

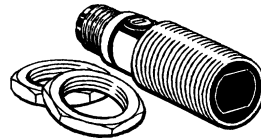
JSL safety light beam



JSL35/50



Light beams with automatic bypass at postal sorting depots in Gothenburg and Malmö.



JSL10

Light beams which stop dangerous machinery

Light beam - the best solution

A light beam is often the best safety solution and at the same time it is very inconspicuous. The operator can have both hands free when entering into a hazardous area and he/she can also be sure that the device will safely stop all dangerous machinery.

Likewise, the light beam is the best safety protection for material transportation in and out of a hazardous area. The light beam is not in the way of the material and can be configured for automatic bypassing.

The light beam is a small unit and is therefore easily installed even in narrow spaces.

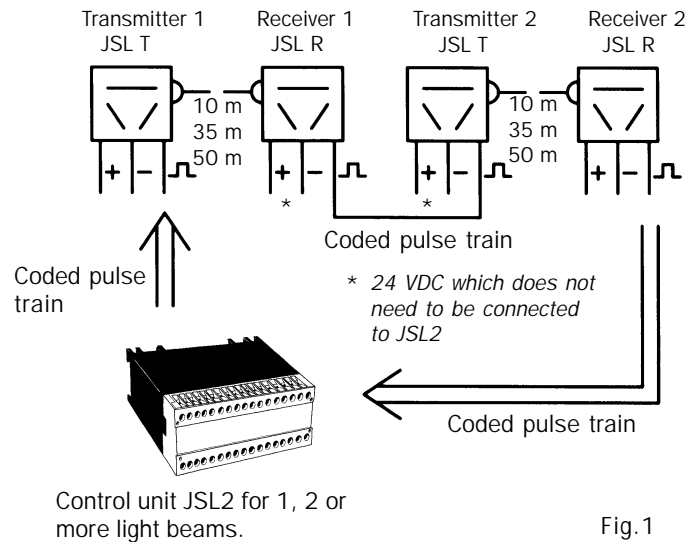
Approval

The light beam fulfils all the requirements of the highest safety category 4. The light beam is EU type-controlled by SAQ under certificate number M506-96. EMC testing is carried out at SP, ref. no. 96F51014:B.

The light beam is a safety component which is included in the machine directive appendix 4 and must therefore be EU type-controlled by an authorised body.

Coded light

A unique coded signal is sent out from the light beam's control unit (JSL2) to the transmitter (JSL T) and it must be identical to the signal which comes back from the receiver (JSL R). This is a condition for the control unit to be able to make a ready signal for dangerous machine movements. Coding guarantees that no ready signals can be produced by light from other sources, interference or faults in components in the transmitter and/or receiver. The light beam is also dynamically supervised which means that if the signal stops pulsating at the right frequency it is immediately detected. By using a special code function in the sensors, the light signal can also travel via 5 transmitter/receiver pairs which are not connected to the control unit.



Resetting

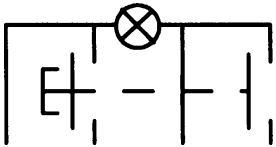


Fig. 2. Duplicated reset input JSL2.

Supervised reset

Resetting of the light beam must be performed outside the hazardous area which the light beam protects. When the reset button has been activated, i.e. the inputs have been both closed and opened, the outputs from the JSL2 are activated and the indicator light goes out. High demands are placed on the reset function, a fault must not lead to the ready signal being given when someone has interrupted the light beam.

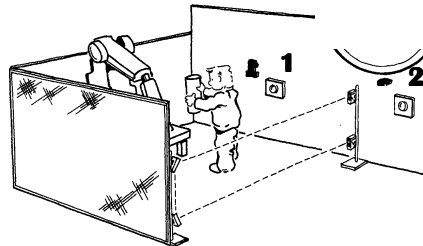


Fig. 3. Both buttons 1 and 2 need to be pressed (in sequence) within the pre-reset time to reset light beam.

