Safety Light Grid
Orion3 Extended

Orion3 Extended is a sturdy light grid for access protection in muting applications.

Only one of the units needs power supply, since both transmitter and receiver are in the same active unit. The other unit is a passive unit containing mirrors to reflect the beams.

With 2-4 beams and an operating range of up to 8 m, it is intended for body detection.

Cost effective solution

Integrated muting function
Muting sensors are connected directly to the light grid, with no need for a remote muting module.

Minimized cabling
A local reset button can be connected directly to the light grid, eliminating the need for cable between the reset button and the electrical cabinet or for an extra control module.

External device monitoring
Each light grid can monitor the actuators without any extra control module (EDM function).

Easy to install

Alignment help
Alignment help and a wide angle within the limits of a Type 4 device facilitate installation.

Easy adjustment
Rotation brackets makes alignment easy.

Fast connection
M12 connectors speed up cabling.

Less cabling
Only the active part needs connecting.

Continuous operation

Visible alignment level
Since the alignment level is displayed, the alignment can be improved before the occurrence of an unwanted stop.

Extensive error indication
Extensive error indication reduces troubleshooting time.

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ABB

Applications and features
## Orion3 Extended

Application

Muting

Orion3 Extended is intended for muting applications. By connecting muting sensors to the light guard, it can distinguish material from persons and allow the material to pass through an opening but not persons. Muting sensors and a connection box for muting are available to simplify the muting application.
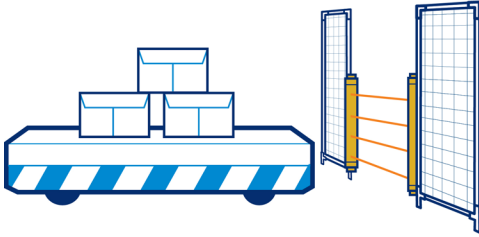
Features

Power on one side

Both transmitter and receiver are in one active unit, and the other unit is a passive unit with mirrors. This simplifies installation and saves cables, making it easier to place in applications where cables needs to be avoided.
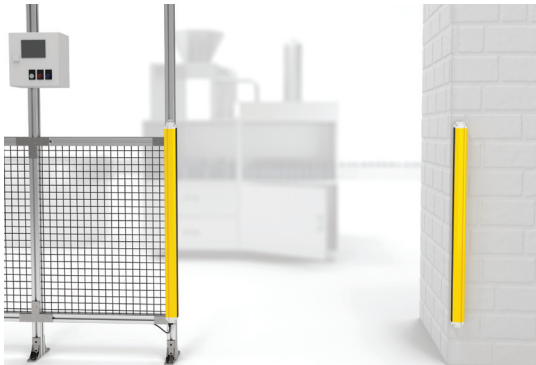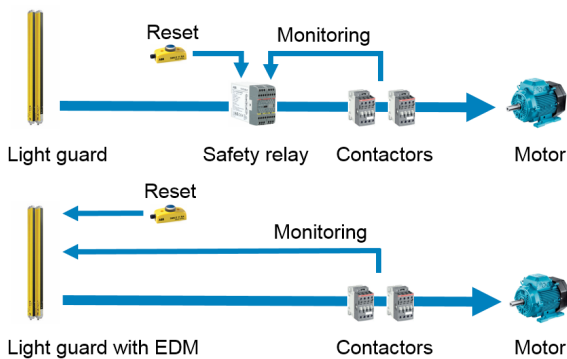
Sturdy profile for demanding applications

With its thicker and sturdier profile is is suitable for applications with tougher requirements.

EDM

External Device Monitoring is a feature allowing the light guard to supervise the actuators in simpler applications, eliminating the need for a safety relay or safety PLC.

