

Laser Barrier

V5



20 m
30 m
50 m

Detection of product cold or hot

Case in metal

Design for harsh environment

Visible laser beam

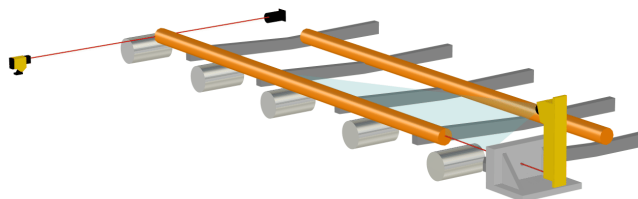


Laser Barrier V5 – features and benefits

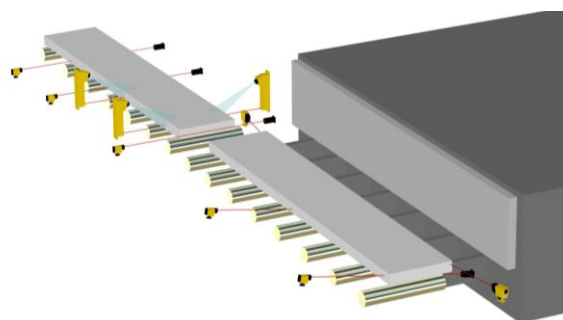
The sensor **V5** works in association with a reflector **R** (cf. literature Lt 3990).

- Visible laser beam of class 2 (no particular using condition according FDA 21 CFR 1040 / IEC 60825-1).
- Bright beam easy to align and which enables large detection range (up to 100 m).
- High accuracy detection.
- Beam modulation and optical filter to have no interference from ambient light. Model with special filter for use in environment with high-level light.
- Cast aluminium case with air purged hood for protecting the lens and optional water-cooling plate.
- Alignment and checking devices: sensitivity potentiometer, light indicator showing operation and alarm.
- Alarm signal when lens or reflector is dirty.
- Model with filter (V5G) for application with emitting background.

Laser Barrier V5 – Examples of applications



Tail detection for on fly length measurement



Slab detection – Charging of reheat furnace

The **Laser Barrier V5** can be used for all detection applications of cold product in the Steel industry.

LARGE RANGE	HARSH ENVIRONMENT	ACCURATE DETECTION
<p>Easy alignment</p>		<p>$s < \pm 1,5 \text{ mm for } d \leq 2 \text{ m}$ $s < \pm 5 \text{ mm for } d \leq 6 \text{ m}$</p>

Laser Barrier V5 – Presentation

The **Laser Barrier V5** consists of :

- An optical unit equipped with laser emitting diode, reception photodiode, electronics with high current transistor output, relay or opto solid state relay and power supply.
- A terminal block with protection cover or a connector fitted with high temperature cable with protective steel braid.
- A hood for lens protection with purging air connection.
- An optional water-cooling plate for use at ambient temperature higher than 50 °C / 122 °F.

Operating principle and Commissioning

The visible and modulated beam emitted by the laser diode is reflected back by a prism reflector placed opposite to the sensor, then detected by the photodiode which outputs a signal to the processing electronics. Product presence is determined depending on whether the beam is blocked or not. Beam modulation, special optical filter and automatic correction make the sensor insensitive to ambient light.

The visible and bright laser beam makes setting up the **Laser Barrier V5** easy and fast.

To align the sensor, the beam has to be aimed at the detection point. Then the reflector has to be positioned so as to centre the point of impact of the beam. The detection accuracy ($\pm 1.5 \text{ mm}$ at 2 m, $\pm 5 \text{ mm}$ at 6 m distance) can be increased by sensitivity potentiometer adjustment. Please find **performance specifications** below:

Reflector (cf. Literature E3990)	R110 - R110 A	R110 HT - R110 HTA	R430 HTA
Distance V5 - reflector: mini / maxi	1 / 30 m	1.5 / 20 m	10 / 50 m
Detection accuracy	For 2 m product/sensor distance : $\pm 1.5 \text{ mm}$ For 6 m product/sensor distance : $\pm 5 \text{ mm}$		



Outputs

Model	V5 - ... - S Transistor output	V5 - ... - SR • Isolated solid state relay output	V5 - ... - R • Relay output
Electrical characteristics	2 complementary push-pull outputs, short circuit protection, Low impedance : 0/24 V - 100 mA max.	2 Optocoupled complementary Solid State Relay : Impedance : 50 Ω Switching capacity +/- 350 V peak +/- 100 mA peak	Single pole changeover Switching capacity : 230 V a.c. - 2.5 A a.c.
Response time	1 ms		Make time : 8 ms Break time : 4 ms
Alarm	Push-pull output, short circuit protection, 0/24 V - 50 mA max. (not available for V5 - • C - R • and V5 - • C - SR • with AC supply voltage) 0V if received light is too low or temperature > 50 °C		

