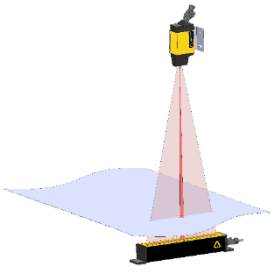
Weld Hole Detector
DTR540/EMR-C



- Large field of detection and off-centered strip
- For detection of 1 or 2 holes
- Smart functions of receiver
- Easy setup and alignment

Lt 1140

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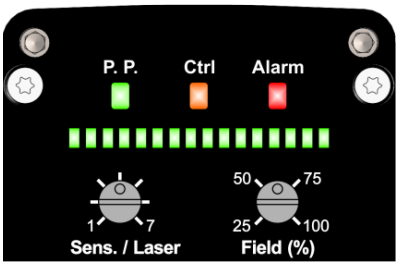
Principle

The receiver DTR540 is a linear photodiode array detector. In association with the EMR-C red LED emitter, it is able to detect the weld hole made in order to locate the linking weld between two strips.
The receiver consists of a lens, a linear diode array and a processing unit enclosed in a cast aluminium case. The image of the viewed area is focused onto the diode array. The output of the receiver DTR540 switches when a hole is seen within the field of view with light emitter EMR-C in the background.
DELTA offers two models of weld hole detector to satisfy different possibilities of weld detection:
- DTS240/EMR-M: for standard application, hole deviation less than 340 mm and strip covering completely the emitter.
DTR540/EMR-C: for application with large variation in the hole position or narrow width and off-centred strip (replacing previous DTR340), or for lines equipped for detection of 2 holes at the same time (replacing previous DTR522).

Features

The detector **DTR540** has been designed for heavy industry, with a mounting bracket adjustable in two axes. In case the sensor must be replaced, it can be easily dismounted from the stand, without disturbing the alignment.
This sensor is 'smart' as it is able to differentiate a real hole according to the hole size and position. The field of view can be adjusted by operator depending on installation distance.
The control panel allows an easy setup and includes:



- 3 LED giving sensor status:
  - **P.P.** is green when detection output is activated (Product Presence)
  - **Ctrl** is orange when detection margin is not enough.
  - **Alarm** is red when alarm output is activated (internal T° too high, receiver out of function)
- A **bargraph** with green LED showing the active field of view and position of the hole within this field.
- The **'Field'** potentiometer to setup the detection angle.
- The '**Sens./Laser**' potentiometer to adjust sensitivity (a combination of size, filter, integration time).
  A **laser cross**, to make alignment of receiver regarding emitter, is activated at power on, and as soon as you turn the 'Sens./Laser' potentiometer (stays ON during 15 min, then automatically switches OFF).

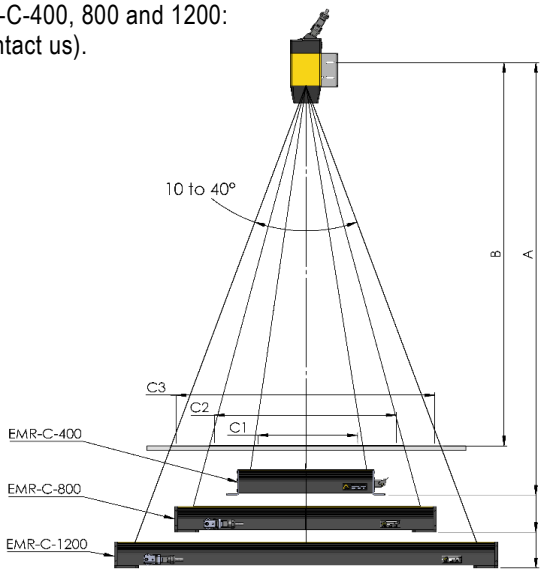
Installation – Field of view

The field of view and the light emitter should cover the lateral position of the hole taking into account its position on the strip and the strip off-center. The tables below show the field of view for EMR-C-400, 800 and 1200:
(values valid for thickness of strips < 5 mm ; for thicker strips, please contact us).

