

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

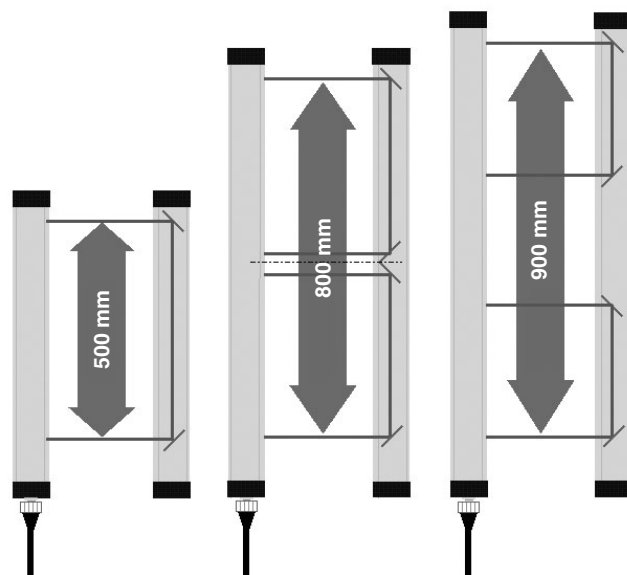
By using a mirror system we can achieve an active - passive multi beam system. This active passive system will improve installation time and reduce costs.



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)



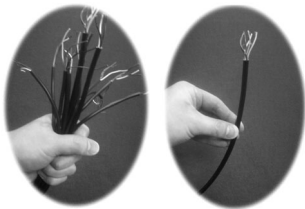
Muting functions are integrated

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

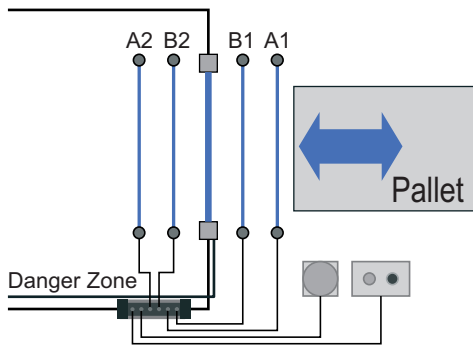
Ex. 2

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)

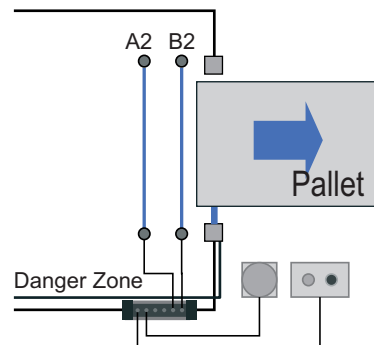


Multiple mute connections are possible

#### 1. PARALLEL MUTING and TWO WAY direction

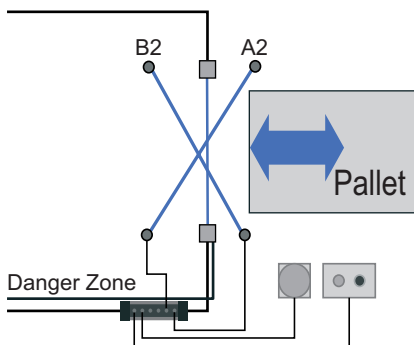


#### 2. PARALLEL MUTING and ONE WAY direction

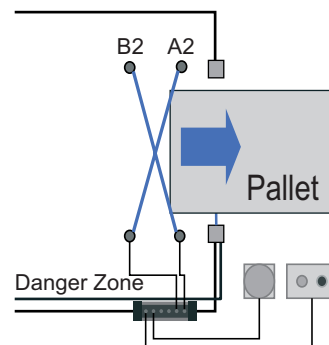


Please add MTL\*. Ex. F3S-TGR-SB4-K1CMTL

#### 3. CROSS MUTING and TWO WAY direction



#### 4. CROSS MUTING and ONE WAY direction



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

#### Reference

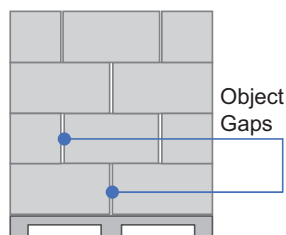
- Muting Lamp
  - Override and Test Switch
  - F3S-TGR-SB□-K□C
  - Muting sensor
  - F3S-TGR-SB-CMB□
  - Mechanical Guard
- \*MTL has a special software inside of F3S-TGR-SB□C which works to finalize a Muting function.