Supervised time resetting

To reset the light beam, first button 1 must be pressed and then button 2 (within the predetermined pre-reset time). This prevents unintentional resetting when someone is within the hazardous area. This is especially important when the area which is protected by the light beam is not clearly visible.

When resetting is performed the safety timer relay JSHT1A/B is used with the JSL2. This allows pre-reset times (in steps from 5 to 40 seconds) to be set.

Automatic resetting

A light beam can also be used to monitor an area. When the light beam is interrupted this can indicate for example that a robot is operating in the area and it is stopped if a person enters into the same area.

When the light beam is clear, the control unit is reset automatically. For area monitoring a JSA2 unit is connected to the JSL2.

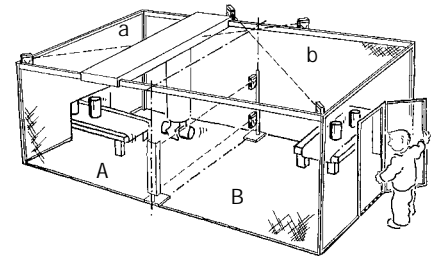


Fig. 4 Lightbeam b indicates that the robot is in the area A. Area B can now be entered without stopping the robot.

Bypassing

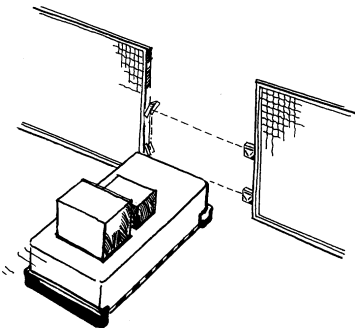


Fig. 5. Automatic bypassing of light beam when the autotruck passes.

Light beam bypassing

For the transportation of materials, the light beam can be bypassed just before it is interrupted. The bypassing is achieved by sensors which detect the autotruck (fig.5) and give signals direct or via safety relay to JSL2 control unit.

Both the inputs for bypassing must be closed throughout the whole time which resetting is needed (see fig.6).



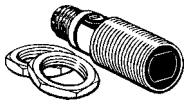
Fig.6 Bypass inputs.

Connection handbook

In our connection handbook there are a number of different bypassing solutions which are used in industry.

There are solutions with or without simultaneous sensor control. A limited max. time for bypassing can be obtained with safety relay JSHT1A/B or JSHT2A/B/C. Max. times can be selected in steps up to 40 sec. A combination of computer and sensor signals can also be used.

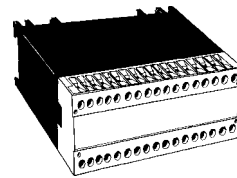
Technical data



JSL 10T/R



JSL 35T/R
JSL 50T/R



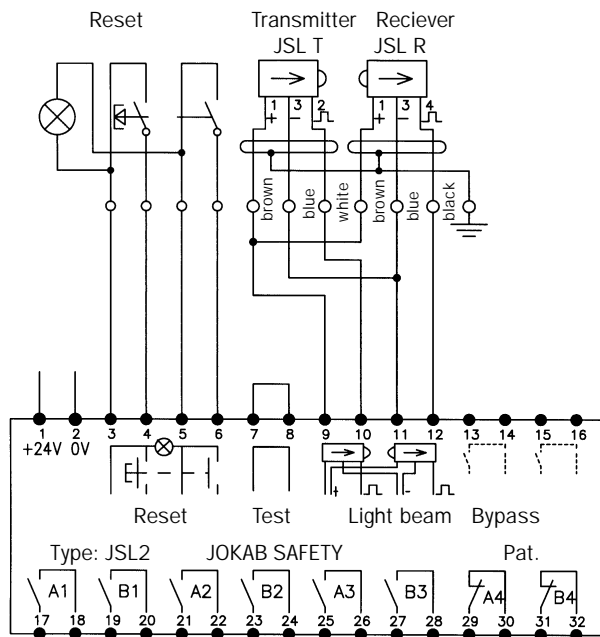
JSL2

Note! Up to six JSLT/R pairs can be supervised by one JSL2.

