

laser-captor System, Type 611-/611-.41

True to the tradition of weber Sensors, the laser-captor high performance laser barrier system offers product detection which can be relied on in the harshest of all Steel Industry environments.

Where heat, steam, water, dust and smoke preclude the use of conventional detection systems, the laser-captor's rugged design ensures maintenance free operation and longevity, together with a dependable high performance operation.

At furnace temperatures in excess of 2400 °F (1316 °C) the laser-captor is used extensively in the tracking of slabs and billets through pusher and walking beam furnaces. Other common applications include: anti-collision detection, safety barriers, accurate positioning and through beam barrier detection.

At the heart of the laser-captor transmitter unit is a high-tech IR semiconductor laser element, that is accompanied by electronics and a collimating lens system. All are totally encapsulated and housed in stainless steel. In the receiver unit the highly sensitive photo detection system and output electronics are protected from the environment with the same rugged design.

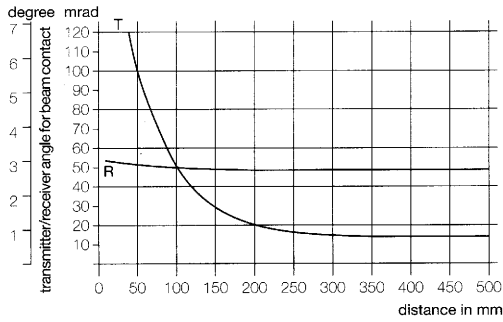
On site adjustment of the receiver's output signal response time between 16 ms and 1s is possible by means of a potentiometer. This allows for specific applications, to find the best balance between a response time and the incidence of short term false signals.

Also available is a receiver unit with an additional control output. This output is activated when the received signal strength falls below a field-adjustable threshold, indicating reduced signal reception and the possibility of false signals on the main output due to i.e. dirty lens covers.

- high performance, high energy transmission
- safety class 1 (no additional protection required)
- low beam divergence
- high sensitivity receiver
- robust design for operation in harsh environments
- longevity, maintenance free

Heavy Duty laser-captor System

Beam characteristics of laser-captor



T - Transmitter beam contact angle nom. 13 mrad (0.9°)

R - Receiver viewing angle nom. 50 mrad (2.6°)

weber Sensors' heavy duty laser-captor system - consisting of the transmitter type 611- and the receiver type 611-.41, is designed to suit long range applications in severe industrial environments where adverse conditions such as dust, smoke, steam and/or heat prevail.

The laser-captor comprises a common transmitter unit and a choice of two different receiver units.

The transmitter unit contains a semi-conductor laser device, which emits light pulses at a fixed pulse repetition rate.

When a system is set up and properly aligned, these light pulses are picked up by the highly sensitive photodetector incorporated in all of the light barrier receiver units.

Use of a semi-conductor laser device and a highly sensitive photodetector guarantees reliable operation, even under extreme conditions.

If there is an interruption of contact between the transmitter and receiver, or if there is a technical defect in the electronics or power supply, the internal alarm relay is de-activated to close the contact (circuit) to activate the externally connected alarm or switchbox.

To meet individual requirements, the light barrier receiver units which are available differ in the following functions:

1. In the standard receiver unit the alarm response time is adjustable from approx. 16 ms to 1s, by means of an adjustable potentiometer on the back panel of the receiver unit.
2. The CON-receiver unit is identical to the standard receiver but has an additional control function, as mentioned below.

Even during normal use, the optics of the transmitter and receiver units will in time become dusty or covered by an oily film, which, if not removed, will reduce the built-in function safety margin, possibly causing false alarms and costly interruptions in production.

To prevent these interruptions an early warning signal can be activated by using the control function of the laser-captor receiver. This sets an electrical signal independent of the "alarm" output, when the strength of the received optical signal falls below a field-adjustable threshold.

If the control output threshold is set with a sufficient margin to the fixed alarm threshold, false alarms can be avoided and maintenance cycles kept to a minimum.

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

For operation in areas with high ambient temperatures, a housing with a water-cooled jacket is available with pipe fittings for connection to a cooling circuit.