### 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)

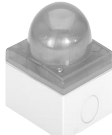
Connector Cable

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

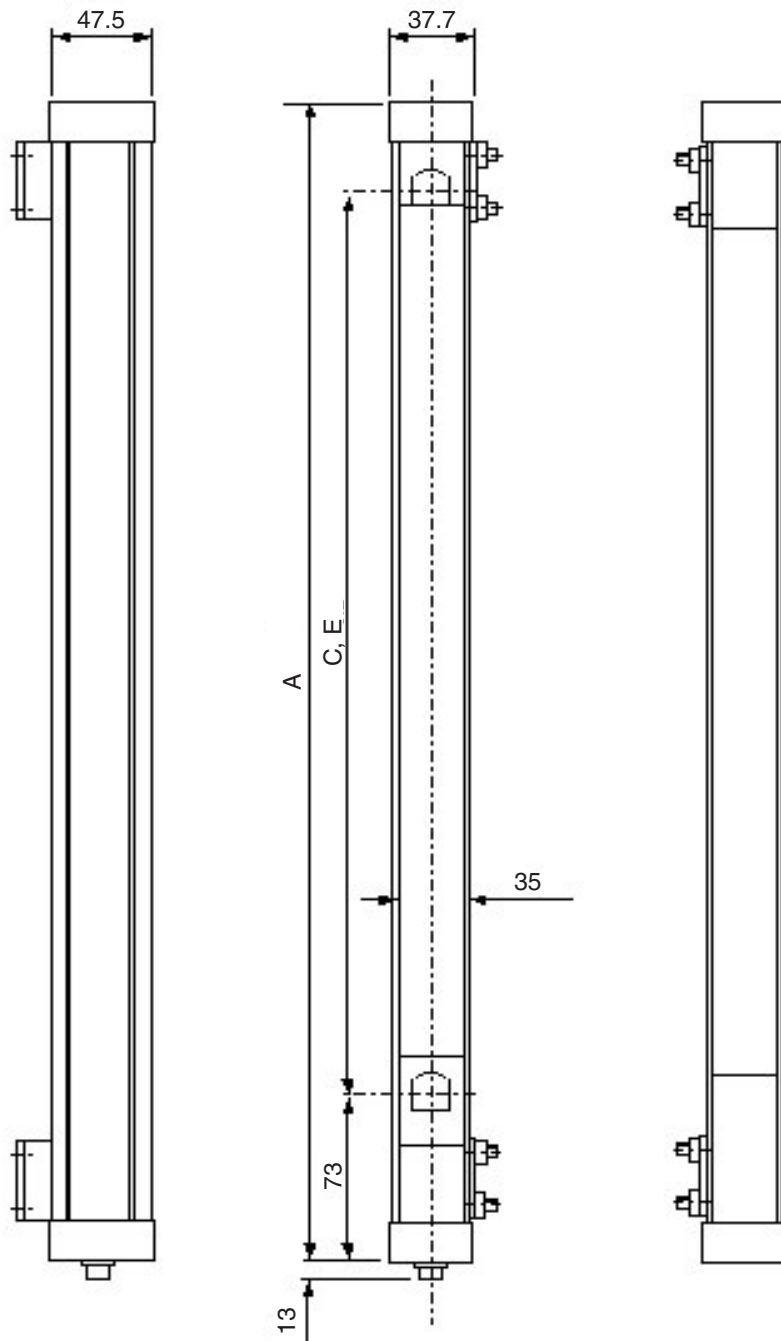
#### F3S-TGR-SB-CMB□

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

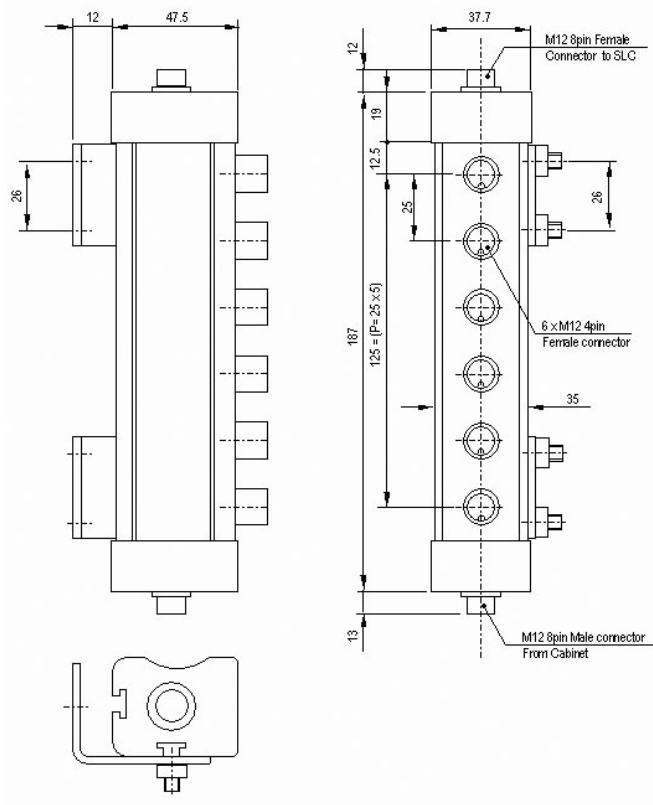
F3S-TGR-SB-K□C-□□□ with Mounting Brackets



