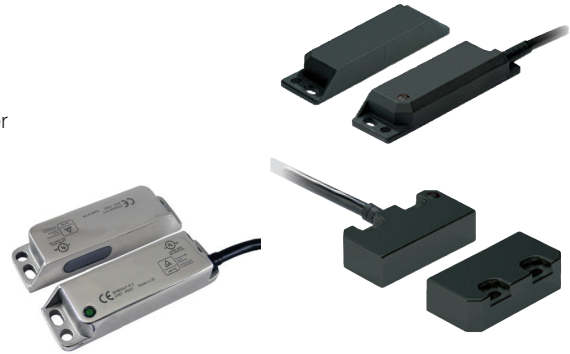


RFID Non-contact Safety Switches

D40R

RFID Non-contact switches are designed to monitor hinged, sliding or removable guard doors. RFID technology provides increased tamper resistance.

- Based on RFID technology, providing high anti-tamper resistance
- The RFID-design covers two models with anti-tamper coding:
 - B-types (Basic coded): Any sensor works with any actuator
 - U-types (Unique coded): Each sensor and actuator use a unique code. This is a solution for applications that requires even a higher anti-tamper coding
- Conforms to safety categories up to PLe acc. EN ISO 13849-1
- Connect up to 20 switches in series, up to PLd acc. EN ISO 13849-1
- LED indicates operation state
- Operates with all two-channel NC Omron safety controllers
- IP69K versions suitable for high pressure cleaning and CIP/SIP processes.
- Stainless steel version specifically designed for Food Processing applications. Can withstand high pressure washdown, high temperatures and detergents.



Model Number Structure

D40R-□□□-21-□
1 2 3 4

1. Type

- L: Elongated Sensor
- S: Small Sensor (not available in stainless steel version)

2. Housing Material

- P: Plastic Housing
- M: Stainless Steel Housing

3. Code

- B: Basic Code
- U: Unique Codes




4. Cable Length/Connection

- 05: 5 m Cable (not available in stainless steel version)
- 10: 10 m Cable
- M12: M12 male connector, 8 pin, fitted with 250 mm cable (not available in stainless steel version)

Ordering Information





Basic coded: Any actuator will operate with any sensor (Teach process needed, if actuator will be changed: Power down - place actuator to sensor - power up).

Unique coded: Only one actuator fits to the code of the sensor (Replacement of only sensor OR actuator is not possible)

| Polyester Housing | | | | |
|--|--------------------------------------|-----------------------|-----------------|-----------------|
| Type | Cable Connection | Contact Configuration | Order Code | |
| | | | Basic Coded | Unique Coded |
| Elongated Sensors  | 5 m pre-wired | 2NC/1NO | D40R-LPB-21-05 | D40R-LPU-21-05 |
| | 10 m pre-wired | | D40R-LPB-21-10 | D40R-LPU-21-10 |
| | M12, 8 pin, fitted with 250 mm cable | | D40R-LPB-21-M12 | D40R-LPU-21-M12 |
| Small Sensors  | 5 m pre-wired | | D40R-SPB-21-05 | D40R-SPU-21-05 |
| | 10 m pre-wired | | D40R-SPB-21-10 | D40R-SPU-21-10 |
| | M12, 8 pin, fitted with 250 mm cable | | D40R-SPB-21-M12 | D40R-SPU-21-M12 |
| Stainless Steel Housing | | | | |
| Type | Cable Connection | Contact Configuration | Order Code | |
| | | | Basic Coded | Unique Coded |
| Elongated Sensors  | 10 m pre-wired | 2NC/1NO | D40R-LMB-21-10 | D40R-LMU-21-10 |

Accessories

Cables

| Type | Cable Connection | Model |
|--|---------------------------|-------------------|
| Cables (M12 Female - 8-pin to flying leads)  | 5 m | D40ML-CBL-M12-05M |
| | 10 m | D40ML-CBL-M12-10M |
| Cables (M12 Male to M12 Female - 8-pin)  | 2 m | D40P-8PMF-M12-02M |
| | 5 m | D40P-8PMF-M12-05M |
| | 10 m | D40P-8PMF-M12-10M |
| T-Connector Connection Cable  | T-Connector for M12 cable | D40P-8PTC-M12 |
| Shorting Plug  | M12 Shorting Plug | D40P-8PSP-M12 |