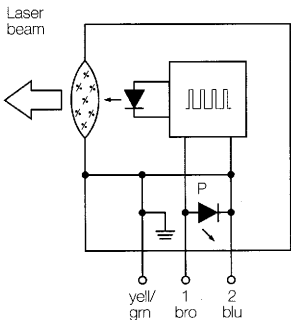
Electrical connections

Number or Color

- 1 / brown (bro)
- 2 / blue (blu)
- yellow/green (yell/grn)

Designation

Supply voltage 24 V DC
Supply voltage ground
Protective ground
(Internally connected to supply voltage ground)



General Technical Data

Operating range	max. approx. 500 m
Supply voltage	24 V DC $\pm 20\%$ (19.2 - 28.8 V)
Overvoltage protection	29.5 V (power off function, latching)
Protection standard	IP 65
Ambient temperature	-15 °C to +55 °C
Housing material	stainless steel (316 Ti)
Mass: Standard housing	approx. 1.8 kg
Mass: Cooling jacket housing	approx. 3.2 kg

Technical Data Transmitter

Type	6111 / 6112
Transmitting element	semi-conductor laser diode
Transmission	pulsed beam
Transmission frequency	approx. 1000 Hz $\pm 10\%$
Pulse width	approx. 20 ns
Nominal beam divergence	approx. 13 mrad
Wave length	nominal 904 nm
Beam peak pulse output power	max. 1.2 W
Nominal beam output power	approx. 700 mW
Lens diameter	20 mm
Laser classification (IEC 825/84)	class 1
Display, power supply (P)	green LED (on)
Current consumption (24 V DC)	max. approx. 40 mA
Connection cable	silicone-armored cable, 3 x 0.75 mm ²
Cable length	2 m

Technical Data Receiver Type 611-.41

Sensing Data

Type	6111.41 / 6112.41
Receiving element	photo diode
Receiving frequency	approx. 100 Hz \pm 10 %
Viewing angle	see graph
Nominal viewing angle	approx. 50 mrad
Detection wavelength (Spectral sensitivity)	900 nm \pm 10 nm
Interference filter	HW 25 nm
Receiving sensitivity	\geq 4 μ W
Lens diameter	38 mm

Alarm Output

Output	relay
Minimum output pulse width	approx. 350 ms \pm 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. 2 A, 125 V AC / 30 V DC

Display + Supply

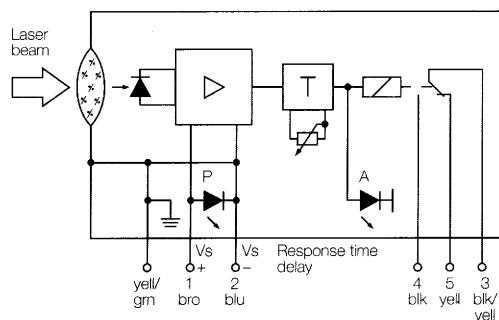
Display, power supply (P)	green LED (on)
Display, output (A)	red LED (on without beam contact)
Current consumption (24 V DC)	max. approx. 100 mA
Connection cable	Silicone armored cable, 6 x 0.75 mm ²
Cable length	2 m

Electrical connections Designation

Number or 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)	Output relay contact
yellow/green (yell/grn)	Protective ground (Internally connected to supply voltage ground)

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



Sensing Data

Type	6115.41 / 6116.41
Receiving element	photo diode
Receiving frequency	approx. 100 Hz \pm 10 %
Viewing angle	see graph
Nominal viewing angle	approx. 50 mrad
Detection wavelength (Spectral sensitivity)	900 nm \pm 10 nm
Interference filter	HW 25 nm
Receiving sensitivity	\geq 4 μ W
Lens diameter	38 mm

Alarm Output

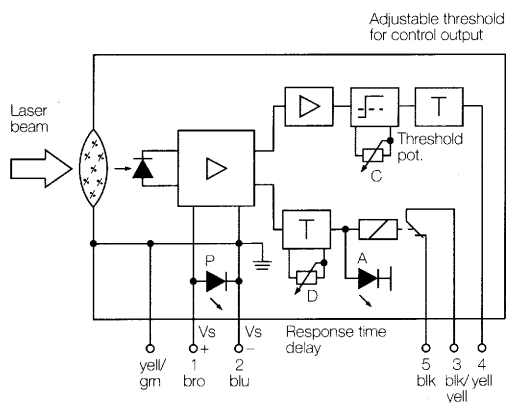
Output	relay
Minimum output pulse width	approx. 350 ms \pm 50 ms
Response time delay (D)	adjustable, range from < 20 ms to > 800 ms
Output relay	energized with beam contact
Relay contact	single pole double throw resistive load max. 2 A, 125 V AC / 30 V DC

