

Safety sensor for Palletisers

F3S-TGR-SB□C series



Features

For Palletiser

F3S-TGR-SB□C series has been developed especially for Palletisers and wrapping machine access protection applications.

Active - Passive system and Plug and play

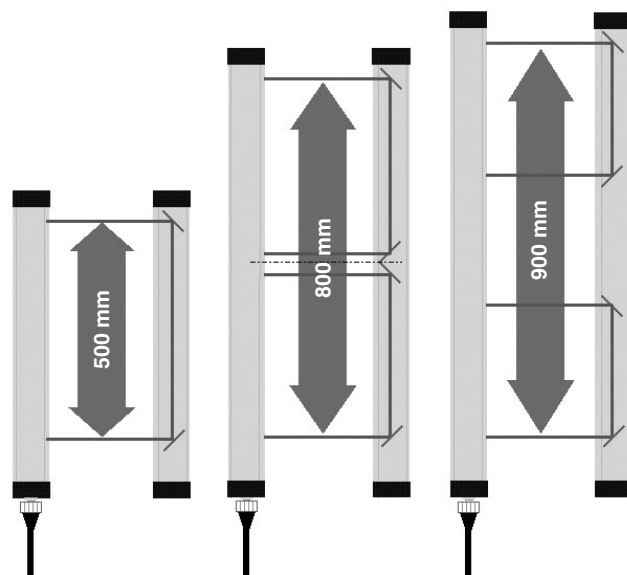
By using a mirror system we can achieve an active - passive multi beam system. This active passive system will improve installation time and reduce costs.



3 Different types available

We provide 3 different Types as following:

- 2 beam Type (beam pitch 500 mm)
- 3 beam Type (beam pitch 400 mm)
- 4 beam Type (beam pitch 300 mm)



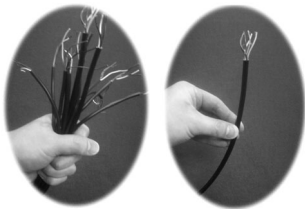
Muting functions are integrated

Following Muting functions are integrated:

- Muting sensor inputs
- Muting Lamp output
- Override input (120 second max)
- Test / Reset input
- Interlock function and Test Reset input

Decentralized Muting connection Box

Furthermore, using a F39-TGR-SB-CMB1, it's possible to reduce the wiring time and wiring material for the muting Sensors and Muting Lamp etc.



Ex. 1

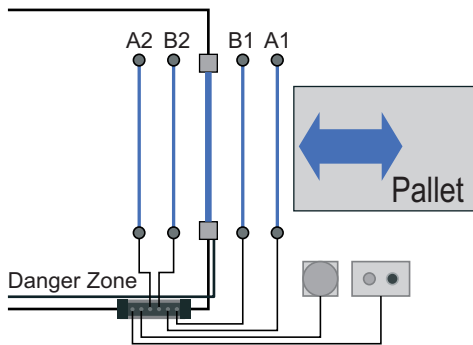
Ex. 2

In the conventional solution all wires from the light curtain, mute sensors, lamp, reset are wired back to the mute controller in the control cabinet (See Ex. 1)
As you can see this solution need JUST ONE WIRE to the cabinet (See Ex. 2)