Manufacturer:	JOKAB SAFETY AB	JOKAB SAFETY AB
Designation:	JSL 10 T/R, JSL 35T/R, JSL 50T/R	JSL2
Safety category:	4 (together with JSL2)	4 (together with JSL T/R)
Operating voltage:	10 - 30 VDC, ripple +/- 10% of operating voltage	24VDC +/-15% ripple (p-p) 10% max
Fuse:		700mA PTC automatic fuse
Current consumption:	< 15 mA per transmitter/receiver	180mA excluding JSL T/R and reset lamp
Reset:		2-channel with supervision and light 24V 10W max
Bypass:		2-channel with supervision
Light source:	Red visible light, 650 nm, < +/- 2°	
Test:		test input for supervision of contactors/relays
Reaction time:		< 25ms
Relay outputs:		3, 2-channel NO:A1-B1, A2-B2 and A3-B3 1, 2-channel NC:A4-B4 6A/250VAC/1500VA/150W
Connections:	see below	see below
Function indicator:	LED on transmitter: supply voltage ok LED on receiver: alignment ok	Supply voltage, output channel A and channel B
Enclosure class:	IP 67	IP 20 (connections), IP 40 (enclosure) DIN 40050
Range:	10,35,50 m	
Installation:	JSL 10: 2 M18 nuts enclosed. JSL 35/50: Either via mounting holes in the casing or with angle bracket JSM 63 (enclosed).	35 mm DIN rail
Ambient temperature:	-25°C - +65°C	-10°C - +55°C
Cable connection:	Plug contact M12	Screw terminal block max 2 x 2,5mm ² Detachable contact strips, secured with screws
Material:	JSL35/50: Polyamide casing and glass lens protection. JSL 10: steel casing.	Polycarbonate/GV/V-0 beige/black Temperature withstand UL 746B 95° C
Colour:	JSL 10: metal, JSL 35/50: yellow	Black and beige
Size (widthxheightxdepth):	JSL 10: M18 x 61 mm JSL 35/50: 30 x 68,5 x 67 mm	152 x 75 x 118 mm
Weight:	JSL 10: 2 x 22g, JSL 35/50: 2 x 140 g	840 g

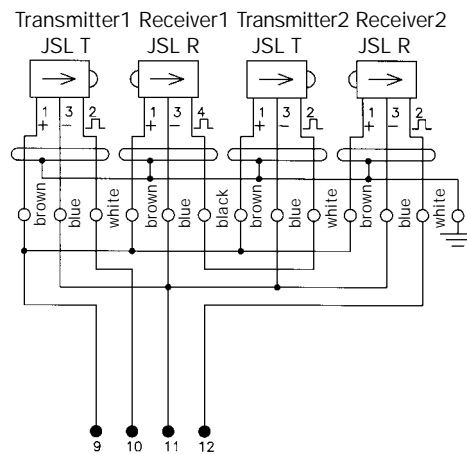
Connection examples

Connection examples for one light beam



Connection examples for two light beams

Contact us for examples with more than two beams.



The colours shown above are for JOKAB SAFETY standard cable JSLK6,5 which has 4 wires (4 x 0,34 mm²). Screened cable should be used to connect both the receiver and transmitter units to the JSL2.

N.B. Observe different connections for receivers 1 and 2 in above circuit. Although the light beam fulfils the EMC-requirement care should be taken in the positioning/installation of connecting cables in order to minimise induced interference from high interference sources such as cables being used to control and supply power to large and/or high frequency motors.

Accessories and Mounting

Post

JSMA 44-L

Post for mirrors and light beam.
Aluminium profile 44 x 44 mm.
Height: 1100 mm.
Other heights are also available.
Delivered with a yellow end plug,
JSM11A.



JSM 30A-K

Floor fixture with screws for mounting to post. Normally three floor fixtures are used (see fig.).



Brackets

JSM 9

Bracket for mirror.