Reset — Monitoring
Light guard — Safety relay — Contactors — Motor

Reset
Monitoring
Light guard with EDM — Contactors — Motor

Local reset

A local reset button is connected directly to the light guard instead of the safety control module in the electrical cabinet. This saves safety relays/PLC inputs and minimizes cabling to the electrical cabinet. Clever accessories makes the connection easier.
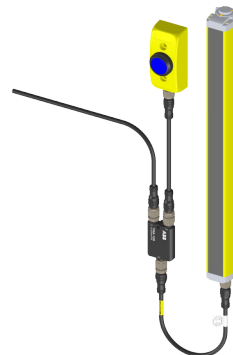
Orion3 Extended, Light grid

Orion3 Extended

22TLC172804F0201

Ordering details

Detection	Protected height mm		Type (Transmitter + receiver)	Order code
Body	500 (2 beams)	Active part	Orion3-4-K1C-050-E	2TLA022307R0000
		Passive part	Orion3-4-M1C-050	2TLA022306R1000
	800 (3 beams)	Active part	Orion3-4-K2C-080-E	2TLA022307R0100
		Passive part	Orion3-4-M2C-080	2TLA022306R1100
	900 (4 beams)	Active part	Orion3-4-K2C-090-E	2TLA022307R0200
		Passive part	Orion3-4-M2C-090	2TLA022306R1300
	1200 (4 beams)	Active part	Orion3-4-K2C-120-E	2TLA022307R0300
		Passive part	Orion3-4-M2C-120	2TLA022306R1400

Please note that active and passive parts are ordered separately and both are necessary for Orion3 Extended to function.

Spare parts (delivered with products originally)

Description	Type	Order code
4 standard brackets for Orion3	JSM Orion02	2TLA022310R1000

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Ordering information
Orion3 Extended cables

M12-C61

M12-CT132

Cables

Description (letter refers to connection examples)	Length m	Angled connector	Type	Order code
M12-5 male + female (a)	1	No	M12-C112	2TLA020056R2000
	3	No	M12-C312	2TLA020056R2100
	6	No	M12-C612	2TLA020056R2200
	10	No	M12-C1012	2TLA020056R2300
	20	No	M12-C2012	2TLA020056R2400
M12-5 female single ended (b)	6	No	M12-C61	2TLA020056R0000
	6	Yes	M12-C61 V	2TLA020056R0100
	10	No	M12-C101	2TLA020056R1000
	10	Yes	M12-C101 V	2TLA020056R1100
	20	No	M12-C201	2TLA020056R1400
M12-5 male single ended (c)	6	No	M12-C62	2TLA020056R0200
	10	No	M12-C102	2TLA020056R1200
M12-8 female single ended (d)	6	No	M12-C63	2TLA020056R3000
	10	No	M12-C103	2TLA020056R4000
	20	No	M12-C203	2TLA020056R4100
M12-8 male + female (e, t_1, t_2)	1	No	M12-C134[1]	2TLA020056R5000
	3	No	M12-C334[1]	2TLA020056R5100
M12-8 female - M12-5 male (t_3)	1	No	M12-CT132[2]	2TLA020060R0600
M12-8 female to M12-8 male + M12-5 male	2 x 0.2	No	M12-CYMUTE[3]	2TLA022316R0100

[1]Used for the connection to Tina 10 and M12-3R. Tina 10 can be connected directly to the light guard without cable, but will form an angle (i.e. not be aligned) with the light guard, which might be a problem if the light guard is mounted close to a wall/aluminum profile.

[2]M12-CT132 is used for the connection of Orion3 Extended to URAX-D1R.

[3]M12-CYMUTE is used to simplify the connection of 2 or 4 muting sensors with the help of the OMC1 connection box.

Ordering information
Orion3 Extended accessories

Orion Laser pointer

OMC1

Tina 10A

Accessories

Description	Type	Order code
Orion Laser pointer	Orion Laser	2TLA022310R5000
4 rotation brackets for Orion3	JSM Orion05	2TLA022310R0300
Kit for mounting of Orion3 in Stand (4 pieces) - For a pair Orion3 - 050 / 080 / 090 (active + passive units)	JSM Orion08	2TLA022310R0600
For a pair Orion3 - 120 (Orion3-4-K2C-120 + Orion3-4-M2C-120)	JSM Orion09	2TLA022310R0700
Orion Plate kit for adjustment of protective stand	Orion Stand Plate	2TLA022312R5000
Deviating mirror in stand	Orion1 Mirror*	
Protective stand	Orion Stand*	
Protective tube	Orion WET*	
Lens shield	Orion Shield*	
Connection box for two or four muting sensors	OMC1	2TLA022316R2000
Retroreflex photoelectric sensor	Mute R2	2TLA022044R0500
Reflector diameter 63 mm	Reflect 1	2TLA022044R2000
Reflector diameter 82 mm	Reflect 2	2TLA022044R3000
Smile reset button with NO contact	Smile 11 RA	2TLA030053R0000
Smile reset button with NO contact for Pluto	Smile 11 RB	2TLA030053R0100
Smile reset button with NC contact for Orion2 Base/Extended and Orion3 Extended	Smile RO2	2TLA022316R3100
Y-connector for series connection of the dynamic signal	M12-3A	2TLA020055R0000
Y-connector for connection of a Smile reset button to Orion	M12-3R	2TLA022316R0000
Adaptation unit OSSD to dynamic signal	Tina 10A	2TLA020054R1200
Adaptation unit OSSD to dynamic signal + connector for reset button	Tina 10B	2TLA020054R1300
Safe AS-i input slave for OSSD, 3 non safe inputs and one reset input	Urax-D1R	2TLA020072R0500

