ReeR

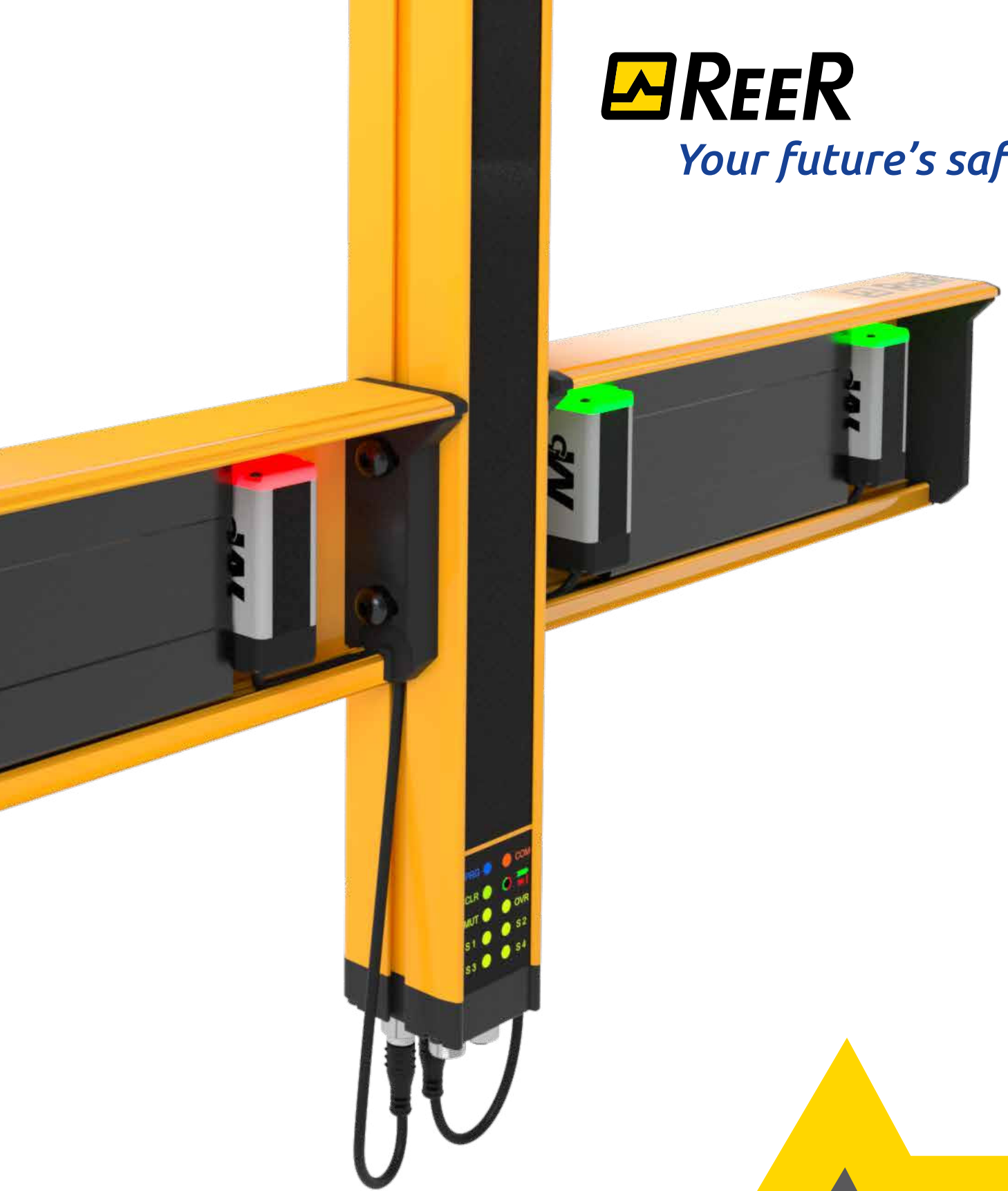*Your future's safe!*

SAFEGATE
access control safety light curtains

product catalogue

Type 4 Muting Integrated Access Control Barrier

TRX TRANSCEIVER

Versions with passive retro-reflector element

Fully scalable
Change configuration at any time

Long range versions
Max. range up to 80 m

3 pre-configured Muting logics
Exit-only (parallel/crossed), Entry-Exit (parallel), Entry-Exit (crossed)

Integrated Status and Muting lamp

Flexible configuration
Hardware or Software configuration to cover all Muting applications

Vast range of accessories
Including connection boxes, special mounting brackets and floor mounting columns
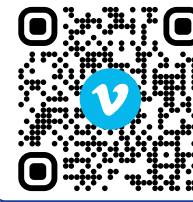
Color-coding
Color-coded connectors for easy installation
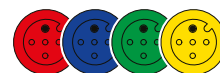
Configuration
with MA Muting
arms with
integrated
sensors

Watch the video!

Connection box
M SG BOX

Configuration
with MZ Muting
brackets with M^5
multi-beam
sensors or M^{TRX}
retro-reflector
sensors

CE

UKCA

TÜV SÜD

c(UL)us
LISTED
ESPE

RoHS
Compliant

SAFETY LEVEL

TYPE **4**

SIL 3 - SILCL 3
PL e - Cat. 4

Pre-configured and
pre-wired Muting arms

M^5 multi-beam Muting sensors
Ideal for sensing unconventional objects

Also available in **TRX** TRANSCEIVER versions with
retro-reflector Muting sensors **M^{TRX}**

SAFEGATE

MAIN FEATURES

Safegate Type 4 range of access control barriers is the ideal solution for the protection of a vast number of high-risk industrial applications, in particular those requiring a high level of integration of the Muting functions.

- Safegate guarantees the perfect integration of all Muting sensors, directly connected to the access control barrier

- Each barrier can be configured as:
  - Exit-only (L-Muting) with crossed (X) or pallalel (P) beams
  - Entry-Exit (T-Muting) with crossed (X) beams
  - Entry-Exit (T-Muting) with pallalel (P) beams

  Configuration can be changed at any time.

- Hardware configurable versions (SM/SMO/SMPO) allow configuration of Muting logics and functional parameters via the Master connector wiring

- Software configurable versions (SMPO) allow configuration of Muting logics and additional functional parameters (i.e. Partial Muting) via Safegate Configuration Software (SCS)

- Programmable versions (SMPO) allow further configuration parameters, ideal to address particular issues in more complicated application scenarios

- Safegate can be used with MA Muting arms (with pre-aligned and pre-configured integrated Muting sensors), with MZ Muting brackets (with M^5 multi-beam photocells) or with any other Muting sensor

- Sensors can be upgraded, added or removed at any time

- Models with integrated status lamp allow to easily recognise the status of the barrier

- Versions (S) without Muting functions are also available in long range versions up to 80 m

- Operating temperature: -30 ... +55 °C

- Protection rate: IP65 and IP67

SMPO versions can be configured via the SCS software

Showing
Exit-only configuration
2 crossed or parallel beams
(One-way, L-Muting)

Showing
Entry-Exit configuration
2 crossed or 4 parallel beams
(Two-way, T-Muting)

Color-coded connectors for easy wiring.

THE SAFEGATE RANGE

Safegate versions

Without Muting functions — **S**

Hardware configuration — **SM**

Hardware configuration
With integrated Status and Muting lamp — **SMO**

Hardware or Software configuration
With integrated Status and Muting lamp — **SMPO**

Also available as **TRX TRANSCEIVER** *with passive retro-reflective elements*

Muting logic

Hardware configuration via Master connector wiring

L2XP configurations
"Exit-only"
2 crossed or parallel beams (One-way)

T2X configurations
"Entry-Exit"
2 crossed beams (Two-way)

T4P configurations
"Entry-Exit"
4 parallel beams (Two-way)

Software configuration via SCS (Safegate Configurator Software)

PROGRAMMABLE

L2X, L2P, T2X, T4P configurations — **SCS**

● ● SM, SMO and SMPO versions

● SMPO versions

Muting sensors
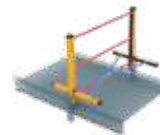
MA
Muting arms with integrated sensors

MA L2X
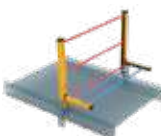2 integrated sensors (emitter and receiver)
L Muting logic
Crossed beams
One-way
Exit-only

MA T2X
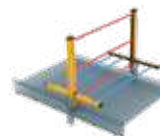2 integrated sensors (emitter and receiver)
T Muting logic
Crossed beams
Two-way
Entry-Exit

MA L2P TRX
2 integrated retro-reflector sensors (tranceiver)
L Muting logic
Parallel beams
One-way
Exit-only

MA T4P TRX
4 integrated retro-reflector sensors (transceiver)
T Muting logic
Parallel beams
Two-way
Entry-Exit

MZ
Muting brackets with M^5 or M^{TRX} sensors

MZ L2XP
2 M^5 multi-beam sensors

MZ L2XP TRX
2 M^{TRX} retro-reflector sensors

L Muting logic
Crossed or Parallel beams
One-way
Exit-only

MZ T2X
2 M^5 multi-beam sensors

MZ T2X TRX
2 M^{TRX} retro-reflector sensors

T Muting logic
Crossed beams
Two-way
Entry-Exit

MZ T4P
4 M^5 multi-beam sensors
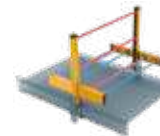
MZ T4P TRX
4 M^{TRX} retro-reflector sensors

T Muting logic
Parallel beams
Two-way
Entry-Exit

External M^5, M^{TRX} sensors (or external photocells)
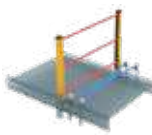
L Muting logic
Crossed beams
One-way
Exit-only
2 sensors
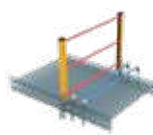
L Muting logic
Parallel beams
One-way
Exit-only
2 sensors

T Muting logic
Crossed beams
Two-way
Entry-Exit
2 sensors

T Muting logic
Parallel beams
Two-way
Entry-Exit
4 sensors

MUTING TYPES

L2X LOGIC WITH CROSSED BEAMS - ONE-WAY MUTING WITH 2 SENSORS

- Max. time between the 2 Muting activation signals: 4 sec.
- Possibility to use with photocells, proximity sensors, and limit switches
- Operative range: 1 ... 3,5 m (depending on Muting sensor type)
- Muting sensor elements adjustable in height and angle
- Max. Muting time-out time: 30 sec. or 9 hours selectable
- Muting enable input available

Characteristics
Suitable solution for any applications of pallet exit.

L2P LOGIC WITH PARALLEL BEAMS - ONE-WAY MUTING WITH 2 SENSORS

- Max. time between the 2 Muting activation signals: 4 sec.
- Possibility to use with photocells, proximity sensors, and limit switches
- Operative range: 0 ... 3,5 m (depending on Muting sensor type)
- Muting sensor elements adjustable in height and angle
- Max. Muting time-out time: 30 sec. or 9 hours selectable
- Muting enable input available

Characteristics
Suitable solution for pallet exit with transparent material applications: i.e. glass.

T2X LOGIC WITH CROSSED BEAMS - TWO-WAY MUTING WITH 2 SENSORS

- Max. time between the 2 Muting activation signals: 4 sec.
- Possibility to use with photocells, proximity sensors, and limit switches
- Operative range: 1 ... 3,5 m (depending on Muting sensor type)
- Muting sensor elements adjustable in height and angle
- Max. Muting time-out time: 30 sec. or 9 hours selectable
- Muting enable input available

Characteristics
Suitable solution for the most common pallet infeed/outfeed applications.
Ideal solution in case of a continuous flow of pallets even without separation between the pallets.

## SEQUENTIAL T4P LOGIC WITH PARALLEL BEAMS - TWO-WAY MUTING WITH 4 SENSORS

- Max. time between the 2 Muting activation signals: 4 sec.
- Possibility to use with photocells, proximity sensors, and limit switches
- Operative range: 0 ... 3,5 m (depending on Muting sensor type)
- Muting sensor elements adjustable in height and angle
- Max. Muting time-out time: 30 sec., 9 hours or infinite selectable
- Muting enable input available

Characteristics
Suitable solution for transparent material and application with presence of a pallet with reduced width or not centred with respect to the conveyor. Through the verification of the 4 sensors, allows to set infinite Muting time-out.
Please note: this configuration needs a separation between two consecutive pallets equal to the distance between the two external Muting sensors.

PARTIAL MUTING
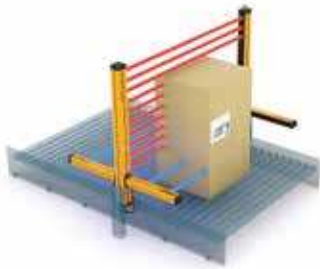
The SMPO programmable versions allows the "Partial Muting" function, hence the possibility of interdicting a number of beams in relation to the size and shape of the pallet in order to prevent dangerous access when the light curtains is in muting condition.

Double threshold
Up to 2 Partial Muting threshold can be configured

APPROVALS

- 2006/42/EC: "Machine Directive"
- 2014/30/EU: "Electromagnetic Compatibility Directive"

Type 4 Safety Level
- EN 61496-1:2013 "Safety of machinery - Electro-sensitive protective equipment - General requirements and tests"
- EN 61496-2:2013 "Safety of machinery - Electro-sensitive protective equipment - Particular requirements for equipment using active opto-electronic protective devices (AOPDs)"

SIL 3 Safety Level
- EN 61508-1:2010 "Functional safety of electrical/electronic programmable electronic safety related systems - General requirements"
- EN 61508-2:2010 "Functional safety of electrical/electronic/programmable electronic safety related systems - Requirements for electrical/electronic/programmable electronic safety-related systems"
- EN 61508-3:2010 "Functional safety of electrical/electronic programmable electronic safety related systems: Software requirements"
- EN 61508-4:2010 "Functional safety of electrical/electronic programmable electronic safety related systems - Definitions and abbreviations"

SILCL 3 Safety Level
- EN 62061:2005/A2:2015 "Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems"

PL e - Cat. 4 Safety Level
- EN ISO 13849-1:2015 "Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design"

- UL (C+US) mark for USA and Canada
- ANSI / UL 1998: "Safety Software in Programmable Components"

CE

UKCA

TÜV SÜD

cULus LISTED E S P E

RoHS Compliant

SAFETY LEVEL

TYPE 4

SIL 3 - SILCL 3
PL e - Cat. 4

Muting arms and Muting brackets are quick and easy to install. They also comply with regulatory requirements on Muting sensors geometry and all other safety-related parameters, as per current standards.

Palletizers with irregular pallets transit showing a Safegate with MZ Muting brackets (M[5] multi-beam photocells)

SAFEGATE

MUTING SENSORS

Four muting inputs integrated into two muting connectors (red and blue)

Muting arms MA

Muting arms (MA) with pre-wired and pre-aligned sensors for all Muting logics configurations:

- **MA L2X** - 2 crossed beams sensors (emitter and receiver)
- **MA L2P TRX** - 2 parallel beams retro-reflective sensors (TRX)
- **MA L2P TRX G** - 2 parallel beams retro-reflective sensors (TRX) with reduced operative range to optimise correct detection of transparent materials (i.e. glass)
- **MA L2P TRX V** - 2 parallel beams retro-reflective sensors (TRX) with longer Muting arms for high-speed conveyors
- **MA T2X** - 2 crossed beams sensors (emitter and receiver)
- **MA T4P TRX** - 4 parallel beams retro-reflective sensors (TRX)
- **MA T4P TRX G** - 4 parallel beams retro-reflective sensors (TRX) with reduced operative range to optimise correct detection of transparent materials (i.e. glass)
- **MA L4P TRX V** - 4 parallel beams retro-reflective sensors (TRX) with longer Muting arms for high-speed conveyors

Muting brackets MZ

Muting brackets (MZ) with M^5 / M^5H multi-beam sensors for all Muting logics configurations:

- **MZ L2XP / MZ L2XP H** - 2 M^5 or M^5H sensors (H version with range up to 5 m). Acting on the position of the sensors, it can be configured with crossed or parallel beams
- **MZ L2P V** - 2 M^5 sensors with parallel beams with longer brackets available for high-speed conveyors
- **MZ T2X / MZ T2X H** - 2 M^5 or M^5H sensors (H version with range up to 5 m) with crossed beams
- **MZ T4P / MZ T4P H** - 4 M^5 or M^5H sensors (H version with range up to 5 m) with parallel beams
- **MZ T4P V** - 4 M^5 sensors with parallel beams with longer brackets for high-speed conveyors

Muting brackets (MZ) with M^{TRX} retro-reflector single beams sensors for all Muting logics configurations:

- **MZ L2XP TRX / MZ L2XP TRX H** - 2 M^{TRX} sensors. Acting on the position of the sensors, it can be configured with crossed or parallel beams. H version with range up to 5 m using the CD8 reflector.
- **MZ L2P TRX G** - 2 M^{TRX} sensors with parallel beams with reduced operative range to optimise correct detection of transparent materials (i.e. glass)
- **MZ T2X TRX / MZ T2X TRX H** - 2 M^{TRX} sensors with crossed beams. H version with range up to 5 m using the CD8 reflector.
- **MZ T4P TRX / MZ T4P TRX H** - 4 M^{TRX} sensors with parallel beams. H version with range up to 5 m using the CD8 reflector.
- **MZ T4P TRX G** - 4 M^{TRX} sensors with parallel beams with reduced operative range to optimise correct detection of transparent materials (i.e. glass)

Muting sensor connectors (M12 5-pole)

MA

MA TRX

MZ

MZ TRX
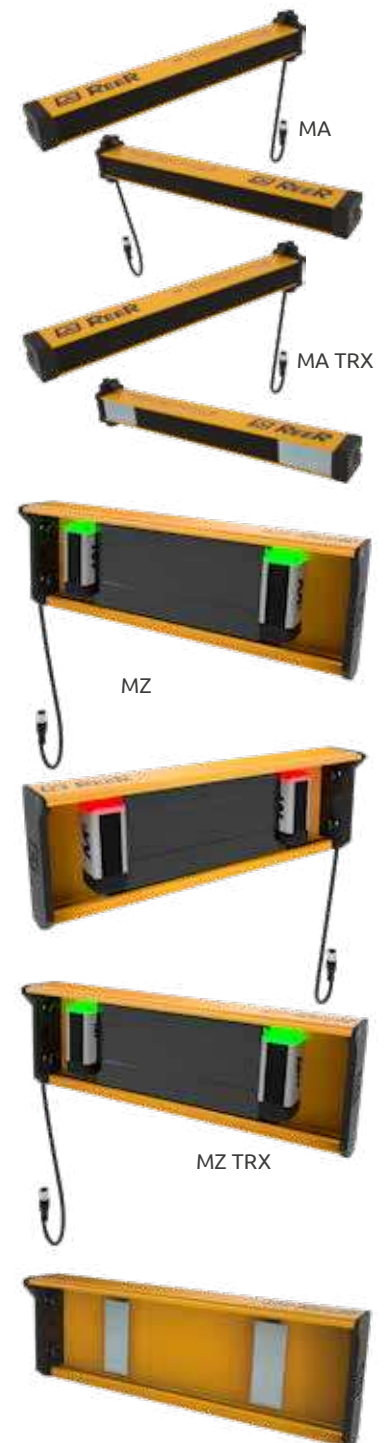
HARDWARE CONFIGURATION

SAFETY LEVEL

TYPE 4

SIL 3 - SILCL 3
PL e - Cat. 4

Resolution (mm)	Start/ Restart	Muting Logic
30, 40	Manual or Automatic	One-way Two-way

Access control	Safety output	Muting Sensors
2, 3, 4 beams	2	External 2 or 4

Built-in Muting function.

Selectable manual or automatic restart.

Integrated feedback input for external relay monitoring (EDM).

M12 5-pole connectors for 2 or 4 Muting sensors.

Hardware configuration of Muting logics and functional parameters via the Master M12 12-pole connector wiring. Use of unshielded cables up to 100 m.

Protected heights: 310 mm ... 2260 mm.

SYNCRO — M^5, M^{TRX} and MA Muting arms are set to avoid interference

Light curtain's Muting Sensor connectors can also allow the direct connection of external photocells

Protected height (mm) 1960, 2110 and 2260: UL certificate not available.

