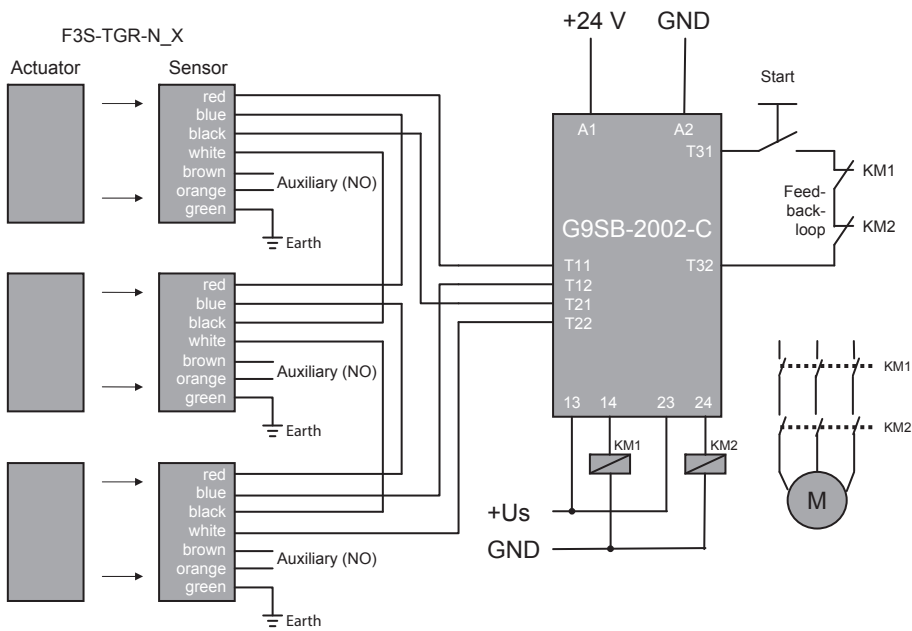
Wiring examples

G9SB

Single Sensor Application with G9SB-2002-C (up to Safety PLe acc. EN ISO 13849-1)



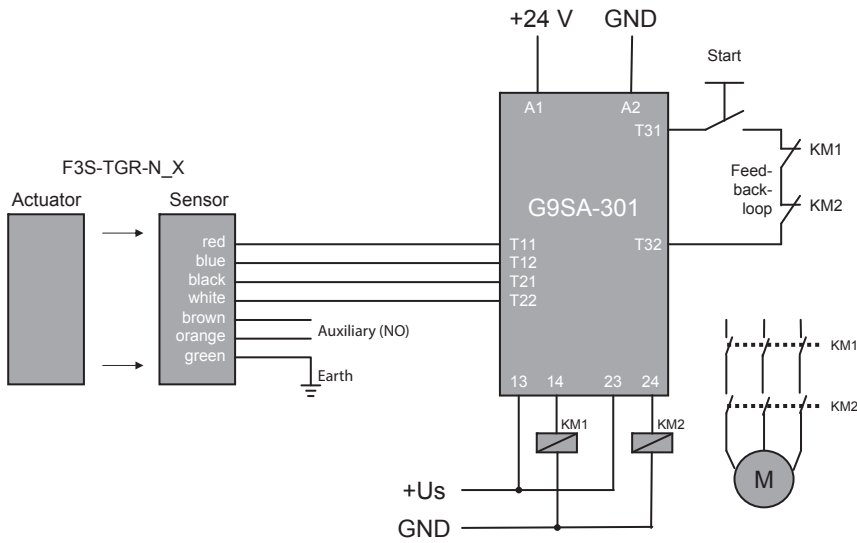
Series connection Application, up to 6 Sensors with G9SB-2002-C (up to Safety PLd acc. EN ISO 13849-1)