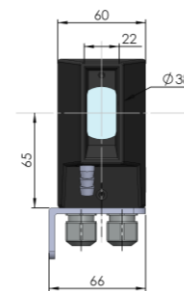
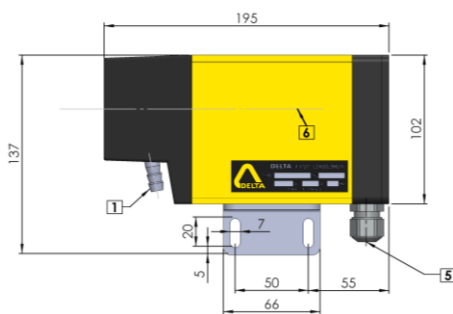
Model	V5 - ... - S	V5 - ... - R1 - V5 - ... - SR1	V5 - ... - R2 - V5 - ... - SR2
Operating mode	S output at 24 VDC and LED on when the beam is interrupted	Dark: relay energized and LED on when the beam is interrupted	Light: relay energized and LED on when the beam is not interrupted
LED indicator	Off: Beam not interrupted Green: Beam interrupted Red: Alarm, beam not interrupted Orange: Alarm, beam interrupted	Off: Beam not interrupted Green: Beam interrupted Red: Alarm, beam not interrupted Orange: Alarm, beam interrupted	Off: Beam interrupted Green: Beam not interrupted Red: Alarm, beam interrupted Orange: Alarm, beam not interrupted

Other data and Dimensions

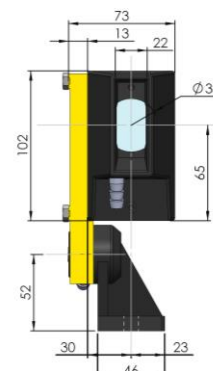
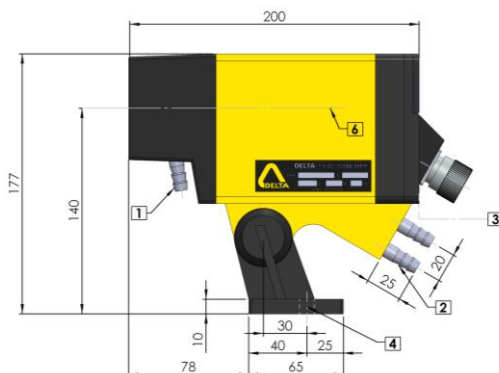
Emitted power / Laser class	1 mW - Class II (FDA 21 CFR 1040), Class 2 (IEC 60825-1)	
Wavelength	650 nm	
Divergence	< 10 mrad	
Operating voltage	220 V (-15%) to 240 V (+10%) - 50 / 60 Hz or 110 V (-15%) to 120 V (+10%) - 50 / 60 Hz or 24 V (±10%) - 50 / 60 Hz	24 V DC (±20%)
Power consumption	10 VA	8 W
Connection	Terminal block – 2 PG 9 (V5 - • B - • •) Connector fitted with silicone cable with protective steel braid (V5 - • C - • •) Standard length of 2 m (other length: 3, 5 or 8 m)	
Weight	2.5 kg (V5 - JC - • •) – 1.8 kg (V5 - LB - • •)	
Protection rating	IP 67 (cast aluminium case)	
Working temperature	-10 to 50 °C (14 to 122 °F) without cooling Up to 120 °C (250 °F) with water cooling: industrial quality water at about 25 °C (77 °F), pressure 1-2 bar and flow 1-2 l/min	



V5 - LB - • •



V5 - JC - • •



- 1 Air supply Ø 10
- 2 Water supplies Ø 10
- 3 Connector clearance 90 mm
- 4 Mounting with screw Ø 10
- 5 Cable glands (2) for cable with Ø 7-10,5 mm
- 6 Optical axis

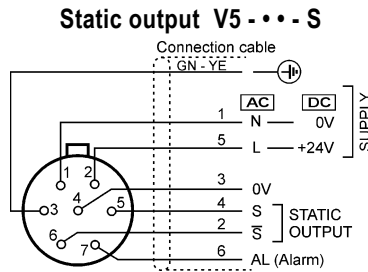


Technical characteristics

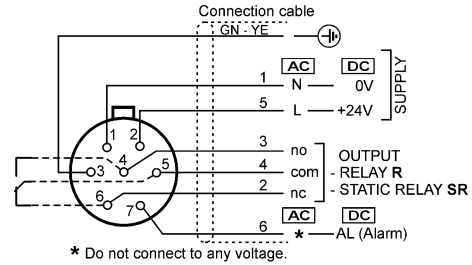
Laser Barrier V5

Connection

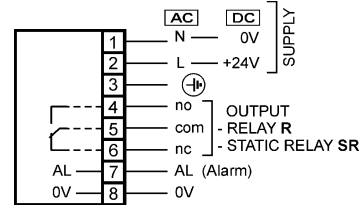
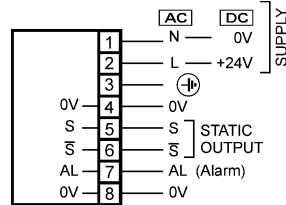
Connector V5 - • C - •



Relay output V5 - • • • - R • and V5 - • • • - SR •

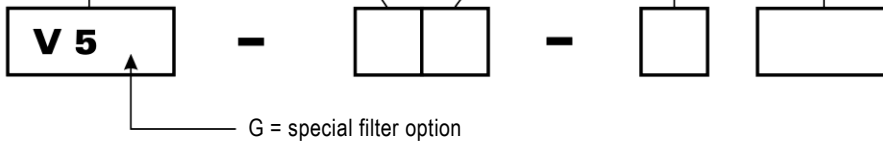


Terminal block V5 - • B - •



Reference for order

CASE	MOUNTING	CONNECTION	OUTPUT	SUPPLY VOLTAGE
	L Bracket	B Terminal block	S Solid-state	230 V AC 115 V AC 24 V AC 24 V DC
			SR1 SR2 Opto solid-state relay	
	J Mounting stand and cooling jacket	C Connector	R1 Relay	
			R2 	



E.g.: V5-JC-R1 115 VAC

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