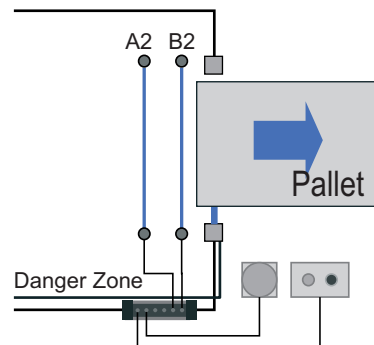


Multiple mute connections are possible

1. PARALLEL MUTING and TWO WAY direction

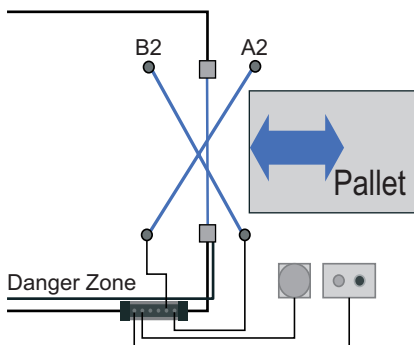


2. PARALLEL MUTING and ONE WAY direction

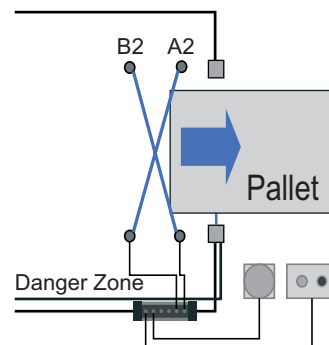


Please add MTL*. Ex. F3S-TGR-SB4-K1CMTL

3. CROSS MUTING and TWO WAY direction



4. CROSS MUTING and ONE WAY direction



Please add MTL*. Ex. F3S-TGR-SB4-K1CMTL

Reference

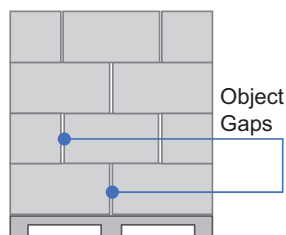
- Muting Lamp
 - Override and Test Switch
 - F3S-TGR-SB□-K□C
 - Muting sensor
 - F3S-TGR-SB-CMB□
 - Mechanical Guard
- *MTL has a special software inside of F3S-TGR-SB□C which works to finalize a Muting function.

Muting Sensors Recommendation

It is recommended to use the E3Z or E3G as muting sensor. Please refer to the E3Z datasheet *Cat.No. E701-E2-Cat04-01* and the E3G datasheet *Cat.No. E278-E2-Cat04-03*.

SOLUTION 1: Object Gaps

In many palletiser applications there is a gap between objects on the pallet. The Muting function may not work correctly because of this gap. To avoid the mutual interruption, we recommend to use E3G□□□□T as muting sensor. E3G-□□□□T has ON delay timer internally (0 to 5 seconds)



SOLUTION 2: Misalignment of pallets


When using a CROSS MUTING system, It may cause that unexpected behavior when the pallets get out of alignment then E3G□□□□T also solves the problem by OFF delay timer (0 to 5 seconds).



List of Models


Safety Multi beam Sensors

F3S-TGR-SB2-K□C Mirror Reflection Type (Type 2)

| Shape | Number of optical axes | Sensing Distance | Beam Pitch | Model |
|---|------------------------|---------------------------------|------------|---------------------------|
|  | 2 | <input type="text"/> 0.5 to 6 m | 500 | F3S-TGR-SB2-K2C-500(MTL)* |
| | 3 | <input type="text"/> 0.5 to 5 m | 400 | F3S-TGR-SB2-K3C-800(MTL)* |
| | 4 | | 300 | F3S-TGR-SB2-K4C-900(MTL)* |

*. If you want to have a ONE WAY direction Type, (see Page D-26) Please add the MTL behind of Model Name. Ex. F3S-TGR-SB4-K2C-500MTL



F3S-TGR-SB4-K□C Mirror Reflection Type (Type 4)

| Shape | Number of optical axes | Sensing Distance | Beam Pitch | Model |
|---|------------------------|---------------------------------|------------|---------------------------|
|  | 2 | <input type="text"/> 0.5 to 6 m | 500 | F3S-TGR-SB4-K2C-500(MTL)* |
| | 3 | <input type="text"/> 0.5 to 5 m | 400 | F3S-TGR-SB4-K3C-800(MTL)* |
| | 4 | | 300 | F3S-TGR-SB4-K4C-900(MTL)* |

*. If you want to have a ONE WAY direction Type, (see Page D-26) Please add the MTL behind of Model Name. Ex. F3S-TGR-SB4-K2C-500MTL



Muting Connecting Box (Order Separately)

