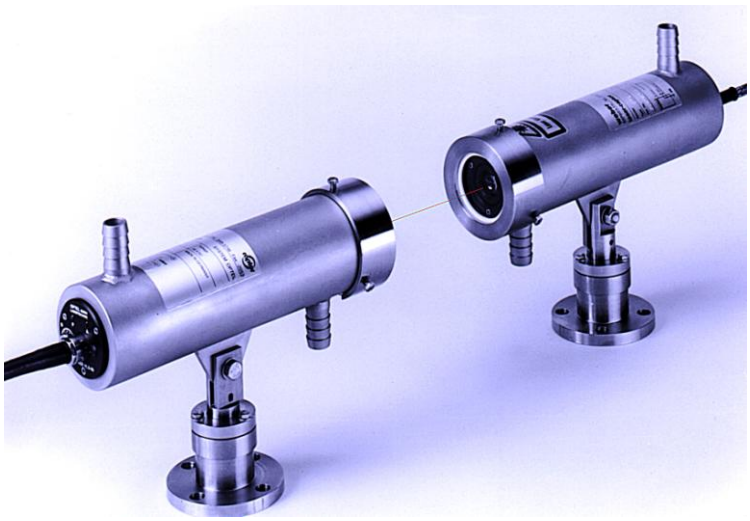
laser-captor

Laser Light Barrier System Type 611- / 611-.41

For applications in severe industrial environments and for perimeter protection



Features

- Installation distances up to 800 m
- Safe class 1 laser product
- Alarm and pre-alarm output
- Robust design for operation in harsh environments
- Double-walled cooling housing
- High sensitivity receiver
- Low beam divergence
- Longevity, maintenance-free

weber
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REV: AA / 17.04.07
sgd.: Wip / Rei

Heavy duty **laser-captor** system type 611- / 611-.41

General description

Weber's heavy duty **laser-captor** of type 611- / 611-.41 with a range of 800 m is suitable for long range perimeter protection and applications in severe industrial environments, where adverse conditions like dust, smoke, steam or extreme heat (2400°F / 1316°C) prevail.

The laser light barrier system comprises a transmitter unit and a choise of two receiver units.

The transmitter unit contains a semiconductor laser device, which emits light pulses at a fixed pulse repetition rate, as long as the supply voltage is applied.

When a system is set up and aligned, these light pulses are picked up by the highly sensitive photodetector in the light barrier receiver unit and the integrated alarm relay is switched to the „Alarm-Off" state.

If the connection between the transmitter and receiver is cut off by an object moving into the optical path, or if there is a technical defect in the electronics or in the power supply, the alarm relay is switched to „Alarm On" state.

The use of a semiconductor laser transmitter and a highly sensitive photodetector guarantees reliable operation, even under extremely difficult conditions. Due to the incorporated high quality optical filter in the receiver unit, even high background illumination, e. g. due to white hot steel, does not lead to a degradation of functionality.

To enhance the advantages of the system, it is possible to individually delay the activation of the alarm relay. By delaying the reaction time of the alarm relay it is possible to avoid false alarms and consequential costly interruptions of production by the loss of a few inconsequential light pulses.

A further increase in operational safety is offered by the 6115.41 receiver.

During operation in adverse environments, the optics of the transmitter and receiver units will in unpredictable time be covered by a dust layer or a dirt/oil film which will reduce the initially high power margin. When the received power draws near the detection threshold of the photodetector, even small changes in operating conditions might result in sufficient pulse losses to provoke false alarms and again costly interruptions of production.

To avoid this the 6115.41 receiver features an independent „Pre-Alarm" function (control output).

If the strength of the received optical signal falls below an individually adjustable threshold, well above the „Alarm" threshold, an „early warning" signal is activated, that can be used to alert the maintenance staff.

By setting the „Pre-Alarm" threshold with a sufficient margin to the fixed „Alarm" threshold, false alarms can be avoided and maintenance cycles kept to a necessary minimum.

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The careful selection of materials and components and the use of rugged stainless steel housings and armoured silicone cables, ensures trouble-free operation even under most severe conditions.

For operation in areas of high ambient temperatures, all devices can be delivered in a special double-walled housing with pipe-fittings for the connection to an air or water cooling circuit.

Laser Safety

The 611- laser transmitter does not emit hazardous laser radiation

There is no danger from the laser, even while looking directly into the laser with an optical instrument (telescope, binoculars, magnifying glass).

A lable is located on top of the transmitter housing, to indicate that the light barrier transmitter unit is a Class 1 laser product as defined in IEC 60825-1/A2:2001 specifications.