Replacement Actuators

| Type | Compatible Switch Model | Model |
|---|-------------------------|------------|
| Replacement Actuators (only for basic coded types) | for D40R-LPB-__ | D40R-LPB-A |
| | for D40R-SPB-__ | D40R-SPB-A |
| | for D40R-LMB-__ | D40R-LMB-A |

Specifications

Electrical Data

| | | Basic Coded | Unique Coded |
|-----------------------|--|---|--|
| Sensor Technology | | RFID (Code) | |
| Serial Switching | | Connect up to 20 switches in series | |
| Code | | Basic Coded: Every switch same code ISO 14119 Type 4 (low) | Unique Coded: 32,000,000 different codes ISO 14119 Type 4 (high) |
| Indicator | | LED lighted (green): Door is closed and safety circuits are closed LED dark: Door is open and safety circuits are open | |
| Power Supply | | 24 VDC \pm 10% | |
| Power Consumption | Max. | 30 mA @ 24 VDC | |
| Dielectric Withstand | | 250 VAC | |
| Insulation Resistance | | 100 M Ω | |
| Output Types | Safety Channel 1 NC Safety Channel 2 NC Auxiliary Channel NO | 200 mA, max. 24 VDC, Solid State (no polarity), minimum internal resistance 8.5 Ω | |
| Contact Release Time | | <2 ms | |

Mechanical Data

| | | Plastic Sensors | Stainless Steel Sensor |
|--------------------------------------|----------------------------|--------------------------------------|--|
| Operating Distance | OFF \rightarrow ON (Sao) | 10 mm | 8 mm |
| | ON \rightarrow OFF (Sar) | 20 mm | 20 mm |
| Recommended Setting Gap | | 5 mm | |
| Actuator Approach Speed | Min. | 4 mm/s | 200 mm/s |
| | Max. | 1000 mm/s | 1000 mm/s |
| Switching Frequency | Max. | 1.0 Hz | |
| Operating Temperature | | -25 to +80°C | |
| Humidity | | -25 to 80°C, 90% RH | |
| Enclosure Protection | Flying lead | IP69K | |
| | M12 connector | IP67 | |
| Cable Material | Flying lead | PVC, 8 core, \varnothing 6 mm o.d. | |
| | M12 connector | 250 mm, PVC, \varnothing 6 mm o.d. | |
| Mounting Bolts | | 2 \times M4 (not supplied) | |
| Tightening Torque for Mounting Bolts | | 1 Nm | |
| Shock Resistance (IEC 68-2-27) | | 11 ms, 30 g | |
| Vibration Resistance (IEC 68-2-6) | | 10... 55 Hz, 1 mm | |
| Body Material | | Polyester | Stainless Steel 316 (mirror polish finish) |
| Mounting Position | | Any direction | |

Reliability Data

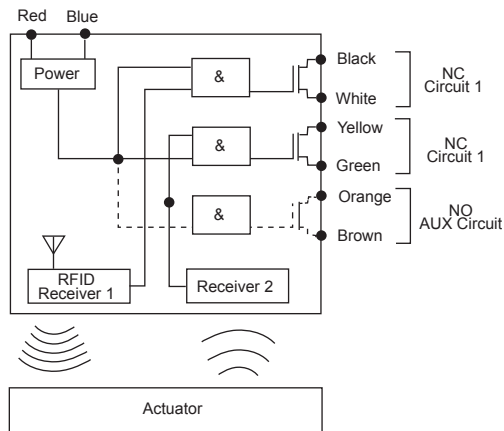
| | |
|------------------------------------|--|
| Performance Level (EN ISO 13849-1) | PLe (If both channels are used in combination with a PLe control device) |
| Category | Cat4 |
| MTTFd | 1100 a |
| Diagnostic Coverage DC | 99% (high) |
| Safety Integrity Level (EN 62061) | SIL3 (If both channels are used in combination with a SIL3 control device) |

Approved Standards

EN Standards Certified by TUV Rheinland: EN ISO13849-1, EN 60204-1, EN ISO 14119, EN/IEC 60947-5-3, UL 508, CSA C22.2.

Circuit Schematic

The RFID non-contact switches are working with both principles, based on RFID and hall technology.