Flexible Connecting Box



| Appearance | SLC Connection Type | Other connection | Model |
|---|--------------------------------------|--|-----------------|
|  | M12 8pin connector without cable | 4 x Muting sensor connection (4pin) 1 x Muting Lamp M12 (4pin) 1 x Override/Test input M12 (4pin) 1 x cabinet connection M12 (8pin) | F39-TGR-SB-CMB1 |
|  | M12 8pin connector with 100 mm cable | | F39-TGR-SB-CMB2 |

Accessories (Order Separately)

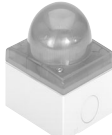
Connector Cable

| Appearance | Cable length | Specification | Model |
|---|--------------|---|---------------------|
|  | 2 m | M12 connector (8pin Socket) For cabinet connection (From F3S-TGR-SB□-K□C or F3S-TGR-SB-CMB□) | F39-TGR-SB4-CVLB2R |
| | 5 m | | F39-TGR-SB4-CVLB5R |
| | 10 m | | F39-TGR-SB4-CVLB10R |
|  | 2 m | M12 connector (4pin Plug) For Muting sensor, Muting Lamp connection and Override/Test connection | F39-TGR-SB4-CVLB2MC |


Connector Plug Assemblies, Screw-on Type

| Appearance | Cable connection direction | Specification | Connection method | Applicable cable diameter | Model |
|---|----------------------------|-------------------|-------------------|---------------------------|-----------|
|  | Straight | DC only 4pin Plug | Screw-on | 3 dia. (3 to 4 dia.) | XS2G-D4S5 |
|  | Right angle | | | | XS2G-D4S6 |


Muting Lamp

| Appearance | Specification | Model |
|---|---------------|---------|
|  | 24 V DC | F39-A11 |

Bulb for Maintenance

| Appearance | Specification | Model |
|---|-----------------|-----------|
|  | 24 V DC 3 W E14 | F39-A11MB |

Laser alignment Kit

| Appearance | Model |
|---|-------------|
|  | F39-LKK2-SB |

Rating and Performance

Safety sensors

F3S-TGR-SB□-K□C

| Item | Model | |
|--------------------------------|---|---|
| | F3S-TGR-SB4-K□C-□□□(MTL)* | F3S-TGR-SB2-K□C-□□□(MTL)* |
| Sensor type | Type 4 | Type 2 |
| Applicable safety category | 4, 3, 2, 1, B | 2, 1, B |
| Operating range | F3S-TGR-SB□-K2C F3S-TGR-SB□-K3C/K4C | 0.5 - 6 m 0.5 - 6 m |
| Beam pitch and Number of beam | F3S-TGR-SB□-K2C F3S-TGR-SB□-K3C F3S-TGR-SB□-K4C | 500 mm 2 beam with mirror 400 mm 3 beam with mirror 300 mm 4 beam with mirror |
| Outermost beam gap | F3S-TGR-SB□-K2C F3S-TGR-SB□-K3C F3S-TGR-SB□-K4C | 500 mm 800 mm 900 mm |
| Effective aperture angle (EAA) | Within ±2.5° | Within ±5° |
| Light source | Infrared LED (880 nm) | |
| Power supply | 24 VDC ± 20% | |
| Current Consumption | 420 mA | |
| OSSD | Two PNP transistor outputs, 250 mA each. (500 mA sum) | |
| Output operation mode | Light - ON | |
| Test functions | Self-test (after power ON and during operation, one cycle during response time) | |
| Protection | Output short-circuit protection, Reverse Polarity protection | |
| Response time | ON to OFF 16ms max OFF to ON 300 ms (Maximum Power-ON time is 900 ms) | |
| Ambient temperature | Operating: -10 to +55 °C (with no dew condensation) | |
| Ambient humidity | 15% to 95% (non condensing) | |
| Metal housing (Al) painted | Yellow (RAL 1303 F14) | |
| Degree of protection | IP65 | |
| Accessories | M6 T-Bolt x 8, M6 Nut x 8 Mounting fixture x 4 | |
| Applicable standards | EN61496-1; 1997 prEN61496-2; 1997 | |

*. If you want to have a ONE WAY direction Type, (see Page D-26) Please add the MTL behind of Model Name. Ex. F3S-TGR-SB4-K2C-500MTL