Overview of different systems available:

Transmitter	type 6111	/ Standard version
Receiver	type 6111.41	/ Standard version
Transmitter	type 6111	
Receiver	type 6115.41	/ with control output
Transmitter	type 6112	/ with cooling jacket
Receiver	type 6112.41	/ with cooling jacket
Transmitter	type 6112	/ with cooling jacket
Receiver	type 6116.41	/ with cooling jacket **and** control output

All units with protection glass and swivel stand

General Technical Data

Operating range	max. 800 m
Supply voltage	24Vdc +/- 20% (19,2V – 28,8V)
Overvoltage protection	29,5V (power off function, latching)
Protection standard	IP65
Ambient temperature	-20°C up to +55°C
Housing material	Stainless steel (AiSi 316Ti)
Connecting cable	2 m armoured silicone cable 0,75 mm²
Weight standard housing	approx. 1,8 kg
Weight cooling housing	approx. 3,2 kg

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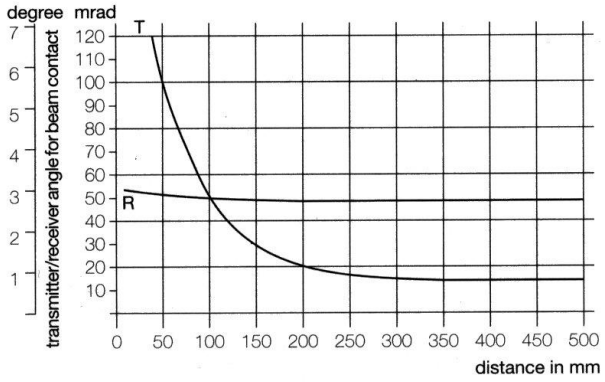

Technical Data Transmitter type 6111 / 6112

Transmitting element	semiconductor laser diode
Transmission	pulsed beam
Transmission frequency	approx. 1000 Hz +/- 10%
Pulse width	approx. 20 ns
Nominal beam divergence	approx. 13 mrad
Transmission wave length	nom. 850 nm
Beam peak pulse output power	max. 1,2 W
Nominal beam output power	approx. 700 mW
Lens diameter	20 mm
Laser classification	Class 1 (IEC 60825-1/A2:2001)
Display, power supply (P)	green LED on
Current consumption (24Vdc)	max. approx. 40 mA
Connection	2 m armoured silicone cable; 3 x 0,75 mm²

Technical Data Receiver type 6111.41 / 6112.41

Sensing data

Receiving element	Photodiode
Receiving frequency	approx. 100 Hz +/- 10%
Viewing angle	see graph
Nominal viewing angle	approx. 50 mrad
Detection wavelength	850 nm +/- 15 nm
Interference filter	HW 25 nm
Receiving sensitivity	>/- 4 µW
Lens diameter	38 mm

Alarm output

Output	relay
Minimum output pulse width	approx. 350 ms +/- 50 ms
Response time delay	adjustable: range from <20 ms to >800 ms
Output relay	energized with beam contact
Relay contact	single pole double throw resistive load max 2 A,125Vac/30Vdc

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Heavy duty **laser-captor** system type 611- / 611-.41

Display & Supply

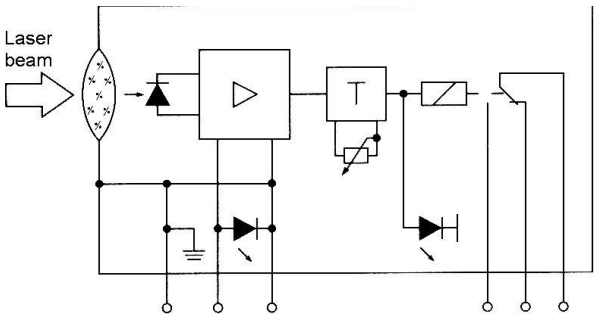
Display power supply (P)	green LED on
Display output (A)	red LED (on without beam contact)
Current consumption	max. approx. 100 mA
Connection	2 m armoured silicone cable; 6 x 0,75 mm²

Electrical connections Designation

Number of color

1 / brown	(bro)	Supply voltage 24 V DC
2 / blue	(blu)	Supply voltage ground
3 / black / yellow	(blk/yell)	Output relay contact
4 / black	(blk)	Output relay contact
5 / yellow	(yell)	Protective ground (Initially connect to supply voltage ground)

Please note, drawing shows:
The relay is depicted in its inactivated i. e. alarm condition (no beam contact)



Technical Data Receiver type 6115.41 / 6116.41 with control output

Sensing data

Receiving element	Photodiode
Receiving frequency	approx. 100 Hz +/- 10%
Viewing angle	see graph
Nominal viewing angle	approx. 50 mrad
Detection wavelength	850 nm +/- 15 nm
Interference filter	HW 25 nm
Receiving sensitivity	>/- 4 µW
Lens diameter	38 mm

Alarm output

Output	relay
Minimum output pulse width	approx. 350 ms +/- 50 ms
Response time delay (D)	adjustable; range from <20 ms to >800 ms
Output relay	energized with beam contact
Relay contact	single pole double throw resistive load max. 2A 125Vac / 30Vdc