Connection Diagram

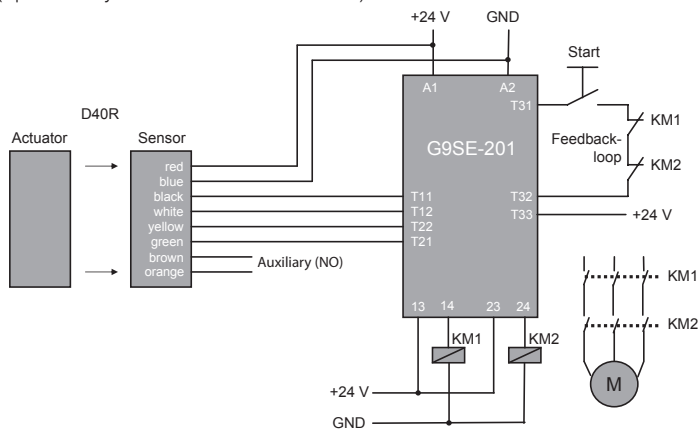
Cable Vision

| Pin No. | Signal Name |
|---------|-----------------|
| red | +24 VDC |
| blue | GND |
| black | NC Channel 1 |
| white | NC Channel 1 |
| yellow | NC Channel 2 |
| green | NC Channel 2 |
| brown | Aux. NO Channel |
| orange | Aux. NO Channel |

Wiring Examples

G9SE

Single Sensor Application with G9SE-201 with Manual Reset
(up to Safety PLe acc. EN ISO 13849-1)

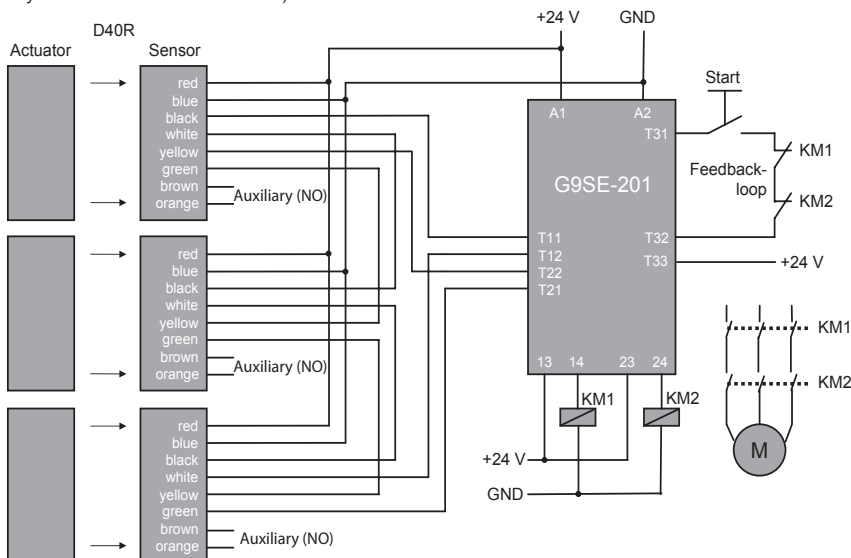


M12-Connector version (M12 male)

| Pin No. (male side) | Signal Name | Wire Color |
|---------------------|-----------------|------------|
| 2 | +24 VDC | red |
| 3 | GND | blue |
| 7 | NC Channel 1 | black |
| 8 | NC Channel 1 | white |
| 4 | NC Channel 2 | yellow |
| 6 | NC Channel 2 | green |
| 5 | Aux. NO Channel | brown |
| 8 | Aux. NO Channel | orange |

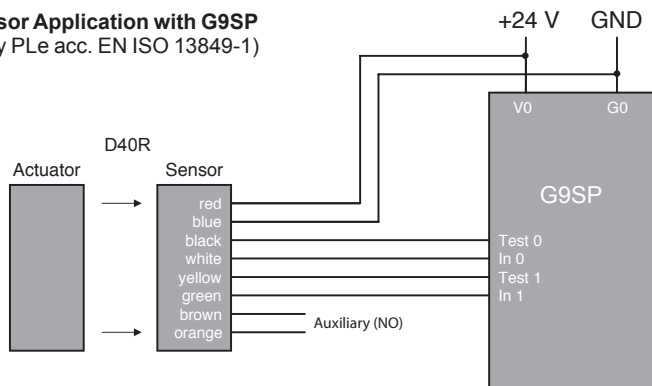
Wiring Examples

Series Connection Application, up to 20 Sensors with G9SE-201 with Manual Reset (up to Safety PLd acc. EN ISO 13849-1)