*These accessories are available in different sizes. More information on www.abb.com/jokabsafety.

Smile 11RB

How to choose correct reset button

| Local or global reset	Adaption to the dynamic signal*	Safety controle module	Type	Suitable connection accessories
Local reset button connected to the light guard (Orion in manual reset mode)	Yes	Vital or Pluto	Smile 11RO2	Tina 10B: OSSD to dynamic signal + local reset button M12-3A: serial connection of the dynamic signal
	No	Any safety control module compatible with light guard	Smile 11RO2	M12-3R: Easy connection of a local reset button
Global reset button connected to the control module (Orion in automatic reset mode)	Yes	Vital	Smile 11RA	Tina 10A: OSSD to dynamic signal Tina 10C: OSSD to dynamic signal + supply to transmitter
		Pluto	Smile 11RB	Tina 10A: OSSD to dynamic signal Tina 10C: OSSD to dynamic signal + supply to transmitter
	No	Any safety control module compatible with light guard	Smile 11RA**	-

* The ABB Jokab safety dynamic signal offers the following advantages:

- Serial connection of safety devices while maintaining PLe/cat. 4, up to 25 Tina 10 per Vital and up to 5 Tina 10 per Pluto input.
- Only one safety input of the Pluto instead of two with the standard OSSD outputs.

** Smile 11RA has one NO contact, which is the most common for reset buttons. Please check what is requested for the chosen safety control module.
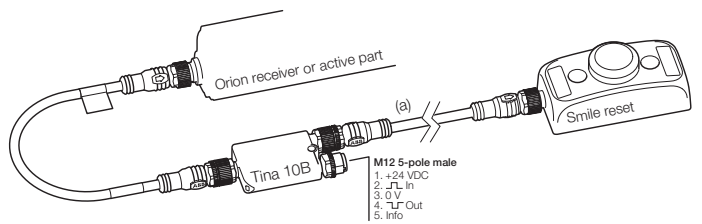
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Connection examples

Orion with Tina 10A/C

M12 5-pole male
1. +24 VDC
2. In
3. 0 V
4. Out
5. Info
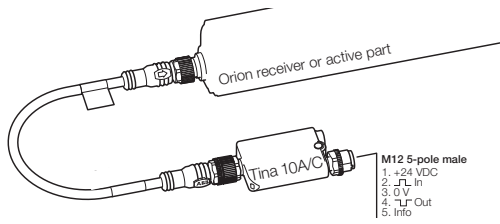
Without local reset button

Connection to the ABB Jokab safety dynamic signal via Tina 10 A/C. To be used with Vital safety control module or Pluto safety PLC.

