

# F3S-TGR-S\_A / F3S-TGR-S\_D

Standalone non-contact switches support applications like guarding doors or position monitoring in machines.

They are using the proven Omron non-contact technology allowing to cover mechanical tolerances and vibrations.

- Models with single or dual actuator available (For one or two door systems in e.g.)
- Based on hall technology
- Connect up to 20 switches in series
- LED for easy diagnosis
- Operates behind stainless steel fittings
- Non-contact – no abrasion – no particles
- Compensation of mechanical tolerances
- Suitable for high pressure cleaning, CIP and SIP processes due IP69K (pre-wired types)
- Conforms to safety categories up to PLe acc. EN ISO 13849-1



## Model number structure

F3S-TGR-S□S□-□  
1 2 3

### 1. Housing Material:

- P: Plastic
- M: Stainless steel

### 2. Actuating type:

- A: Single actuator sensing
- D: Dual actuator sensing



### 3. Cable length/connection

- 05: 5 m cable
- 10: 10 m cable
- M1J8: M12 male connector, 8 pin, fitted with 250 mm cable



## Ordering information

### Switches

#### Polyester housing

Type	Cable connection	Order code
Single actuator sensing 	5 m pre-wired	F3S-TGR-SPSA-05
	10 m pre-wired	F3S-TGR-SPSA-10
	M12, 8 pin fitted with 250 mm cable	F3S-TGR-SPSA-M1J8
Dual actuator sensing 	5 m pre-wired	F3S-TGR-SPSD-05
	10 m pre-wired	F3S-TGR-SPSD-10
	M12, 8 pin fitted with 250 mm cable	F3S-TGR-SPSD-M1J8

#### Stainless steel housing

Type	Cable connection	Order code
Single actuator sensing 	5 m pre-wired	F3S-TGR-SMSA-05
	10 m pre-wired	F3S-TGR-SMSA-10
	M12, 8 pin fitted with 250 mm cable	F3S-TGR-SMSA-M1J8
Dual actuator sensing 	5 m pre-wired	F3S-TGR-SMSD-05
	10 m pre-wired	F3S-TGR-SMSD-10
	M12, 8 pin fitted with 250 mm cable	F3S-TGR-SMSD-M1J8

## Accessories

		Order code
Cables 8-pin	2 m	Y92E-M12PURSH8S2M-L
	5 m	Y92E-M12PURSH8S5M-L
	10 m	Y92E-M12PURSH8S10M-L
	25 m	Y92E-M12PURSH8S25M-L
Actuators (only for master coded types)	for F3S-TGR-SPSA and -SPSD	F39-TGR-SPS-A
	for F3S-TGR-SMSA and -SMSD	F39-TGR-SMS-A
Mounting screws	Set of Torx safety screws (M4, 4 × 30 mm, 4 × 20 mm, 4 × 10 mm; incl. washers and Torx bit)	F3S-TGR-N-SCREWS

## Specifications

### Mechanical data

Item	Model	Polyester Sensor	Stainless steel sensor
Indicator		Green LED: Indication of safety circuits closed (Guard closed, actuator present, feedback circuit checked) Yellow LED: Indication of safety circuits open (Actuator removed)	
Operating distance	OFF → ON (Sao)	10 mm Close	
	ON → OFF (Sar)	15 mm Open	
Rec. setting gap		5 mm	
Tolerance to misalignment		5 mm in any direction from 5 mm setting gap	
Actuator approach speed	Min.	4 mm/s	
	Max.	1,000 mm/s	
Operating temperature		-25 to 45°C	
Enclosure protection	Flying lead	IP69K	
	M12 connector	IP67	
Cable		PVC, Ø 6 mm o.d.	
Mounting bolts		2 × M4	
Tightening torque for mounting bolts	Max.	1 Nm	
Shock resistance (IEC 68-2-27)		11 ms, 30 g	
Vibration resistance (IEC 68-2-6)		10 to 55 Hz, 1 mm	
Material		UL approved Polyester	Stainless steel 316

### Electrical data

Item	Model	Polyester sensor	Stainless steel sensor
Sensing technology		Hall	
Serial connection		up to 20 switches	
Power supply		24 VDC±10%	
Power consumption	Max.	0.1 A	
Switching current	Min.	10 mA, 5 VDC	
Rated loads	Safety outputs	Max.	3 A @ 24 VDC
	Auxiliary output	Max.	0.5 A @ 24 VDC

