



ABB JOKAB SAFETY Products

Focus II Safety Light Curtains and Grids

Power and productivity
for a better world™



Focus II Safety Light Curtains and Light Grids

Focus II is a new version of our previous Light Grid/Light Curtain Focus. Features such as muting and override are standard in all Focus II Light Curtains and Light Grids. For Light Curtains, blanking and break functions are also standard. The optical sensors on Focus II also have variable channel frequencies. The Focus II units are Light Curtains/Grids with safety functions intended for applications where it is of great importance to protect persons from a dangerous machine, robot or other automated systems where it is possible to access to a dangerous area.

Focus II creates a protection field with infrared beams. If any beam is interrupted the safety mechanism is triggered and the dangerous machine is stopped. Focus II fulfills the requirements for non-contact safety equipment type 4 (Focus II series) according to the international regulation standard EN 61496-1.

Units are available with safety heights between 150 and 2400 mm. All electronic control and monitoring functions are included in the Light Curtain profiles. External connection is made via a M12 connection at the end of the profile. Synchronization between transmitter and receiver is achieved optically. No electrical connection between the units is required. Control and monitoring of the beam transmission is carried out by two micro-processors which also give information on the status and alignment of the Light Curtain via several LEDs.

Muting and Override included in all Focus II

The “Muting” and “Override” functions are available on all Focus II Light Grids/Curtains and is enabled directly when an indication lamp is connected. Muting implies that one or more segments or the whole Light Curtain can be bypassed during in and out passage of material.

In the Focus II with Muting there is also an Override function which makes it possible to bypass the Light Grid/Curtain—i.e. activate the outputs if a machine start is necessary even if one or more Light Beams are interrupted. This is the case when the muting function is chosen and the A and B inputs are activated. If, for example, during the muting operation a loading pallet has stopped inside the safety field after a voltage loss, the override function is used to enable the pallet to be driven clear.

Floating Blanking or Fixed Blanking

The “Floating blanking or Fixed blanking” functions are available on all Focus II Light Curtains and is enabled directly via the internal dipswitches. Floating blanking makes it possible to ‘disconnect’ a defined number of beams from the safety field. The object is then free to move in the safety field without the safety function being triggered. During “fixed blanking” the object is not able to move in the safety field. The other beams are active with normal resolution.



Applications

Optical protection in an opening or around a risk area for:

- Mechanical and hydraulic power presses
- Molding presses
- Stamping, riveting and eyelet operations
- Automated machinery
- Robotic cells
- Conveyors
- Material handling equipment
- Printing presses
- Welding equipment
- Machining centers
- Packaging machinery



Muting with MFII-T and MFII-L Units

Features

- Type 4 according to EN 61496
- Flexible assembly
- LED indication
- High protection class (IP65)
- Range 3 to 40 m
- Time reset
- Floating/fixed blanking
- Muting
- Single/double break function (PSDI)
- External device monitoring (EDM)
- Available with different resolutions
- Up to PL e according to EN 954-1/EN ISO 13849-1

Approvals



Safety outputs OSSD1 and OSSD2

Focus II has two PNP outputs—OSSD1 and OSSD2. If the load to be switched is alternating current or requires a higher current than 500 mA then one should use a safety interface, e.g. E1T, Pluto PLC or the FRM-1 unit (converts the outputs to relay contacts) from ABB JOKAB SAFETY. The FMC-Tina and Tina 10A/10B/10C converts the outputs to a dynamic signal for connection to Pluto or Vital. Pluto can also work directly with the OSSD-outputs.

Single/Double Break Function (PSDI)

With the Single Break function the Light Curtain allows operation after entry and withdrawal out of the curtain. Similarly, the Double Break function allows operation after entry and withdrawal twice.

External Device Monitoring (EDM)

In all Light Grids and Light Curtains an EDM function is available which allows Focus II to test if the external control element responds correctly. A test channel is connected through the respective contactor, in order to detect any faults and thereby prevent a reset.

Focus II Light Curtain

Standard

- Muting (bypassing) partly or completely
- Supervised output for muting lamp
- Override
- Manually supervised or automatic reset
- Time-reset
- Fixed or floating blanking
- Single/double break
- EDM

Reset

On every Focus II there are inputs for reset and other functions—Reset, Alignment and Override (bypassing is only possible when muting is used.) The reset option is chosen through dual switches in the Focus II receiver. At delivery, Focus II is set to automatic reset.