TECHNICAL FEATURES

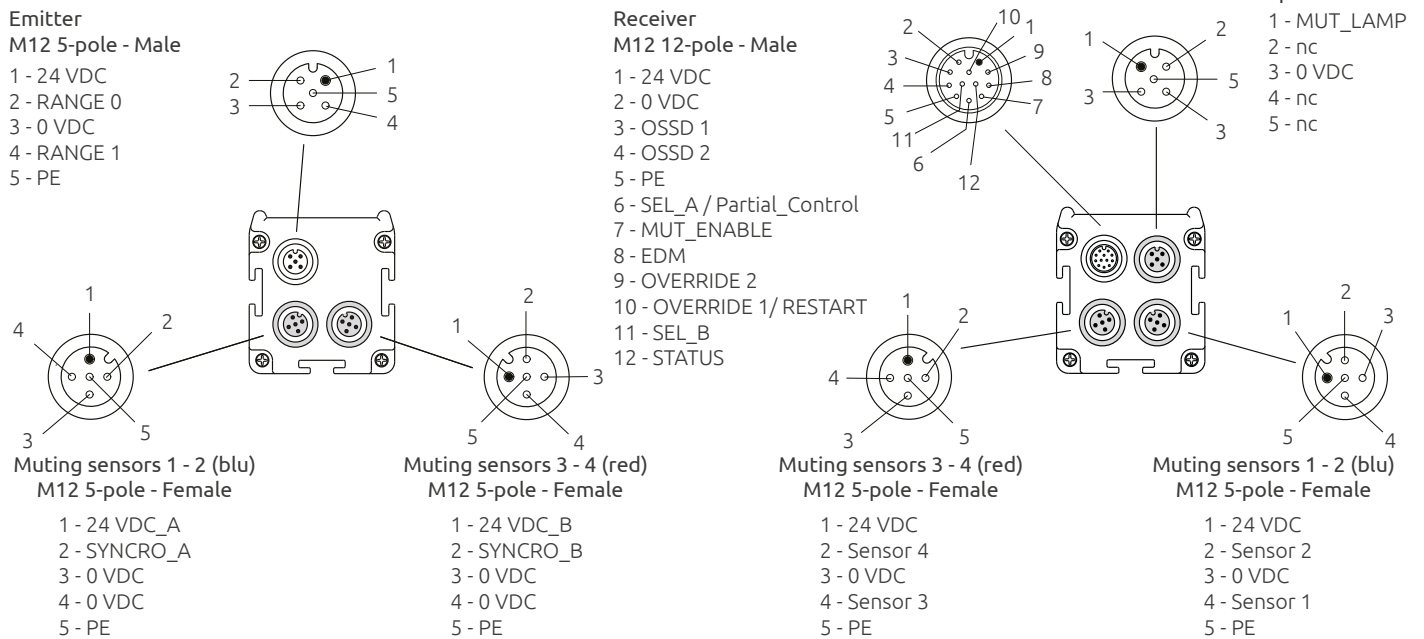|	
Operative range (m)	0 ... 4 or 0 ... 12 selectable 0 ... 3 or 1...6 selectable (14 mm models)
Response time (ms)	5,5 ... 28 depending on the model (see technical manual)
Response time for Muting signals (ms)	100
Safety outputs	2 PNP auto-controlled (400 mA at 24 VDC) with short-circuit, overload, polarity reversal protection
Display	LEDs for self-diagnosis and light curtain status
Muting lamp output	24 VDC; 0,5 ... 5 W
External Device Monitoring	External device monitoring feedback input with selectable enabling
Max. Muting time-out	30 sec. or 9 hours selectable (for any type of Muting logic). Infinite (only for Two-way sequential Muting logic)
Override function	Built-in override function with 2 operating modes selectable: - manual action with hold to run - automatic with pulse command
Max. override time-out (min.)	15 Maximum number of consecutive override: 30
Power supply (VDC)	24 ± 20%
Muting logics	Hardware configurable One-way muting with 2 sensors Two-way muting with 2 or 4 sensors
Muting sensors	- MA Muting arms kits - MZ Muting brackets kits - External, with relay or PNP output (dark-on logic)

CABLES NEEDED

- Emitter: M12 5-pole. See page 47 (CDx, CDM9, CDM99)
- Receiver: M12 12-pole. See page 50 (CS12Dx)

ACCESSORIES

- MA Muting arms kits. See page 30
- MZ Muting brackets kits. See page 34
- Safety relays. See page 45
- Connection boxes. See page 46
- M12 5-pole (CJSx) for external Muting lamp. See page 47
- Support columns. See page 54
- Deflecting mirrors. See page 57
- Brackets. See page 58

SM

HARDWARE CONFIGURATION

CONNECTORS

Emitter
M12 5-pole - Male
1 - 24 VDC
2 - RANGE 0
3 - 0 VDC
4 - RANGE 1
5 - PE

Receiver
M12 12-pole - Male
1 - 24 VDC
2 - 0 VDC
3 - OSSD 1
4 - OSSD 2
5 - PE
6 - SEL_A / Partial_Control
7 - MUT_ENABLE
8 - EDM
9 - OVERRIDE 2
10 - OVERRIDE 1/ RESTART
11 - SEL_B
12 - STATUS

External Muting lamp
M12 5-pole - Female
1 - MUT_LAMP
2 - nc
3 - 0 VDC
4 - nc
5 - nc

Muting sensors 1 - 2 (blu)
M12 5-pole - Female
1 - 24 VDC_A
2 - SYNCRO_A
3 - 0 VDC
4 - 0 VDC
5 - PE

Muting sensors 3 - 4 (red)
M12 5-pole - Female
1 - 24 VDC_B
2 - SYNCRO_B
3 - 0 VDC
4 - 0 VDC
5 - PE

Muting sensors 3 - 4 (red)
M12 5-pole - Female
1 - 24 VDC
2 - Sensor 4
3 - 0 VDC
4 - Sensor 3
5 - PE

Muting sensors 1 - 2 (blu)
M12 5-pole - Female
1 - 24 VDC
2 - Sensor 2
3 - 0 VDC
4 - Sensor 1
5 - PE

PART NUMBERS

Finger detection   Max. range: selectable 3 or 6 m

Resolution 14 mm

Versions SM	SM 301	SM 451	SM 601	SM 751	SM 901	SM 1051	SM 1201	SM 1351	SM 1501	SM 1651	SM 1801	SM 1951
Part number	1390021	1390022	1390023	1390024	1390025	1390026	1390027	1390028	1390029	1390030	1390031	1390032
Protected height (mm)	310	460	610	760	910	1060	1210	1360	1510	1660	1810	1960
Number of beams	30	45	60	75	90	105	120	135	150	165	180	195
Overall height (mm)	395	545	695	845	995	1145	1295	1445	1595	1745	1895	2045

Hand detection   Max. range: selectable 4 or 12 m

Resolution 30 mm

Versions SM	SM 303	SM 453	SM 603	SM 753	SM 903	SM 1053	SM 1203	SM 1353	SM 1503	SM 1653	SM 1803	SM 1953	SM 2103	SM 2253
Part number	1390221	1390222	1390223	1390224	1390225	1390226	1390227	1390228	1390229	1390230	1390231	1390232	1390233	1390234
Protected height (mm)	310	460	610	760	910	1060	1210	1360	1510	1660	1810	1960	2110	2260
Number of beams	16	23	31	38	46	53	61	68	76	83	91	98	106	113
Overall height (mm)	395	545	695	845	995	1145	1295	1445	1595	1745	1895	2045	2195	2345

Resolution 40 mm

Versions SM	SM 304	SM 454	SM 604	SM 754	SM 904	SM 1054	SM 1204	SM 1354	SM 1504	SM 1654	SM 1804	SM 1954	SM 2104	SM 2254
Part number	1390321	1390322	1390323	1390324	1390325	1390326	1390327	1390328	1390329	1390330	1390331	1390332	1390333	1390334
Protected height (mm)	310	460	610	760	910	1060	1210	1360	1510	1660	1810	1960	2110	2260
Number of beams	11	16	21	26	31	36	41	46	51	56	61	66	71	76
Overall height (mm)	395	545	695	845	995	1145	1295	1445	1595	1745	1895	2045	2195	2345

Access control   Max. range: selectable 4 or 12 m

2, 3, 4 beams

Versions SM	SM 2B	SM 3B	SM 4B
Part number	1390620	1390621	1390622
Number of beams	2	3	4
Beam spacing (mm)	500	400	300
Protected height (mm)	510	810	910
Overall height (mm)	684	984	1084

HARDWARE CONFIGURATION, PASSIVE RETRO-REFLECTOR ELEMENT

TRX TRANSCEIVER

SAFETY LEVEL

TYPE 4

SIL 3 - SILCL 3
PL e - Cat. 4

Access control	Start/ Restart	Muting Logic
2, 3, 4 beams	Manual or Automatic	One-way Two-way

Safety output	Muting Sensors
2	External 2 or 4

Built-in Muting function.

Versions with passive retro-reflector element.

Selectable manual or automatic restart.

Integrated feedback input for external relay monitoring (EDM).

M12 5-pole connectors for 2 or 4 Muting sensors.

Hardware configuration of Muting logics and functional parameters via the Master M12 12-pole connector wiring. Use of unshielded cables up to 100 m.

Protected heights: 510 mm ... 910 mm.

SYNCRO — M^5, M^{TRX} and MA Muting arms are set to avoid interference

Light curtain's Muting Sensor connectors can also allow the direct connection of external photocells

CE UKCA TÜV SÜD c(UL)us LISTED ESPE RoHS Compliant

TECHNICAL FEATURES

Operative range (m)	0 ... 8
Response time (ms)	5,5
Response time for Muting signals (ms)	100
Safety outputs	2 PNP auto-controlled (400 mA at 24 VDC) with short-circuit, overload, polarity reversal protection
Display	LEDs for self-diagnosis and light curtain status
Muting lamp output	24 VDC; 0,5 ... 5 W
External Device Monitoring	External device monitoring feedback input with selectable enabling
Max. Muting time-out	30 sec. or 9 hours selectable (for any type of Muting logic). Infinite (only for Two-way sequential Muting logic)
Override function	Built-in override function with 2 operating modes selectable: - manual action with hold to run - automatic with pulse command
Max. override time-out (min.)	15 Maximum number of consecutive override: 30
Power supply (VDC)	24 ± 20%
Muting logics	Hardware configurable One-way muting with 2 sensors Two-way muting with 2 or 4 sensors
Muting sensors	- MA Muting arms kits - MZ Muting brackets kits - External, with relay or PNP output (dark-on logic)

CABLES NEEDED

- Active element: M12 12-pole. See page 50 (CS12Dx)

ACCESSORIES

- MA Muting arms kits. See page 30
- MZ Muting brackets kits. See page 34
- Safety relays. See page 45
- Connection boxes. See page 46
- M12 5-pole (CJSx) for external Muting lamp. See page 47
- Support columns. See page 54
- Brackets. See page 58

SM TRX

HARDWARE CONFIGURATION, PASSIVE RETRO-REFLECTOR ELEMENT

CONNECTORS

Active element
M12 12-pole - Male

1 - 24 VDC
2 - 0 VDC
3 - OSSD 1
4 - OSSD 2
5 - PE
6 - SEL_A / Partial_Control
7 - MUT_ENABLE
8 - EDM
9 - OVERRIDE 2
10 - OVERRIDE 1/ RESTART
11 - SEL_B
12 - STATUS

External Muting lamp
M12 5-pole - Female

1 - MUT_LAMP
2 - nc
3 - 0 VDC
4 - nc
5 - nc

Muting sensors 3 - 4 (red)
M12 5-pole - Female

1 - 24 VDC
2 - Sensor 4
3 - 0 VDC
4 - Sensor 3
5 - PE

Muting sensors 1 - 2 (blu)
M12 5-pole - Female

1 - 24 VDC
2 - Sensor 2
3 - 0 VDC
4 - Sensor 1
5 - PE

PART NUMBERS

Access control   Max. range: 8 m

2, 3, 4 beams

Versions SM TRX	SM 2B TRX	SM 3B TRX	SM 4B TRX
Part number	1390630	1390631	1390632
Number of beams	2	3	4
Beam spacing (mm)	500	400	300
Protected height (mm)	510	810	910
Overall height (mm)	674	945	1045

HARDWARE CONFIGURATION, WITH INTEGRATED STATUS AND MUTING LAMP

STATUS LAMP

SAFETY LEVEL

TYPE 4

SIL 3 - SILCL 3
PL e - Cat. 4

Resolution (mm)	Start/ Restart	Muting Logic
30 - 40	Manual or Automatic	One-way Two-way

Access control	Safety output	Muting Sensors
2, 3, 4 beams	2	External 2 or 4

Built-in Muting function.

Selectable manual or automatic restart .

Integrated feedback input for external relay monitoring (EDM).

Integrated Status and Muting lamp.

M12 5-pole connectors for 2 or 4 Muting sensors.

Hardware configuration of Muting logics and functional parameters via the Master M12 12-pole connector wiring. Use of unshielded cables up to 100 m.

Protected heights: 310 mm ... 2260 mm.

SYNCRO M^5, M^{TRX} and MA Muting arms are set to avoid interference

Light curtain's Muting Sensor connectors can also allow the direct connection of external photocells

Protected height (mm) 1960, 2110 and 2260: UL certificate not available.

TECHNICAL FEATURES

Operative range (m)	0 ... 4 or 0 ... 12 selectable 0 ... 3 or 1...6 selectable (14 mm models)
Response time (ms)	5,5 ... 28 depending on the model (see technical manual)
Response time for Muting signals (ms)	100
Safety outputs	2 PNP auto-controlled (400 mA at 24 VDC) with short-circuit, overload, polarity reversal protection
Display	LEDs for self-diagnosis and light curtain status
Muting lamp output	24 VDC; 0,5 ... 5 W
Status and Muting lamp	**Integrated**, multicolor LED
External Device Monitoring	External device monitoring feedback input with selectable enabling
Max. Muting time-out	30 sec. or 9 hours selectable (for any type of Muting logic). Infinite (only for Two-way sequential Muting logic)
Override function	Built-in override function with 2 operating modes, selectable: - manual action with hold to run - automatic with pulse command
Max. override time-out (min.)	15 Maximum number of consecutive override: 30
Power supply (VDC)	24 ± 20%
Muting logics	Hardware configurable One-way muting with 2 sensors Two-way muting with 2 or 4 sensors
Muting sensors	- MA Muting arms kits - MZ Muting brackets kits - External, with relay or PNP output (dark-on logic)

CABLES NEEDED

- Emitter: M12 5-pole. See page 47 (CDx, CDM9, CDM99)
- Receiver: M12 12-pole. See page 50 (CS12Dx)

ACCESSORIES
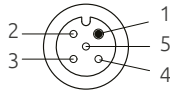
- MA Muting arms kits. See page 30
- MZ Muting brackets kits. See page 34
- Safety relays. See page 45
- Connection boxes. See page 46
- M12 5-pole (CJSx) for external Muting lamp. See page 47
- Support columns. See page 54
- Deflecting mirrors. See page 57
- Brackets. See page 58

SMO

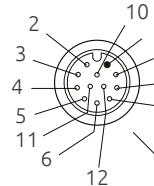## HARDWARE CONFIGURATION, WITH INTEGRATED STATUS AND MUTING LAMP
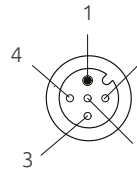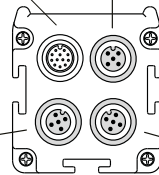
CONNECTORS

Emitter
M12 5-pole - Male
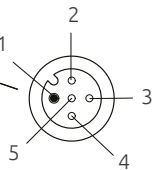1 - 24 VDC
2 - RANGE 0
3 - 0 VDC
4 - RANGE 1
5 - PE

Receiver
M12 12-pole - Male
1 - 24 VDC
2 - 0 VDC
3 - OSSD 1
4 - OSSD 2
5 - PE
6 - SEL_A / Partial_Control
7 - MUT_ENABLE
8 - EDM
9 - OVERRIDE 2
10 - OVERRIDE 1/ RESTART
11 - SEL_B
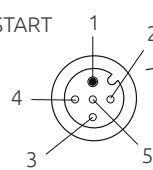12 - STATUS

External Muting lamp
M12 5-pole - Female
1 - MUT_LAMP
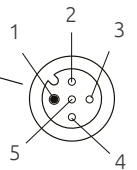2 - nc
3 - 0 VDC
4 - nc
5 - nc

Muting sensors 1 - 2 (blu)
M12 5-pole - Female
1 - 24 VDC_A
2 - SYNCRO_A
3 - 0 VDC
4 - 0 VDC
5 - PE

Muting sensors 3 - 4 (red)
M12 5-pole - Female
1 - 24 VDC_B
2 - SYNCRO_B
3 - 0 VDC
4 - 0 VDC
5 - PE

Muting sensors 3 - 4 (red)
M12 5-pole - Female
1 - 24 VDC
2 - Sensor 4
3 - 0 VDC
4 - Sensor 3
5 - PE

Muting sensors 1 - 2 (blu)
M12 5-pole - Female
1 - 24 VDC
2 - Sensor 2
3 - 0 VDC
4 - Sensor 1
5 - PE

PART NUMBERS

Finger detection   Max. range: selectable 3 or 6 m

Resolution 14 mm

Versions SMO	SMO 301	SMO 451	SMO 601	SMO 751	SMO 901	SMO 1051	SMO 1201	SMO 1351	SMO 1501	SMO 1651	SMO 1801	SMO 1951
Part number	1390041	1390042	1390043	1390044	1390045	1390046	1390047	1390048	1390049	1390050	1390051	1390052
Protected height (mm)	310	460	610	760	910	1060	1210	1360	1510	1660	1810	1960
Number of beams	30	45	60	75	90	105	120	135	150	165	180	195
Overall height (mm)	420	570	720	870	1020	1170	1320	1470	1620	1770	1920	2070

Hand detection   Max. range: selectable 4 or 12 m

Resolution 30 mm

Versions SMO	SMO 303	SMO 453	SMO 603	SMO 753	SMO 903	SMO 1053	SMO 1203	SMO 1353	SMO 1503	SMO 1653	SMO 1803	SMO 1953	SMO 2103	SMO 2253
Part number	1390241	1390242	1390243	1390244	1390245	1390246	1390247	1390248	1390249	1390250	1390251	1390252	1390253	1390254
Protected height (mm)	310	460	610	760	910	1060	1210	1360	1510	1660	1810	1960	2110	2260
Number of beams	16	23	31	38	46	53	61	68	76	83	91	98	106	113
Overall height (mm)	420	570	720	870	1020	1170	1320	1470	1620	1770	1920	2070	2220	2370

Resolution 30 mm

Versions SMO	SMO 304	SMO 454	SMO 604	SMO 754	SMO 904	SMO 1054	SMO 1204	SMO 1354	SMO 1504	SMO 1654	SMO 1804	SMO 1954	SMO 2104	SMO 2254
Part number	1390341	1390342	1390343	1390344	1390345	1390346	1390347	1390348	1390349	1390350	1390351	1390352	1390353	1390354
Protected height (mm)	310	460	610	760	910	1060	1210	1360	1510	1660	1810	1960	2110	2260
Number of beams	11	16	21	26	31	36	41	46	51	56	61	66	71	76
Overall height (mm)	420	570	720	870	1020	1170	1320	1470	1620	1770	1920	2070	2220	2370

Access control   Max. range: selectable 4 or 12 m

2, 3, 4 beams

Versions SMO	SMO 2B	SMO 3B	SMO 4B
Part number	1390640	1390641	1390642
Number of beams	2	3	4
Beam spacing (mm)	500	400	300
Protected height (mm)	510	810	910
Overall height (mm)	710	1010	1110

HARDWARE CONFIGURATION, PASSIVE RETRO-REFLECTOR ELEMENT WITH INTEGRATED STATUS AND MUTING LAMP

STATUS LAMP

TRX TRANSCEIVER

SAFETY LEVEL

TYPE 4

SIL 3 - SILCL 3
PL e - Cat. 4

Access control	Start/ Restart	Muting Logic
2, 3, 4 beams	Manual or Automatic	One-way Two-way

Safety output	Muting Sensors
2	External 2 or 4

Built-in Muting function.

Versions with passive retro-reflector element.

Selectable manual or automatic restart.

Integrated feedback input for external relay monitoring (EDM).

Integrated Status and Muting lamp.

M12 5-pole connectors for 2 or 4 Muting sensors.

Hardware configuration of Muting logics and functional parameters via the Master M12 12-pole connector wiring. Use of unshielded cables up to 100 m.

Protected heights: 510 mm ... 910 mm.

SYNCRO — M⁵, Mᵀᴿˣ and MA Muting arms are set to avoid interference

Light curtain's Muting Sensor connectors can also allow the direct connection of external photocells

TECHNICAL FEATURES

Operative range (m)	0 ... 8
Response time (ms)	5,5
Response time for Muting signals (ms)	100
Safety outputs	2 PNP auto-controlled (400 mA at 24 VDC) with short-circuit, overload, polarity reversal protection
Display	LEDs for self-diagnosis and light curtain status
Muting lamp output	24 VDC; 0,5 ... 5 W
Status and Muting lamp	**Integrated ,** multicolor LED
External Device Monitoring	External device monitoring feedback input with selectable enabling
Max. Muting time-out	30 sec. or 9 hours selectable (for any type of Muting logic). Infinite (only for Two-way sequential Muting logic)
Override function	Built-in override function with 2 operating modes selectable: - manual action with hold to run - automatic with pulse command
Max. override time-out (min.)	15 Maximum number of consecutive override: 30
Power supply (VDC)	24 ± 20%
Muting logics	Hardware configurable One-way muting with 2 sensors Two-way muting with 2 or 4 sensors
Muting sensors	- MA Muting arms kits - MZ Muting brackets kits - External, with relay or PNP output (dark-on logic)

CABLES NEEDED

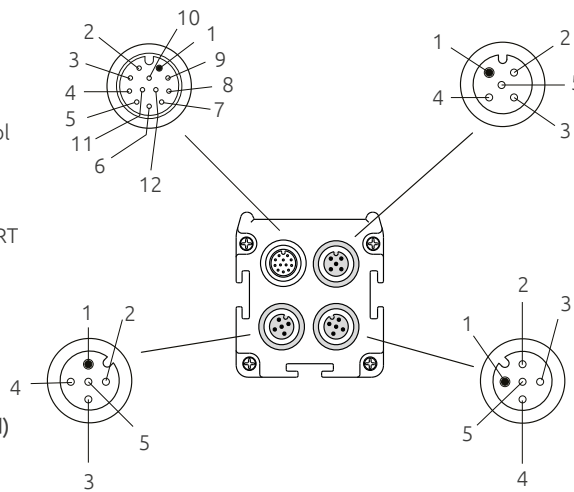- Active element: M12 12-pole. See page 50 (CS12Dx)

ACCESSORIES

- MA Muting arms kits. See page 30
- MZ Muting brackets kits. See page 34
- Safety relays. See page 45
- Connection boxes. See page 46
- M12 5-pole (CJSx) for external Muting lamp. See page 47
- Support columns. See page 54
- Brackets. See page 58

CE   UKCA   TÜV SÜD   c(UL)us LISTED ESPE   RoHS Compliant

SMO TRX

HARDWARE CONFIGURATION, PASSIVE RETRO-REFLECTOR ELEMENT WITH INTEGRATED STATUS AND MUTING LAMP

CONNECTORS

Active element
M12 12-pole - Male

1 - 24 VDC
2 - 0 VDC
3 - OSSD 1
4 - OSSD 2
5 - PE
6 - SEL_A / Partial_Control
7 - MUT_ENABLE
8 - EDM
9 - OVERRIDE 2
10 - OVERRIDE 1/ RESTART
11 - SEL_B
12 - STATUS

External Muting lamp
M12 5-pole - Female

1 - MUT_LAMP
2 - nc
3 - 0 VDC
4 - nc
5 - nc

Muting sensors 3 - 4 (red)
M12 5-pole - Female

1 - 24 VDC
2 - Sensor 4
3 - 0 VDC
4 - Sensor 3
5 - PE

Muting sensors 1 - 2 (blu)
M12 5-pole - Female

1 - 24 VDC
2 - Sensor 2
3 - 0 VDC
4 - Sensor 1
5 - PE

PART NUMBERS

Access control   Max. range: 8 m

2, 3, 4 beams

Versions SMO TRX	SMO 2B TRX	SMO 3B TRX	SMO 4B TRX
Part number	1390650	1390651	1390652
Number of beams	2	3	4
Beam spacing (mm)	500	400	300
Protected height (mm)	510	810	910
Overall height (mm)	699	970	1070

PROGRAMMABLE, WITH INTEGRATED STATUS AND MUTING LAMP

STATUS LAMP

PROGRAMMABLE

SAFETY LEVEL

TYPE 4

SIL 3 - SILCL 3
PL e - Cat. 4

Resolution (mm)	Start/ Restart	Muting Logic
30, 40	Manual or Automatic	One-way Two-way

Access control	Safety output	Muting Sensors
2, 3, 4 beams	2	External 2 or 4

Built-in Muting function.
Selectable manual or automatic restart.

