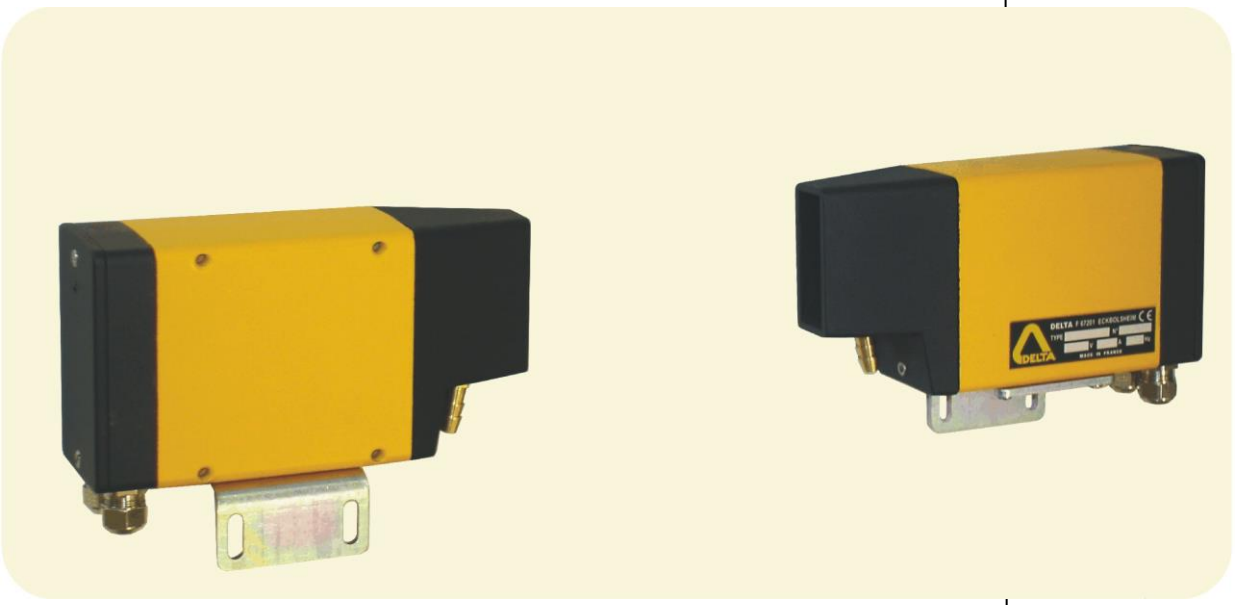
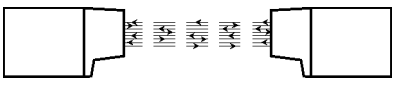
Optical Barrier

VE/VR



- Detection of hot or cold products
- Models with alarm signal
- Designed for harsh environment
- Visible beam



200 m

Lt 952

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Special Features

- Visible red diode emission.
- Insensitivity to ambient light.
- Cast aluminum case with air purged hood for protecting the lens and with optional water-cooling plate.
- Modular construction allowing rapid maintenance.
- Alignment and checking devices: sensitivity potentiometer, light indicator showing operation.
- Alarm signal, when the lenses become too dirty or when the internal temperature is too high.

The **Optical Barrier VE/VR** is used in heavy industries with very harsh environment as coke plants, rolling mills etc.

The emitter **VE** unit emits a high intensity, visible beam of modulated red light. This beam is detected by the photosensitive diode fitted with an optical filter and whose signal is processed by the incorporated circuitry of the receiver **VR**. The output changes state depending on whether the modulated beam is interrupted or not.
Beam modulation, special optical filter and automatic correction make the sensor insensitive to ambient light.

Optical Barrier VE/VR – Presentation

The **Optical Barrier VE/VR** consists of an emitter **VE** and a receiver **VR**:
The **VE** emitter includes:

- An optical unit equipped with an emitting diode 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 air purging connection.
- An optional water-cooling plate for use at ambient temperature higher than 70 °C (160 °F).

The **VR** receiver includes**:**

- An optical unit equipped with a special filter, a 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 air purging connection.
- An optional water-cooling plate for use at ambient temperature higher than 70 °C (160 °F).

Commissioning

1. **Adjustment of light reception:**

- Set the Sensitivity potentiometer to max.
- Align the emitter (VE) to get the brightest reflection of the red beam on the receiver (VR) lens.
- Determine on/off points by swivelling the receiver (VR) horizontally and vertically. Fix the receiver in the middle position.
- With optimum alignment, the LED indicator of the receiver (VR) lights up. If it does not light up or if it turns red or orange (Alarm, received light too low): readjust and/or clean VE and VR.

2. **Object detection check:**

Move the object into the beam; the LED indicator (VR) should switch off. It should switch on again when the object is removed.