- **Automatic reset** – When the light field is free the outputs are closed directly. (Setting when delivered).
- **Manual reset** – Focus II gives a ready signal when the light field is free and the reset button has been actuated.
- **Time reset** – During manual reset. To reset the Focus II a pre-reset button must first be actuated and afterwards within 8 seconds a reset button outside the risk area must be actuated.

Note: For further technical information, please reference the Focus II operating manual.

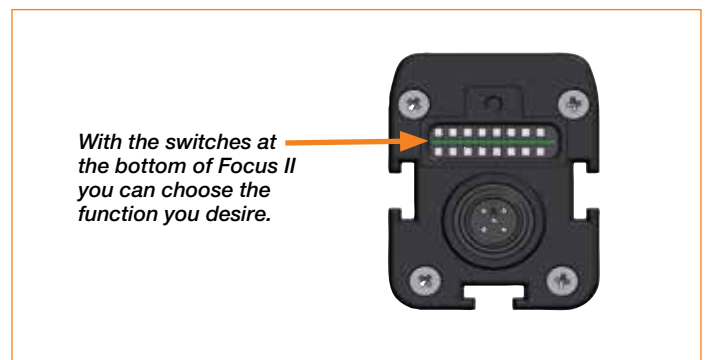
Focus II Light Grid

Standard

- Muting (bypassing) of one, two, three or four beams
- Supervised output for muting lamp
- Override
- Manually supervised or automatic reset
- Time-reset
- EDM

Option

- Light Grids for tough environments with parallel beams of light for improved reliability.



Muting (bypassing)

Focus II muting types

- T-muting. Four NO muting sensors are used in two pairs (OR function), allowing bi-directional transport of material. Maximum muting time is 600 s. Muting A and Muting B need an activation time difference of 30 ms.
- L-muting. Two NO muting sensors works together with the light protection, allowing transport out from the hazardous area. Maximum muting time is 600 s. Muting A and Muting B need a activation time difference of 30 ms.
- X-muting. One NO and one NC muting sensor is like a cross through the light protection, allowing bi-directional transport of material. An alternative X-muting (only on Focus Light beams) with 2 NO muting sensor is also possible, but then with the condition of a 30 ms activation time difference on the muting sensors. Both solutions gives an infinite muting time.

Built-in muting for Focus II is available in three ways:

- Pre-made muting units MF-T and MF-L, which have integral photocells.
- Connection of muting sensors via a FMC.
- Separate connection of muting sensors (Mute R) directly to the Focus II receiver unit.

Muting-lamp

It is possible to connect the muting-lamp via a FMC. During bypassing the muting-lamp is lit. Bypassing is only possible if the muting-lamp is functioning or a resistor of 220 Ohm is used in its place.

Muting with MF-T and MF-L units

MF-T and MF-L are muting units with integrated photocells built into a aluminum profile. They work with all Focus II Light Curtain and Light Grids. No additional sensors are required because the muting units contain the required components. MF-T/MF-L is connected between the Focus II and the supervising unit (e.g safety relay, safety PLC). The cable between the Focus II and MF-T/MF-L is included with the muting unit.

MF-T

The muting unit MF-T consist of a transmitter unit and a receiver unit with four photocells A1, B1, B2 and A2. A1 and A2 are connected in parallell and B1 and B2 connected in parallell. In this way the unit is configured for installations where material is transported into and/or out of a hazardous area.

MF-L

The muting unit MF-L consist of a transmitter unit and a receiver unit with two photocells A1 and B1. The A1 and B1 sensor are actuated before the material is transported through the Light Curtain and Light Grids. The Light Grid is an active part in upholding the muting function once A1 and B1 have been passed by the material. The Light Curtain and Light Grids are being bypassed just as long as the material exiting. Unit MF-L is primarily intended for material transport out of a hazardous area.

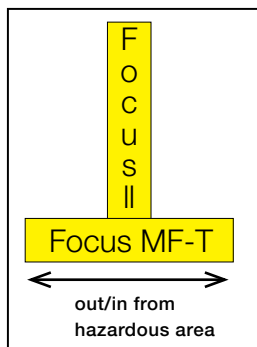
MF-T Reflex

The muting unit MF-T Reflex consist of a transmitter/receiver side and a reflector unit. The active side contains four transmitters/receivers photocells. The MF-T Reflex works as the MF-T with a limited range (6m). These units, together with a Light Grid with one active and one passive side provides a good solution where electrical connections are only necessary on one side!