Integrated feedback input for external relay monitoring (EDM).

Integrated Status and Muting lamp.

M12 5-pole connectors for 2 or 4 Muting sensors.

Hardware configuration via the Master M12 12-pole connector wiring. Use of unshielded cables up to 100 m.

Software Configuration via Safegate Configuration Software (SCS) (PC connection with USB-M12 cable).

Protected heights: 310 mm ... 2260 mm.

SYNCRO — M⁵, M^TRX and MA Muting arms are set to avoid interference

Light curtain's Muting Sensor connectors can also allow the direct connection of external photocells

Protected height (mm) 1960, 2110 and 2260: UL certificate not available.

TECHNICAL FEATURES

Operative range (m)	0 ... 4 or 0 ... 12 selectable 0 ... 3 or 1...6 selectable (14 mm models)
Response time (ms)	5,5 ... 28 depending on the model (see technical manual)
Response time for Muting signals (ms)	100
Safety outputs	2 PNP auto-controlled (400 mA at 24 VDC) with short-circuit, overload, polarity reversal protection
Display	LEDs for self-diagnosis and light curtain status
Muting lamp output	24 VDC; 0,5 ... 5 W
Status and Muting lamp	**Integrated, m**ulticolor LED
External Device Monitoring	External device monitoring feedback input with selectable enabling
Max. Muting time-out	Hardware or software configurable
Partial Muting	Software configurable. Possibility to inhibit only a selected number of beams
Override function	Built-in override function with 2 operating modes. Hardware or software configurable
Max. override time-out (min.)	15 Maximum number of consecutive override: 30
Power supply (VDC)	24 ± 20%
Muting logics	Hardware or software configurable One-way muting with 2 sensors Two-way muting with 2 or 4 sensors
Muting sensors	- MA Muting arms kits - MZ Muting brackets kits - External with relay or PNP output (dark-on logic)

CABLES NEEDED

ACCESSORIES

SMPO

PROGRAMMABLE, WITH INTEGRATED STATUS AND MUTING LAMP

CONNECTORS

Emitter
M12 5-pole - Male
1 - 24 VDC
2 - RANGE 0
3 - 0 VDC
4 - RANGE 1
5 - PE

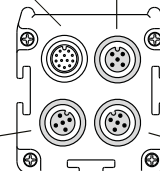**Receiver**
M12 12-pole - Male
1 - 24 VDC
2 - 0 VDC
3 - OSSD 1
4 - OSSD 2
5 - PE
6 - SEL_A / Partial_Control
7 - MUT_ENABLE
8 - EDM
9 - OVERRIDE 2
10 - OVERRIDE 1/ RESTART
11 - SEL_B
12 - STATUS

Programming and external Muting lamp
M12 5-pole - Female
1 - MUT_LAMP
2 - USB +
3 - 0 VDC
4 - VBUS
5 - USB -

Muting sensors 1 - 2 (blu)
M12 5-pole - Female
1 - 24 VDC_A
2 - SYNCRO_A
3 - 0 VDC
4 - 0 VDC
5 - PE

Muting sensors 3 - 4 (red)
M12 5-pole - Female
1 - 24 VDC_B
2 - SYNCRO_B
3 - 0 VDC
4 - 0 VDC
5 - PE

Muting sensors 3 - 4 (red)
M12 5-pole - Female
1 - 24 VDC
2 - Sensor 4
3 - 0 VDC
4 - Sensor 3
5 - PE

Muting sensors 1 - 2 (blu)
M12 5-pole - Female
1 - 24 VDC
2 - Sensor 2
3 - 0 VDC
4 - Sensor 1
5 - PE

PART NUMBERS

Finger detection   Max. range: selectable 3 or 6 m

Resolution 14 mm

Versions SMPO	SMPO 301	SMPO 451	SMPO 601	SMPO 751	SMPO 901	SMPO 1051	SMPO 1201	SMPO 1351	SMPO 1501	SMPO 1651	SMPO 1801	SMPO 1951
Part number	1390081	1390082	1390083	1390084	1390085	1390086	1390087	1390088	1390089	1390090	1390091	1390092
Protected height (mm)	310	460	610	760	910	1060	1210	1360	1510	1660	1810	1960
Number of beams	30	45	60	75	90	105	120	135	150	165	180	195
Overall height (mm)	420	570	720	870	1020	1170	1320	1470	1620	1770	1920	2070

Hand detection   Max. range: selectable 4 or 12 m

Resolution 30 mm

Versions SMPO	SMPO 303	SMPO 453	SMPO 603	SMPO 753	SMPO 903	SMPO 1053	SMPO 1203	SMPO 1353	SMPO 1503	SMPO 1653	SMPO 1803	SMPO 1953	SMPO 2103	SMPO 2253
Part number	1390281	1390282	1390283	1390284	1390285	1390286	1390287	1390288	1390289	1390290	1390291	1390292	1390293	1390294
Protected height (mm)	310	460	610	760	910	1060	1210	1360	1510	1660	1810	1960	2110	2260
Number of beams	16	23	31	38	46	53	61	68	76	83	91	98	106	113
Overall height (mm)	420	570	720	870	1020	1170	1320	1470	1620	1770	1920	2070	2220	2370

Resolution 40 mm

Versions SMPO	SMPO 304	SMPO 454	SMPO 604	SMPO 754	SMPO 904	SMPO 1054	SMPO 1204	SMPO 1354	SMPO 1504	SMPO 1654	SMPO 1804	SMPO 1954	SMPO 2104	SMPO 2254
Part number	1390381	1390382	1390383	1390384	1390385	1390386	1390387	1390388	1390389	1390390	1390391	1390392	1390393	1390394
Protected height (mm)	310	460	610	760	910	1060	1210	1360	1510	1660	1810	1960	2110	2260
Number of beams	11	16	21	26	31	36	41	46	51	56	61	66	71	76
Overall height (mm)	420	570	720	870	1020	1170	1320	1470	1620	1770	1920	2070	2220	2370

Access control   Max. range: selectable 4 or 12 m

2, 3, 4 beams

Versions SMPO	SMPO 2B	SMPO 3B	SMPO 4B
Part number	1390680	1390681	1390682
Number of beams	2	3	4
Beam spacing (mm)	500	400	300
Protected height (mm)	510	810	910
Overall height (mm)	710	1010	1110

PROGRAMMABLE, PASSIVE RETRO-REFLECTOR ELEMENT WITH INTEGRATED STATUS AND MUTING LAMP

STATUS LAMP

PROGRAMMABLE

TRX
TRANSCEIVER

SAFETY LEVEL

TYPE 4

SIL 3 - SILCL 3
PL e - Cat. 4

Access control	Start/ Restart	Muting Logic
2, 3, 4 beams	Manual or Automatic	One-way Two-way

Safety output	Muting Sensors
2	External 2 or 4

Built-in Muting function.
Selectable manual or automatic restart.

Versions with passive retro-reflector element.

Integrated feedback input for external relay monitoring (EDM).

Integrated Status and Muting lamp.

M12 5-pole connectors for 2 or 4 Muting sensors.

Hardware configuration via the Master M12 12-pole connector wiring. Use of unshielded cables up to 100 m.

Software Configuration via Safegate Configuration Software (SCS) (PC connection with USB-M12 cable).

Protected heights: 510 mm ... 910 mm.

SYNCRO — M5, MTRX and MA Muting arms are set to avoid interference

Light curtain's Muting Sensor connectors can also allow the direct connection of external photocells

CE   UKCA   TÜV SÜD   c UL us LISTED E S P E   RoHS Compliant

TECHNICAL FEATURES

Operative range (m)	0 ... 8
Response time (ms)	5,5
Response time for Muting signals (ms)	100
Safety outputs	2 PNP auto-controlled (400 mA at 24 VDC) with short-circuit, overload, polarity reversal protection
Display	LEDs for self-diagnosis and light curtain status
Muting lamp output	24 VDC; 0,5 ... 5 W
Status and Muting lamp	Integrated, multicolor LED
External Device Monitoring	External device monitoring feedback input with selectable enabling
Max. Muting time-out	Hardware or software configurable
Partial Muting	Software configurable. Possibility to inhibit only a selected number of beams (3 and 4 beams only)
Override function	Built-in override function with 2 operating modes. Hardware or software configurable
Max. override time-out (min.)	15 Maximum number of consecutive override: 30
Power supply (VDC)	24 ± 20%
Muting logics	Hardware configurable One-way muting with 2 sensors Two-way muting with 2 or 4 sensors
Muting sensors	- MA Muting arms kits - MZ Muting brackets kits - External, with relay or PNP output (dark-on logic)

CABLES NEEDED

- Active element: M12 12-pole. See (CS12Dx)
- Programming: USB-M12 5-pole adapter. See (CS12USB)

ACCESSORIES

- MA Muting arms kits. See
- MZ Muting brackets kits. See
- Safety relays. See
- Connection boxes. See
- M12 5-pole (CJSx) for external Muting lamp. See
- Support columns. See
- Brackets. See

SMPO TRX

PROGRAMMABLE, PASSIVE RETRO-REFLECTOR ELEMENT WITH INTEGRATED STATUS AND MUTING LAMP

CONNECTORS

Active element
M12 12-pole - Male

1 - 24 VDC
2 - 0 VDC
3 - OSSD 1
4 - OSSD 2
5 - PE
6 - SEL_A / Partial_Control
7 - MUT_ENABLE
8 - EDM
9 - OVERRIDE 2
10 - OVERRIDE 1/ RESTART
11 - SEL_B
12 - STATUS

External Muting lamp
M12 5-pole - Female

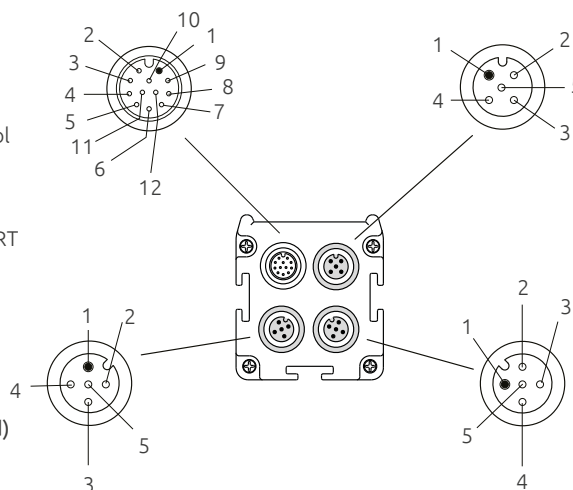1 - MUT_LAMP
2 - nc
3 - 0 VDC
4 - nc
5 - nc

Muting sensors 3 - 4 (red)
M12 5-pole - Female

1 - 24 VDC
2 - Sensor 4
3 - 0 VDC
4 - Sensor 3
5 - PE

Muting sensors 1 - 2 (blu)
M12 5-pole - Female

1 - 24 VDC
2 - Sensor 2
3 - 0 VDC
4 - Sensor 1
5 - PE

PART NUMBERS

Access control   Max. range: 8 m

2, 3, 4 beams

Versions SMPO TRX	SMPO 2B TRX	SMPO 3B TRX	SMPO 4B TRX
Part number	1390690	1390691	1390692
Number of beams	2	3	4
Beam spacing (mm)	500	400	300
Protected height (mm)	510	810	910
Overall height (mm)	699	970	1070

WITHOUT MUTING FUNCTION, BUILT-IN CONTROL FUNCTION

SAFETY LEVEL

TYPE 4

SIL 3 - SILCL 3
PL e - Cat. 4

Access control	Start/ Restart	Safety output
2, 3, 4 beams	Manual or Automatic	2

Selectable manual or automatic restart.

Integrated feedback input for external relay monitoring (EDM).

Hardware configuration via the Master M12 5-pole connector wiring. Use of unshielded cables up to 100 m.

Protected heights: 510 mm ... 910 mm.

TECHNICAL FEATURES

|	
Operative range (m)	0 ... 4 or 0 ... 12 selectable
Response time (ms)	5,5
Safety outputs	2 PNP auto-controlled (400 mA at 24 VDC) with short-circuit, overload, polarity reversal protection
Display	LEDs for self-diagnosis and light curtain status
External Device Monitoring	External device monitoring feedback input with selectable enabling
Power supply (VDC)	24 ± 20%

CABLES NEEDED

- Emitter: M12 5-pole. See page 47 (CDx, CDM9, CDM99)
- Receiver: M12 8-pole. See page 47 (C8Dx, C8DM9, C8DM99, C8D9x, C8DM11, C8DM911)

ACCESSORIES

- Safety relays. See page 45
- Support columns. See page 54
- Deflecting mirrors. See page 57
- Brackets. See page 58

CONNECTORS

See models S LR / SO LR page 23

PART NUMBERS

Hand detection   Max. range: selectable 4 or 12 m   new

Resolution 30 mm

Versions S	S 303	S 453	S 603	S 753	S 903	S 1053	S 1203	S 1353	S 1503	S 1653	S 1803	S 1953	S 2103	S 2253
Part number	1390201	1390202	1390203	1390204	1390205	1390206	1390207	1390208	1390209	1390210	1390211	1390212	1390213	1390214
Protected height (mm)	310	460	610	760	910	1060	1210	1360	1510	1660	1810	1960	2110	2260
Number of beams	16	23	31	38	46	53	61	68	76	83	91	98	106	113
Overall height (mm)	420	570	720	870	1020	1170	1320	1470	1620	1770	1920	2070	2220	2370

Resolution 40 mm

Versions S	S 304	S 454	S 604	S 754	S 904	S 1054	S 1204	S 1354	S 1504	S 1654	S 1804	S 1954	S 2104	S 2254
Part number	1390301	1390302	1390303	1390304	1390305	1390306	1390307	1390308	1390309	1390310	1390311	1390312	1390313	1390314
Protected height (mm)	310	460	610	760	910	1060	1210	1360	1510	1660	1810	1960	2110	2260
Number of beams	11	16	21	26	31	36	41	46	51	56	61	66	71	76
Overall height (mm)	420	570	720	870	1020	1170	1320	1470	1620	1770	1920	2070	2220	2370

Access control   Max. range: selectable 4 or 12 m

2, 3, 4 beams

Versioni S	S 2B	S 3B	S 4B
Codice ordinazione	1390600	1390601	1390602
Number of beams	2	3	4
Beam spacing (mm)	500	400	300
Protected height (mm)	510	810	910
Overall height (mm)	684	984	1084

S TRX / S TRX - A

WITHOUT MUTING FUNCTION, PASSIVE RETRO-REFLECTOR ELEMENTS

TRX
TRANSCEIVER

SAFETY LEVEL

TYPE 4

SIL 3 - SILCL 3
PL e - Cat. 4

Access control	S TRX Start/Restart	Safety output
2, 3, 4 beams	Manual or Automatic	2

S TRX - A Start/Restart
Automatic

Versions with passive retro-reflector element.

S TRX versions: Selectable manual or automatic restart. Integrated feedback input for external relay monitoring (EDM).

S TRX - A versions: automatic restart.

Hardware configuration via the Master M12 8-pole connector wiring.

Use of unshielded cables up to 100 m.

Protected heights: 510 mm ... 910 mm.

PART NUMBERS

Access control Max. range: 8 m

2, 3, 4 beams

Versions S TRX	S 2B TRX	S 3B TRX	S 4B TRX
Part number	1390610	1390611	1390612
Versions S TRX - A	S 2B TRX - A	S 3B TRX - A	S 4B TRX - A
Part number	1390616	1390617	1390618
Number of beams	2	3	4
Beam spacing (mm)	500	400	300
Protected height (mm)	510	810	910
Overall height (mm)	674	945	1045

CE UKCA TÜV SÜD c UL us LISTED ESPE RoHS Compliant

TECHNICAL FEATURES

Operative range (m)	0 ... 8
Response time (ms)	5,5
Safety outputs	2 PNP auto-controlled (400 mA at 24 VDC) with short-circuit, overload, polarity reversal protection
Display	LEDs for self-diagnosis and light curtain status
External Device Monitoring	External device monitoring feedback input with selectable enabling
Power supply (VDC)	24 ± 20%

CABLES NEEDED

- Active element: M12 8-pole. See page 47 (C8Dx, C8DM9, C8DM99, C8D9x, C8DM11, C8DM911)

ACCESSORIES

- Safety relays. See page 45
- Support columns. See page 54
- Brackets. See page 58

CONNECTORS
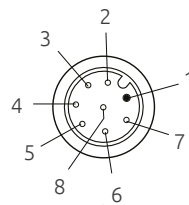
Active element S TRX versions
M12 8-pole - Male
1 - OSSD 1
2 - 24 Vcc
3 - OSSD 2
4 - EDM
5 - SEL_A
6 - SEL_B
7 - 0 Vcc
8 - PE
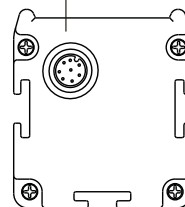
Active element S TRX - A versions
M12 5-pole - Male
1 - OSSD 1
2 - 24 Vcc
3 - OSSD 2
4 - 0 Vcc
5 - PE
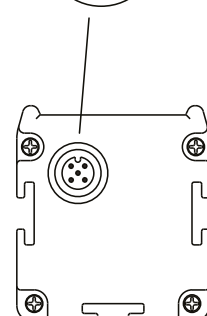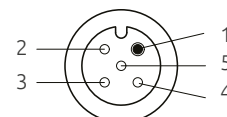
HIGH RANGE (LONG RANGE), WITHOUT MUTING FUNCTION, BUILT-IN CONTROL FUNCTION
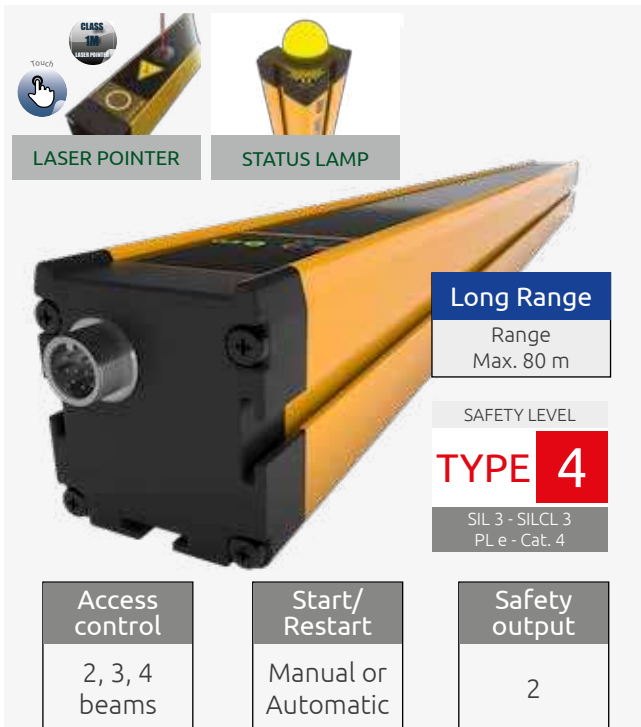
LASER POINTER

STATUS LAMP

Long Range
Range Max. 80 m

SAFETY LEVEL
TYPE 4

SIL 3 - SILCL 3
PL e - Cat. 4

Access control	Start/Restart	Safety output
2, 3, 4 beams	Manual or Automatic	2

Selectable manual or automatic restart. Integrated feedback input for external relay monitoring (EDM).

SO LR versions with integrated status lamp. Models with integrated laser pointer (ILP) are also available.

Hardware configuration via the Master M12 12-pole connector wiring. Use of unshielded cables up to 100 m.

Protected heights: 510 mm ... 910 mm

PART NUMBERS

Access control Max. range: selectable 40 or 80 m

2, 3, 4 beams

Versions S LR	S 2B LR	S 3B LR	S 4B LR
Part number	1390013	1390014	1390015
Versions S LR ILP	S 2B LR ILP	S 3B LR ILP	S 4B LR ILP
Part number	1390033	1390034	1390035
Number of beams	2	3	4
Beam spacing (mm)	500	400	300
Protected height (mm)	510	810	910
Overall height LR / LR ILP (mm)	648 / 673	948 / 973	1048 / 1073

Versions SO LR	SO 2B LR	SO 3B LR	SO 4B LR
Part number	1390016	1390017	1390018
Versions SO LR ILP	SO 2B LR ILP	SO 3B LR ILP	SO 4B LR ILP
Part number	1390036	1390037	1390038
Number of beams	2	3	4
Beam spacing (mm)	500	400	300
Protected height (mm)	510	810	910
Overall height LR / LR ILP (mm)	673 / 698	973 / 998	1073 / 1098

TECHNICAL FEATURES

Operative range (m)	6 ... 40 or 8 ... 80 selectable
Response time (ms)	5,5
Safety outputs	2 PNP auto-controlled (400 mA at 24 VDC) with short-circuit, overload, polarity reversal protection
Display	LEDs for self-diagnosis and light curtain status
Status lamp (SO LR versions only)	Integrated, multicolor LED (red and green)
External Device Monitoring	External device monitoring feedback input with selectable enabling
Power supply (VDC)	24 ± 20%
Laser pointer Max. power (mW)	<1 (class 1M according to the EN 60825-1) not dangerous to the eyes and skin. One laser pointer per beams.