G9SA

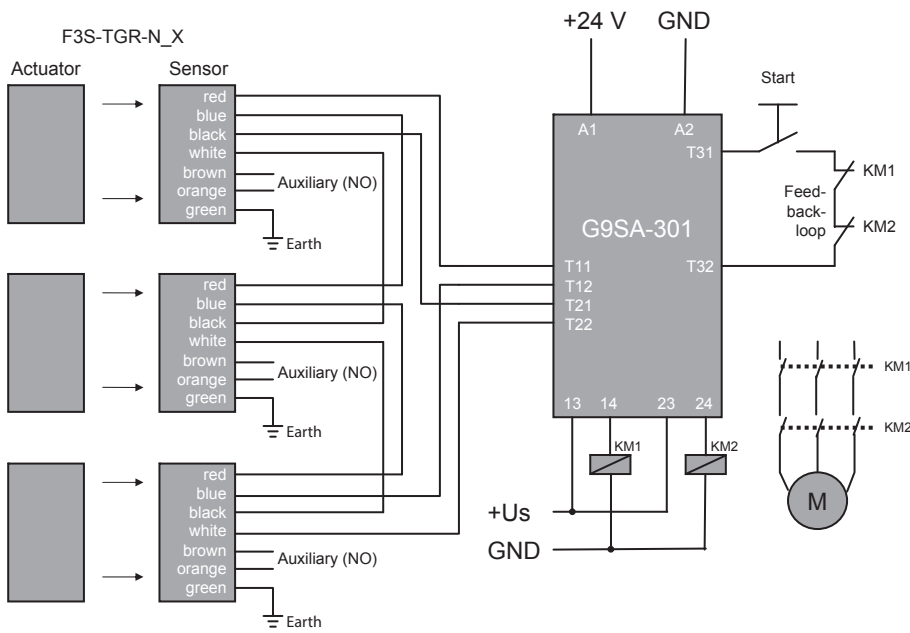
Single Sensor Application with G9SA-301

(up to Safety PLe acc. EN ISO 13849-1)



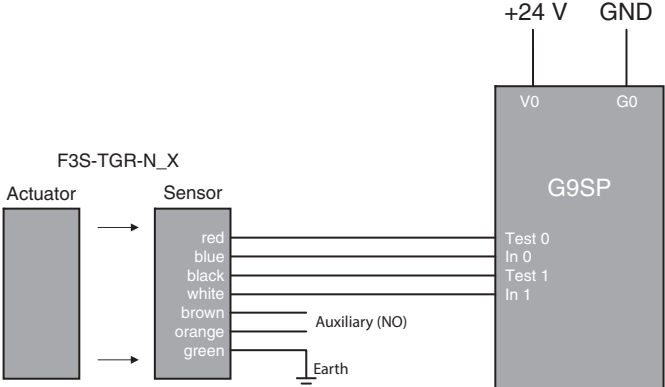
Series connection Application, up to 6 Sensors with G9SA-301

(up to Safety PLd acc. EN ISO 13849-1)

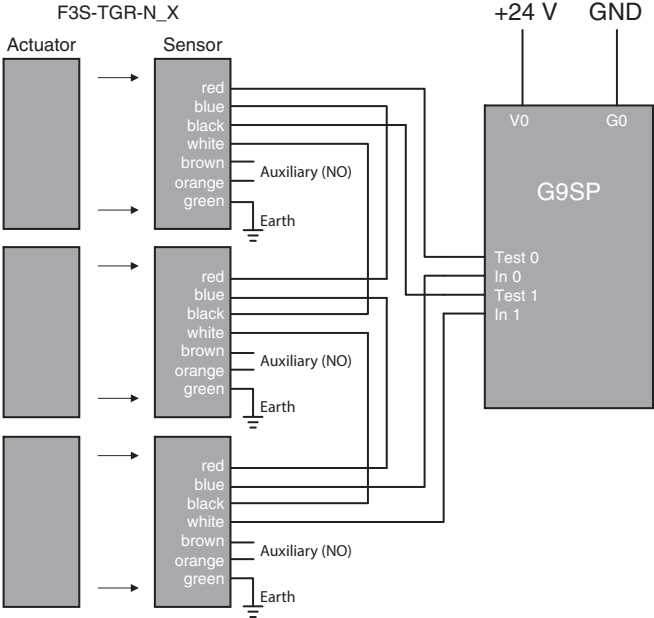


G9SP

Single Sensor Application with G9SP
(up to Safety PLe acc. EN ISO 13849-1)



Series connection Application, up to 6 Sensors with G9SP
(up to Safety PLd acc. EN ISO 13849-1)



Safety Precautions

! WARNING

Be sure to turn OFF the power before performing wiring. Do not touch charge parts (e.g., terminals) while power is ON. Doing so may result in electric shock.