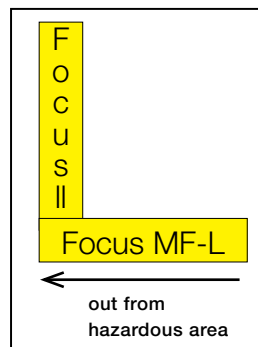
MF-L Reflex

The muting unit MF-L Reflex consist of a transmitter/receiver unit and a reflector unit. The active side contains two transmitters/receivers photocells. The MF-L Reflex works as the MF-L with a limited range (6m). These units, together with a Light Grid with one active and one passive side provides a good solution where electrical connections are only necessary on one side!

MF-T



MF-L



Muting accessories FMC and FMI units



Approvals:



Applications:

- FMC: Muting connection box
- FMI: Muting Indicator

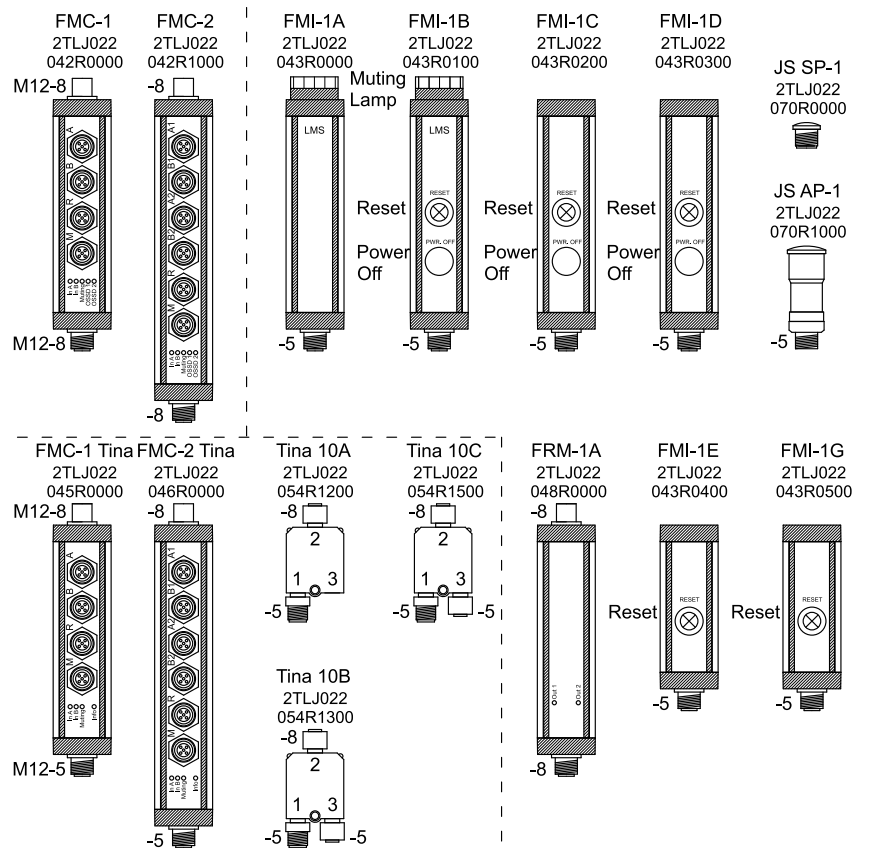
Features:

- Small
- Easy to connect

Various FMC, FMI, FRM- versions and Tina units

The Tina-versions have dynamic safety outputs for Vital/Pluto.

Model	Description
FMC-1(2)	with connectors for muting sensors (A+B), reset, power off and muting lamp (R) and muting lamp (M).
FMI-1A	with muting lamp only.
FMI-1B	with reset, power off and muting lamp.
FMI-1C	with reset and power off.
FMI-1D	with reset, power off and internal resistor for the muting lamp.
FMI-1E	as pre reset connected to connector A (A2) on FMC-1(2) (Tina).
FMI-1G	with reset, and internal resistor for the muting lamp.
FMC-1 (2) Tina	same as FMC-1(2) but connected to Vital or Pluto.
Tina 10A	adaptor unit for connecting Focus II to Vital or Pluto.
Tina 10B	simplified FMC-1(2) Tina including only the connector (R).
Tina 10C	simplified FMC-1(2) Tina including only power supply on con.no.3.
FRM-1A	translates the two OSSD outputs to relay outputs (and power supply).
JS SP-1	protection plug for not used connectors.
JS AP-1	adaptor for FMC units to use instead of FMI-1B or -1D on the (R) connector including muting resistor.