Reset to Orion with Tina 10B

M12 5-pole male
1. +24 VDC
2. In
3. 0 V
4. Out
5. Info

With local reset button

Connection to the ABB Jokab safety dynamic signal via Tina 10B. To be used with Vital safety control module or Pluto safety PLC.
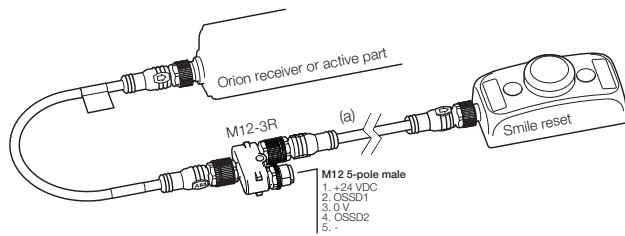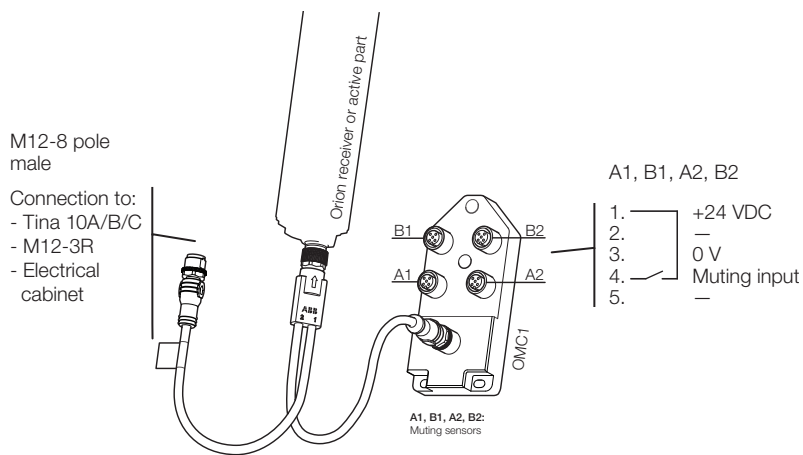
Reset to Orion with M12-3R

M12 5-pole male
1. +24 VDC
2. OSSD1
3. 0 V
4. OSSD2
5. -

Connection of a local reset button via M12-3R.