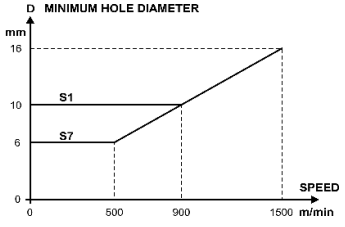
Max field of detection		A: Distance to EMR-C-400					
		900	1100	1300	1500	1700	1900
B: Distance pass-line	700	295	235	195			
	900		310	255	220		
	1100			315	270	235	
	1300				320	280	250
	1500					325	285

Max field of detection		A: Distance to EMR-C-800					
		900	1100	1300	1500	1700	1900
B: Distance pass-line	700	600	475	390			
	900		620	515	440		
	1100			635	540	470	
	1300				645	560	495
	1500					650	575

Max field of detection		A: Distance to EMR-C-1200					
		900	1100	1300	1500	1700	1900
B: Distance pass-line	700	900	710	590			
	900		930	770	655		
	1100			950	810	705	
	1300				965	840	745
	1500					975	865



The minimum hole diameter (in mm) depending on the line speed is given in this graph:



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Technical characteristics

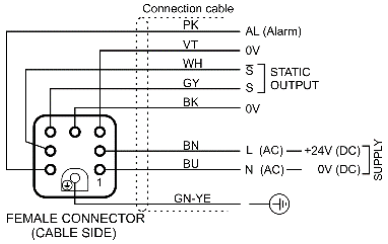
Reference	*DTR540-●-**1H***	*DTR540-●-**2H***
Number of holes	1	2
Minimum hole diameter	Sensitivity set to high (7): 6 mm at max 500 m/min / 16 mm at 1500 m/min Sensitivity set to low (1): 10 mm at max 900 m/min / 16 mm at 1500 m/min	
Number of pixels	1024	
Detection angle (adjustable)	10° to 40°	
Dist. range receiver to strip	700 – 1500 mm	
Detection field	Max. 1000 mm	
Lateral angle / field	0.18 ° / 2.2 – 4.5 mm at min – max distance	
Response time	2 ms	
On time	500 ms	
Laser pointer (IEC 60825-1 2014)	Laser cross, green, class 2M Activated during 15 min at power on and as soon as the Sens./Laser potentiometer is turned	

Receiver	*DTR540-**S**-●*	*DTR540-**SR**-●*
Product Presence (P.P.)	Transistor: 2 PNP "High side" S & /S 0/24V complementary outputs ; low impedance: 50 mA max ; protected against short circuit. Switching time: 0.2 ms	2 Optocoupled complement. Solid State Relay: Impedance: 50 Ω, Switching capacity: +/- 350 V peak +/- 100 mA peak. Switching time: 0.2 ms
Alarm output	PNP "High side" 0/24V ; low impedance: 50 mA ; 24V when alarm activated: internal failure or temperature > 55° (131 °F), or supply voltage out of range	
Display and setting	3 status LED (P.P., Ctrl, Alarm) / 16 LEDs for display of detection array 2 potentiometers: to select the detection range and to adjust the sensitivity	
Operating voltage / Power consumption	VAC: 115 V (-15%) to 230 V (+10%) – 50/60 Hz / 5 VA VDC: 10 to 30 VDC / 5 W	
Connection	Connector fitted with silicone cable & protective steel braid. Length 2 m (standard), 3 m, 5 m, 8 m	
Weight	2.5 kg	
Protection rating	IP66 (cast aluminium case)	
Air Purging	Protection of the optic with clean air: 50 to 200 g/cm², 4 to 16 l/min	
Operating temperature	-20°C to 60°C (-4°F to 140°F)	

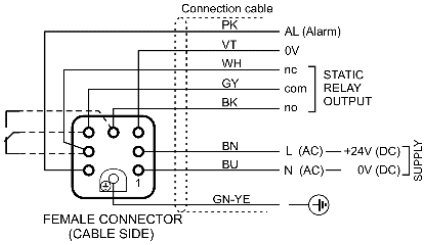
Emitter	*EMR-C-400*	*EMR-C-800*	*EMR-C-1200*
Emission	Continuous Red LED		
Emission length / width	400 mm / 30 mm	800 mm / 30 mm	1200 mm / 30 mm
Alarm output	Push-pull output, 0/24 V - 50 mA max 0V if internal failure or internal temperature > 55°C (131 °F)		
Operating voltage	VAC: 110 V (-15%) to 230 V (+10%) – 50/60 Hz VDC: 24 VDC (+/-20%)		
Power consumption AC / DC	20 VA / 10 W	40 VA / 20 W	60VA / 30 W
Connection	Connector fitted with silicone cable & protective steel braid. Length 2 m (standard), 3 m, 5 m, 8 m		
Weight	4 kg	8 kg	12 kg
Protection Rating	IP66 (cast aluminium case)		
Operating temperature	-20°C to 55°C (-4°F to 131°F)		