Control output (C)

Output	PNP transistor
Impedance	2,2 K Ohm
Operating voltage level (Beam power above threshold)	>/- 20V
Operating current	max. 30 mA
Operating voltage level (beam power below set threshold)	</- 2 V
Threshold adjustment	potentiometer with 270° angle range
Threshold maximum	12 µW min. receiving sensitivity (potentiometer at right end)
Threshold range	max. 20 dB sensitivity reduction (potentiometer at left end)

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Heavy duty **laser-captor** system type 611- / 611-.41

Display & Supply

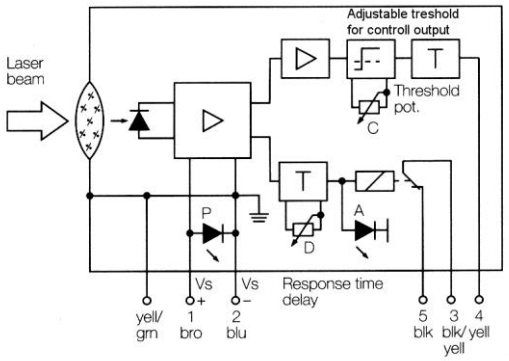
Display, power supply (P)	green LED on
Display; output (A)	red LED (on without beam contact)
Current consumption (24Vdc)	max. approx. 100 mA
Connection	2 m armoured silicone cable; 6 x 0,75 mm²

Electrical connections **Designation**

Number of colour

1 / brown	(bro)	Supply voltage 24 V DC
2 / blue	(blu)	Supply voltage ground
3 / black / yellow	(blk/yell)	Output relay contact
4 / yellow	(yell)	Control output with variable detection threshold 20V: Optical power level above set threshold 0V : Optical power level below set threshold
5 / black	(blk)	Output relay contact
yellow / green	(yell/grn)	Protective ground (initially connect to supply voltage ground.

Please note!
Drawing below shows the relay in its inactivated i. e. alarm condition (no beam contact)



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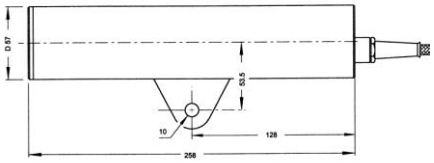
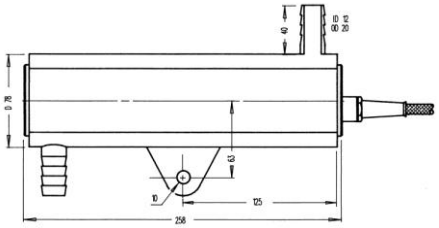


Standard housing

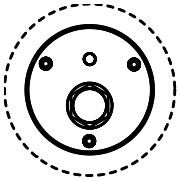
Types: 6111 (Transmitter)
6111 (Receiver)
6111.41 (Receiver)



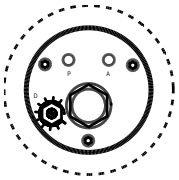
Housing with cooling jacket

Types: 6112 (Transmitter)
6112.41 (Receiver)
6116.41 (Receiver)

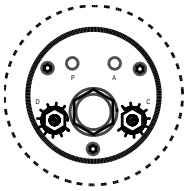
View from behind on back cover



Transmitter
Standard 6111
Cooling jacket



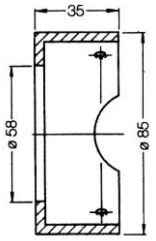
Receiver
Standard 6111.41
colling jacket 6112.41



Receiver
Standard 6115.41
cooling jacket 6116.41

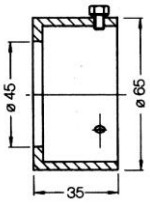
Lens protection caps
for types:

6111.- - / 6115.- -
6112.- - / 6116.- -



6112.- -
6116.- -

3 Hexagonal screws
DIN 933, M5 x 6,
stainless steel

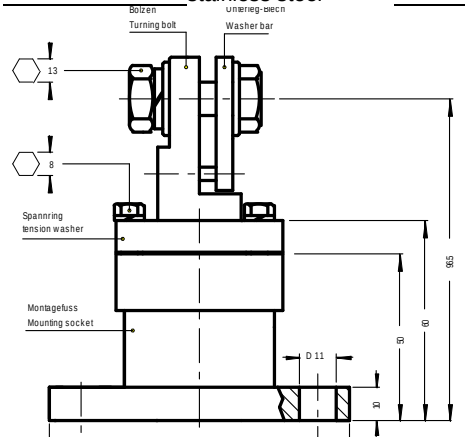


6111.- -
6115.- -

3 Hexagonal screws
DIN 933, M4 x 6,
stainless steel

Swivel stand

Type 413831



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