Muting Connecting Box

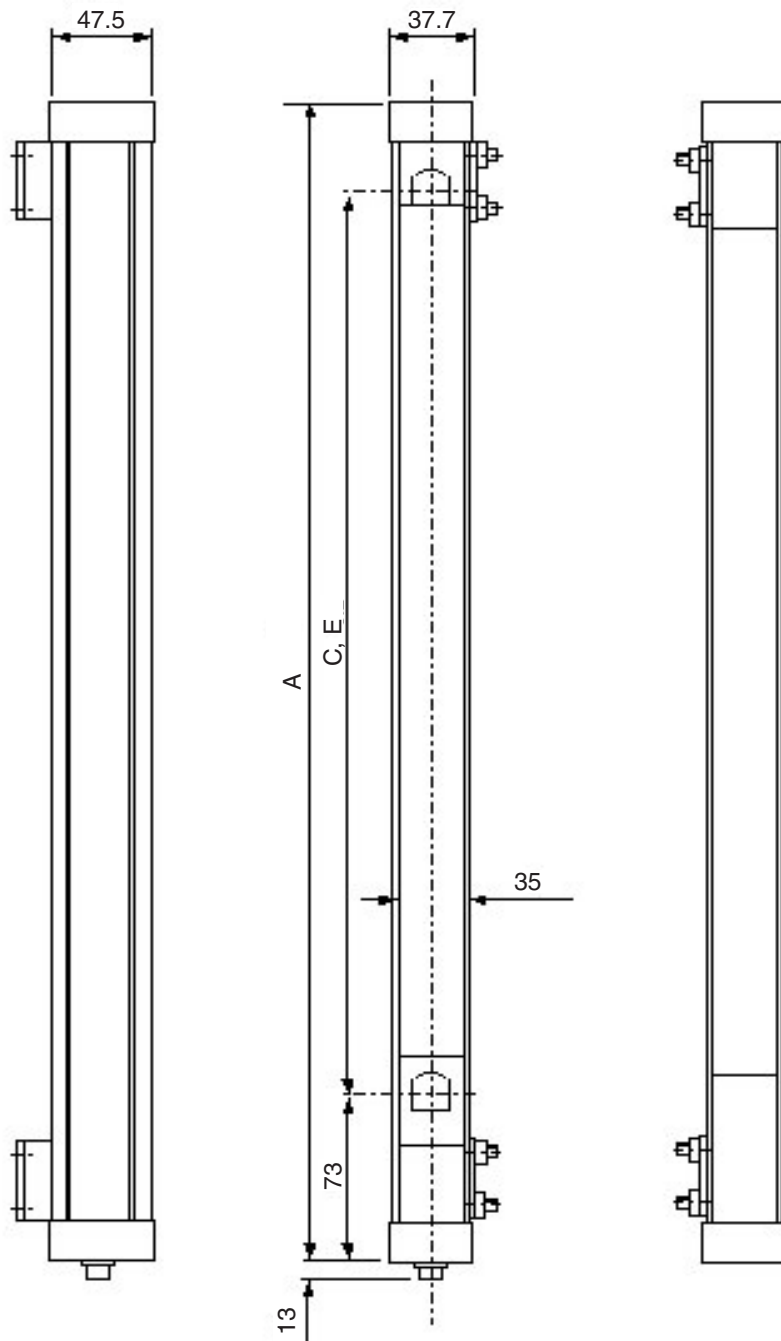
F3S-TGR-SB-CMB□

| Item | Model | F39-TGR-SB-CMB□ |
|----------------------------|--|-------------------------|
| Power supply | 24 VDC ± 20% | |
| Consumption | 10 W max | |
| Ambient temperature | During operation: -10 to +55 °C (with no dex condensation) | |
| Ambient humidity | 15% to 95% (non condensing) | |
| RX connector | M12 8 pins female | |
| Cabinet connector | M12 8 pins male | |
| Sensor connector | 4 x M12 4 pins female | |
| Muting indicator | M12 4 pins female | |
| Test / Override connectors | M12 4 pins female | |
| Metal housing (Al) painted | Yellow (RAL 1303 F14) | |
| Degree of protection | IP65 | |
| Material | Case | Aluminium |
| | Connector | Brass with nickel plate |
| | Front Cover | Aluminium |
| Weight | 0.5 kg | |
| Accessories | M6 T-Bolt x 4, M6 Nut x 4 Mounting fixture x 2, Connector cover x 2 | |