Electrical connections Designation

Number or Color

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: 20 V, optical power level above set threshold: 0 V, optical power level below set threshold
5 / black (blk)	Output relay contact
yellow/green (yell/grn)	Protective ground (Internally connected to supply voltage ground)

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

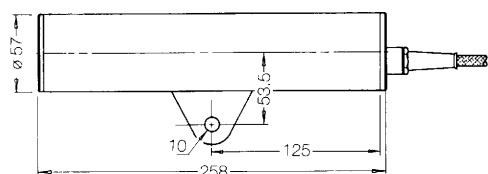


Control Output (C)

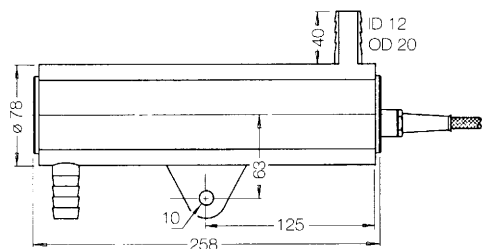
Output	PNP-transistor
Impedance	2.2 K Ohm
Operating voltage level (Beam power above set threshold)	\geq 20 V
Operating current	max. 30 mA
Operating voltage level (Beam power below set threshold)	\leq 2 V
Threshold adjustment	potentiometer with 270° angle range
Threshold maximum	12 μ W min. receiving sensitivity (potentiometer at right end)
Threshold range	max. 20 dB sensitivity reduction (potentiometer at left end)

Display + Supply

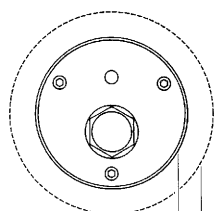
Display, power supply (P)	green LED (on)
Display, output (A)	red LED (on without beam contact)
Current consumption (24 V DC)	max. approx. 100 mA
Connection cable	Silicone armored cable, 6 x 0.75 mm ²
Cable length	2 m



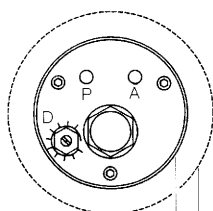
Standard housing
 Types 6111 (Transmitter)
 6111.41 (Receiver)
 6115.41 (Receiver)



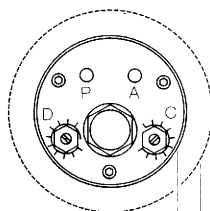
Cooling jacket housing
 Types 6112 (Transmitter)
 6112.41 (Receiver)
 6116.41 (Receiver)



Transmitter
 Standard 6111 -
 cooling jacket 6112

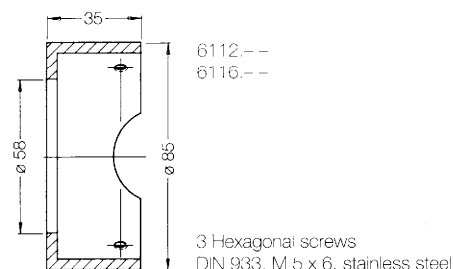


Receiver
 Standard 6111.41 -
 cooling jacket 6112.41



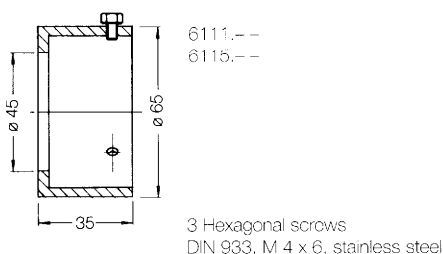
Receiver
 Standard 6115.41 -
 cooling jacket 6116.41

View from behind
 on back cover



6112.--
 6116.--

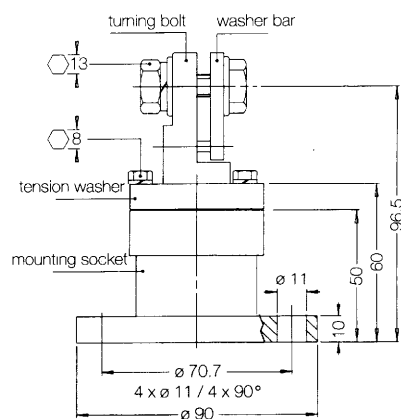
3 Hexagonal screws
 DIN 933, M 5 x 6, stainless steel



6111.--
 6115.--

3 Hexagonal screws
 DIN 933, M 4 x 6, stainless steel

Lens protection
 caps for types
 6111.-- / 6115.--
 6112.-- / 6116.--



all parts stainless steel

Swivel stand
 Type 413831