CABLES NEEDED

- Emitter: M12 5-pole. See page 47 (CDx, CDM9, CDM99)
- Receiver: M12 8-pole. See page 47 (C8Dx, C8DM9, C8DM99, C8D9x, C8DM11, C8DM911)

ACCESSORIES

- Safety relays. See page 45
- Support columns. See page 54
- Deflecting mirrors. See page 57
- Brackets. See page 58

CONNECTORS
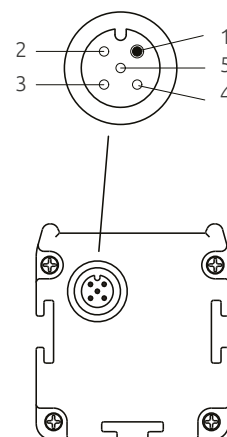
Emitter M12 5-pole Male

1 - 24 Vcc
2 - RANGE 0
3 - 0 Vcc
4 - RANGE 1
5 - PE
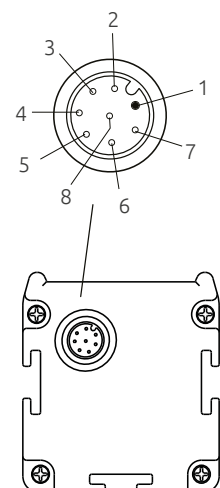
Receiver M12 8-pole Male
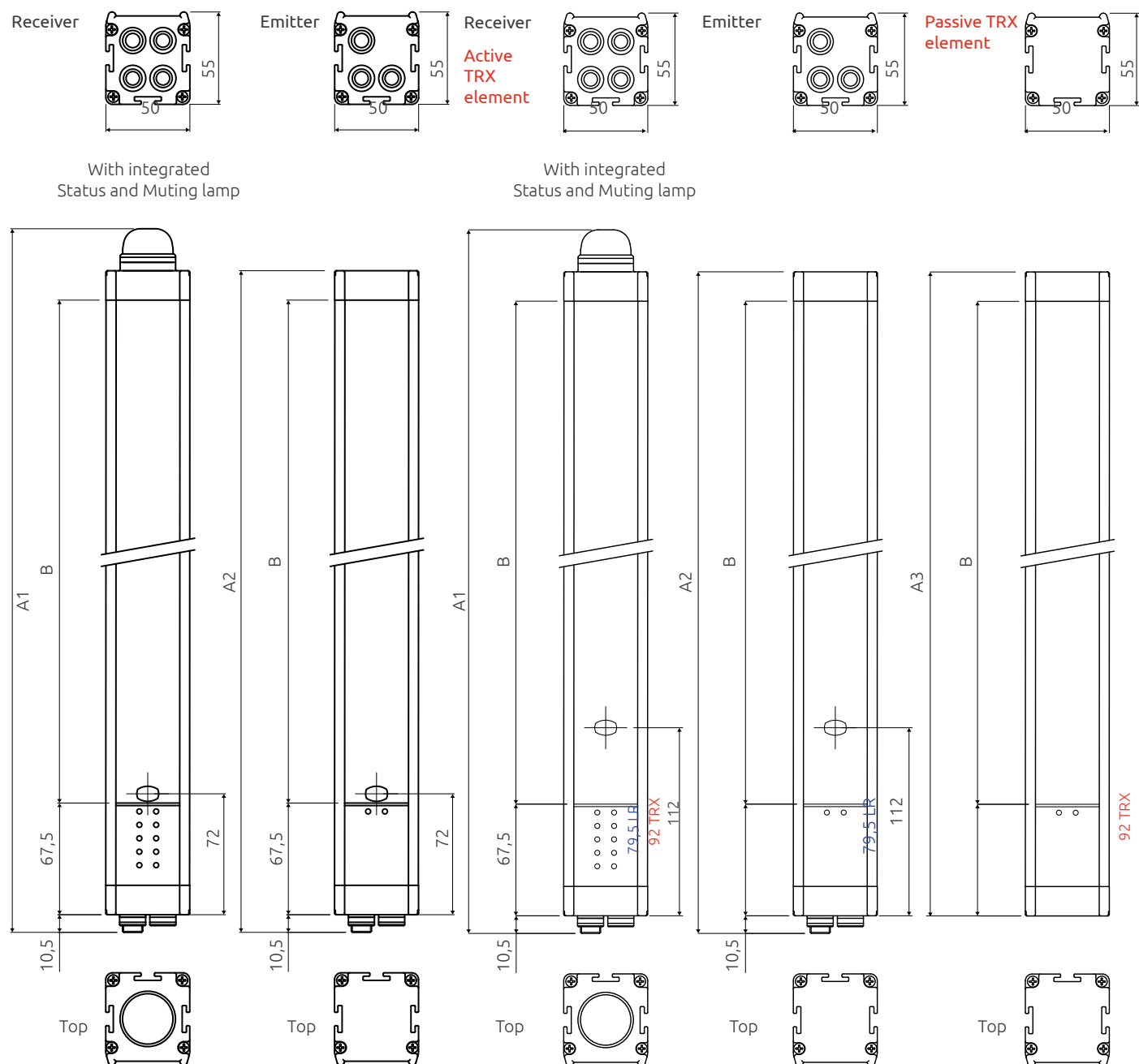
1 - OSSD 1
2 - 24 Vcc
3 - OSSD 2
4 - EDM
5 - SEL_A
6 - SEL_B
7 - 0 Vcc
8 - PE

MECHANICAL DATA

Finger and Hand detection models (14, 30, 40 mm) Access control models (2, 3, 4 beams)

Receiver — With integrated Status and Muting lamp

Emitter

Receiver — Active TRX element

Emitter

Passive TRX element

With integrated Status and Muting lamp

Versions	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2B	3B	4B
A SMO, SMPO	420	570	720	870	1020	1170	1320	1470	1620	1770	1920	2070	2220	2370	710	1010	1110
SO LR, SO LR ILP*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	673*	973*	1073*
SMO TRX, SMPO TRX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	699	970	1070
A1 SM, S	395	545	695	845	995	1145	1295	1445	1595	1745	1895	2045	2195	2345	684	984	1084
S LR, S LR ILP*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	648*	948*	1048*
SM TRX, S TRX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	674	945	1045
A2 Passive TRX element	-	-	-	-	-	-	-	-	-	-	-	-	-	-	663,5	934,5	1034,5
B S, SM, SMO, SMPO	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	589	889	989
S/SO LR, S/SO LR ILP*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	554*	854*	954*
Active TRX element	-	-	-	-	-	-	-	-	-	-	-	-	-	-	578,5	849,5	949,5
B1 Passive TRX element															628,5	899,5	999,5
Mounting	Set of 4 brackets included						Set of 6 brackets included								Set of 4 brackets included		

* Height of the ILP models is the height of the Lr models + 25 mm

SENSORS ADJUSTMENT

All MA Muting arms are adjustable in height and angle.

This unique feature, allows to control the angle of the detection plane, facilitating the detection of irregular materials in transit.

The reference ruler on the side of the barrier facilitates the alignment of the arms.

MA and MA TRXMuting arms

Maximum vertical adjustment allowed: ± 70 mm

Maximum angular adjustment allowed: ± 8°

MZ Muting brackets with M^5 multi-beams or M^{TRX} retro-reflection photocells, in addition to the height and angular adjustment, also allow angular adjustment of the M^5 / M^{TRX} sensors on their vertical axis.

MZ brackets are equipped with 2 fixing rails for Muting sensors. One allows angular adjustments, the other no. By using this second track to fix the Muting sensors, alignment is achieved automatically on the normal plane of the bracket.

MZ and MZ TRX Muting brackets

Maximum angular adjustment allowed: ± 8°

Maximum angular adjustment allowed: ± 8°

Maximum vertical adjustment allowed: ± 70 mm

SAFEGATE

INTEGRATED STATUS AND MUTING LAMP

GUARD	CLEAR	MUTING	OVERRIDE	OVERRIDE REQUEST	BREAK	FAIL
	Flashing		*Flashing*	*Flashing*		*Flashing*
Normal operations	Waiting for restart	Muting in progress	Override in progress	Waiting for an override	Occupied curtain (at least one beam occupied)	Error condition

DISPLAY
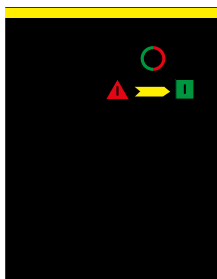
Emitter SM - SMO - SMPO versions

1 - Tri-colour LED	Description
🔴	Power on - Initial Test
🔴 *Flashing*	Fail condition
🟡	Test condition
🟢	Normal operation
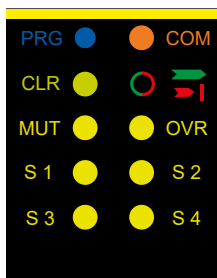
Receiver SM - SMO - SMPO versions
**Active element SM TRX - SMO TRX - SMPO TRX**

PRG	COM	CLR	LED bi-colour	MUT	OVR	S1	S2	S3	S4	Description
🔵	🟠	🟡	🟢	🟡	🟡	🟡	🟡	🟡	🟡	Power on - Initial Test

Receiver

Active element

Regular operations

LED	LED status	Description
PROG	🔵	Light curtain programmed via USB
COM	🟠	Communication with active PC
CLR	🟡	Light curtain awaiting for RESTART (clear gate)
LED bi-colour	🔴	OSSD outputs set to OFF - Occupied light curtain condition
	🟢	GUARD condition
MUT	🟡	Muting active
OVR	🟡	Override active
	🟡 *Flashing*	Override request
S1	🟡	Interruption Sensor 1
	⚪	Sensor 1 clear
S2	🟡	Interruption Sensor 2
	⚪	Sensor 2 clear
S3	🟡	Interruption Sensor 3
	⚪	Sensor 3 clear
S4	🟡	Interruption Sensor 4
	⚪	Sensor 4 clear
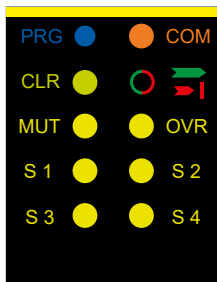
Fault operations

LED bi-colour	Number of flashes				Description
	CLR	MUT	OVR	S1 S2 S3 S4	
2					Configuration error SEL_A/SEL_B/EDM
3					Wrong EDM configuration
3	3				EDM feedback failure
3		3			STATUS input failure
3			3		OVERRIDE_1 / OVERRIDE_1 input failure
3				3	Sensor input failure
3	3	3	3	3	Muting lamp failure
4					OSSD1 / OSSD2 error
5					Main card error
5	5				Main card (EEPROM) error
5			5		Main card error
6					Main card (Microcontroller) error
6	6				Generic default board error
6		6			Beams error
6			6		24 VDC power supply overload
6	6	6	6		Lamp/status over current
7					Receiving beams failure
8					Interfering emitter detected

Receiver S versions
Active element S TRX - S TRX-A versions

WEAK	CLR	LED bi-colore	Descrizione
🔵	🟡	🟢	Power on - Initial Test

Durante il funzionamento normale

LED	Stato LED	Descrizione
WEAK	🔵	Weak signal
CLR	🟡	Light curtain awaiting for RESTART (clear gate)
LED bi-colore	🔴	OSSD outputs set to OFF - Occupied light curtain condition
	🟢	GUARD condition

SAFEGATE

CODE LEGEND

`S` `M` `P` `O` `E` `30` `3` `TRX` `A`
              `R` `2B`

Automatic Start/Restart

Versions with passive retro-reflector element

Resolution

1 - 14 mm
3 - 30 mm
4 - 40 mm

Protected height

30x - 310 mm	105x - 1060 mm	180x - 1810 mm
45x - 460 mm	120x - 1210 mm	195x - 1969 mm
60x - 610 mm	135x - 1360 mm	210x - 2110 mm
75x - 760 mm	150x - 1510 mm	225x - 2260 mm
90x - 910 mm	165x - 1660 mm	

Number of beams

2B - 2 beams   3B - 3 beams   4B - 4 beams

Emitter or receiver

E   Emitter
R   Receiver

Status and muting lamp

O   Integrated

Programmability of the light curtain

P   Programmable light curtain

Integrated Muting functions

Palletizer with regular pallets transit showing a Safegate with MA Muting arms (integrated sensors)

SAFEGATE CONFIGURATION SOFTWARE (SCS)

Software configurable versions (SMPO) allow configuration of Muting logics and additional functional parameters (i.e. Partial Muting) via Safegate Configuration Software (SCS). Programmable versions (SMPO) allow managing further configuration parameters, ideal to address particular issues in more complicated application scenarios.

Access to the programming functions of the light curtains protected by two-level password

Possibility of downloading the existing configuration of the light curtain

Uploading of the light curtain configuration

Light curtains general parameter configuration
- Automatic or manual restart
- K1/K2 feedback enabling
- K1/K2 feedback reading time

Muting logic configuration
- L Muting logic with parallel or crossed beams
- T Muting logic with crossed beams
- T Muting logic with parallel beams (sequential)
- T Muting logic with parallel beams (concurrent)

Muting parameters configuration
- Muting enable
- Occupancy order of the sensors (direction)
- Sensor gap for non-homogeneous pallet materials
- Muting closure and Muting time-out

Partial Muting configuration
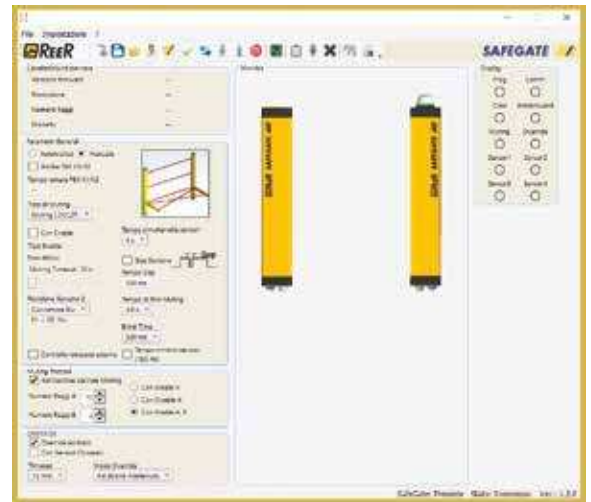Can be activated and configured 2 thresholds to define the number of beens in Muting condition.
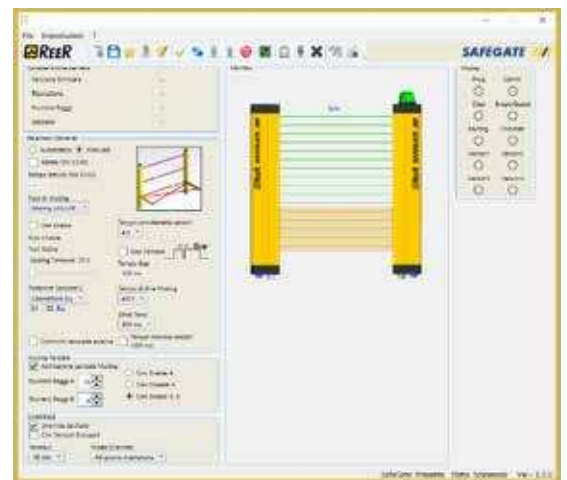
Override function configuration

Check and configuration validation

Light curtain status monitoring

Configuration

Status monitor

MA L2X

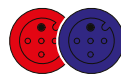## MUTING ARMS KIT - L MUTING LOGIC WITH 2 CROSSED BEAMS

TECHNICAL FEATURES

Model	MA L2X
Part number	1390800
Opto-electronic sensors	2 crossed beams
Operative range (m)	1 ... 2,5

Color-coded connectors for easy installation.
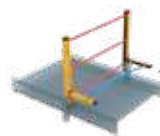
Dangerous area

The Muting arms must be installed in the dangerous area.

Crossed beams Muting arms with 2 through-beam sensors.

Can be used in conjunction with Safegate access control barriers to create a one-way access control system with exit-only L-Muting logic.

The kit includes: 2 Muting arms (emitter and receiver) with pre-wired and pre-aligned Muting sensors, screws and fixing brackets.
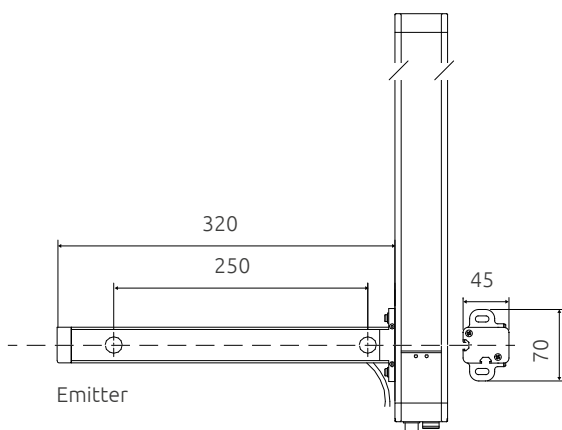
DIMENSIONS

320
250
45
70
Emitter

320
250
45
70
35
Receiver

Dimensions: mm

MA L2P TRX / G / V / VG

TRX MUTING ARMS KIT - L MUTING LOGIC WITH 2 PARALLEL BEAMS

Parallel beams Muting arms with 2 retro-reflective sensors. Can be used in conjunction with Safegate access control barriers to create a one-way access control system with exit-only L-Muting logic.

The kit includes: 2 Muting arms (active and passive elements) with pre-wired and pre-aligned Muting sensors, screws and fixing brackets.
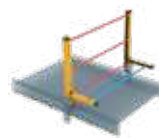
Special versions

MA L2P TRX G with special built-in Muting sensors to optimise correct and consistent detection of transparent materials (i.e. glass).

MA L2P TRX V with longer built-in Muting arms for high-speed conveyors.

TECHNICAL FEATURES

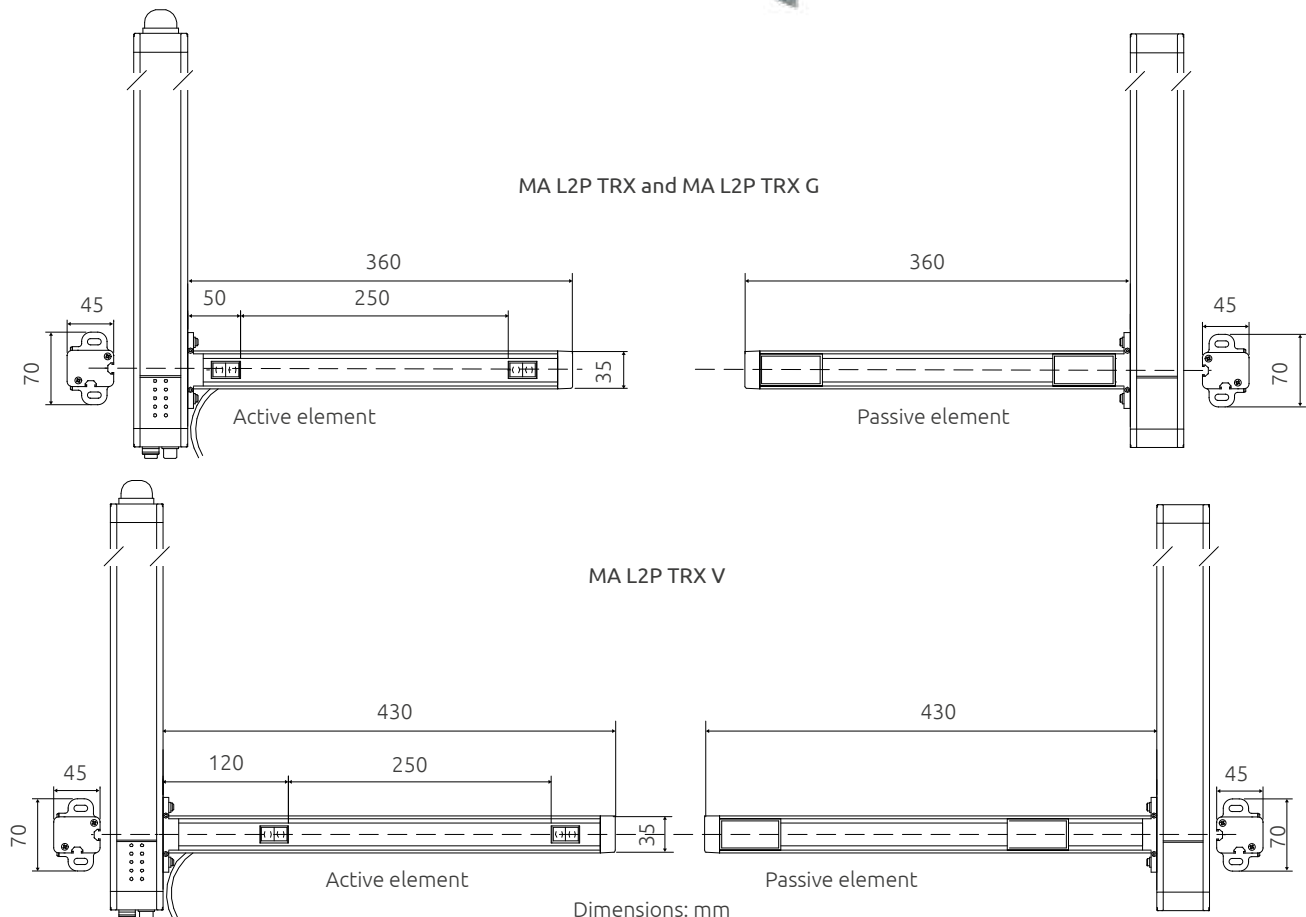| Model	MA L2P TRX MA L2P TRX G (transparent material) MA L2P TRX V (high-speed conveyors) MA L2P TRX VG (high speed for transparent material)
Part number	MA L2P TRX - 1390804 MA L2P TRX G - 1390813 MA L2P TRX V - 1390806 MA L2P TRX VG - 1390821
Opto-electronic sensors	2 parallel beams
Operative range (m)	0 ... 3,5 (MA L2P TRX) 0 ... 2 (MA L2P TRX G) 0 ... 3,5 (MA L2P TRX V) 0 ... 2 (MA L2P TRX VG)
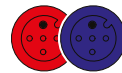
Color-coded connectors for easy installation.

Dangerous area

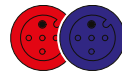The Muting arms must be installed in the dangerous area.