| Item | Model | F39-TGR-SB-CMB□ |
|----------------------|---|-----------------|
| Applicable standards | 93/68/EEC DIN V VDE 0801:1990 and am.A1:1994 EN 50081-2:1993 EN 55022:1998 | |

Dimensions

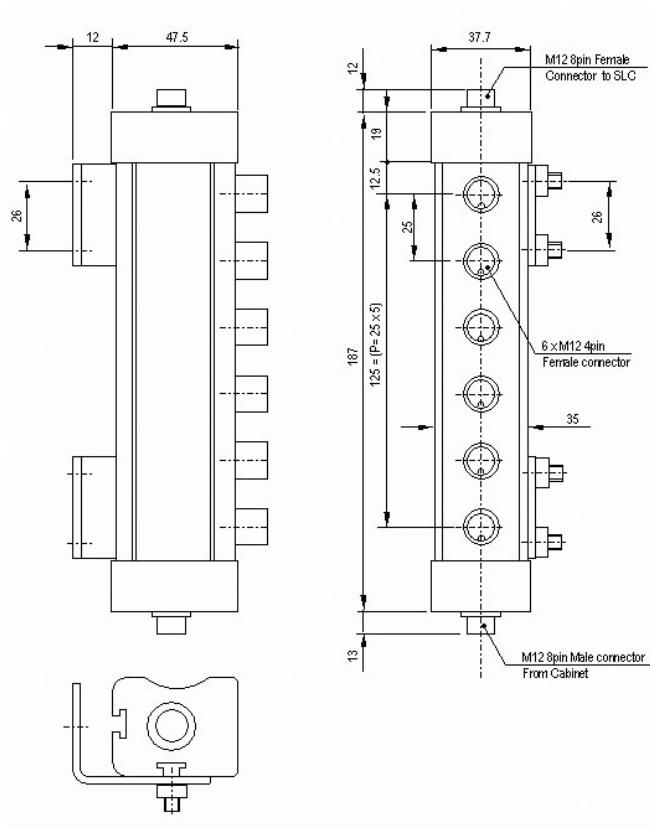
F3S-TGR-SB-K□C-□□□ with Mounting Brackets



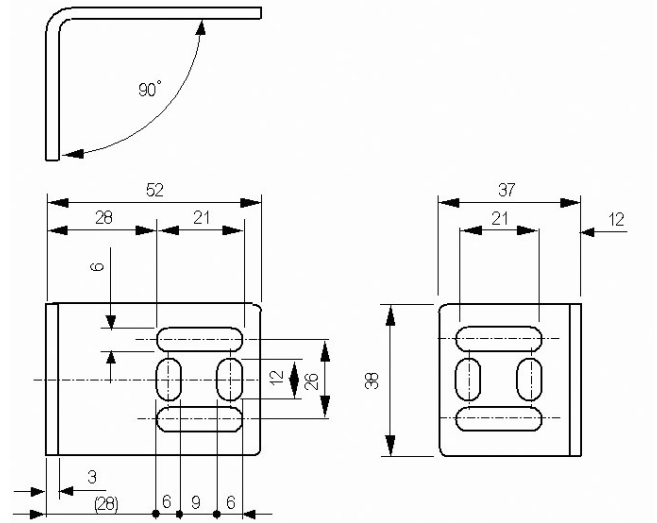
| Model | A | C | E |
|--------------------|----------|--------|--------|
| F3S-TGR-SB□-K2C500 | 614 mm | 500 mm | 500 mm |
| F3S-TGR-SB□-K3C800 | 914 mm | 800 mm | 400 mm |
| F3S-TGR-SB□-K4C900 | 1,014 mm | 900 mm | 300 mm |