Connection

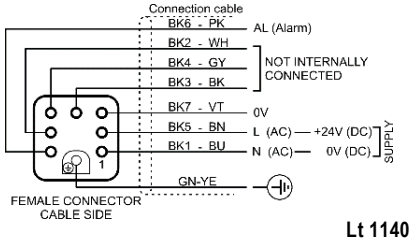
DTR540-S



DTR540-SR



EMR-C



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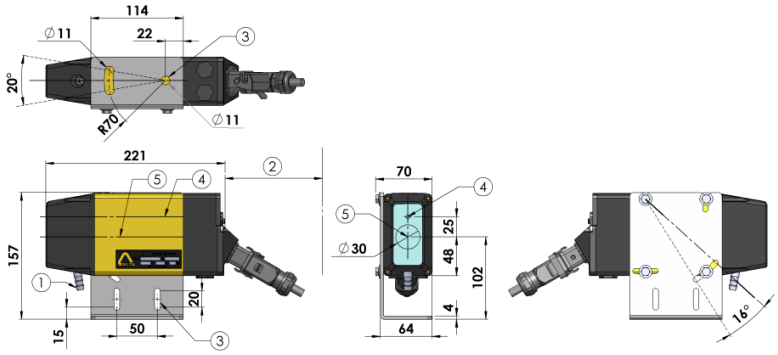
Dimensions

DTR540

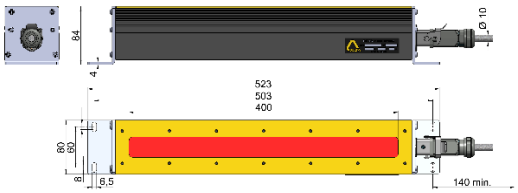


① Air supply Ø 10
② Connector clearance: min 120 mm
③ Mounting with 2 screws M6 or M10
④ Laser cross origin
⑤ Optical axis

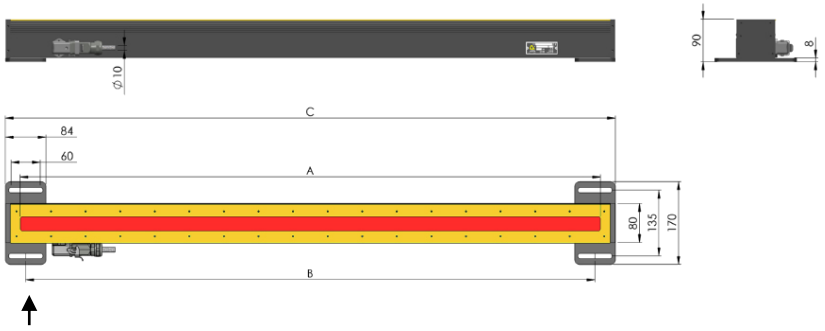
EMR-C-•••

	A	B	C
EMR-C-800	800	775	860
EMR-C-1200	1200	1175	1260

EMR-C-400



EMR-C-800
EMR-C-1200



Note: *The fixing plate can be mounted on bottom or side of the emitter).*

Reference for order

DTR540-•-•• ••• L=•

Output type	*Number of Holes*	*Supply voltage*	*Cable length*
S: High side PNP SR: Static Relay	1H: One 2H: Two	115-230V 24VDC	0: no cable 2: 2 m (standard) 3: 3 m 5: 5 m 8: 8 m

e.g.: DTR540-S-1H 115-230V L=2

EMR-C-••• ••• L=•

Length (mm)	*Supply voltage*	*Cable length*
400 800 1200	115-230V 24VDC	0: no cable 2: 2 m (standard) 3: 3 m 5: 5 m 8: 8 m

e.g.: EMR-C-800 115-230V L=2

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