DIMENSIONS

MA L2P TRX and MA L2P TRX G

360
50
250
45
70
35

Active element

360
45
70

Passive element

MA L2P TRX V

430
120
250
45
70
35

Active element

430
45
70

Passive element

Dimensions: mm

MA T2X

MUTING ARMS KIT - T MUTING LOGIC WITH 2 CROSSED BEAMS

TECHNICAL FEATURES

Model	MA T2X
Part number	1390802
Opto-electronic sensors	2 crossed beams
Operative range (m)	1 ... 2,5

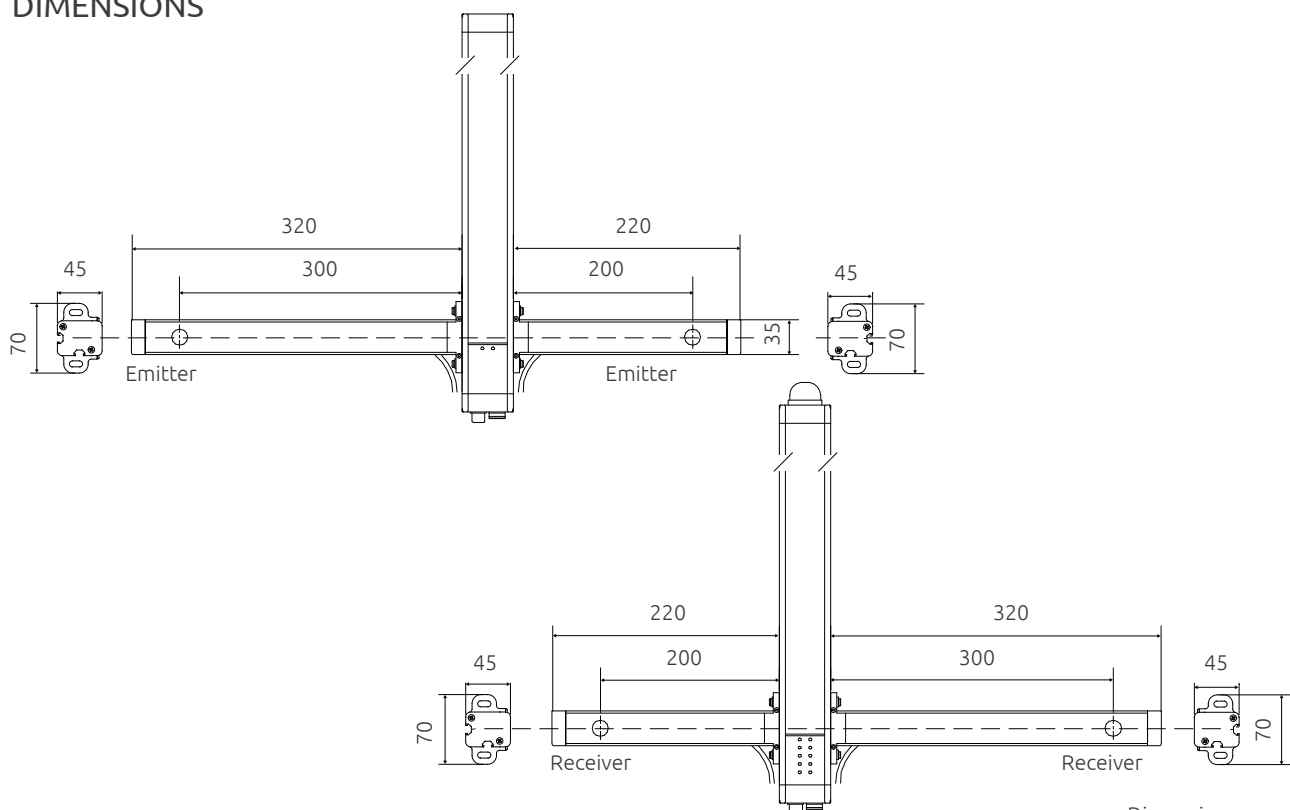Color-coded connectors for easy installation.

Dangerous area

The long Muting arms must be installed in the dangerous area.

Crossed beams Muting arms with 2 through-beam sensors. Can be used in conjunction with Safegate access control barriers to create a two-way access control system with entry-exit T-Muting logic.

The kit includes: 4 Muting arms (emitter and receiver) with pre-wired and pre-aligned Muting sensors, screws and fixing brackets.

DIMENSIONS

320 · 300 · 45 · 70 · Emitter · 220 · 200 · Emitter · 35 · 45 · 70

220 · 200 · 45 · 70 · Receiver · 320 · 300 · Receiver · 45 · 70

Dimensions: mm

MA T4P TRX / G / V / VG

TRX MUTING ARMS KIT - T MUTING LOGIC WITH 4 PARALLEL BEAMS

Parallel beams Muting arms with 4 retro-reflective sensors.

Can be used in conjunction with Safegate access control barriers to create a two-way access control system with entry-exit T-Muting logic.
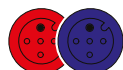
The kit includes: 4 Muting arms (active and passive elements) with pre-wired and pre-aligned Muting sensors, screws and fixing brackets.

TECHNICAL FEATURES

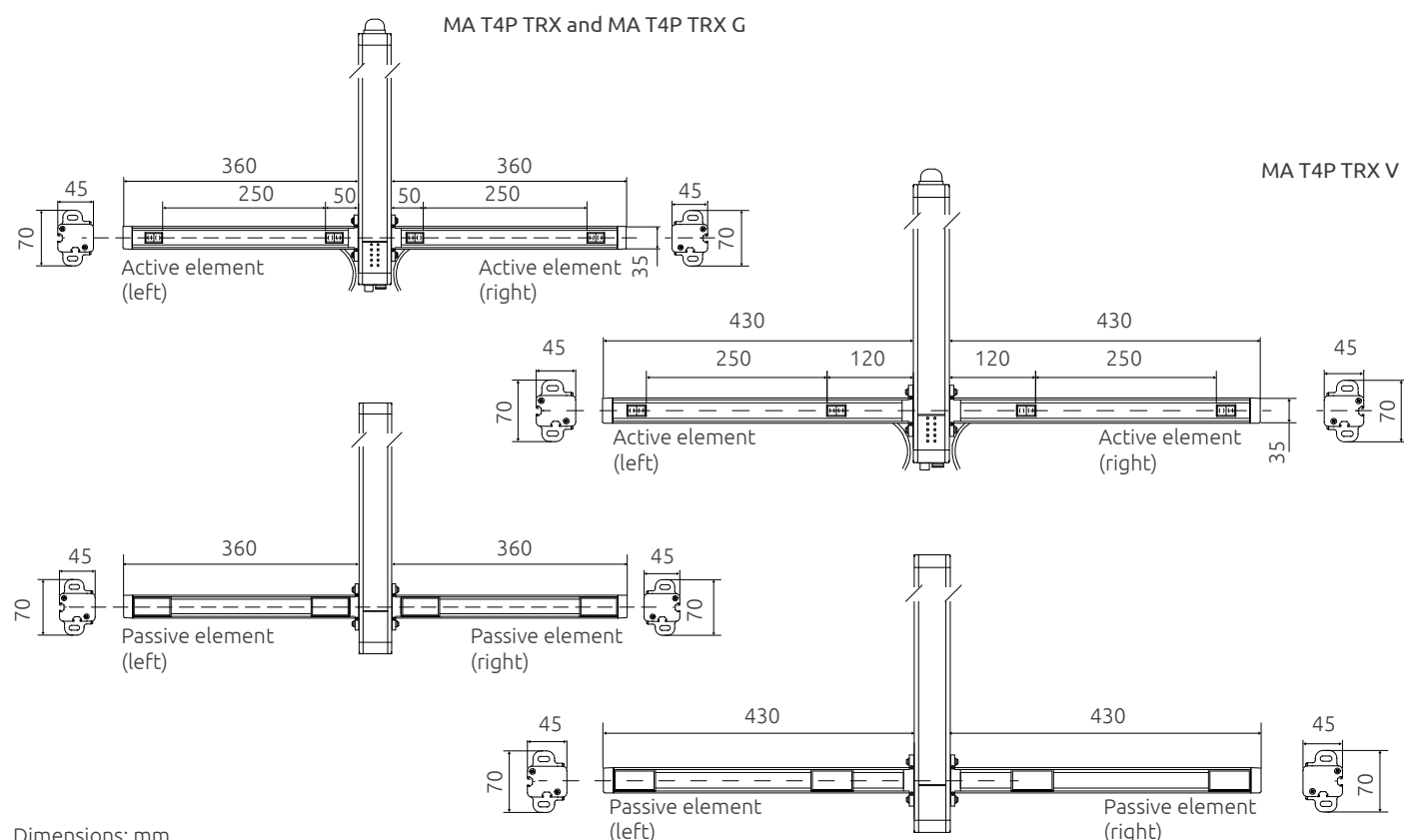| Model	MA T4P TRX MA T4P TRX G (transparent material) MA T4P TRX V (high-speed conveyors) MA T4P TRX VG (high-speed for transparent material)
Part number	MA T4P TRX - 1390805 MA T4P TRX G - 1390814 MA T4P TRX V - 1390807 MA T4P TRX VG - 1390822
Opto-electronic sensors	4 parallel beams
Operative range (m)	0 ... 3,5 (MA T4P TRX) 0 ... 2 (MA T4P TRX G) 0 ... 3,5 (MA T4P TRX V) 0 ... 2 (MA T4P TRX VG)

Special versions

MA T4P TRX G with reduced operative range Muting sensors optimised for a correct and consistent detection of transparent materials (i.e. glass).

MA T4P TRX V model with longer built-in Muting arms for high-speed conveyors.

Color-coded connectors for easy installation.

DIMENSIONS

MA T4P TRX and MA T4P TRX G

MA T4P TRX V

Active element (left)
Active element (right)
Passive element (left)
Passive element (right)

Dimensions: mm

MZ L2XP / H / V

MUTING BRACKETS KIT - L LOGIC WITH CROSSED OR PARALLEL BEAMS
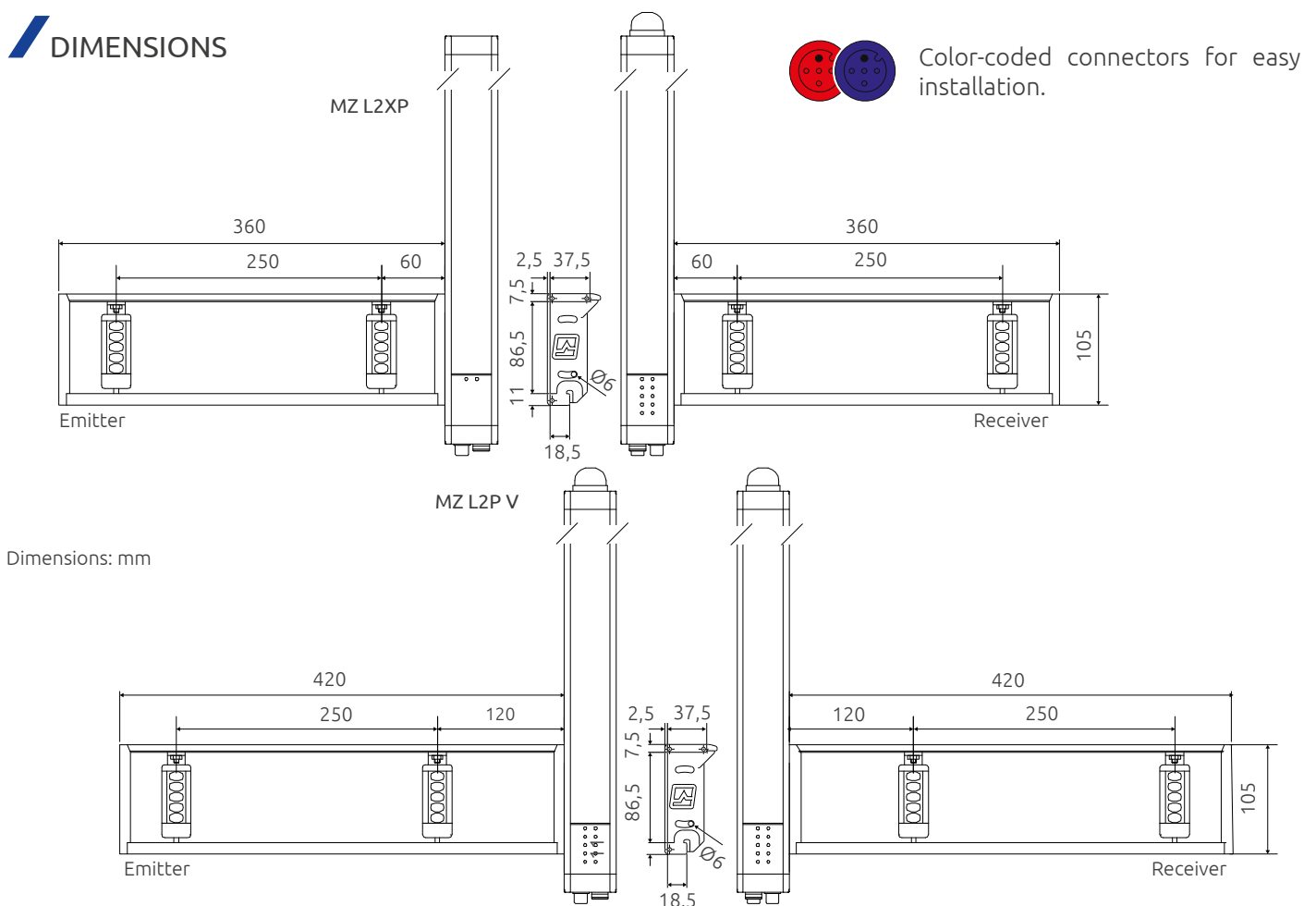
Crossed or parallel beams Muting brackets with 2 M^5 or M^{5}H multi-beam photocells. Can be used in conjunction with Safegate access control barriers to create a one-way access control system with exit-only L-Muting logic.

The kit includes: 2 Muting brackets with 2 M^5 or M^{5}H multi-beam photocells (emitter and receiver), screws and fixing brackets.

Special versions

MZ L2XP V with longer Muting brackets for high-speed conveyors.

TECHNICAL FEATURES

Model	MZ L2XP MZ L2XP H MZ LX2P V (high speed conveyors)
Part number	MZ L2XP - 1390808 MZ L2XP H - 1390823 MZ L2XP V - 1390811
Opto-electronic sensors	MZ L2XP - 2 M^5 crossed or parallel beams MZ L2XP H - 2 M^{5}H crossed or parallel beams MZ LX2P V - 2 M^5 crossed or parallel beams
Operative range (m)	1 ... 3,5 LX; 0 ... 3,5 LP (MZ L2XP and MZ L2XP V) 0 ... 5 (MZ L2XP H)

NOTE

This model defaults in P (parallel beams) configuration. To change to X (crossed beams) configuration, the multi-beam photocells, on one of the brackets, must be reversed and re-oriented accordingly.
To avoid any interference, the two M^5 or M^{5}H multi-beam photocells use different encodings.

DIMENSIONS

Color-coded connectors for easy installation.

MZ L2XP

360
250 60
2,5 37,5
7,5
86,5
11
Ø6
18,5

Emitter

60 250
360
105

Receiver

MZ L2P V

Dimensions: mm

420
250 120
2,5 37,5
7,5
86,5
Ø6
18,5

Emitter

120 250
420
105

Receiver

MZ L2XP TRX / H / G

TRX MUTING BRACKETS KIT - L LOGIC WITH CROSSED OR PARALLEL BEAMS

C3F8 reflectors.
Range up to
3,5 m
MZ L2XP TRX

C8D reflectors.
Range up to
5 m
MZ L2XP TRX H

Crossed or parallel beams Muting brackets with 2 M^{TRX} retro-reflector single-beam photocells. Can be used in conjunction with Safegate access control barriers to create a one-way access control system with exit-only L-Muting logic.

The kit includes: 2 Muting brackets with 2 M^{TRX} retro-reflector single-beam photocells and 2 reflectors, screws and fixing brackets.
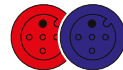
Special versions

MZ L2P TRX G with reduced operative range Muting sensors optimised for a correct and consistent detection of transparent materials (i.e. glass).

TECHNICAL FEATURES

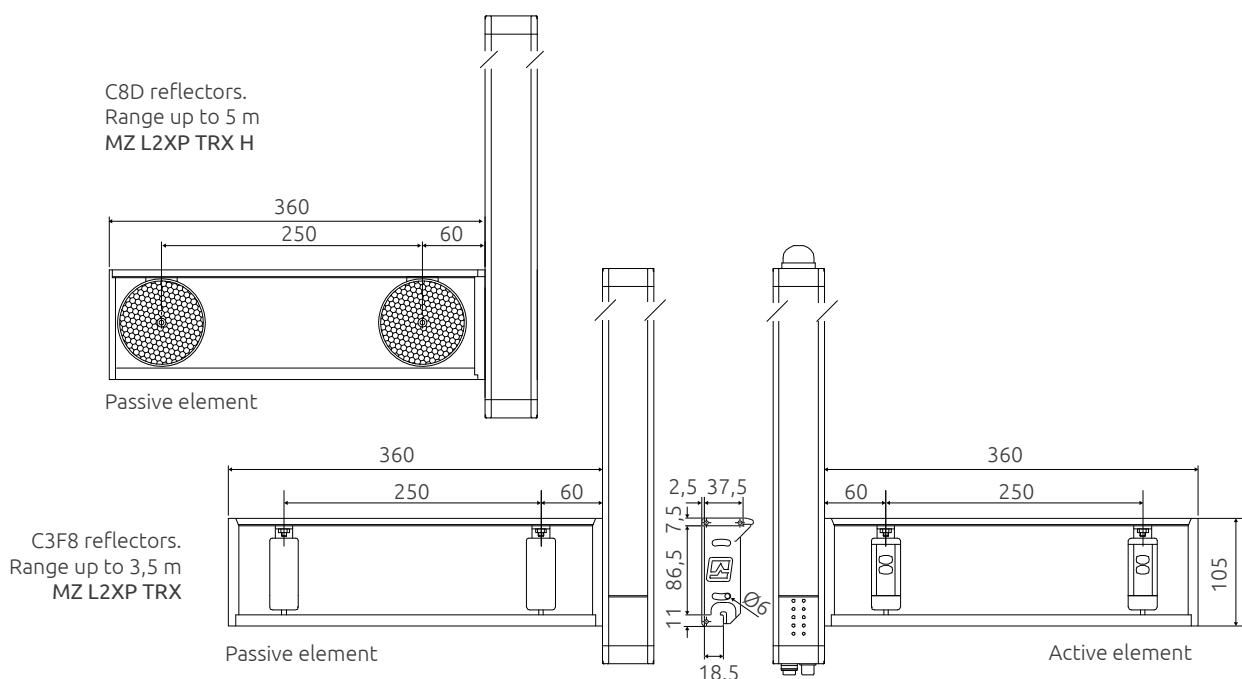| Model	MZ L2XP TRX MZ L2XP TRX H MZ L2P TRX G (transparent material)
Part number	MZ L2XP TRX - 1390815 MZ L2XP TRX H - 1390826 MZ L2XP TRX G - 1390818
Opto-electronic sensors	2 M^{TRX} crossed or parallel beams
Operative range (m)	1 … 3,5 LX; 0 … 3,5 LP (MZ L2XP TRX) 1 … 5 LX; 0 … 5 LP (MZ L2XP TRX H) 1 … 2 LX; 0 … 2 LP (MZ L2XP TRX G)

NOTE

This model defaults in P (parallel beams) configuration. To change to X (crossed beams) configuration, the photocells must be re-oriented.
To avoid any interference, the two M^{TRX} photocells use different encodings.

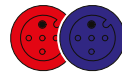Color-coded connectors for easy installation.

DIMENSIONS

C8D reflectors.
Range up to 5 m
MZ L2XP TRX H

360
250   60

Passive element

C3F8 reflectors.
Range up to 3,5 m
MZ L2XP TRX

360
250   60

Passive element

2,5 37,5
86,5 7,5
11
18,5

360
60   250

Active element

105

Dimensions: mm

MZ T2X / H

MUTING BRACKETS KIT - T LOGIC WITH CROSSED BEAMS

TECHNICAL FEATURES

Model	MZ T2X MZ T2X H
Part number	MZ T2X - 1390809 MZ T2X H - 1390824
Opto-electronic sensors	2 M^5 crossed beams 2 M^5H crossed beams
Operative range (m)	1 ... 3,5 (MZ T2X) 1 ... 5 (MZ T2X H)

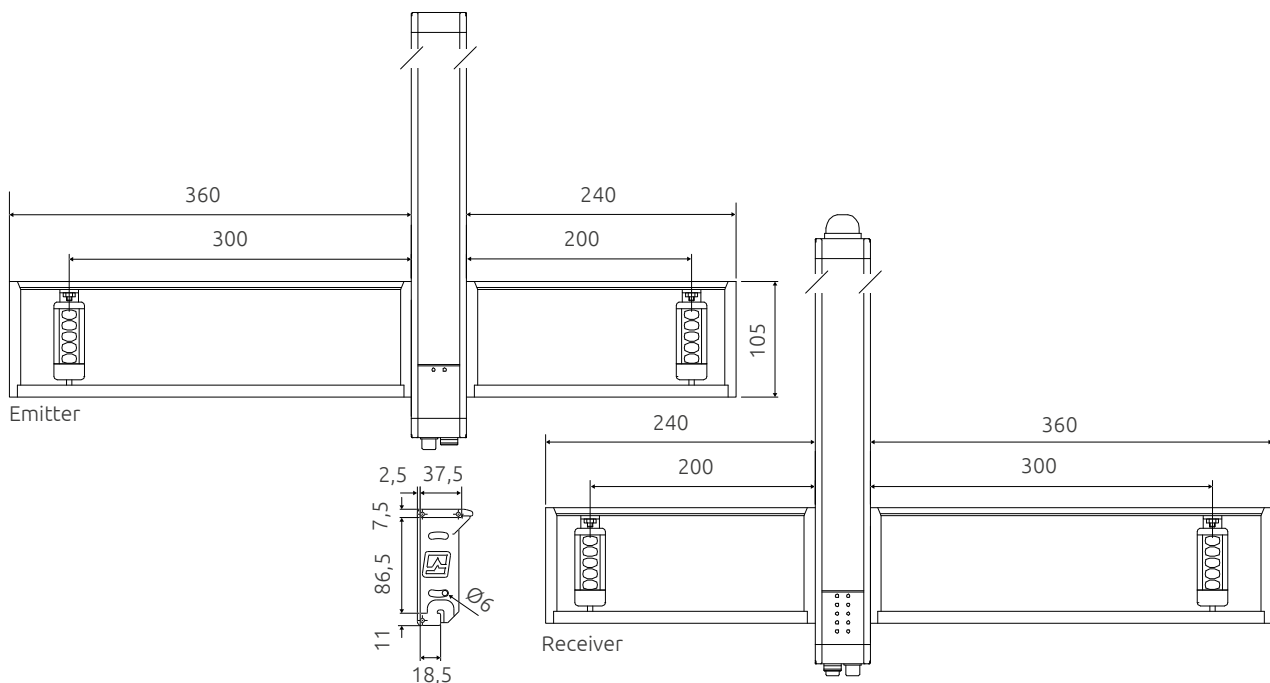Color-coded connectors for easy installation.
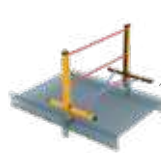
Dangerous area

The long Muting brackets must be installed in the dangerous area.

Crossed beams Muting brackets with 2 M^5 or M^5H multi-beam photocells. Can be used in conjunction with Safe-gate access control barriers to create a two-way access control system with entry-exit T-Muting logic.

The kit includes: 4 Muting brackets with 2 M^5 or M^5H multi-beam photocells (emitter and receiver), screws and fixing brackets.

DIMENSIONS

Emitter

Receiver

360 | 240
300 | 200
105
240 | 360
200 | 300

2,5 37,5
86,5 7,5
11
18,5
Ø6

Dimensions: mm

C3F8 reflectors.
Range up to 3,5 m
MZ T2XP TRX

C8D reflectors.
Range up to 5 m
MZ T2XP TRX H

MZ T2X TRX / H / G

TRX MUTING BRACKETS KIT - T LOGIC WITH CROSSED BEAMS

TECHNICAL FEATURES

Model	MZ T2X TRX MZ T2X TRX G (transparent material)
Part number	MZ T2X TRX - 1390816 MZ T2X TRX H - 1390828 MZ T2X TRX G - 1390819
Opto-electronic sensors	2 M^{TRX} crossed beams
Operative range (m)	1 ... 3,5 (MZ T2X TRX) 1 ... 5 (MZ T2X TRX H) 1 ... 2 (MZ T2X TRX G)

Special versions

MZ T2X TRX G with reduced operating range Muting sensors optimised for a correct and consistent detection of transparent materials (i.e. glass).