F39-TGR-SB-CMB1

Muting connection box

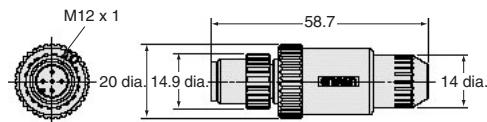


Mounting bracket (Common bracket for F3S-TGR-SB□-K□C and F39-TGR-SB-CMB□)

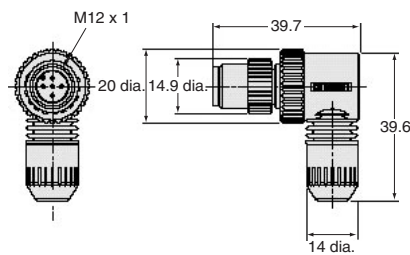


Connector Plug Assemblies, Screw-on Type

XS2G-D4S5



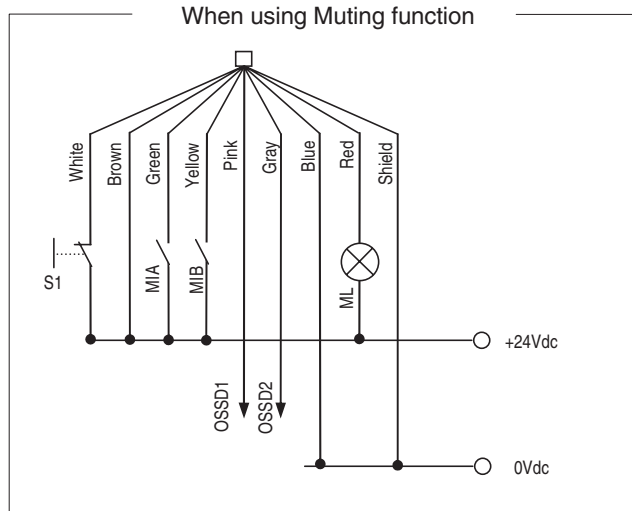
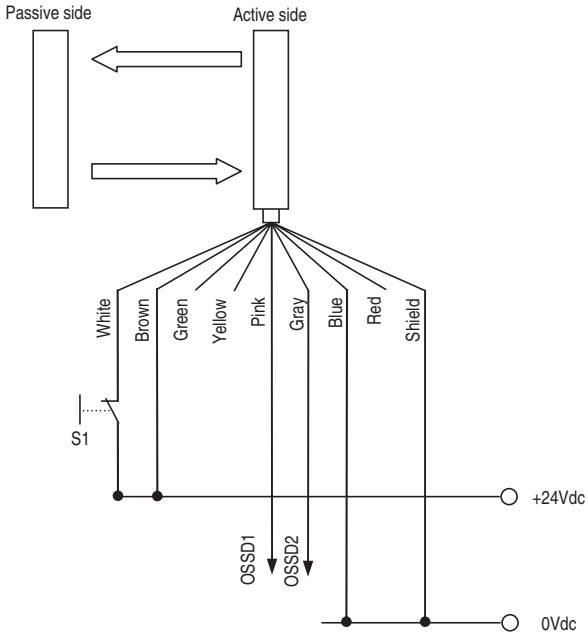
XS2G-D4S6