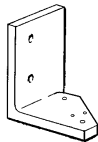
JSM 11

Wallbracket for JSM 63 and JSM 9.



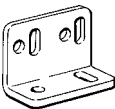
JSM 60-L

Bracket for JSM9 (mirror) or JSM 63 (light beam).
Post fixing screws are included.



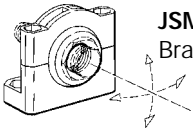
JSM 62-L

Bracket for JSM 9 with mirror for horizontal angling around a machine.
Screws for bracket are included.



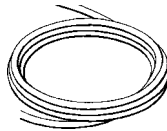
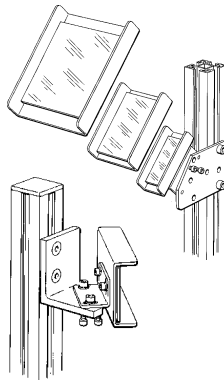
JSM 63

Bracket for light beam JSL 35/50T/R. (Two JSM 63 brackets are included with each lightbeam pair.)



JSM 64

Bracket for JSL10T/R.



Mirrors

JSM 6

Mirror for 0 - 6 m
100 x 40 x 25 mm
(Plastic cover: **JSM 16**)

JSM 7A

Mirror for 0 - 12 m, adjustable
115 x 80 x 30 mm
(Plastic cover: **JSM 17**)

JSM 8A

Mirror for 0 - 40 m, adjustable
160 x 135 x 30 mm
(Plastic cover: **JSM 18**)

N.B.

Every mirror reduces the distance by 20%.
Plastic covers are used to prevent destruction of glass in a welding environment. Screws and brackets are included with all mirrors.

Cable and connectors

JSLK - Cable in custom length for JSL T/R.

JSLK0 - Connector for JSL T/R with screws terminals for cable

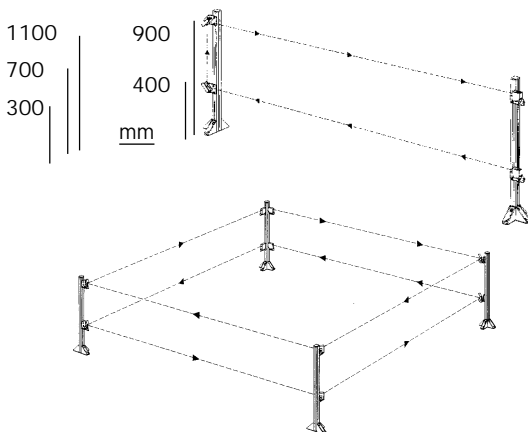
JSLK6,5 - 6,5m cable with connector for JSL T/R.

JSLK10 - 10m cable with connector for JSL T/R.

Safety Distance

The basic principle is that dangerous machine movements shall be stopped before somebody reaches the dangerous area, which should be at least 850 mm from the light beams. When determining the correct safety distance the stopping time of the machine and the risk level must be taken into account (see also EN999). Contact us for further information.

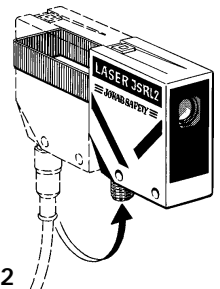
Alignment



Alignment

When aligning the light beam look forwards, the transmitter in the lens of which will be seen a strong red light. When this light is seen from the receiver (via mirrors if fitted) the light beam is correctly aligned. The LED on the receiver is on when the receiver is aligned with the transmitter. By moving the transmitter up/down and left/right the best alignment can be found.

When vertically mounting, (as shown in the diagram) the receiver should be mounted above the transmitter as this will simplify the alignment and minimise the risk of light disturbance. In exceptional light disturbance environments the received light can be adjusted by a screw on the rear of the receiver, on JSL 10 this can be made on the transmitter. To make the alignment even easier the Laser Aligner (JSRL 2) can be used. The laser has visible light (Class IIa) and is easy to mount for aligning. Supply to the Laser-Aligner is taken from the T/R connector.



Laser-Aligner JSRL 2

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