Performances

Maximum distance between emitter and receiver		200 m
Detection margin	Distance emitter – receiver: 5 m	> 1600
	Distance emitter – receiver: 15 m	> 180

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Outputs

Model	*VR - • • - S* *Transistor Output*	*VR - • • - SR •* *Isolated solid state relay output*	*VR - • • - 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 VR - • C - R • and VR - • C - SR • with AC supply voltage) 0V if received light too low or internal temperature > 55°C		

Model	*VR - • • - **S***	*VR - • • - **R1*** – *VR - • • - **SR1***	*VR - • • - **R2*** – *VR - • • - **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

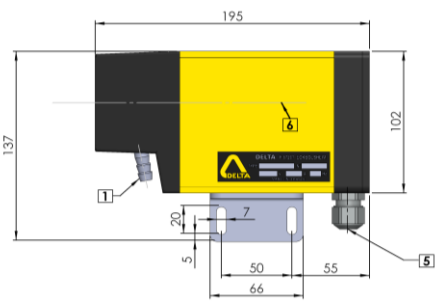
Other data

Emitter	Red LED, with 2.5 kHz modulation	
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 (VE/VR - • **B** - • •) Connector fitted with silicone cable with protective steel braid (VE/VR - - **C** - -). Standard length of 2 m (other length: 3, 5 or 8 m)	
Weight (emitter + receiver)	5 kg (VE/VR - JC - •) – 3.6 kg (VE/VR - LB - •)	
Protection rating	IP 67 (cast aluminium case)	
Air purging	Protection of the optic with clean air: 50 to 200 g/cm², 4 to 16 l/mn	
Working temperature	-20 to 70 °C (0 to 160 °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	

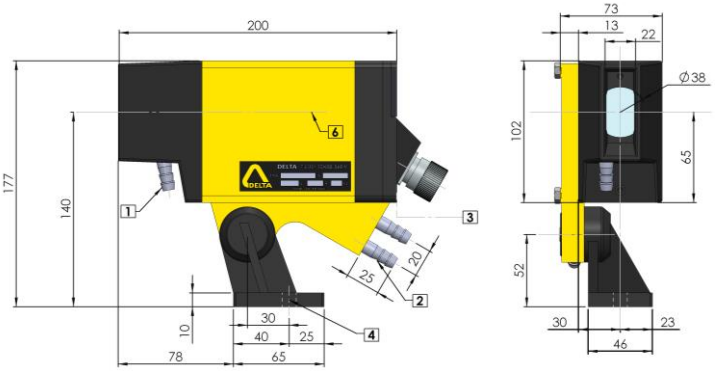
CE

Dimensions

VE - LB
VR - LB - •



VE - JC
VR - 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

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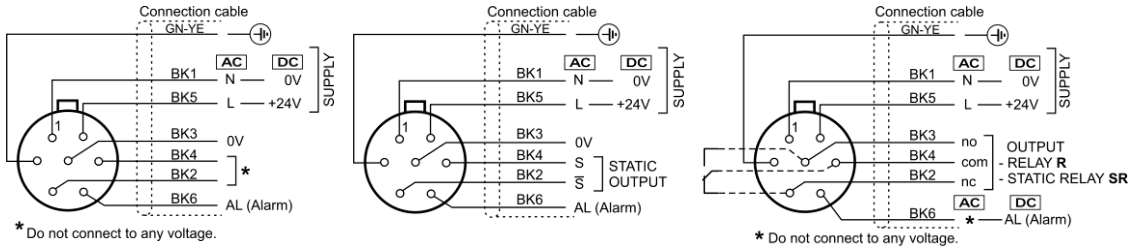
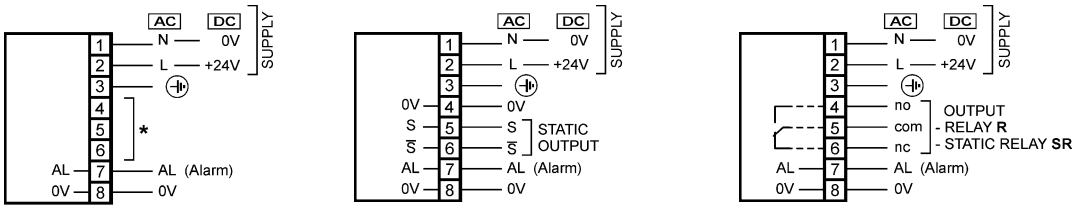
Connection

VE - • • | **VR - • • - S** | **VR - • • - R •** **VR - • • - SR •**

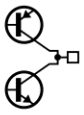
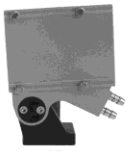
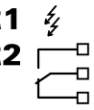
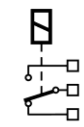
Connection via connector (VE/VR - • C - •)



Connection via terminal block (VE/VR - • 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
	J  Mounting stand and cooling jacket	**C**  Connector	**SR1** **SR2**  Opto solid-state relay	
			R1 **R2**  Relay	

VE/VR – ☐☐ – ☐ ☐

E.g.: **VE/VR-JC-R1 230VAC**

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