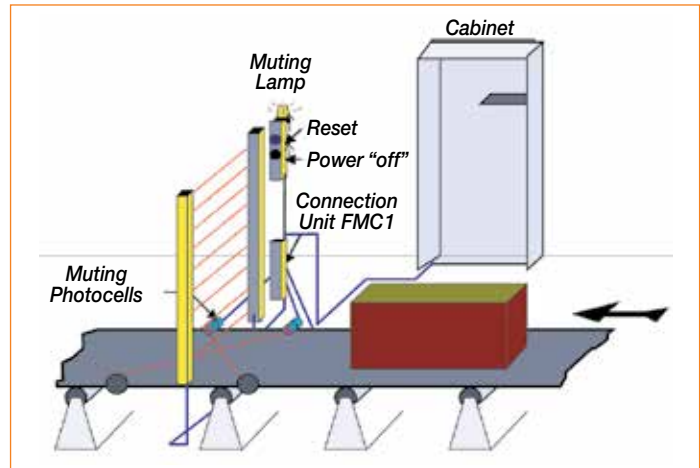
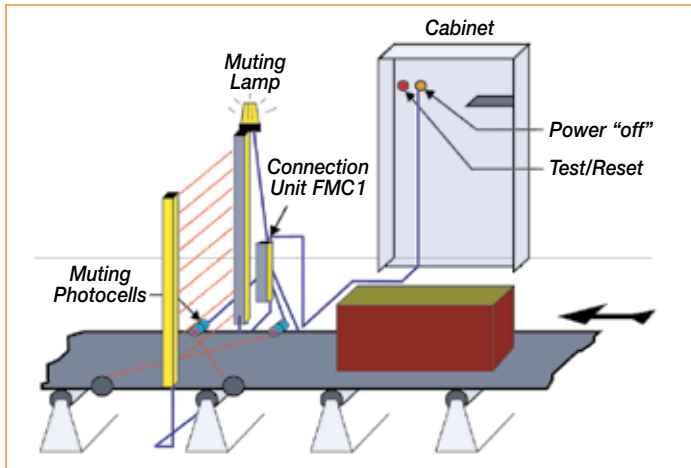


Muting accessories (cont.)

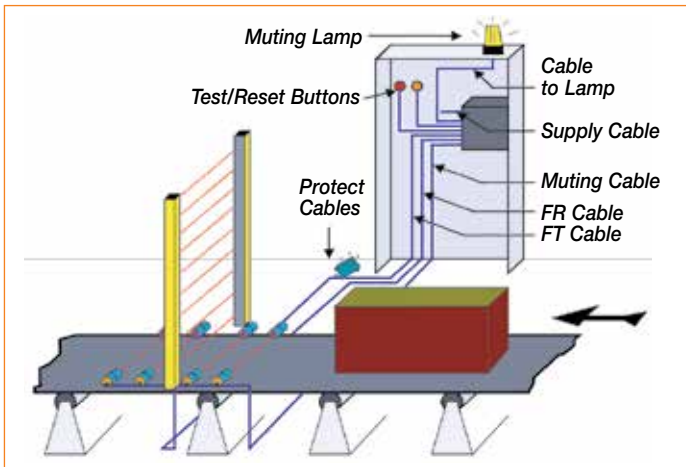
FMC and FMI units

Connection of Focus II and Muting Components with FMC1 and FMI1

Connection of Light Curtain with connection block FMC 1, test/reset button 1 and switch for supply voltage placed in or by the control cabinet. Connection of Light Curtain with connection block FMC1. The FMI reset unit must be placed out of reach from the risk area.



Connection of Focus II and Muting Components directly to Control Cabinet



The test/reset button shall be placed so the operator can see the protected area during reset, testing and bypassing, It should not be possible to reach the button from within the risk area.

The lamp for indication of muting and bypassing shall be placed so that it can be seen from all directions from where it is possible to access the dangerous area.