Connection

F3S-TGR-SB□-K□C

Connection example



S1: External Test / Interlock reset Switch

MIA : Muting input A

MIB : Muting input B

ML : Muting Lamp

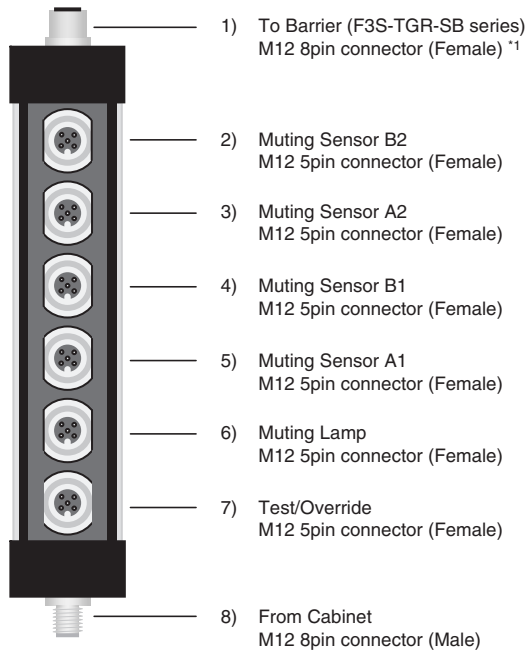
In case of Cat 4 (EN954-1), OSSD1/2 must be connected Safety Relay Unit (G9SA, G9SB-301B etc.) with feedback monitor

Pin reference

| Front View | Pin No. | Signal Name | Wire Color |
|------------|---------|----------------------|------------|
| | 1 | Test and Reset Input | White |
| | 2 | +24 Vdc | Brown |
| | 3 | Muting A Input | Green |
| | 4 | Muting B Input | Yellow |
| | 5 | OSSD1 (OUT1) | Gray |
| | 6 | OSSD2 (OUT2) | Pink |
| | 7 | 0 Vdc | Blue |
| | 8 | Muting Lamp (0 Vdc) | Red |

F3S-TGR-SB-CMB□

Pin and Plug reference



*1 In case of F3S-TGR-SB-CMB2,
M12 8pin connector with 100 mm cable

1) To F3S-TGR-SB Series

| Front View | Pin No. | Signal Name | Wire Color |
|------------|---------|----------------------|------------|
| | 1 | Test and Reset Input | White |
| | 2 | +24 Vdc | Brown |
| | 3 | Muting A Input | Green |
| | 4 | Muting B Input | Yellow |
| | 5 | OSSD1 (OUT1) | Gray |
| | 6 | OSSD2 (OUT2) | Pink |
| | 7 | 0 Vdc | Blue |
| | 8 | Muting Lamp (0 Vdc) | Red |

2), 3) 4), 5) Wiring of Muting Sensor connection

| Front View | Pin No. | Signal Name | Wire Color |
|------------|---------|-------------|------------|
| | 1 | +24 Vdc | Brown |
| | 2 | No connect | White |
| | 3 | 0 V | Blue |
| | 4 | PNP Input | Black |

6) Wiring of Muting Lamp connection

| Front View | Pin No. | Signal Name | Wire Color |
|------------|---------|-------------|------------|
| | 1 | +24 Vdc | Brown |
| | 2 | No connect | White |
| | 3 | No connect | Blue |
| | 4 | 0 V | Black |

7) Test/Override connection

| Front View | Pin No. | Signal Name | Wire Color |
|------------|---------|----------------|------------|
| | 1 | +24 Vdc | Brown |
| | 2 | Test input | White |
| | 3 | No connect | Blue |
| | 4 | Override input | Black |