Connection of muting sensors with M12-CYMUTE and OMC1

M12-8 pole male

Connection to:
- Tina 10A/B/C
- M12-3R
- Electrical cabinet

A1, B1, A2, B2

1. +24 VDC
2. —
3. 0 V
4. Muting input
5. —

A1, B1, A2, B2:
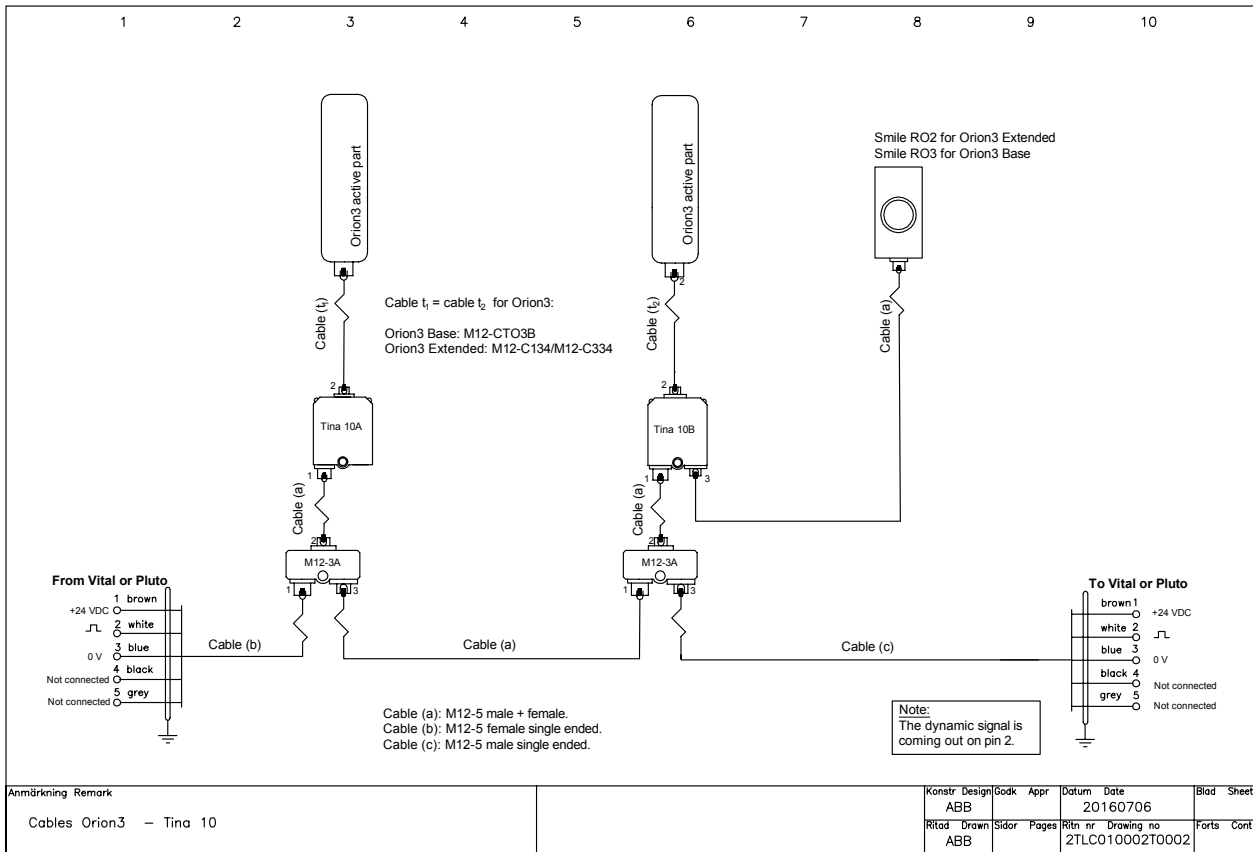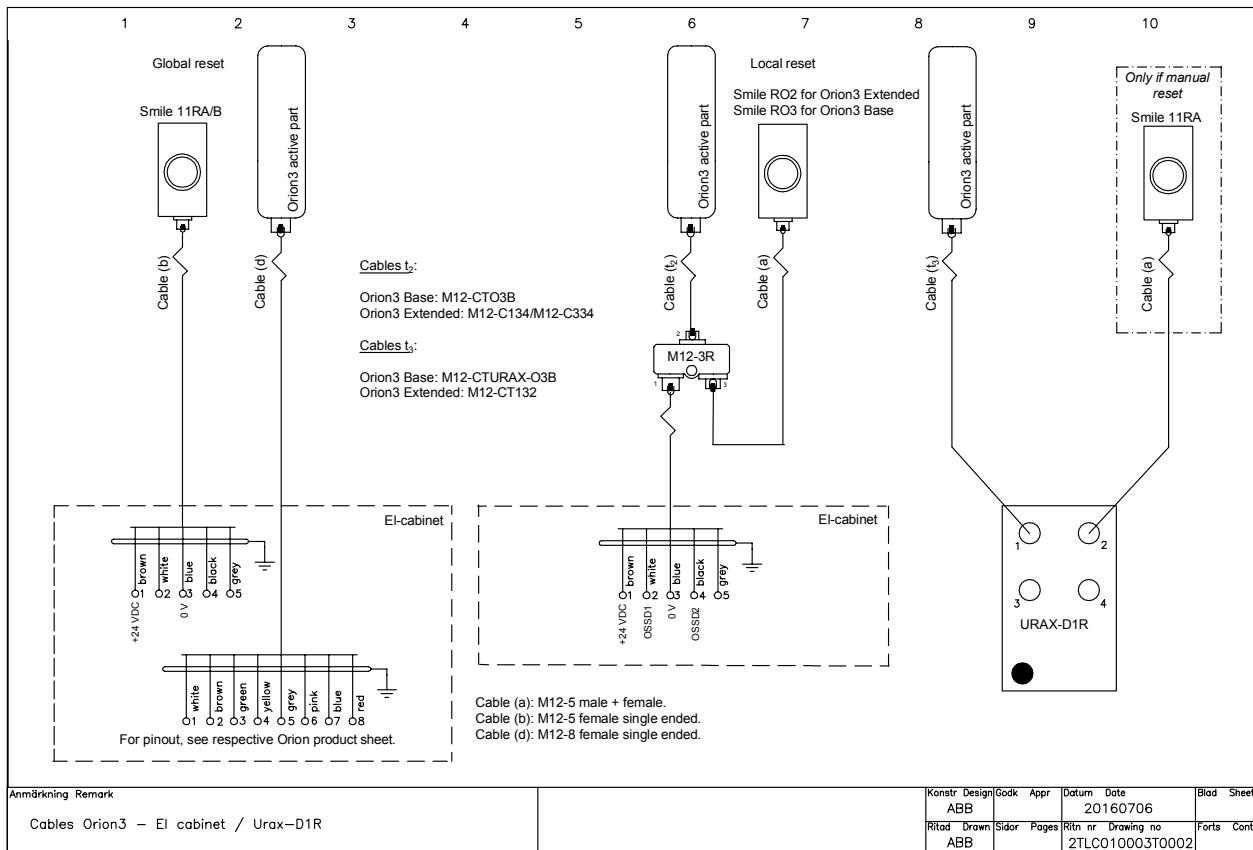Muting sensors

NB: Cable with M12-5 male + female connectors shall be used between muting sensors and OMC1 inputs A1, B1, A2, B2.