If photocells are used as muting sensors, the sensor receivers should be assembled on the Light Curtain's transmitter side to minimize the interference risk.

The system is protected against dangerous functions caused by damage on the transmitter cable and/or the receiver cable. However, we recommend that the cables be protected so that physical damage to them can be minimized.

Focus II Modular Muting Capabilities

The Focus II Safety Light Curtain offers the selection of complete muting of the protective field during the in and out passage of material. Through dipswitch settings in the Focus standard version, it is also capable of muting only specific modules within the protective field.

The Focus II is capable of muting independent beam module packets or a combination of them (up to 4). For example, a box travels down a conveyor and instead of muting the entire Light

Curtain you can mute only modules 1 and 2—which equates to the height of the box—allowing continual protection on the remaining Safety Light Curtain modules.

The module size is directly dependent on the Focus II Light Curtain resolution and length.

Adjustable mounting brackets - Mount

The Focus II adjustable mounting brackets offer over 12 different mounting possibilities with adjustability in vertical height, pivoting, rotating and angeling. The adjustable brackets simplify the installation and set up of Focus II Safety Light Curtains and Grids

Brackets technical data

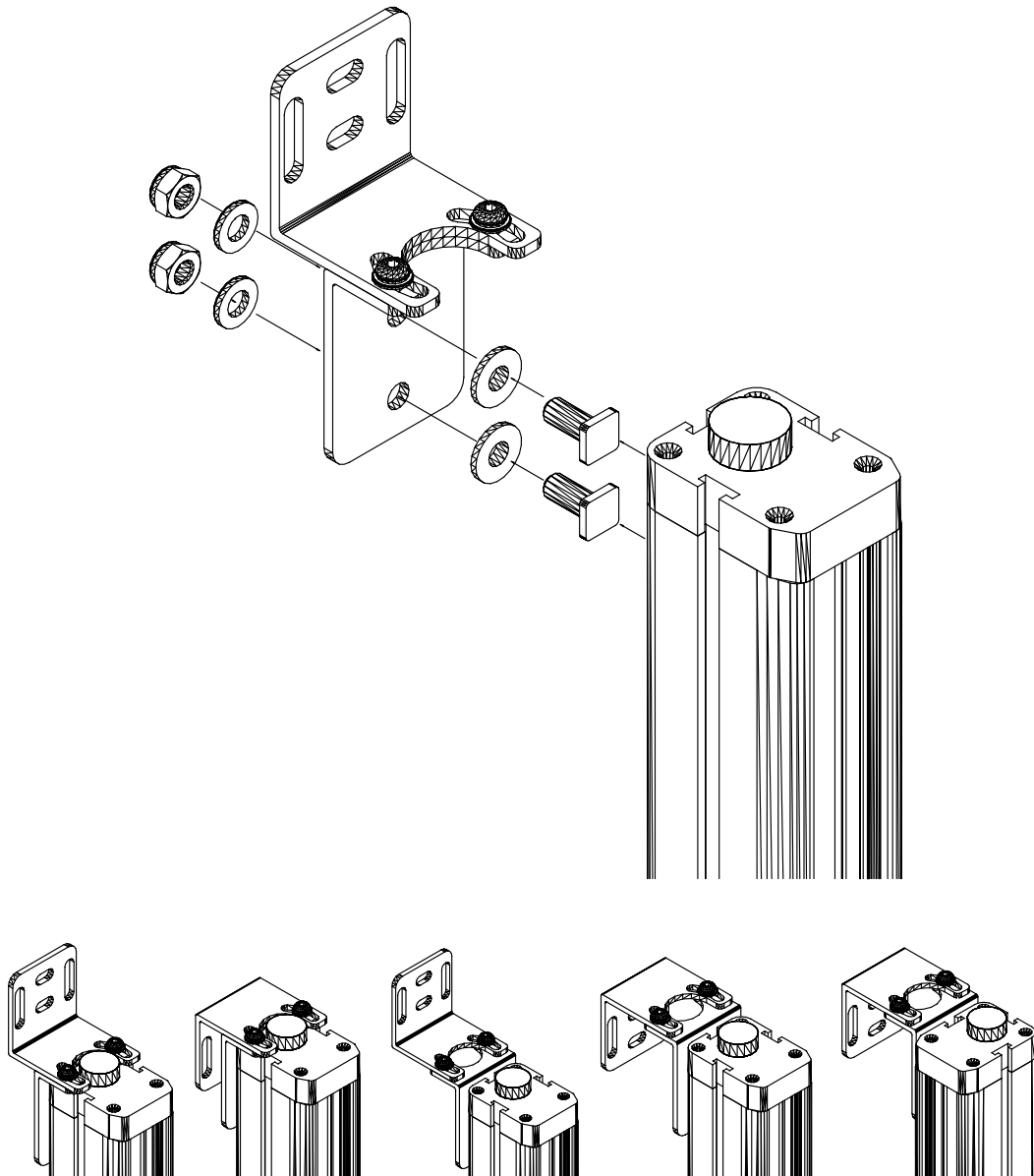
Manufacturer	ABB JOKAB SAFETY
Ordering information	visit www.jokabsafetyna.com for ordering information
Color	Black powder coated