Color-coded connectors for easy installation.

Dangerous area.

The long Muting brackets must be installed in the dangerous area.

Crossed beams Muting brackets with 2 M^{TRX} retro-reflector single-beam photocells. Can be used in conjunction with Safegate access control barriers to create a two-way access control system with entry-exit T-Muting logic.
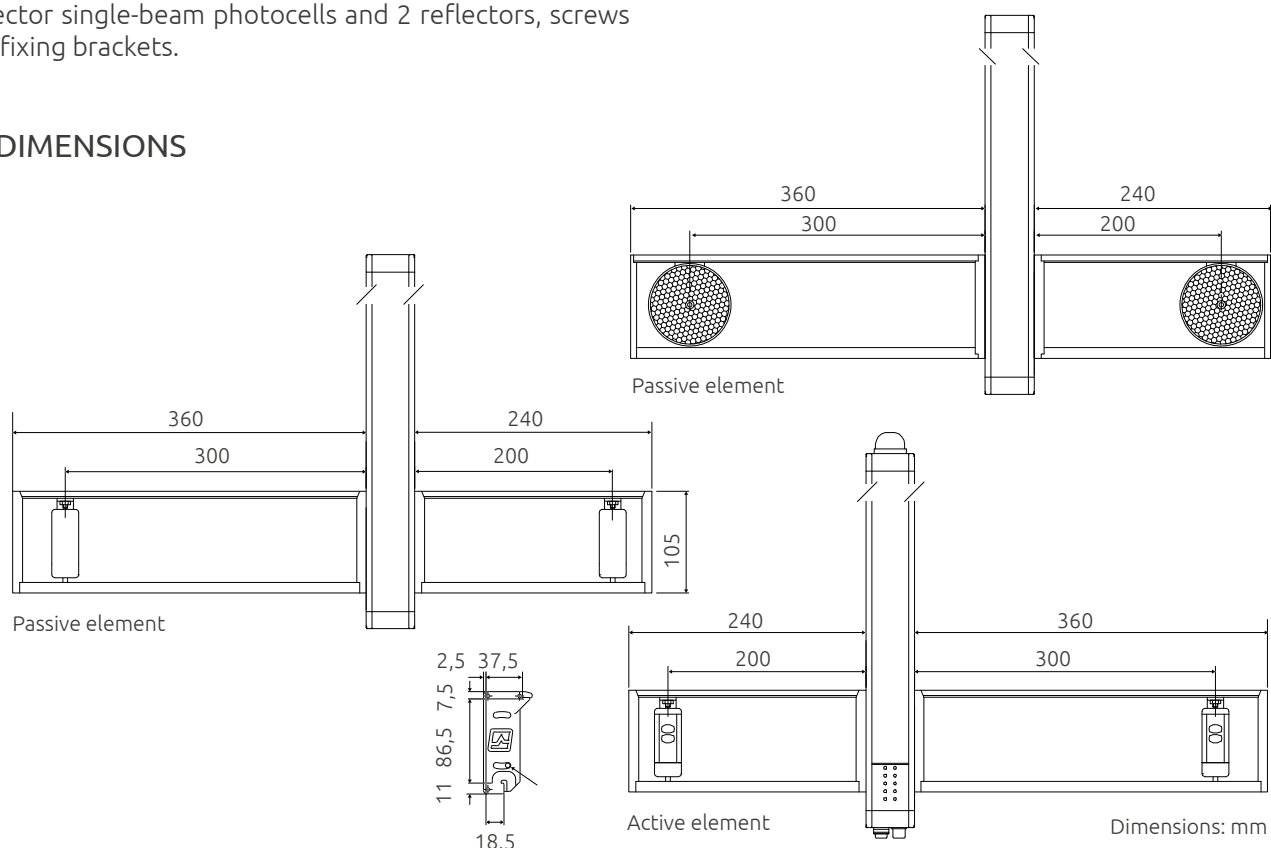
The kit includes: 4 Muting brackets with 2 M^{TRX} retro-reflector single-beam photocells and 2 reflectors, screws and fixing brackets.

DIMENSIONS

Passive element

Active element

Dimensions: mm

MZ T4P / H / V

MUTING BRACKETS KIT - T LOGIC WITH PARALLEL BEAMS

TECHNICAL FEATURES

Model	MZ T4P MZ T4P H MZ T4P V (high speed conveyors)
Part number	MZ T4P - 1390810 MZ T4P H - 1390825 MZ T4P V - 1390812
Opto-electronic sensors	4 M^5 parallel beams 4 M^5H parallel beams
Operative range (m)	0 ... 3,5 (MZ T4P) 0 ... 5 (MZ T4P H)

Parallel beams Muting brackets with 4 M^5 or M^5H multi-beam photocells. Can be used in conjunction with Safe-gate access control barriers to create a two-way access control system with entry-exit T-Muting logic.

The kit includes: 4 Muting brackets with 4 M^5 or M^5H multi-beam photocells (emitter and receiver), screws and fixing brackets.

Special versions

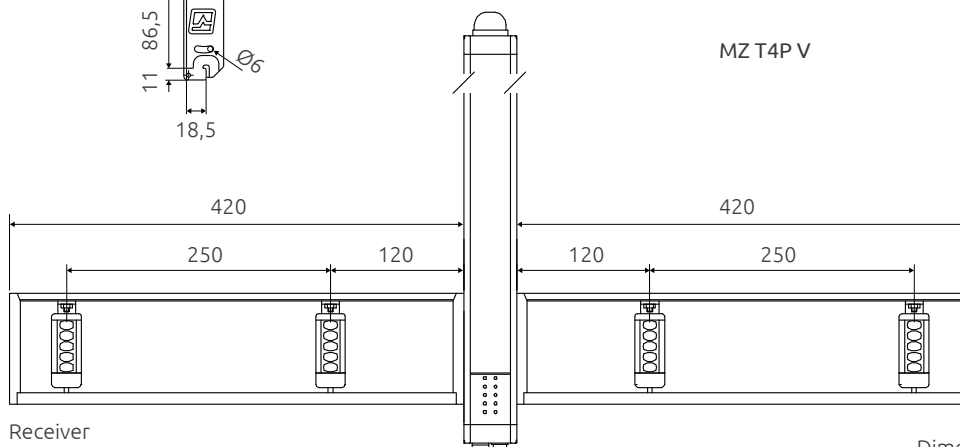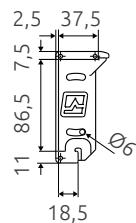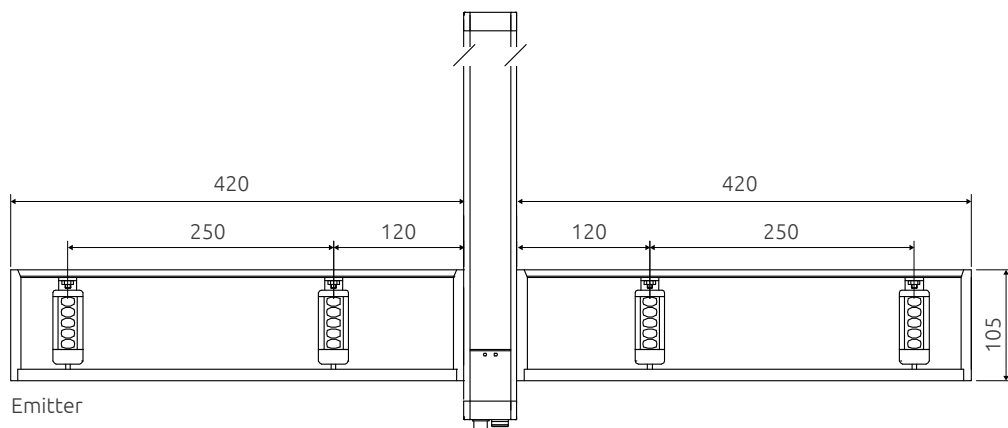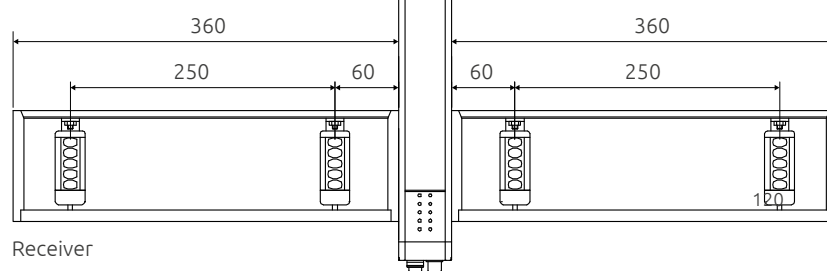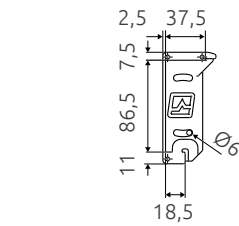**MZ T4P V** with longer Muting brackets for high-speed conveyors.

NOTE

To avoid any interference, the two M^5 multi-beam photo-cells use different encodings.

Color-coded connectors for easy installation.

DIMENSIONS

360
250 **60** **60** **250**
105

Emitter

2,5 **37,5**
7,5
86,5
11
⌀6
18,5

MZ T4P

360
250 **60** **60** **250**
120

Receiver

420
250 **120** **120** **250**
105

Emitter

2,5 **37,5**
7,5
86,5
11
⌀6
18,5

MZ T4P V

420
250 **120** **120** **250**

Receiver

Dimensions: mm

C3F8 reflectors.
Range up to 3,5 m
MZ T4P TRX

C8D reflectors.
Range up to 5 m
MZ T4P TRX H
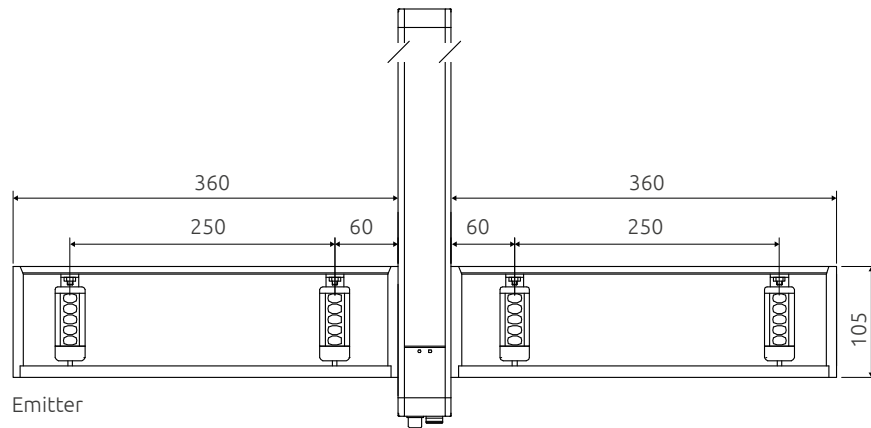
MZ T4P TRX / H / G

TRX MUTING BRACKETS KIT - T LOGIC WITH PARALLEL BEAMS

◢ TECHNICAL FEATURES

Model	MZ T4P TRX MZ T4P TRX H MZ T4P TRX G ((transparent material)
Part number	MZ T4P TRX - 1390817 MZ T4P TRX H - 1390827 MZ T4P TRX G - 1390820
Opto-electronic sensors	4 M^{TRX} parallel beams
Operative range (m)	0 ... 3,5 (MZ T4P TRX) 0 ... 5 (MZ T4P TRX H) 0 ... 2 (MZ T4P TRX G)

Parallel beams Muting brackets with 4 M^{TRX} retro-reflector single beam photocells. Can be used in conjunction with Safegate access control barriers to create a two-way access control system with entry-exit T-Muting logic.

The kit includes: 4 Muting brackets with 4 M^{TRX} retro-reflector single-beam photocells and 4 reflectors, screws and fixing brackets.

Special versions

MZ T4P TRX G with reduced operating range Muting sensors optimised for a correct and consistent detection of transparent materials (i.e. glass).

 Color-coded connectors for easy installation.

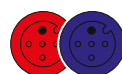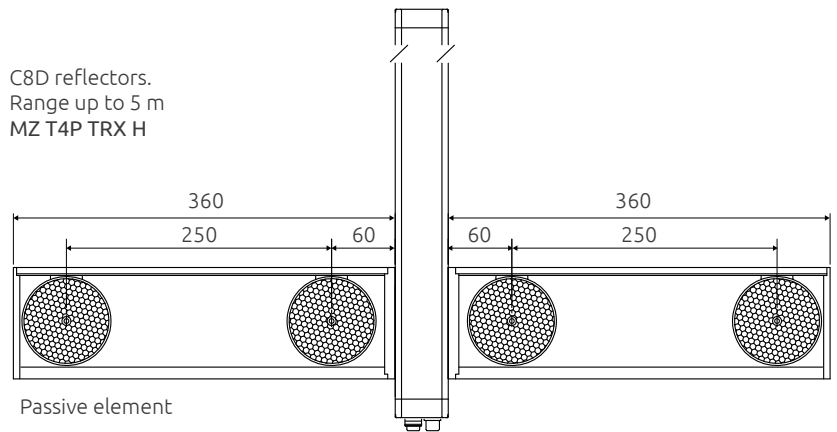## NOTE

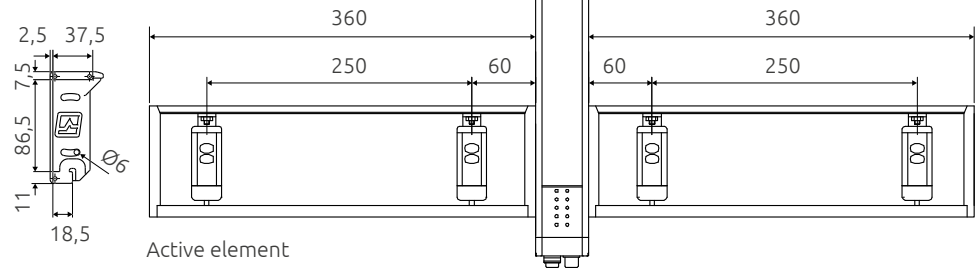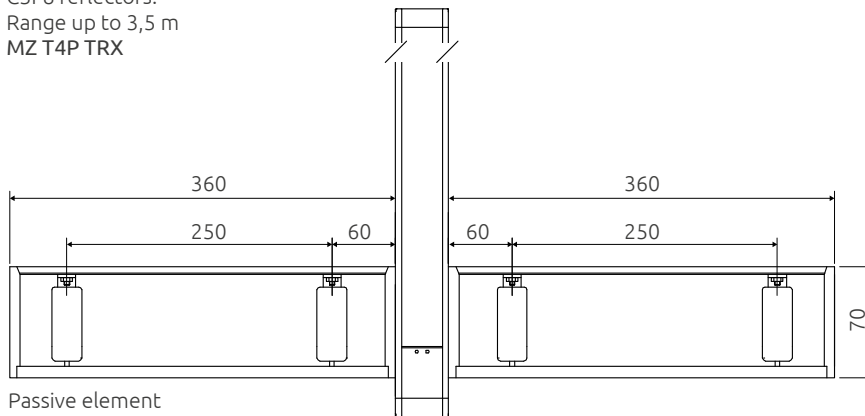*To avoid any interference, the two MTRX photocells use different encodings.*

DIMENSIONS

C8D reflectors.
Range up to 5 m
MZ T4P TRX H

360   360
250   60   60   250

Passive element

C3F8 reflectors.
Range up to 3,5 m
MZ T4P TRX

360   360
250   60   60   250

70

Passive element

2,5   37,5
7,5
86,5
11
Ø6
18,5

360   360
250   60   60   250

Active element

Dimensions: mm

M⁵

MULTI-BEAM PHOTOCELL

Backlit top cover with status LED

Through-beam barrier type photocell with 5 beams.

Ideal for installation as Muting sensor, allows to detect also the most difficoult objects like, for example, piles of pallets.

With a compact metal housing and a polycarbonate protective front window, it offers the right degree of robustness ideal also in the most demanding environments.

The integrated status signaling lamp allows to easily verify the status of the system.

TECHNICAL FEATURES

Operative range (m)	0 … 3,5 (0 … 5 M⁵H models)
Measurement time (ms)	< 100
Power supply (VDC)	24 ± 20%
Power comsumption at 24 VDC (W)	1
Number of beams	5
Beam spacing (mm)	10
Outputs on receiver	0 or 24V (PNP 100 mA 24 VDC) dark-on
Immunity to the ambient light (lx)	> 10000 (solar)
Emission angle	± 5°
Emission wavelenght (nm)	940 (modulated infrared)
Electrical connections	Pigtail cable with M12 5-pole (emitter and receiver)
Fastening	Back slot with L brackets
Dimension h x w x d (mm)	72 x 28 x 30
Cable length (mm)	900

STATUS DISPLAY

	LED	State	Description
Emitter	🟡	ON	Beam emitted
	🟡	OFF	No beam
Receiver	🟢	ON	Controlled area is free
	🔴	ON	Break condition (controlled area is obstucted)
	🔴	Blinking	Fault detect

Operating temperature: -30 … +55 °C

Protection rate: IP65

PART NUMBERS

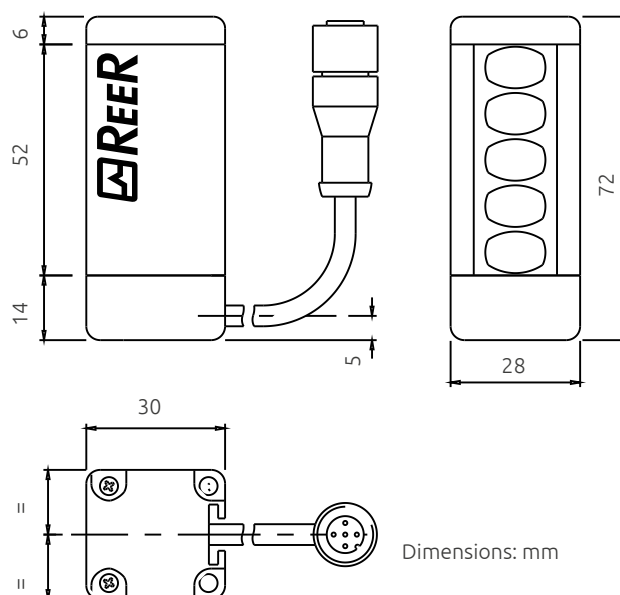M⁵ (A coding): **1250910**   M⁵H (A coding): **1250916**
M⁵ (B coding): **1250911**   M⁵H (B coding): **1250917**

Note: The use of different coding is recommended for the installation of two M⁵ multi-beam photocells next to each other in order to avoid interference.

DIMENSIONS

Dimensions: mm

Backlit top cover with status LED

M^{TRX}

RETRO-REFLECTOR PHOTOCELL

Single-beam retro-reflection photocell, consisting of:

- Active TX/RX
- Reflector (to be ordered separately)

With a compact metal housing and a polycarbonate protective front window, it offers the right degree of robustness ideal also in the most demanding environments.

Two versions are available: M^{TRX} and M^{TRX} GLASS with low scanning range to optimise correct and consistent detection of transparent materials (i.e. glass).

The integrated status signaling lamp allows to easily verify the status of the system.

TECHNICAL FEATURES

Operative range (m) *It varies depending on the model of the reflector*	Reflector	M TRX	M TRX G
	C3F10	0 ... 2,5	0 ... 1,5
	C3F8	0 ... 3,5	0 ... 2
	CD8	0 ... 5	0 ... 3
Measurement time (ms)		65	
Power supply (VDC)		24 ± 20%	
Power coms. at 24 VDC (W)		0,2	
Number of beams		1	
Outputs		0 or 24 VDC (PNP 100 mA dark-on)	
Emission angle		± 5°	
Emission wavelenght (nm)		660 (modulated infrared)	
Electrical connections		Pigtail cable with M12 5-pole	
Fastening		Back slot with L bracket	
Dimension h x w x d (mm)		72 x 28 x 30	
Cable length (mm)		900	

PART NUMBERS

M^{TRX} (A coding): **1250912**   M^{TRX G} (A coding): **1250914**
M^{TRX} (B coding): **1250913**   M^{TRX G} (B coding): **1250915**

NOTE: The use of different coding is recommended for the installation of two M^{TRX} photocells next to each other in order to avoid interference.