Connection examples

Cables Orion3 to Tina 10

Cable t₁ = cable t₂ for Orion3:

Orion3 Base: M12-CTO3B
Orion3 Extended: M12-C134/M12-C334

Smile RO2 for Orion3 Extended
Smile RO3 for Orion3 Base

From Vital or Pluto

+24 VDC	1	brown
⊓	2	white
0 V	3	blue
Not connected	4	black
Not connected	5	grey

To Vital or Pluto

brown	1	+24 VDC
white	2	⊓
blue	3	0 V
black	4	Not connected
grey	5	Not connected

Cable (a): M12-5 male + female.
Cable (b): M12-5 female single ended.
Cable (c): M12-5 male single ended.

Note:
The dynamic signal is coming out on pin 2.

Anmärkning Remark		Konstr Design	Godk Appr	Datum Date		Blad Sheet
Cables Orion3 — Tina 10		ABB		20160706		
		Ritad Drawn	Sidor Pages	Ritn nr Drawing no		Forts Cont
		ABB		2TLC010002T0002		

Cables Orion3 to electrical cabinet and Urax-D1R

Global reset

Smile 11RA/B

Local reset

Smile RO2 for Orion3 Extended
Smile RO3 for Orion3 Base

Only if manual reset

Smile 11RA

Cables t₂:

Orion3 Base: M12-CTO3B
Orion3 Extended: M12-C134/M12-C334

Cables t₃:

Orion3 Base: M12-CTURAX-O3B
Orion3 Extended: M12-CT132

El-cabinet

+24 VDC	1	brown
	2	white
0 V	3	blue
	4	black
	5	grey

El-cabinet

+24 VDC	1	brown
OSSD1	2	white
0 V	3	blue
OSSD2	4	black
	5	grey

white	brown	green	yellow	grey	pink	blue	red
1	2	3	4	5	6	7	8

For pinout, see respective Orion product sheet.

URAX-D1R

Cable (a): M12-5 male + female.
Cable (b): M12-5 female single ended.
Cable (d): M12-8 female single ended.

Anmärkning Remark		Konstr Design	Godk Appr	Datum Date		Blad Sheet
Cables Orion3 — El cabinet / Urax—D1R		ABB		20160706		
		Ritad Drawn	Sidor Pages	Ritn nr Drawing no		Forts Cont
		ABB		2TLC010003T0002		

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Connection examples
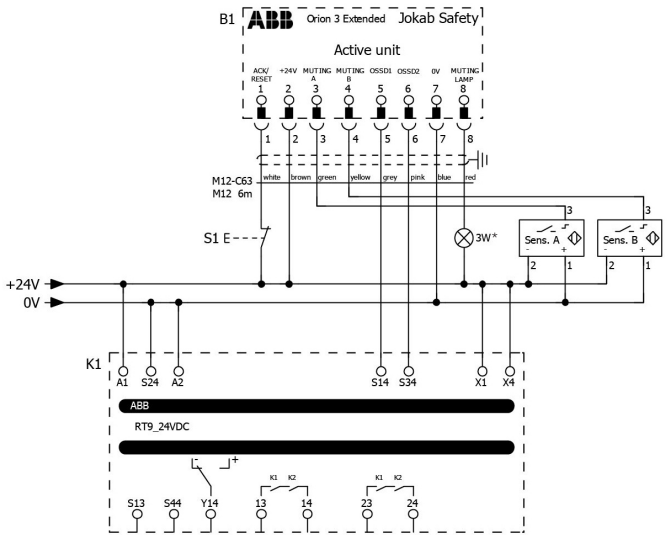## Orion3 Extended with muting sensors