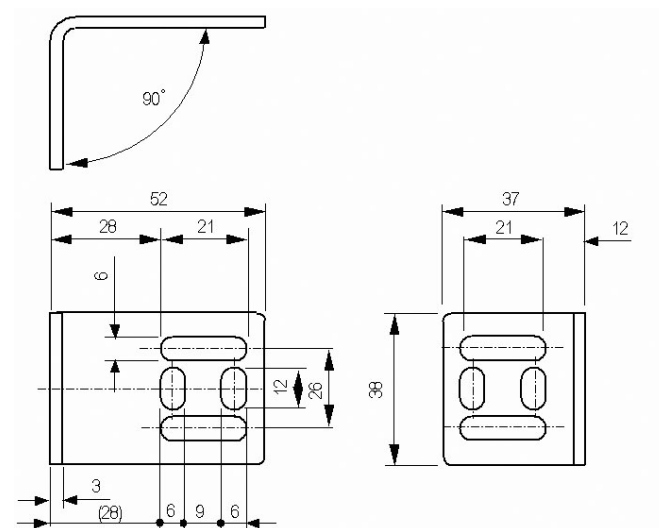
Model	A	C	E
F3S-TGR-SB□-K2C500	614 mm	500 mm	500 mm
F3S-TGR-SB□-K3C800	914 mm	800 mm	400 mm
F3S-TGR-SB□-K4C900	1,014 mm	900 mm	300 mm

F39-TGR-SB-CMB1

Muting connection box

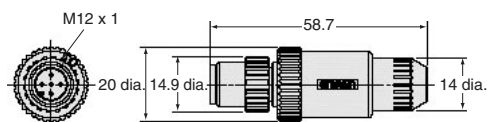


Mounting bracket (Common bracket for F3S-TGR-SB□-K□C and F39-TGR-SB-CMB□)