Reflectors. See page 40

STATUS DISPLAY

	LED	State	Description
Active element	🟢	ON	Controlled area is free
	🔴	ON	Break condition (controlled area is obstucted)
	🔴	Blinking	Fault detect

DIMENSIONS

Operating temperature: -30 ... +55 °C

Protection rate: IP65

Dimension: mm

CE   RoHS Compliant
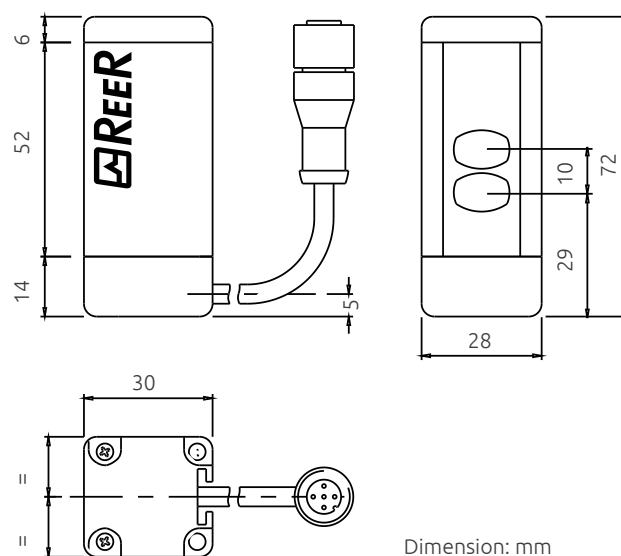
REFLECTOR

Reflector CD8

Ø 4,8

r 430

Ø 84

8
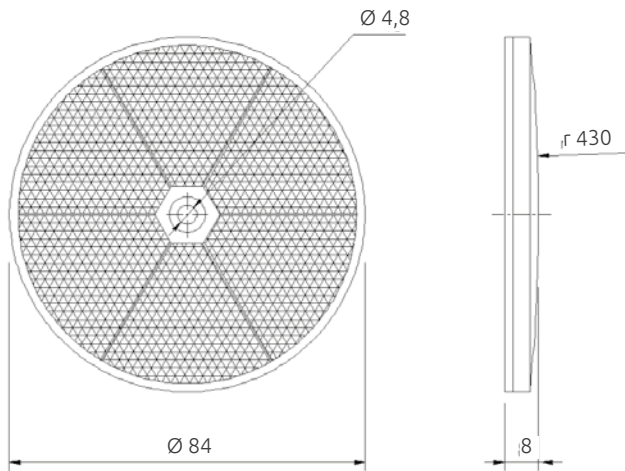
Mounting: with fixing screws (not provided)
Operative range (m): 0 ... 5

Reflector C3F10

30

Ø 3   30

96
106
116
114

7,5
3,3

45°
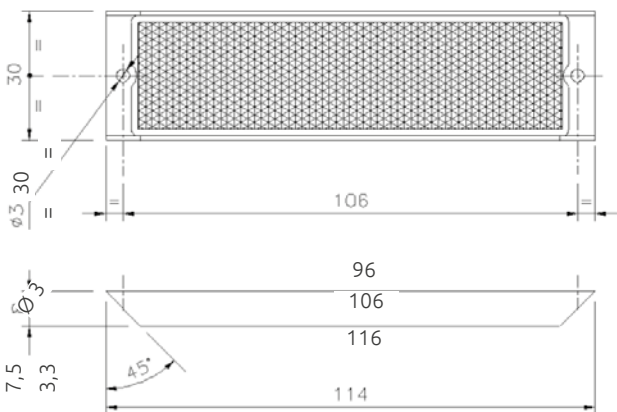
Mounting: with fixing screws (not provided)
Operative range (m): 0 ... 2,5

Reflector C3F8

r 2   23   2

59   79

30   7,2

15
Ø 10

8   r 10
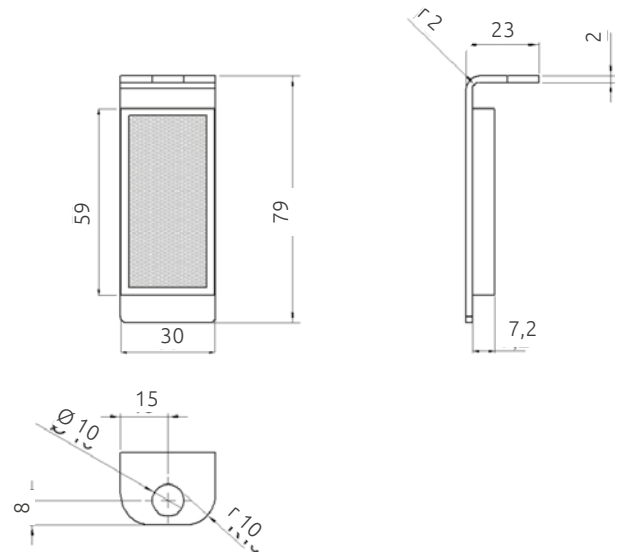
Mounting: with provided brackets
Operative range (m): 0 ... 3,5

PART NUMBERS

Reflector CD8: **1210032**

Reflector C3F8: **1210221**

Reflector C3F10: **1210035**

SFB 4M BRACKETS

BRAKETS FOR PHOTOCELLS M^5 AND M^{TRX}

Set of 4 swivel brackets for MZ SAFEGATE Muting sensor support. For correct fixing of the M^5 and M^{TRX} photocells on the SAFEGATE MZ support

PART NUMBER

SFB 4M brackets: **1250901**

AD SR0 - AD SR0A

SAFETY RELAY MODULES FOR DEVICES WITH INTEGRATED FEEDBACK INPUT FOR EDM

AD SR0 and AD SR0A safety relay modules. Can be connected to Safegate safety light curtains or with any light curtain equipped with feedback input for monitoring external relays (EDM).

- Guided-contact safety relays
- Additional NC contact line for the monitoring by light curtain (EDM)

TECHNICAL FEATURES

Safety relay outputs	**AD SR0** 2 NO + 1 NC - 2 A 250 VAC Each NO safety output line is interrupted twice by the two relays **AD SR0A** 2 NO - 2 A 250 VAC
Response time (ms)	≤ 20
Power supply (VDC)	24 ± 20%
Electrical connections	On terminal block
Operating temperature (°C)	0 ... +55
Protection rating	IP20 for housing IP2X for terminal block
Fastening	DIN rail fastening according to EN 50022-35 standard
Dimensions h x w x d (mm)	101 x 35 x 120

PART NUMBERS

AD SR0 and AD SR0A module includes multi-language instruction manual and CE declaration of conformity.

AD SR0: **1330902**
AD SR0A: **1330903**

Certified by
TÜV Rheinland
Product Safety GmbH

This product uses two guided contact safety relays manufactured by DOLD (type OA or OA 5643 5644) and certified by TUEV Rheinland.

M SGO BOX

M SG and M SGO connection boxes are accessory devices designed for a quick and reliable connection of Safegate light curtains and to provide all major operating controls in the guarded area.

- Lighted button for Start/Restart function with green LED indicating output status
- Key switch controlling the override function
- Pilot lamp indicating Muting function active (M SGO BOX model only)
- Connection to the light curtain via connectors
- Dip switches for configuration of light curtain and Muting functions
- 2 built-in safety relays with guided contacts driven and controlled by the light curtain
- Internal terminal blocks for cable connections
- Electrical connection through cable gland:
  - Power supply
  - Connection to the internal relays output contacts and related EDM signal input
  - External Muting enable and partial Muting signals
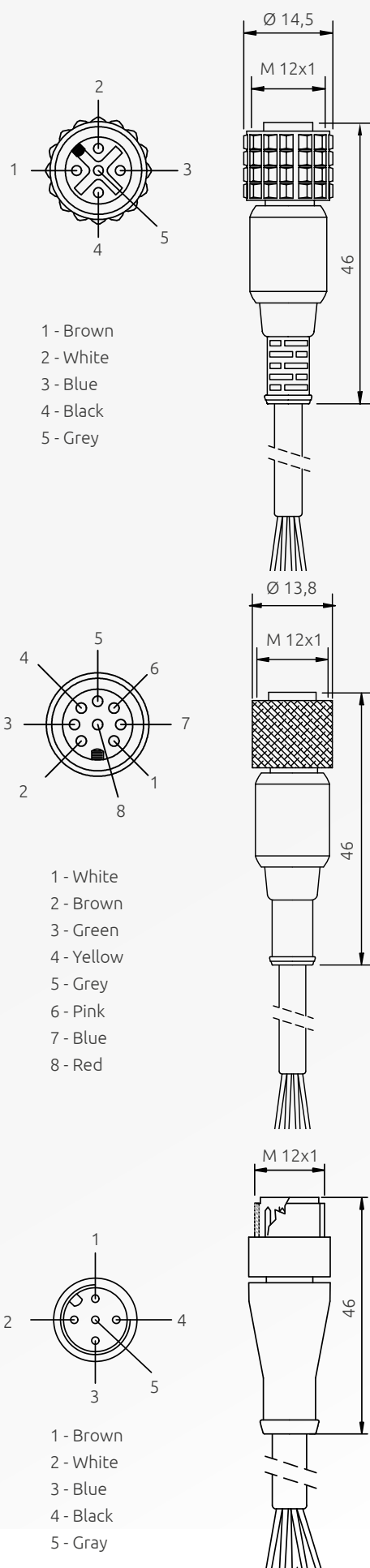 - Light curtains status signal

APPROVALS

- 2014/30/EU: "Electromagnetic Compatibility Directive"
- UL (C+US) mark for USA and Canada

M SG / M SGO BOX

CONNECTION BOX FOR SAFEGATE SAFETY LIGHT CURTAINS

TECHNICAL FEATURES

Model	M SG BOX	M SGO BOX	M SG BOX RST	M SG BOX PLUS	M SGO BOX PLUS	M SG BOX OSSD	M SGO BOX OSSD	M SG BOX RST P
Part number	1390953	1390952	1390959	1390955	1390556	1390957	1390958	1390960
Integrated Muting lamp	no	yes	no	no	yes	no	yes	no
Safety output	Relay 2 NO + 1 NC * 2A - 250 VAC			Relay 4 NO + 1 NC * 2A - 250 VAC		OSSD 2 static PNP 400mA - 24VCC		
Override	yes		no	yes				no
I/O modules connection	no							yes
Start/Restart	yes							
Dimensions h x w x d (mm)	210 x 110 x 95							

* Each NO safety output line is interrupted twice by the integrated relays.

CABLES NEEDED

Model	Connectors	Cables needed	Connectable models
M SG BOX	M12 12-pole for receiver (active TRX element) connection	See page 51 (CFF12Px)	All excepted model S
M SG BOX PLUS			
M SG BOX OSSD	M12 5-pole for emitter connection	See page 50 (CFM5Px)	
M SGO BOX	M12 12-pole for receiver (active TRX element) connection	See page 51 (CFF12Px)	All excepted model S
M SGO BOX PLUS	M12 5-pole for emitter connection	See page 50 (CFM5Px)	
M SGO BOX OSSD	M12 5-pole for Muting lamp connection	See page 50 (CFM5Px)	
M SG BOX RST	M12 8-pole for receiver (active TRX element) connection	See page 52 (CFF8Px)	Model S and S TRX only
	M12 5-pole for emitter connection	See page 50 (CFM5Px)	
M SG BOX RST P	M12 5-pole for active TRX-A element connection	See page 52 (CJBEx)	Model S TRX-A only
	M12 5-pole for I/O module with dedicated industrial bus	See page 50 (CFM5Px)	

M SG BOX

M SG BOX RST

CDx

M12 FEMALE STRAIGHT CONNECTOR 5-POLE

Ø 14,5

M 12x1

46

1 - Brown
2 - White
3 - Blue
4 - Black
5 - Grey

Model	Part number	Description
CD5	1330950	Pre-wired cable 5 m
CD10	1330956	Pre-wired cable 10 m
CD15	1330952	Pre-wired cable 15 m
CD20	1330957	Pre-wired cable 20 m
CD25	1330949	Pre-wired cable 25 m
CD50	1330965	Pre-wired cable 50 m

Emitter connection

C8Dx

M12 FEMALE STRAIGHT CONNECTOR 8-POLE

Ø 13,8

M 12x1

46

1 - White
2 - Brown
3 - Green
4 - Yellow
5 - Grey
6 - Pink
7 - Blue
8 - Red

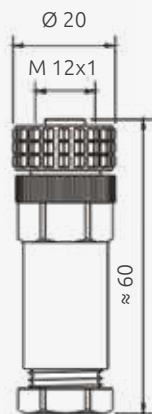| Model	Part number	Description
C8D5	1330980	Pre-wired cable 5 m
C8D10	1330981	Pre-wired cable 10 m
C8D15	1330982	Pre-wired cable 15 m
C8D25	1330967	Pre-wired cable 25 m
C8D40	1330966	Pre-wired cable 40 m

S versions receiver connection

CJSx

M12 MALE STRAIGHT CONNECTOR 5-POLE

M 12x1

46

1 - Brown
2 - White
3 - Blue
4 - Black
5 - Gray

Model	Part number	Description
CJS1	1390915	Pre-wired cable 1 m
CJS3	1390916	Pre-wired cable 3 m

External Muting lamp

External photocells connection

CABLES

CDM9

M12 FEMALE STRAIGHT CONNECTOR 5-POLE SCREW TERMINAL, PG9 CABLE GLAND

Model	Part number
CDM9	1330954

Emitter connection
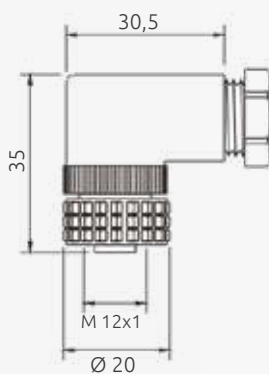
CDM99

M12 FEMALE 90° ANGLE CONNECTOR 5-POLE SCREW TERMINAL, PG9 CABLE GLAND
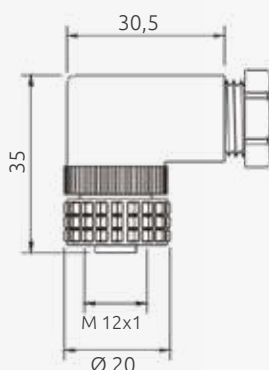
Model	Part number
CDM99	1330955

Emitter connection
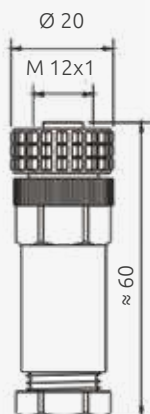
C8DM9

M12 FEMALE STRAIGHT CONNECTOR 8-POLE SCREW TERMINAL, PG9 CABLE GLAND

Model	Part number
C8DM9	1330986

S versions receiver connection

C8DM99

M12 FEMALE 90° ANGLE CONNECTOR 8-POLE SCREW TERMINAL, PG9 CABLE GLAND

Model	Part number
C8DM99	1330987

S versions receiver connection
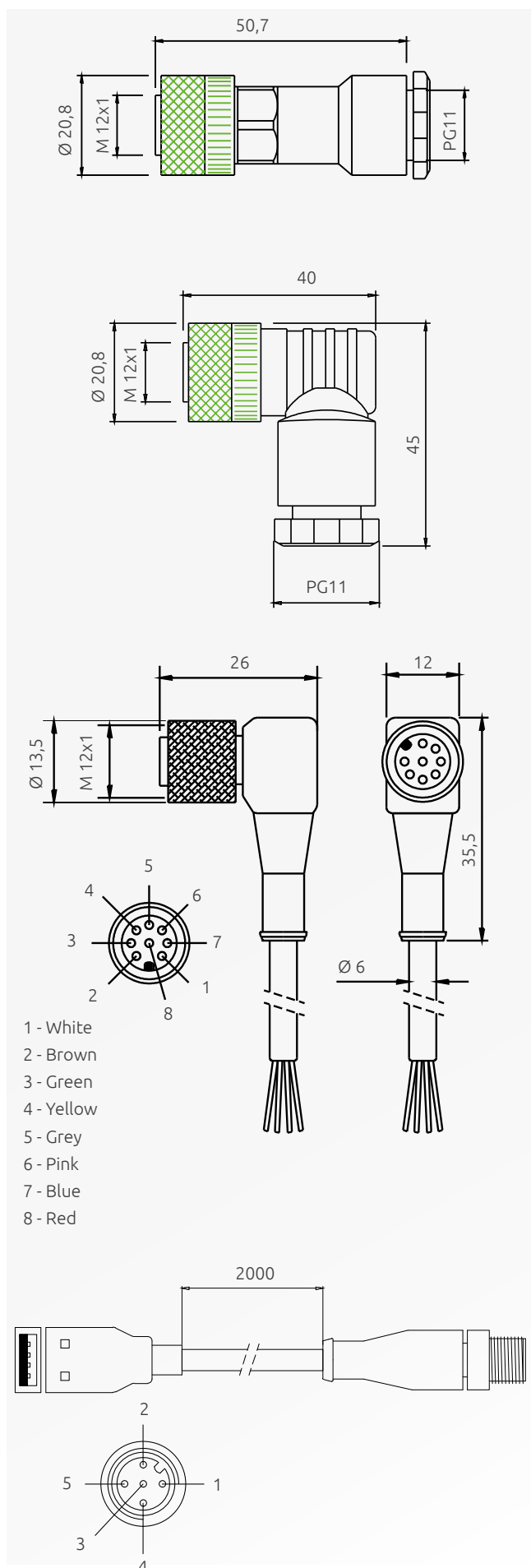
C8DM11

M12 FEMALE STRAIGHT CONNECTOR 8-POLE SCREW TERMINAL, PG11 CABLE GLAND

Model	Part number	
C8DM11	1330978	S versions receiver connection

C8DM911

M12 FEMALE 90° ANGLE CONNECTOR 8-POLE SCREW TERMINAL, PG11 CABLE GLAND

Model	Part number	
C8DM911	1330979	S versions receiver connection

C8D9x

M12 FEMALE 90° ANGLE CONNECTOR 8-POLE

Model	Part number	Description
C8D95	1330983	Pre-wired cable 5 m
C8D910	1330984	Pre-wired cable 10 m
C8D915	1330985	Pre-wired cable 15 m

S versions receiver connection

1 - White
2 - Brown
3 - Green
4 - Yellow
5 - Grey
6 - Pink
7 - Blue
8 - Red

CS12USB

USB-M12 5-POLE ADAPTER

Model	Part number
CS12USB	1390905

SMPO light curtains programming cable
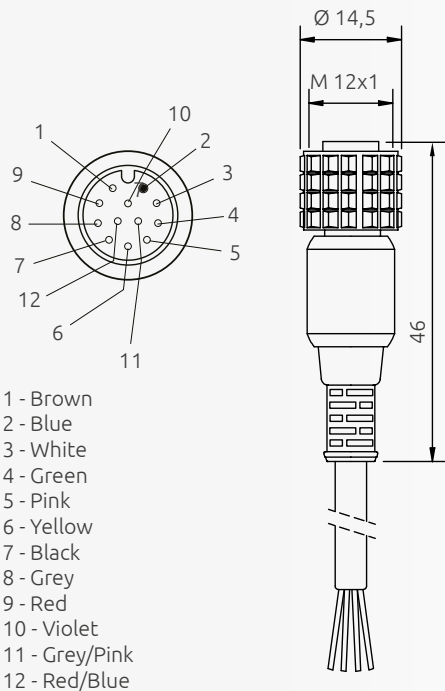
CS12Dx

M12 FEMALE STRAIGHT CONNECTOR 12-POLE

1 - Brown
2 - Blue
3 - White
4 - Green
5 - Pink
6 - Yellow
7 - Black
8 - Grey
9 - Red
10 - Violet
11 - Grey/Pink
12 - Red/Blue

Model	Part number	Description
CS12D3	1390900	Pre-wired cable 3 m
CS12D5	1390901	Pre-wired cable 5 m
CS12D10	1390902	Pre-wired cable 10 m
CS12D15	1390906	Pre-wired cable 15 m
CS12D20	1390907	Pre-wired cable 20 m

SM, SMO, SMPO receiver connection
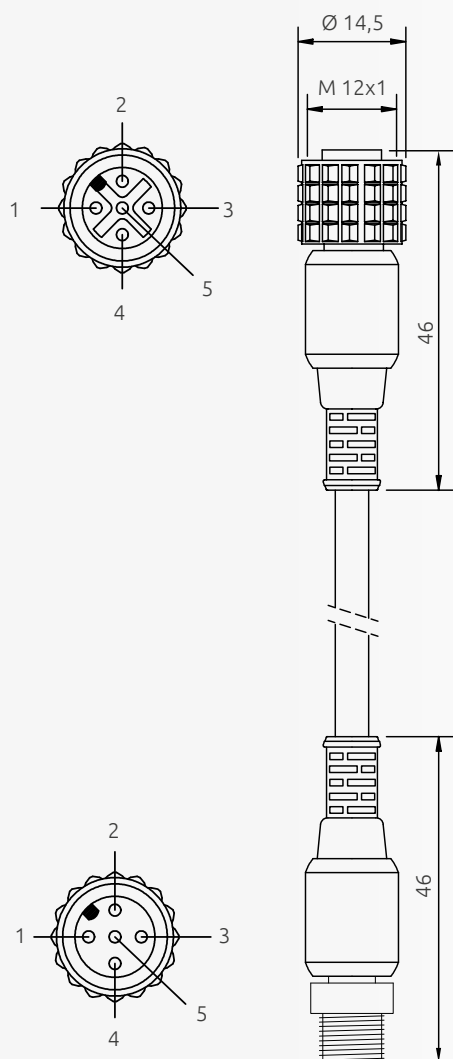
CFM5Px

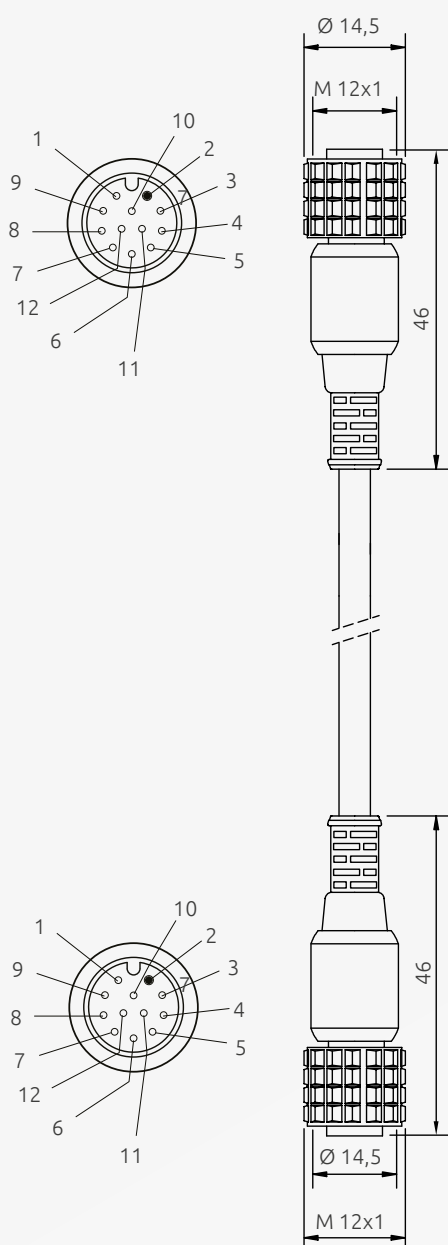### CABLE WITH 2 M12 5-POLE MALE/ FEMALE STRAIGHT CONNECTORS

Model	Part number	Description
CFM5P3	1390908	Pre-wired cable 3 m
CFM5P5	1390909	Pre-wired cable 5 m
CFM5P10	1390911	Pre-wired cable 10 m

Connection between:

Safegate emitter and boxes: M SG, M SGO, M SG PLUS, M SGO PLUS, M SG OSSD, M SGO OSSD

Auxiliary Muting lamp connector and boxes: M SGO, M SGO PLUS, M SGO OSSD

Profisafe I/O modules and box: M SG RST P

CFF12Px

CABLE WITH 2 M12 12-POLE FEMALE STRAIGHT CONNECTORS

Model	Part number	Description
CFF12P3	1390912	Pre-wired cable 3 m
CFF12P5	1390913	Pre-wired cable 5 m
CFF12P10	1390914	Pre-wired cable 10 m