Orion3 Extended connected to a RT9 safety relay with global reset
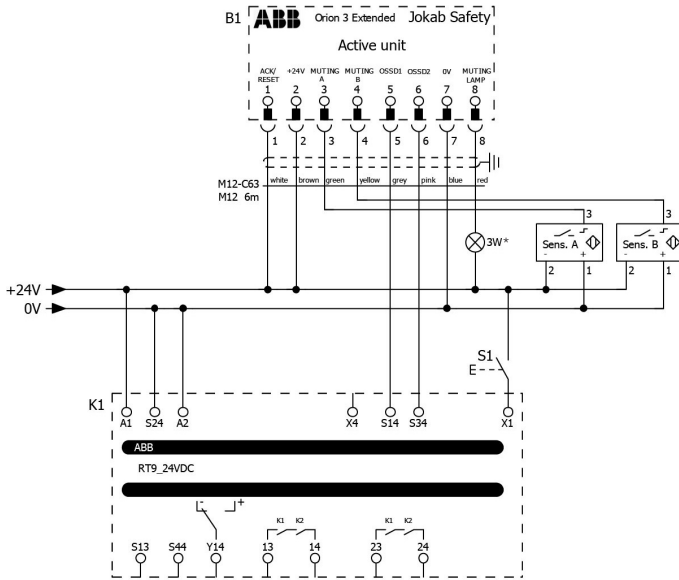
Reset button connected to the safety relay. Configuration of the light guard (with the dip-switches):
- Automatic reset
- EDM deactivated

Orion3 Extended connected to a RT9 safety relay with local reset

Reset button connected to the light guard. Configuration of the light guard (with the dip-switches):
- Automatic reset
- EDM deactivated

*Since the device has an integrated muting lamp, it is optional to connect an external lamp on pin 8.

Technical data

Approvals	CE cULus LISTED TÜV SÜD
Functional safety data	
EN ISO 13849-1:2008	PL e, Cat 4
EN 61508-1..4:2010	SIL3; $PFH_D = 8{,}57 \times 10^{-9}$
EN 62061:2005/A1:2013	SIL CL 3
Electrical data	
Power supply	+24 VDC ± 20 %
Power consumption, Active unit	2,5 W max (without load)
Cable length (for power supply)	70 m max
Outputs	2 PNP
Short-circuit protection	1.4 A at +55°C
Output current	0.5 A max / output
Output voltage – ON	Power supply value less 1 V (min)
Output voltage – OFF	0.2 V max
Capacitive load	2.2 µF at +24 VDC max
Current for external lamp	20 mA min, 250 mA max
Response time	K1C-050: 11 ms, others: 12 ms
Connectors	M12-8 pole male connector
Optical data	
Light emission (λ)	Infrared (860 nm)
Resolution	319.75 - 519.75 mm
Operating distance	0.5...8 m except K2C-090: 0.5..6.5 m
Ambient light rejection	According to IEC-61496-2:2013
Mechanical data	
Operating temperature	0…+ 55 °C
Storage temperature	- 25…+ 70 °C
Humidity range	15…95 % (no condensation)
Protection class	IP65 (EN 60529:2000)
Housing material	Painted aluminium
Cap material	PBT Valox 508
Lens material	PMMA
Weight	
Orion3-4-K1C-050-B	1.3 kg
Orion3-4-K2C-080-B	1.8 kg
Orion3-4-K2C-090-B	2.1 kg
Orion3-4-K2C-120-B	2.6 kg
Orion3-4-M1C-050 (passive)	1.2 kg
Orion3-4-M2C-080 (passive)	1.7 kg
Orion3-4-M2C-090 (passive)	1.9 kg
Orion3-4-M2C-120 (passive)	2.5 kg
Connection Active unit*	
White (1)**	Reset/Acknowledge/EDM
Brown (2)	+24 VDC
Green (3)	Muting sensor A
Yellow (4)	Muting sensor B
Grey (5)	OSSD1
Pink (6)	OSSD2
Blue (7)	0 V
Red (8)	Muting lamp

* Colors according to ABB Jokab Safety standard cables.
** See Function on next page.