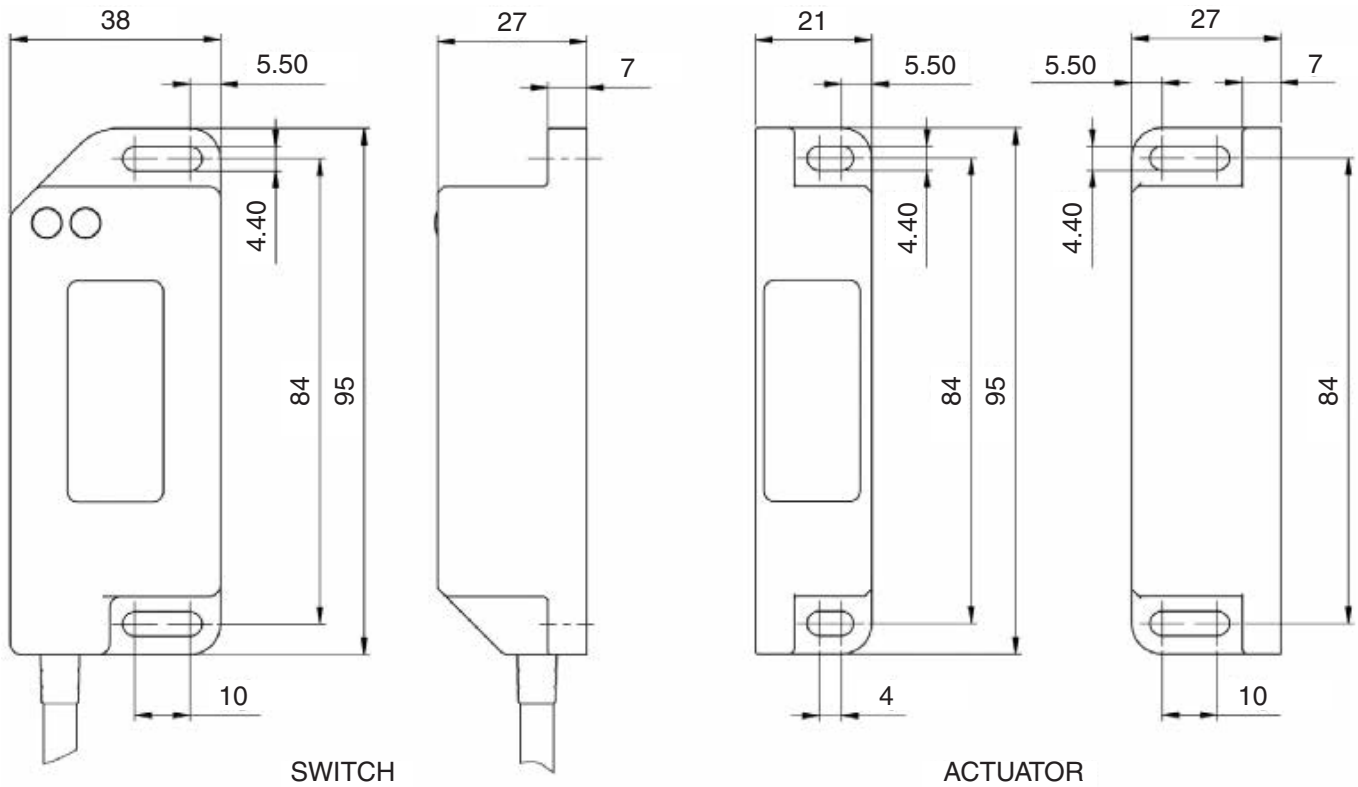
### Reliability Data

EN ISO 13849-1	up to PLe depending upon system architecture
EN 62061	up to SIL3 depending upon system architecture
PFHd	$2.52 \times 10^{-8}$
Proof Test Interval (Life)	47 years
MTTFd (@ nop: 8 cycles per hour)	470 years

### Approved standards

EN standards certified by TÜV Rheinland
EN ISO 13849-1
EN 62061
EN ISO 14119
EN 60204-1
EN/IEC 60947-5-3
UL 508, CSA C22.2
BS 5304
EN 1088 conformance

## Dimensions



## Connection diagram

### Cable version

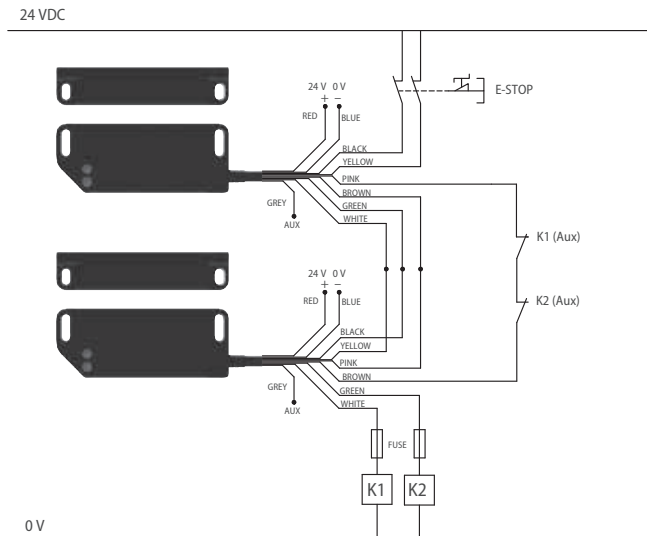
Wire	Signal
red	+24 VDC
blue	GND
black	NC Channel 1 (force guided relay)
white	NC Channel 1 (force guided relay)
yellow	NC Channel 2
green	NC Channel 2
orange	Reset/Check Circuit – Manual start
pink	Reset/Check Circuit – Auto start
brown	Reset/Check Circuit – Output
grey	Aux. Output