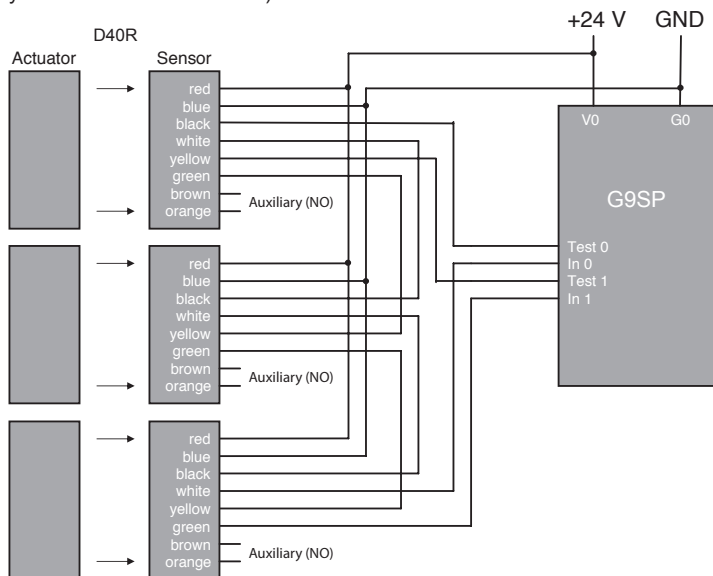


NOTE: For automatic reset connect the feedback loop between T31 and T33. Connect T32 to +24 VDC.

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

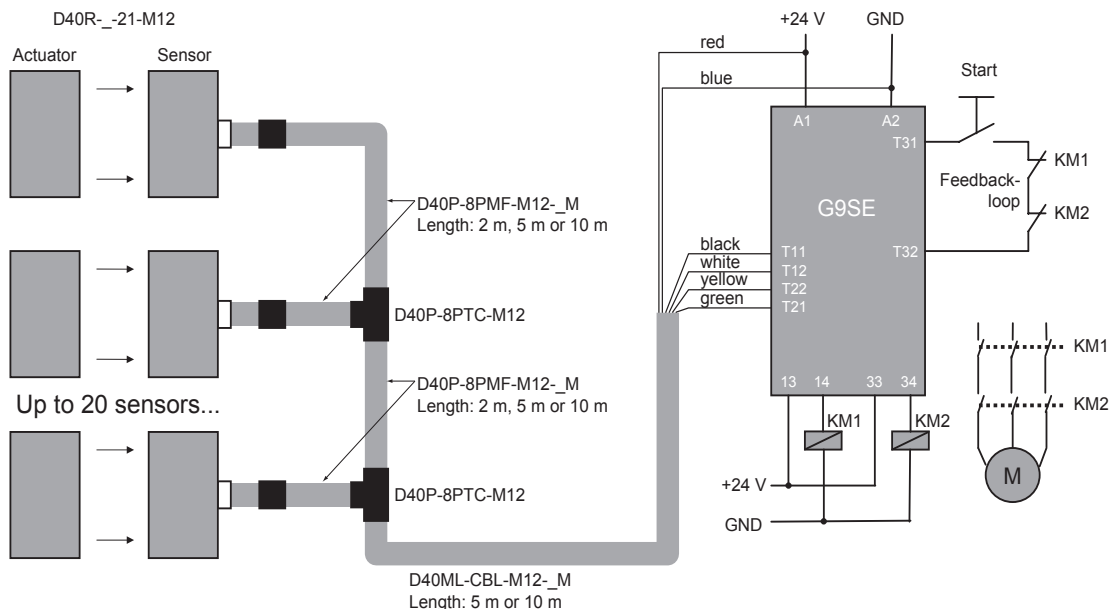


Series Connection Application, up to 3 Sensors with G9SP (up to Safety PLd acc. EN ISO 13849-1)