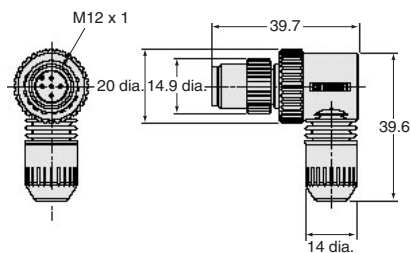


Connector Plug Assemblies, Screw-on Type

XS2G-D4S5



XS2G-D4S6

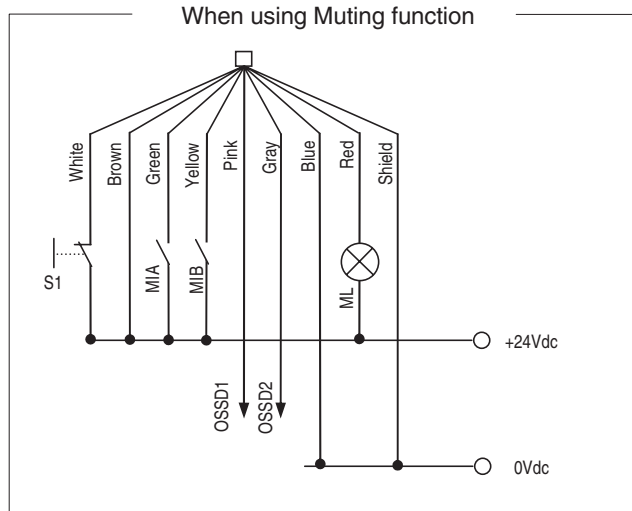
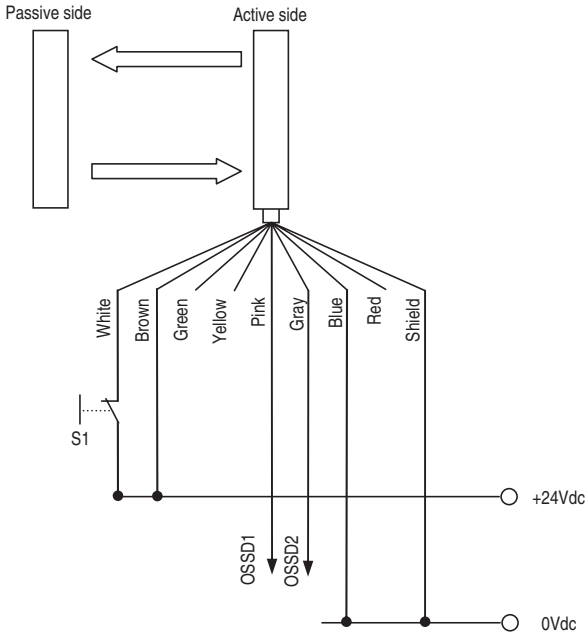


