

# Contrast scanners

	<b>Glossary of technical terms</b>	<b>160</b>
<b>LT serie</b>	<b>Contrast scanners - DC</b>	<b>162</b>

### General description

The contrast scanners LT operate with an optimal energy balance on the principle of the reflected Light scanner. Without the scanning distance changing, it can distinguish up to 15 grey scale steps from black to white. This is necessary for recognition of contrast marks such as printed colour bars. What matters for the legibility of a mark is the difference in brightness between the mark and its background.

The material surface can be rough, smooth or glossy and made of paper, plastic or metal.

### Operating principle

The light from the source is reflected back by the surface of the object to be scanned. Lighter surfaces reflect more light than darker surfaces, such as marks. This difference is recognized by the contrast scanner LT. The light receiver converts the light into a proportional voltage. This voltage is compared with the set switching threshold. Whether the edge is positive or negative, depends on the set response (light switching or dark switching) and on the response output.

### Mounting information

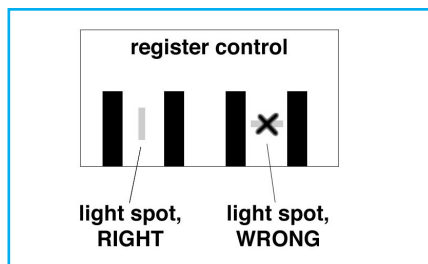
The Contrast scanners LT must be mounted in such a way that the material which is to be scanned is in a constant distance. The side movements must be compensated by adequate length of distance.

The more the distance is constant, the better the contrast resolution.

For a correct function the contrast scanner LT must be mounted such that the working distance can be regulated and reproduced.

It is necessary to evade any vibrations so that it does not influence the working distance. If the surface of the material to be scanned is illuminated sufficiently strong, the receiving zone must be protected.

The contrast scanners LT must be mounted in such a way that the luminous spot has its parallel axis at the contrast border perpendicular in the sense of the contrast.



Besides with the Contrast scanners LT it is possible to select the position of the emission of the luminous spot; it is sufficient to change the position of the lens with the stopper at the side of the product.


### Sensitivity adjustment

To obtain the maximum signal margin with the maximum tolerance of the scanning distance, the commuting threshold must be in the middle between the background signals and the contrast marks.

### Applications

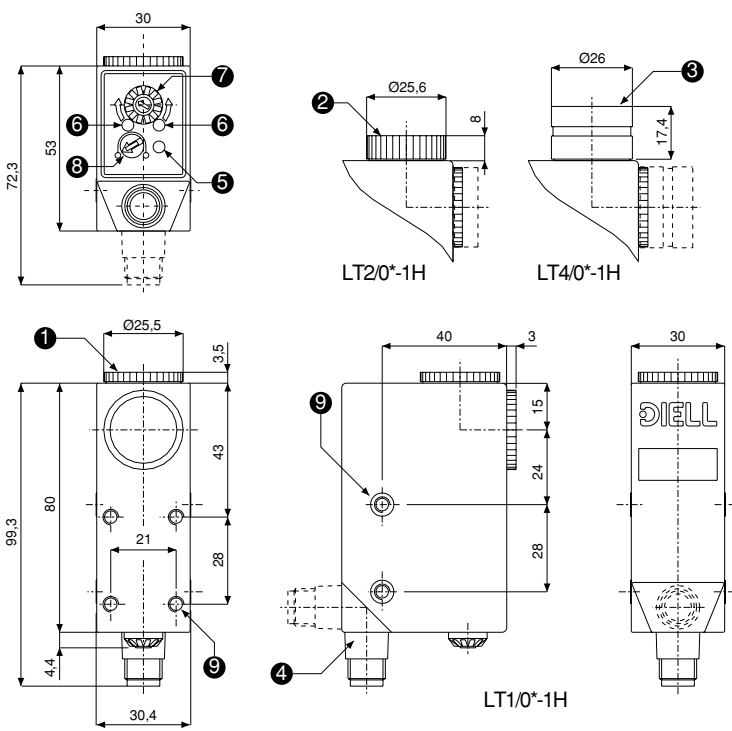
The contrast scanners LT are mostly used in packing industries; other applications are for positioning of boxes and tubes, the sorting of different coloured marks, the positioning of labels, the recognizing of codes, the control of expiring dates or the respective composition.



SERIE	LT
	
<b>Contrast scanners - DC</b>	
<ul style="list-style-type: none"> <li>◆ Long-life LED light source</li> <li>◆ Switching frequency 10KHz</li> <li>◆ Different scanning distances depending on type</li> <li>◆ Insensitive to external light</li> <li>◆ On/off output NPN or PNP</li> <li>◆ Sensitivity adjustment</li> <li>◆ 2 position adjustable M12 connector exit</li> <li>◆ Sturdy metal housing</li> <li>◆ IP65 protection degree</li> <li>◆ Complete protection against electrical damage</li> </ul>	



### DIMENSIONAL DRAWING



Key	
1	Lens LT1 (sensing distance 10mm)
2	Lens LT2 (sensing distance 20mm)
3	Lens LT4 (sensing distance 40mm)
4	2 position M12 plug-in exit
5	Red LED (output state)
6	Green LEDs (rotation indicators)
7	Switching level indicator
8	Impulse commutator (dark/bright)
9	Mounting holes M5x5,5mm

### LED indicators

Three LED signals:  
function indicator,  
2 rotation direction indicators.