Applications:

- Focus Light Curtains and Light Grids mounting

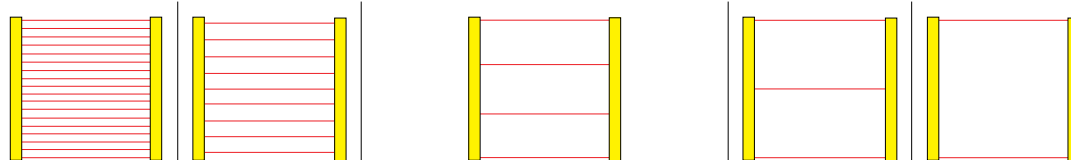
Features:

- Over 12 different mounting capabilities
- High rotational radius



Focus II Type 4 (FII-4) summary

Note:
Visit www.jokabsafety.com
for ordering information

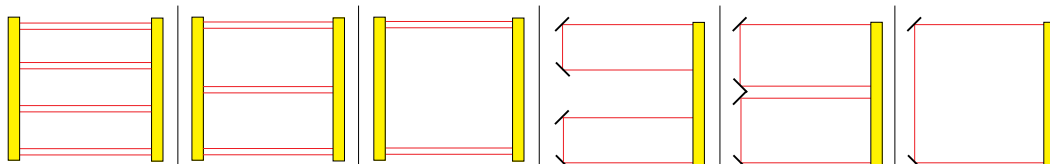


Type 4	FII-4-14-zzzz	FII-4-30-zzzz	FII-4-K4-zzzz		FII-4-K3-800	FII-4-K2-500
Resolution	14	30	300	400	400	500
Height (mm=zzzz)	150	150	900	1200	800	500
	300	300				
	450	450				
	600	600				
	750	750				
	900	900				
	1050	1050				
	1200	1200				
	1350	1350				
	1500	1500				
	1650	1650				
	1800	1800				
	1950	1950				
	2100	2100				
	2250	2250				
2400	2400					
Range (m)						
SR	0.2-3	0.2-7	0.5-20		0.5-20	0.5-20
LR	3-6	7-14	20-40		20-40	20-40
Reaction time off (ms)	12-68	9-31	13		13	13
Reaction time on (ms)	138-104	141-119	142		142	142
Manual reset	■	■	■		■	■
Automatic reset	■	■	■		■	■
Pre reset	■	■	■		■	■
Muting inputs	■	■	■		■	■
Muting lamp supervision	■	■	■		■	■
Override	■	■	■		■	■
Muting T/L/X	■	■	■		■	■
Blanking 3 types	■	■	■		■	■
Single/Double break	■	■	■		■	■
EDM	■	■	■		■	■
Dyn. Adaption to Vital/Pluto	◆	◆	◆		◆	◆

■ Standard

◆ With Tina 10A/10B/10C or FMC_Tina.