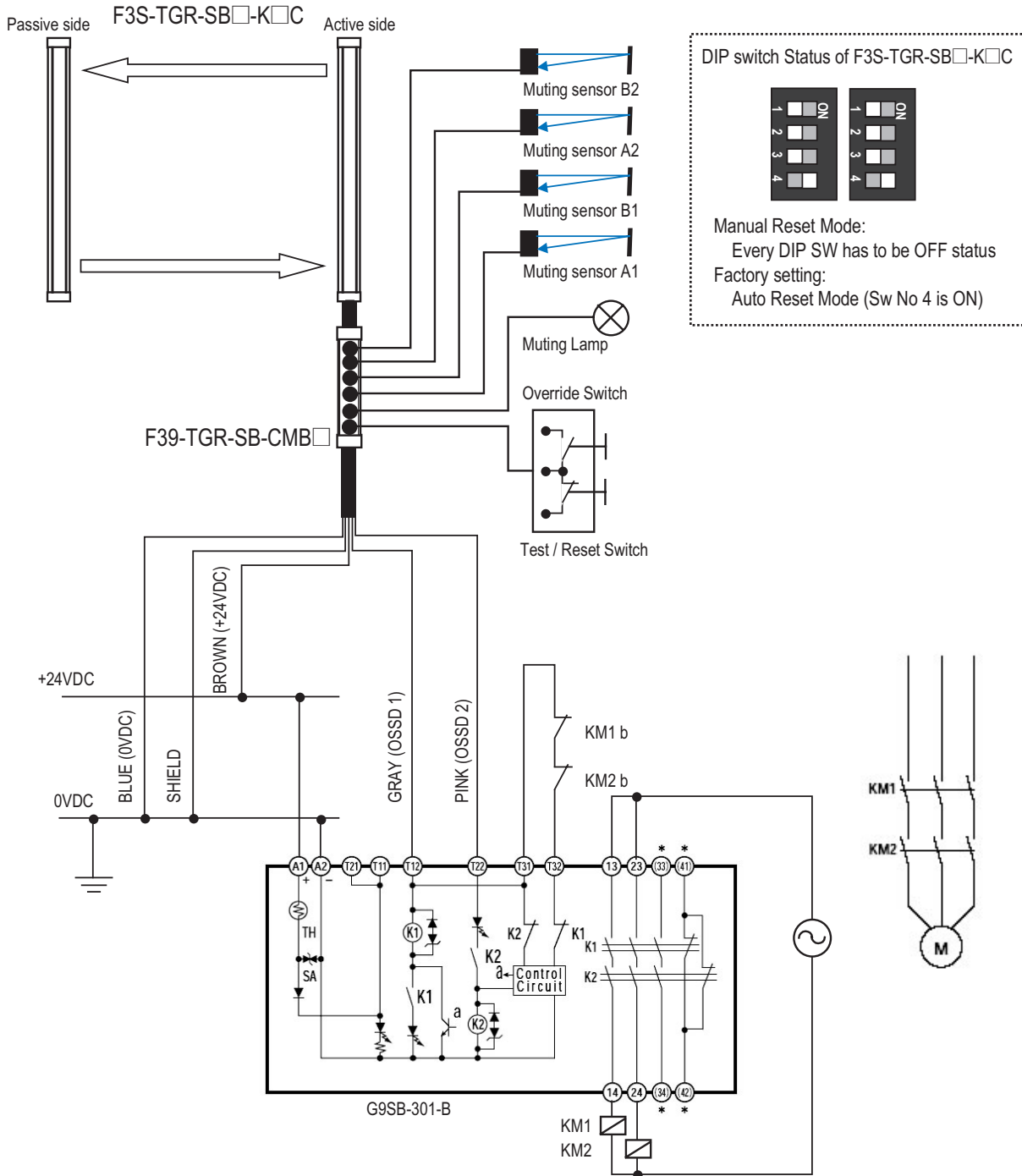
8) From Cabinet

| Front View | Pin No. | Signal Name | Wire Color |
|------------|---------|----------------------|------------|
| | 1 | Test and Reset Input | White |
| | 2 | +24 Vdc | Brown |
| | 3 | Muting A Input | Green |
| | 4 | Muting B Input | Yellow |
| | 5 | OSSD1 (OUT1) | Gray |
| | 6 | OSSD2 (OUT2) | Pink |
| | 7 | 0 Vdc | Blue |
| | 8 | Muting Lamp (0 Vdc) | Red |

Application

Manual Reset Mode (by Safety barrier)

F3S-TGR-SB4-K2C / F39-TGR-SB-CMB□ / G9SB-200-B or 301-B



DIP switch Status of F3S-TGR-SB□-K□C

| | | | |
|---|-----|---|-----|
| 1 | ON | 1 | ON |
| 2 | OFF | 2 | OFF |
| 3 | OFF | 3 | OFF |
| 4 | ON | 4 | ON |

Manual Reset Mode:
Every DIP SW has to be OFF status
Factory setting:
Auto Reset Mode (Sw No 4 is ON)

F39-TGR-SB-CMB□ Plug reference

Muting Sensor (B2/A2/B1/A1)

Muting Lamp

Test and Override inputs

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