### M1J8-Connector version (M12 male)

Pin No. (male side)	Signal	Wire (Y92E-M12PURSH8_M-L)
2	+24 VDC	brown
3	GND	green
7	NC Channel 1 (force guided relay)	blue
1	NC Channel 1 (force guided relay)	white
4	NC Channel 2	yellow
6	NC Channel 2	pink
5	Reset/Check Circuit – Auto start	grey
8	Reset/Check Circuit – Output	red

## Wiring examples

### Serial connection (up to 20 switches) – Auto start PLd Cat3



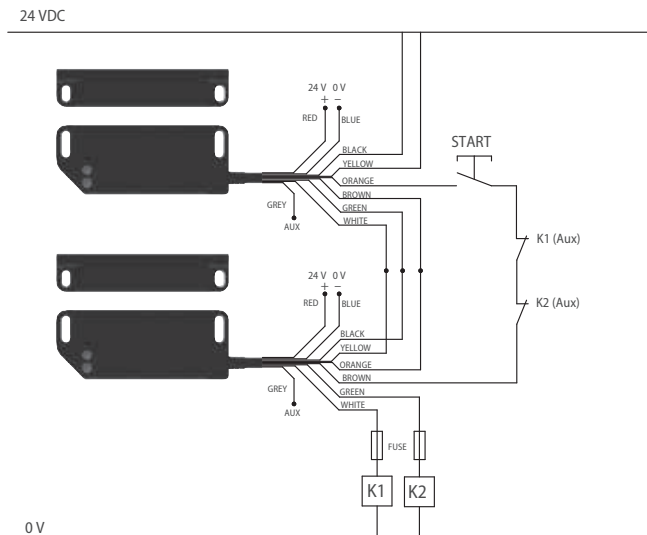
Two switches connected in series to give dual circuit safety outputs to machine contactors.

Safety Circuit 1 (Black/White) utilises internally checked force guided relay contacts and is connected in series with the corresponding Safety Circuit 2 (Yellow/Green) of the next switch.

Allows minimal wiring and higher current switching to K1 and K2 contactors.

An automatic start with contactor feedback check is achieved by connecting K1 (Aux) and K2 (Aux) feedback contacts through Pink and Brown feedback check circuit. A mechanical E-Stop button is connected in series with the safety outputs.

### Serial connection (up to 20 switches) – Manual start PLe Cat4



Two switches connected in series to give dual circuit safety outputs to machine contactors.

Safety Circuit 1 (Black/White) utilises internally checked force guided relay contacts and is connected in series with the corresponding Safety Circuit 2 (Yellow/Green) of the next switch.

Allows minimal wiring and higher current switching to K1 and K2 contactors.

A manual start and contactor feedback check is achieved by connecting K1 (Aux) and K2 (Aux) feedback contacts momentary start button through the Orange and Brown feedback check.

## 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.

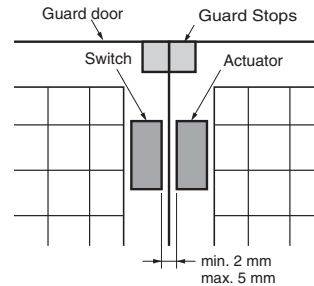
## Solvents

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.

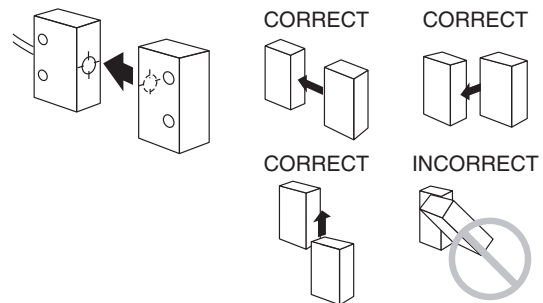
## Guard Stops

### 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.

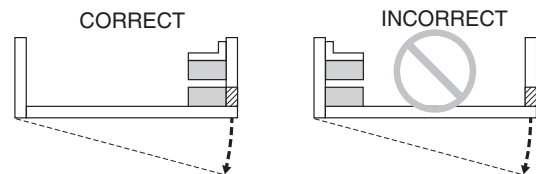


## Mounting Direction



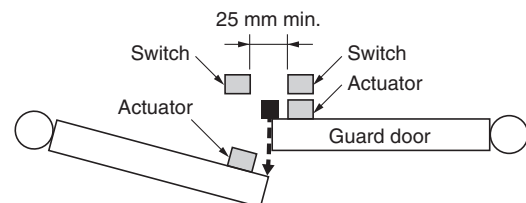
## Using for Hinged Doors

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.



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.  
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.