Note:
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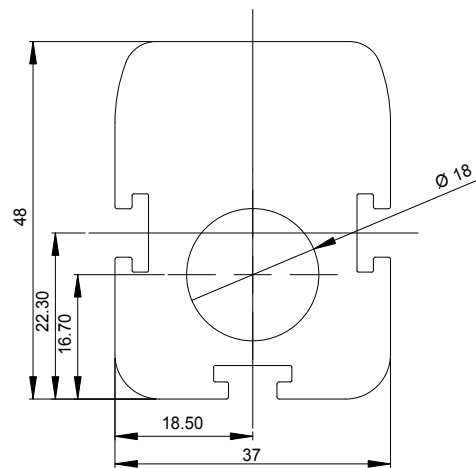
Type 4	FII-4-K4-zzzz D		FII-4-K3-800 D	FII-4-K2-500 D	FII-4-K2C-zzzz		FII-4-K2C-800	FII-4-K1C-500
Resolution	300	400	400	500	300	400	800	500
Height (mm=zzzz)	900	1200	800	500	900	1200	800	500
Range (m) SR LR	0.5-20 20-40		0.5-20 20-40	0.5-20 20-40	0.5-7		0.5-8	0.5-12
Reaction time off (ms)	13		13	13	13		13	13
Reaction time on (ms)	142		142	142	142		142	142
Manual reset	■		■	■	■		■	■
Automatic reset	■		■	■	■		■	■
Pre reset	■		■	■	■		■	■
Muting inputs	■		■	■	■		■	■
Muting lamp supervision	■		■	■	■		■	■
Override	■		■	■	■		■	■
Muting T/L/X	■ / ■ / ■		■ / ■ / ■	■ / ■ / ■	■ / ■ / ■		■ / ■ / ■	■ / ■ / ■
Blanking 3 types	- / - / -		- / - / -	- / - / -	- / - / -		- / - / -	- / - / -
Single/Double break	- / -		- / -	- / -	- / -		- / -	- / -
EDM	■		■	■	■		■	■
Dyn. Adaption to Vital/Pluto	◆		◆	◆	◆		◆	◆

■ **Standard**

◆ **With Tina 10A/10B/10C or FMC_Tina.**

Technical data

Manufacturer	ABB JOKAB SAFETY
Ordering information	visit www.jokabsafetyna.com for ordering information
Supply voltage	24VDC \pm 20%
Power consumption	
Transmitter	70 mA maximum
Receiver	100 mA maximum
Safety level	
EN/IEC 61496	Type 4
EN 954-1	Focus II type 4: Category 4
EN ISO 13849-1	Focus II type 4: PL e
EN/IEC 61508	Up to SIL 3
PFH _d	$2,5 \times 10^{-9}$
Resolution	14 mm and 30 mm
Wavelength on transmitter LED	880 nm
Profile dimensions	37 x 48 mm
Protection class	IP65
Operating temperature	-10 to +55° C
Storage temperature	-25 to +70° C
Outputs	2 supervised PNP outputs with cross circuit monitoring
Max. load	500 mA (overload c.c. protection)
Response time	9 – 68 ms (depending on model)
Connection transmitter	M12 5-pin
Connection receiver	M12 8-pin
Indicator	LEDs on the transmitter and receiver indicating adjustment, dirt, power supply and outputs
Enclosure	Aluminium painted yellow
Conformity	2006/42/EG, EN/IEC 61496-1/2 EN 954-1, EN ISO 13849-1 EN/IEC 61508



Ordering data

Safety Light Curtains

To create a complete Focus II Safety Light Curtain part number, simply fill in the fields below.

FII-4-_____-_____
A
B

A This letter represents the effective resolution of the Focus II Safety Light Curtain.

14	14mm (0.55") resolution for finger detection
30	30mm (1.18") resolution for hand detection

B This letter represents the protective height of the Focus II Safety Light Curtain.

150	150mm (5.91")	1350	1350mm (53.15")
300	300mm (11.81")	1500	1500mm (59.06")
450	450mm (17.72")	1650	1650mm (64.96")
600	600mm (23.62")	1800	1800mm (70.87")
750	750mm (29.53")	1950	1950mm (76.77")
900	900mm (35.43")	2100	2100mm (82.68")
1050	1050mm (41.34")	2250	2250mm (88.58")
1200	1200mm (47.24")	2400	2400mm (94.49")

Safety Light Grids

To create a complete Focus II Safety Light Grid part number, simply fill in the fields below.

FII-4-K-_____
A

A This letter represents the protective height of the Focus II Safety Light Grid.

4-900	4 beams spaced 300mm (11.81") apart with 900mm (35.43") protective height
4-1200	4 beams spaced 400mm (15.75") apart with 1200mm (47.24") protective height
3-800	3 beams spaced 400mm (15.75") apart with 800mm (31.50") protective height
2-500	2 beams spaced 500mm (19.69") apart with 500m (19.69") protective height

Contact us

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