F3S-TGR

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

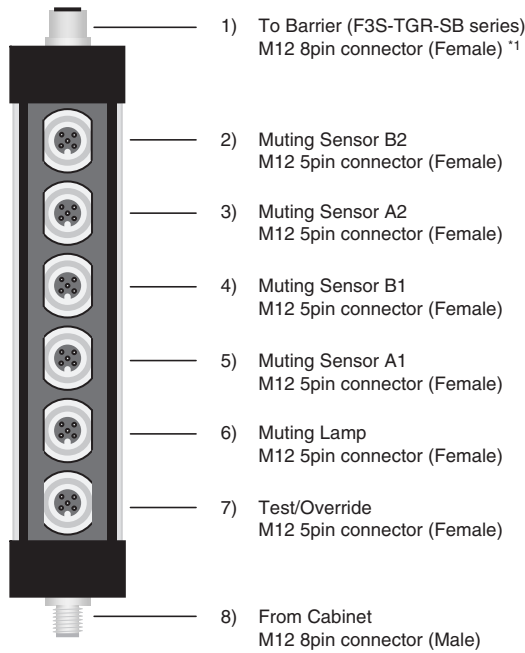
Pin reference

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

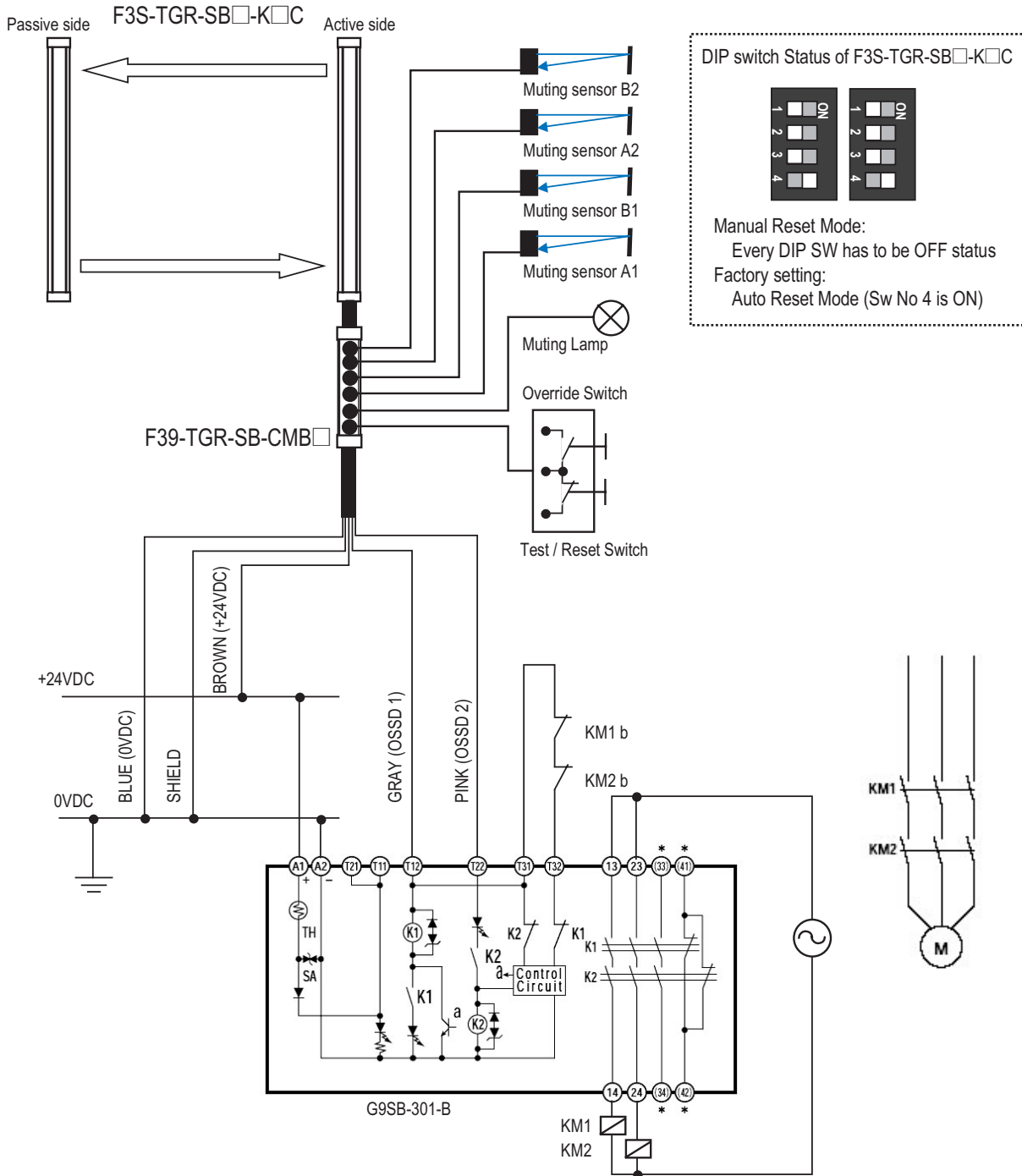
8) From Cabinet

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	OFF	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.