Do not allow the actuator to come close to the switch with the door open. Doing so may cause machinery to start operating and may result in injury.



Keep actuators (magnets) away from magnetically sensitive equipment like PC harddisks, floppy disks etc. The magnetic field of the magnet will damage existing data.



Application Precautions

- Use the product only in the authorized Ex zones (see Ex specification)
- Do not use load currents exceeding the rated value.
- Be sure to wire each conductor correctly.
- Be sure to confirm correct operation after completing mounting and adjustment.
- Do not drop or attempt to disassemble the product.
- Be sure to use the correct combination of switch and actuator.
- Use a power supply of the specified voltage. Do not use power supplies with large ripples or power supplies that intermittently generate incorrect voltages.
- Capacitors are consumable and require regular maintenance and inspection.

Installation Locations

Do not install the product in the following locations. Doing so may result in product failure or malfunction.

- Locations subject to direct sunlight
- Locations subject to humidity levels outside the range 35% to 85% or subject to condensation due to extreme temperature changes
- Locations subject to corrosive or flammable gases
- Locations subject to shocks or vibration in excess of the product ratings
- Locations subject to dust (including iron dust) or salts

Take appropriate and sufficient countermeasures when using the product in the following locations.

- Locations subject to static electricity or other forms of noise
- Locations subject to possible exposure to radioactivity
- Locations subject to power supply lines
- It is advisable to mount the switches on non ferrous materials. The presence of ferrous material can effect switching sensitivity.

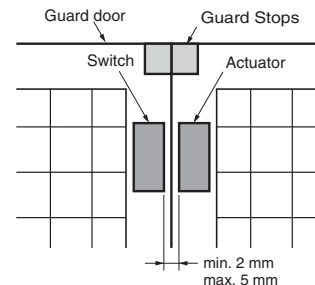
Solvents

Ensure that solvents, such as alcohol, thinner, trichloroethane, or gasoline do not adhere to the product. Solvents may cause markings to fade and components to deteriorate.

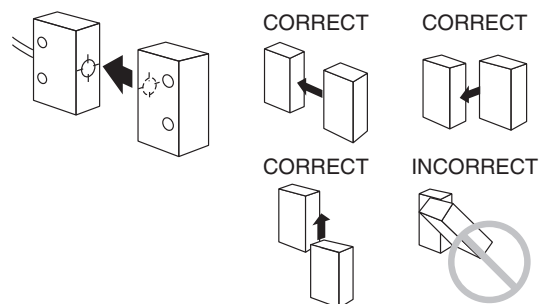
Guard Stops

! CAUTION

Use guard stops in the way shown below to ensure that the switch and actuator do not make contact when the guard door is closed.

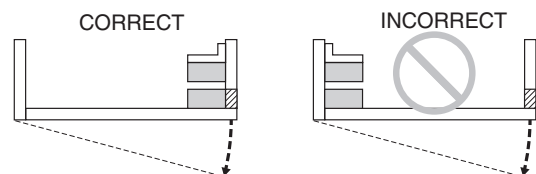


Mounting Direction



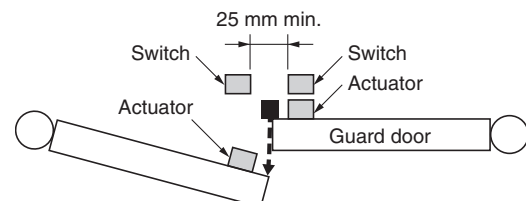
Using for Hinged Doors

On hinged doors, install the Sensor at an opening edge as shown below.



Mutual Interference

If the switch and actuator are mounted in parallel, be sure to separate them by at least 25 mm, as shown below.



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.