### Adjustment of sensitivity

### Lens selectable assembly

It's possible to insert the lens in two different positions, axial and 90°

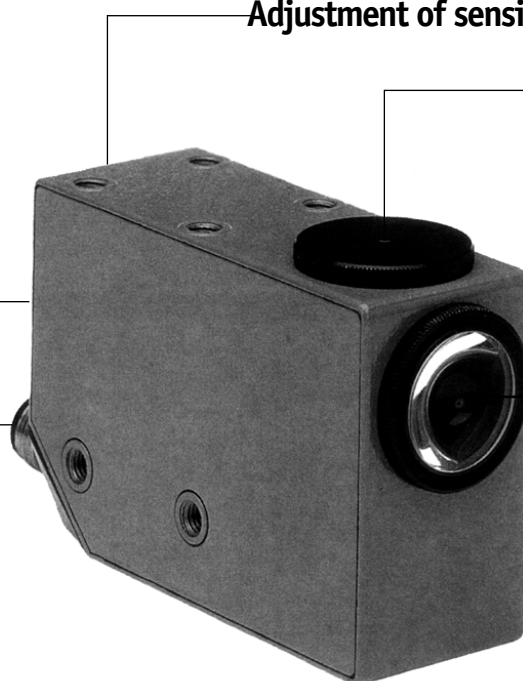
### 3 scanning distances

Three different scanning distances (10, 20 and 40mm) according to the models.

### M12 output connector

Turnable in 2 position: axial and 90°.

**Long life  
light source,  
green LED**

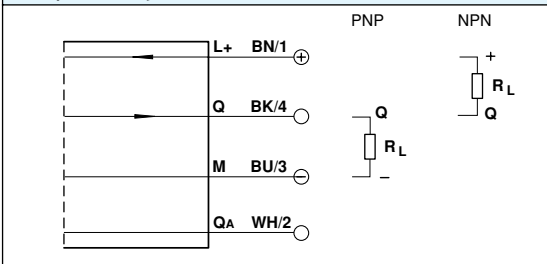
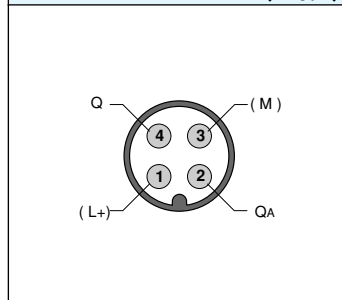


**ORDERING SYSTEM**

		<b>L T 1 / O N - 1 H</b>			
serie					
contrast scanner	<b>LT</b>			<b>H</b>	cable exit M12 plug cable exit
model					housing
sensing distance 10mm	<b>1</b>			<b>1</b>	metal
sensing distance 20mm	<b>2</b>				logic
sensing distance 40mm	<b>4</b>			<b>N</b>	NPN output
output state				<b>P</b>	PNP output
NO/NC output selectable	<b>0</b>				

**SPECIFICATIONS**

Model	<b>LT1/0*-1H</b>	<b>LT2/0*-1H</b>	<b>LT4/0*-1H</b>
<b>Nominal sensing distance Sn</b>	10mm	20mm	40mm
Light spot dimension	1,2x4,2mm	1,5x5,5mm	1,1x4,2mm
Lenses	211	212	210
<b>Operating voltage</b>	10-30Vdc		
Ripple	5Vpp		
Current consumption	80mA		
<b>Load current</b>	≤100mA		
Wavelength	green LED		
Duration of light source	100000 hours (with temperature of +25°C)		
<b>Output type</b>	NPN or PNP		
Analog output	0,3...10mA (Ri max=800Ω)		
Output voltage HIGH	Uv<2V (NPN models) - Uv (PNP models)		
Output voltage LOW	0V		<2V
Switching frequency	10KHz		
Response time	50μs		
<b>Supply electrical protections</b>	polarity reversal, transient		
Output electrical protections	short circuit		
<b>Temperature range</b>	-10...+55°C (in use); -10...+75°C (not in use)		
Shock and vibrations	IEC68		
Electromagnetic compatibility	IEC801		
<b>Protection degree (DIN 40 050)</b>	IEC IP65		
LED indicators	red (function indicator), 2 green (rotation indicators)		
Weight (approx.)	400g		

**WIRING DIAGRAMS**
**NPN / PNP output**

**CONNECTORS**
**M12 (H type)**

**CHARACTERISTIC CURVES**
**Excess gain**