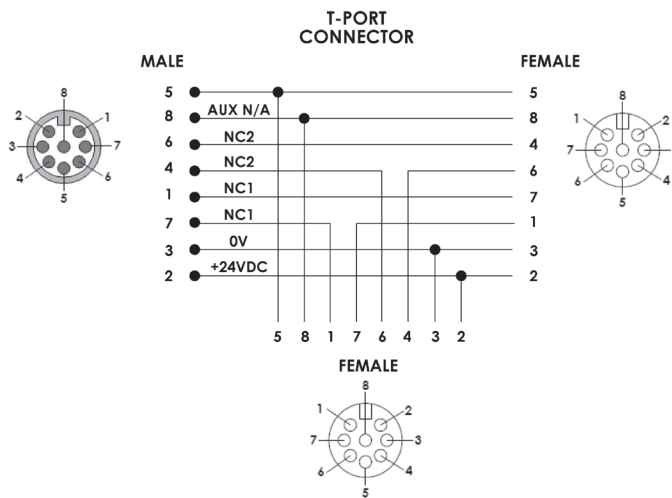
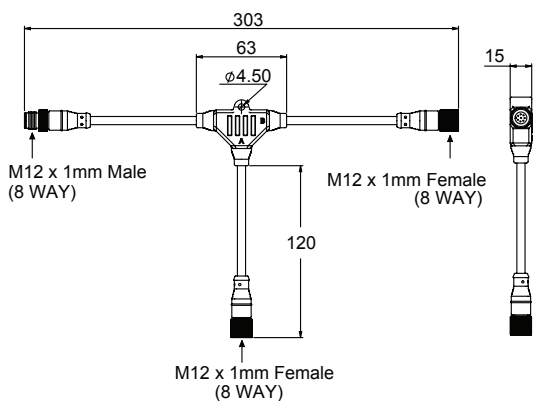


Wiring Examples

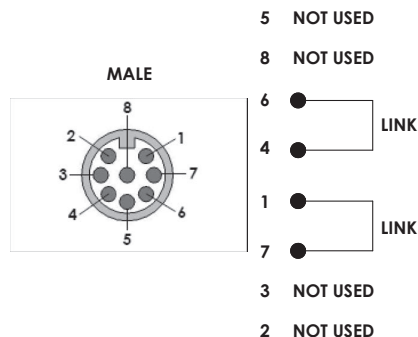
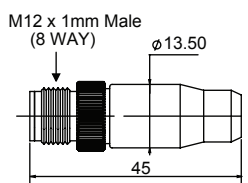
T-Connector and Connection Cable
Series connection with 3 Sensors for example with G9SE
 (up to Safety PLd acc. EN ISO 13849-1)



T-Connector Dimensions and Wiring



Shorting Plug Dimensions and Wiring



*Use Shorting Plug to terminate T-tap if port is not used.

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

- Do not use the product in locations subject to explosive or flammable gases.
- 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.

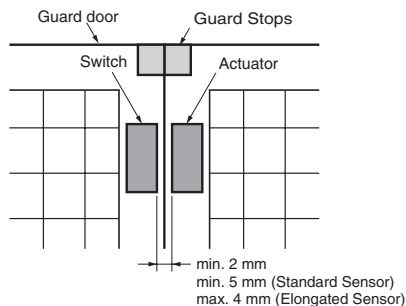
Solvents

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.

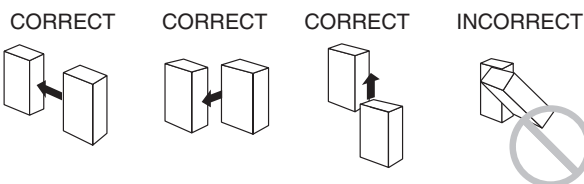
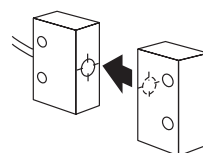
Guard Stops

⚠ 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.

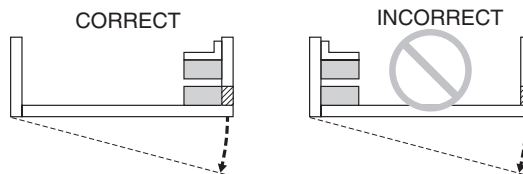


Mounting Direction



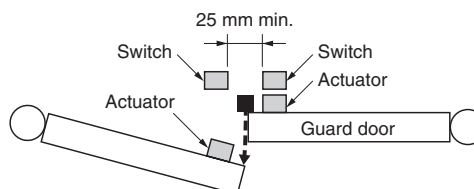
Using for Hinged Doors

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.



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