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Technical data

Function selection with dip-switches

Dip-switches	Function	ON (at delivery)	OFF
1	Muting timeout	10 min.	infinite
2	T/X or L-muting	T/X-muting	L-muting
3	Muting filter	Deactivated	Activated
4	Reset of the Override	Manual	Automatic
5	Not used	-	-
6	EDM	Deactivated	Activated
7	Reset	Automatic	Manual
8	Not used	-	-

Dimension drawings

Orion3 Extended
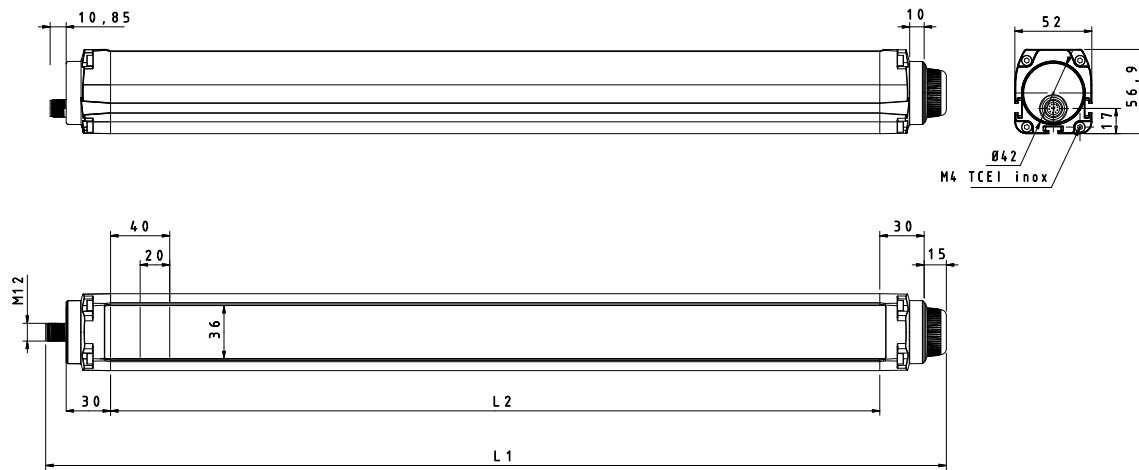
Active unit - All dimensions in mm
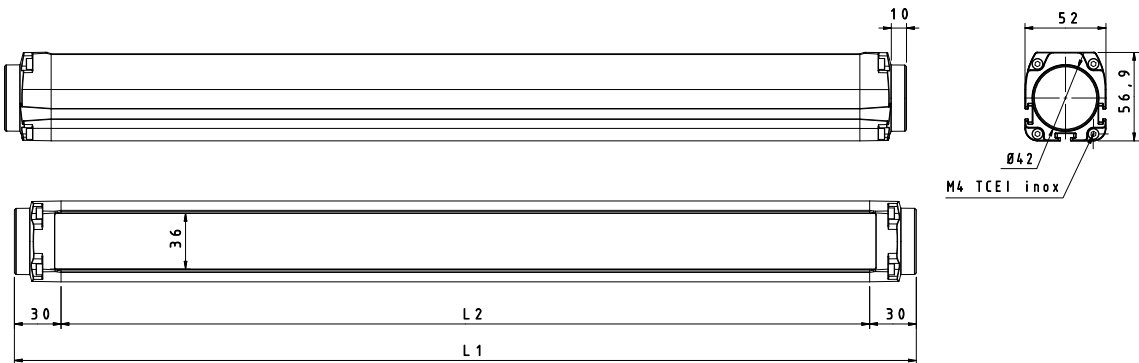
Passive unit - All dimensions in mm

Dimensions

Type	L_1 mm	L_2 mm
Orion3-4-K1C-050-B (active unit)	606.4	520.5
Orion3-4-K2C-080-B (active unit)	906.4	820.5
Orion3-4-K2C-090-B (active unit)	1006.4	920.5
Orion3-4-K2C-120-B (active unit)	1306.4	1220.5
Orion3-4-M1C-050 (passive unit)	580.5	520.5
Orion3-4-M2C-080 (passive unit)	880.5	820.5
OOrion3-4-M2C-090 (passive unit)	980.5	920.5
Orion3-4-M2C-090 (passive unit)	1280.5	1220.5

Contact us

ABB AB

Jokab Safety

Varlabergsvägen 11

SE-434 39 Kungsbacka

Tel. +46 (0) 21-32 50 00

www.abb.com/jokabsafety

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