Connection between Safegate reciver or active element (TRX versions) main connector and boxes: M SG, M SGO, M SG PLUS, M SGO PLUS, M SG OSSD, M SGO OSSD
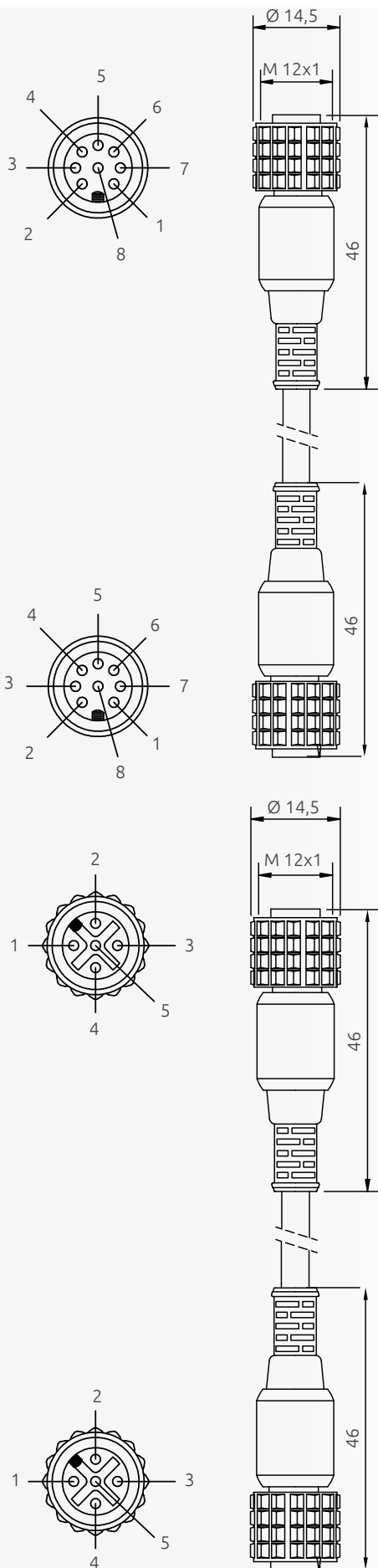
CFF8Px

CABLE WITH 2 M12 8-POLE FEMALE STRAIGHT CONNECTORS

| Model	Part number	Description
CFF8P3	1390918	Pre-wired cable 3 m
CFF8P5	1390919	Pre-wired cable 5 m
CFF8P10	1390920	Pre-wired cable 10 m

Connection between Safegate reciver or active element (TRX versions) main connector and boxes: M SG RST

CJBEx

CABLE WITH 2 M12 5 POLE FEMALE STRAIGHT CONNECTORS

Model	Part number	Description
CJBE3	1360960	Pre-wired cable 3 m
CJBE5	1360961	Pre-wired cable 5 m
CJBE10	1360962	Pre-wired cable 10 m

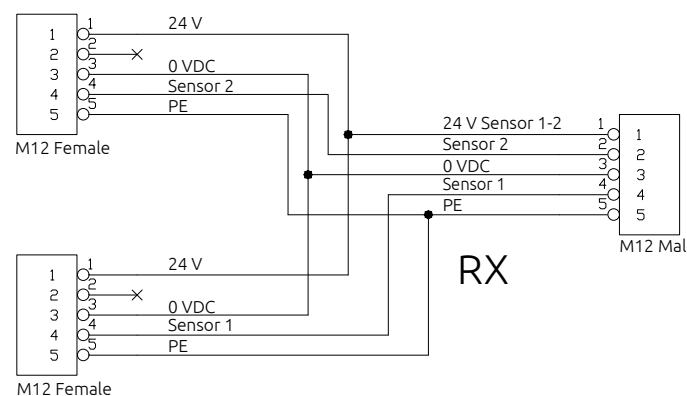Connection between Safegate active element (TRX-A versions) main connector and boxes: M SG RST P
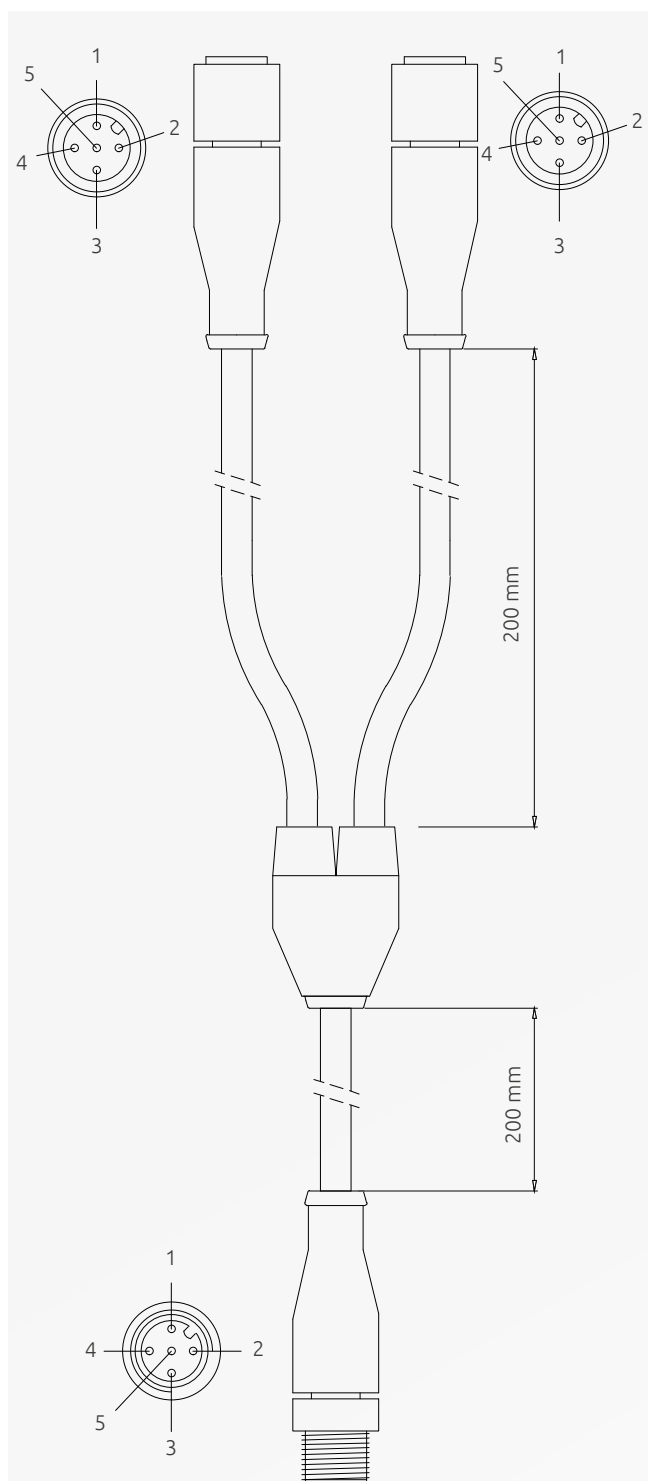
CSY12RX

M12 5-POLE Y-SPLITTER FOR THE CONNECTION OF 4 MUTING SENSORS RECEIVER / ACTIVE ELEMENT (TRX)

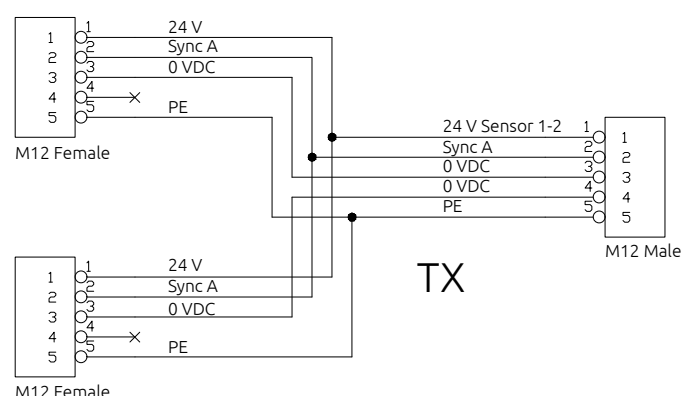| Model	Part number
CSY12RX	1390904

RX

CSY12TX

M12 5-POLE Y-SPLITTER FOR THE CONNECTION OF 4 MUTING SENSORS EMITTER

Model	Part number
CSY12TX	1390903

TX

Y-splitter for MZ T4P Muting sensors models up to November* 2020

NOTE: Starting from November* 2020 the MZ T4P Muting sensors model are supplied with pre-wired cable and use of Y-splitter cables is no longer necessary.

*Check with ReeR

> MA Muting arms
> and
> MZ Muting brackets
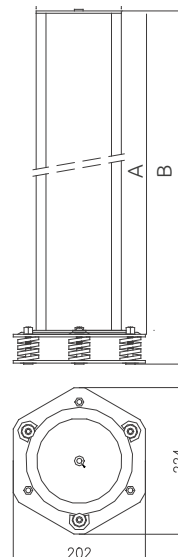> can be mounted
> directly to the column

Support columns for Safegate safety light curtains, designed to provide secure fastening to the floor, fast installation, and a simple and precise adjustment of the optical alignment of the system.

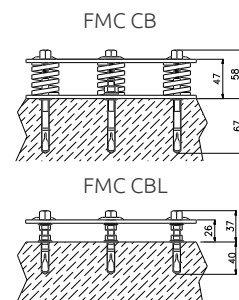Steel base with spring system for a perfect adjustment of the column vertical axis.

Made by aluminium extrusion poles, with adjustable angular orientation. Easy assembling and disassembling of the light curtain with easy adjustment of the first beam's height.
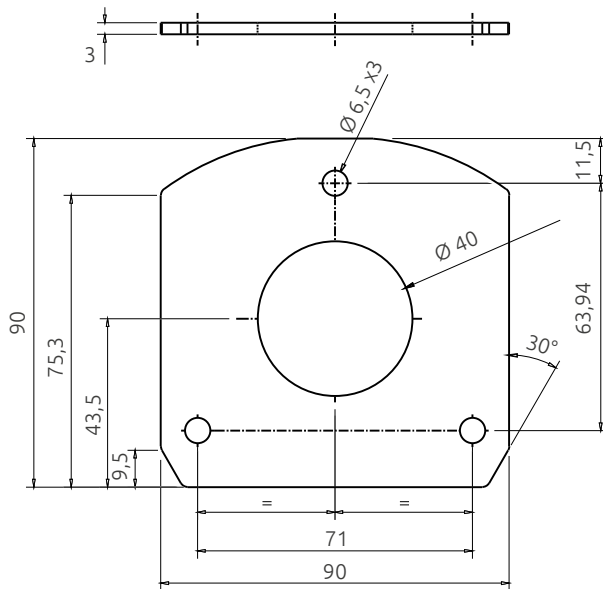
Allow the installation of the MA Muting arms or MZ Muting brackets to the column itself.

FMC SG BR Models complete with PG11 rear union for light curtain cable sheath.

Built-in spirit level for a correct positioning of the vertical axis on the upper cover of the column.

PG11 rear union
FMC EBR models

FMC SG

FLOOR-MOUNTED SUPPORT COLUMNS

PART NUMBERS

Columns*

Model	FMC SGB2	FMC SGB3	FMC SGB4	FMC SG1700	FMC SG2000
Part number	1200700	1200701	1200702	1200703	1200704
Model with PG11 rear union for cable sheath	FMC SGB2 R	FMC SGB3 R	FMC SGB4 R	FMC SG1700 R	FMC SG2000 R
Part number	1200705	1200706	1200707	1200708	1200709
A - Height (mm)	1000	1200	1330	1670	1970
B - Overall height with FMC CB base (mm)	1055	1255	1385	1725	2025
B - Overall height with FMC CBL base (mm)	1037	1237	1367	1707	2007
For light curtains with:	2 beams	3 beams	4 beams	Controlled height up to 1360 mm	Controlled height up to 1660 mm

Bases for columns*

Model	FMC CB	FMC CBL
Part number	1200500	1200501
Description	Base for column	Base for column with reduced height
Height (mm)	55	37

Steel foundation inserts included with the product.

*Note for ordering

Column Part number do not include the base which must be ordered separately (FMC CB and FMC CBL models).

A: column height
B: column height with base FMC CB or FMC CBL

FMC CB

FMC CBL

FMC SG CAP-O

UPPER COVER WITH CENTRAL HOLE FOR MUTING LAMP

An upper cover without spirit level is available as an accessory. The central hole allows the light curtain to move upwards making the Status / Muting lamp visible.

Part number: **1390954**

NOTE: The upward movement of the light curtains must respect the standards. (distances and beams positioning).

POSITIONING OF THE LIGHT CURTAINS

The following table shows the correct position of the light curtain (distance between the first beam and ground):

Column model	H, distance between first beam and ground (mm)
FMC-SGB2 FMC-SGB2R	≤ 400 mm
FMC-SGB3 FMC-SGB3R FMC-SGB4 FMC-SGB4R FMC-SG1700 FMC-SG1700R FMC-SG2000 FMC-SG2000R	≤ 300 mm

MA Muting arms or MZ Muting brackets can be mounted directly to the column

FMC S

FMC SB

FMC CB

FMC S / FMC SB

COLUMNS WITH DEFLECTING MIRRORS

PART NUMBERS

Model	FMC S2	FMC S3	FMC S4	FMC S 1700	FMC S 2000
Part number	1200620	1200621	1200622	1200625	1200623
Description	Single mirror for 2 beams and controlled height up to 700 mm light curtains	Single mirror for 3 beams and controlled height up to 900 mm light curtains	Single mirror for 4 beams and controlled height up to 900 mm light curtains	Single mirror for controlled height up to 1360 mm	Single mirror for controlled height up to 1660 mm
A - Height (mm)	1000	1200	1330	1670	1970
B - Overall height with FMC CB base (mm)	1055	1255	1385	1725	2025
B - Overall height with FMC CBL base (mm)	1037	1237	1367	1707	2007

Model	FMC SB2	FMC SB3	FMC SB4
Part number	1200645	1200646	1200647
Description	2 mirrors for 2 beams light curtains	3 mirrors for 3 beams light curtains	4 mirrors for 4 beams light curtains
A - Height (mm)	1000	1200	1330
B - Overall height with FMC CB base (mm)	1055	1255	1385
B - Overall height with FMC CBL base (mm)	1037	1237	1367

Note for ordering

Column Part number do not include the base which must be ordered separately (FMC CB and FMC CBL models). See page 48 "Bases for columns"
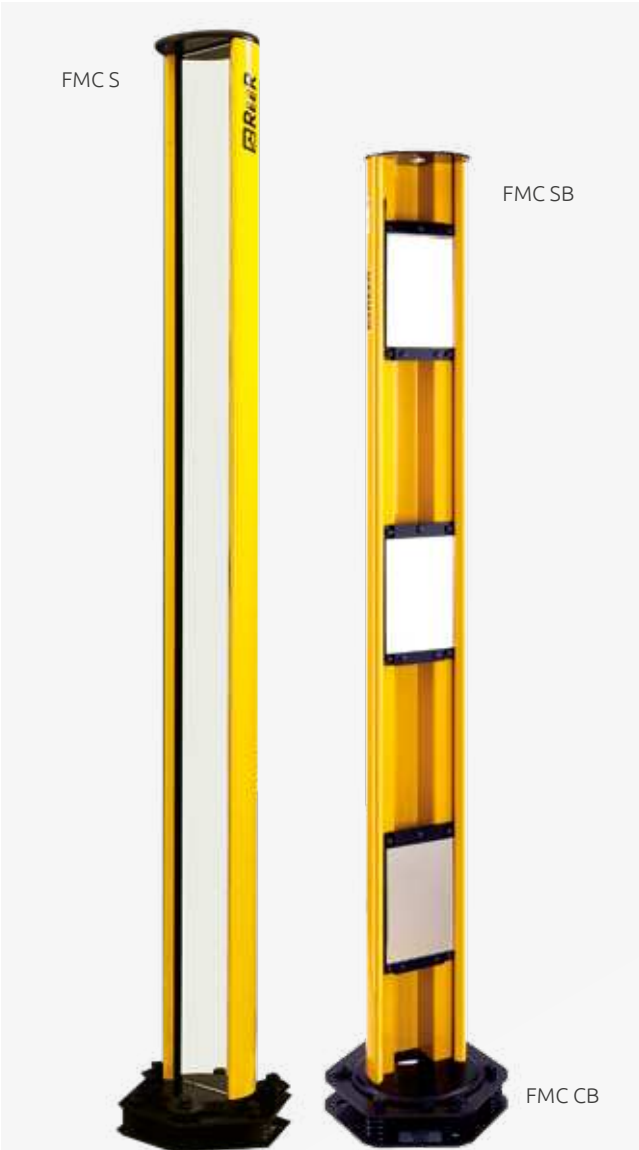
Support columns with deflecting mirrors, designed to provide secure fastening to the floor, fast installation, and a simple and precise adjustment of the optical alignment of the system.
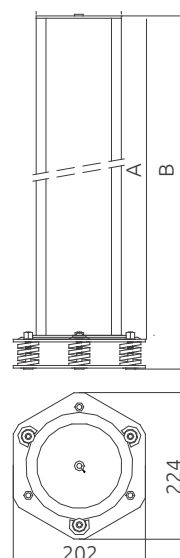
FMC S models with pre-assembled deflecting mirrors, allow perimeter protections of up to 4 sides.

FMC SB models with pre-installed independent adjustable deflecting mirrors for safety light grids with 2, 3 and 4 beams. For applications with multiple sides and/or with a large protected perimeter is recomended the use of this models.
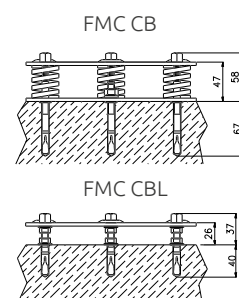
Optical power reduction factor: 15% for each mirror.

Special models equipped with mirror with protective anti-fragmentation film available on request.

NOTE: for more information on how to chose mirrors, please refers to ReeR website, section "Light Curtains - Applications".

A: column height
B: column height with base FMC CB or FMC CBL

FMC CB

FMC CBL

ACCESSORIES

SP
DEFLECTING MIRRORS

TECHNICAL FEATURES

Material	Extruded aluminium
Mirror pre-fitted with heights (mm)	250 ... 1900
Angular orientation	Adjustable using supplied brackets
Optical power reduction factor	15% (for each mirror)
Protective anti-fragmentation film	Available on request

PART NUMBERS

Model	Part number	Height H in picture (mm)	For light curtains with protected height (mm)	For light grids with:
SP 300 S	1201806	400	310	
SP 400 S	1201801	540	460	
SP 600 S	1201811	715	610	2 beams
SP 700 S	1201802	885	760	
SP 900 S	1201812	1065	910	3 beams
SP 1100 S	1201803	1230	1060	4 beams
SP 1200 S	1201810	1400	1210	
SP 1300 S	1201807	1450	1360	
SP 1500 S	1201808	1600	1510	
SP 1600 S	1201813	1750	1660	
SP 1800 S	1201809	1900	1810	

The SP deflecting mirrors allow to create perimeter protection of areas with access points on multiple sides, with a considerable reduction of costs.

This solution eliminates the need to use more than one safety light curtain. Can be used to create perimeter protection of up to 4 sides.
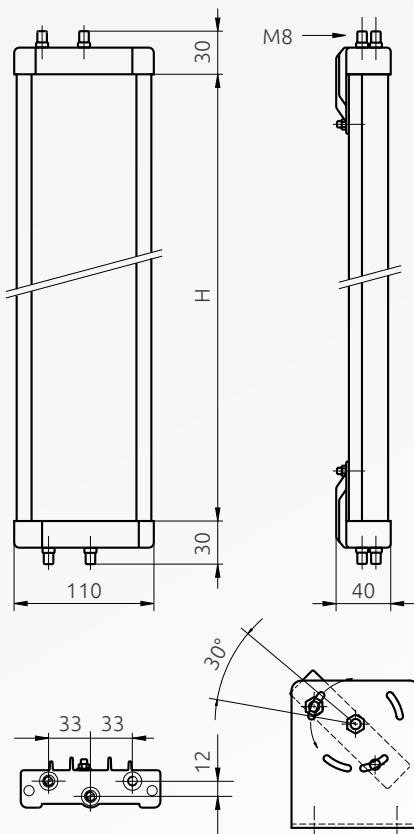
The following rules should be taken into consideration when using deflecting mirrors:

- Total working distance (range) given by the sum of the lengths of all sides giving access to the protected area
- Each mirror used will decrease the maximum working range between the Emitter and the Receiver by 15%
- In order to ensure compliance mirrors must be placed at the minimum safety distance on each side from the danger zone
- The use of the LAD laser alignement device is recomended for a quick and reliable alignment of the system expecially when using longer range light curtains or grids

NOTE: for more information on how to chose mirrors, please refers to ReeR website, section "Light Curtains - Applications".

The SFB swivel brackets allow the rotation of the light curtain around its longitudinal axis, as well as the adjustment of its vertical and horizontal position.

The use of swivel brackets is recommended to align light curtains in long range applications or when deflecting mirrors are used and mild adjustment is necessary.

The test rod is an opaque cylinder to test the light curtain checking that no beams are bypassed due to the presence of reflecting surfaces.

The test is carried out by slowly moving the test rod (Ø = Resolution of the light curtain) in the centre and then along each side of the protected area. During this procedure the Green LED on the Receiver must always remain switched off.

LAD 5 laser alignment device allows a fast and reliable optical alignment of SAFEGATE safety light curtains; also compatible with the use of the FMC floor mounting columns.

LAD 5 devices emit a laser beam with visible red light with useful range up to 100 m.

The use is recommended for aligning light curtains that operate over long distances or multiple sides with the use of deflecting mirrors.
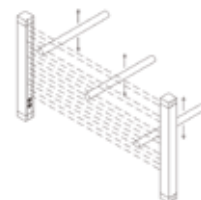
SFB SG
ADJUSTABLE BRACKETS

/ PARTS NUMBERS

Model	Part number	Description
SFB 4SG	1390950	Set of 4 adjustable brackets for protected heights up to 1050 mm
SFB 6SG	1390951	Set of 6 adjustable brackets for protected heights from 1200 mm

TR
TEST RODS

/ PART NUMBERS

Model	Part number	Diameter
TR 14	1330960	ø 14 mm
TR 30	1330962	ø 30 mm
TR 40	1330963	ø 40 mm

LAD 5
LASER ALIGNMENT DEVICE

/ TECHNICAL FEATURES

Light source	Laser diode – wavelength 650 nm
Class light source	II – EN 60825-1
Range (m)	100
Beam divergence (mrd)	< 0,5
Max. power (mW)	1
Power supply (VDC)	3 (2 AAA batteries)
Fastening	Quick fastening to the light curtains
Dimensions h x w x d (mm)	117 x 55,68 x 72

/ PART NUMBERS

LAD 5: **1390940**

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