W280L-2 Long Range
Compact photoelectric sensors

Laser class 1 photoelectric proximity sensors –
great performance, simple operation
W280L-2 Long Range photoelectric proximity sensor – „best in class“ in laser class 1

Longest laser class 1 sensing distance

On black, 6% remission

- 3 m

Max. 2,5 m

other manufacturers

High reliability

- Reliable detection on various surface colors and textures even at high incident angles

- Resistant to stray reflections from shiny or highly reflective objects beyond the set sensing distance, e.g. metal, windows, safety vests

- Immune to cross talk from opposed sensors
Easy set-up – simple, intuitive, fast

2 in 1: reduced costs
- 2 sensing distances / 2 switching points (1 + 2) can be set independently
- 2 sensing distances adjustment potentiometers – one for each switching output
- 2 indicating LEDs – one for each switching output

Fast commissioning
- Setting with potentiometer is preferred by most users
- Image shows version with one switching point

Flexible in application
- Rotatable connector
- Light / dark operate selection switch
- Versatility of use reduces stock inventory
Product description

The WTT280L-2 Long Range provides up to 4.0 m sensing distance on light colored targets. The option of 2 independent switching outputs allows feedback of low and high detection points. Setup is easy through an intuitive sensing range adjustment potentiometer and indicator LED for each switching output. A visible red Class 1 laser ensures alignment is quick and precise. An integrated protective system in the W280L-2 Long Range prevents adverse effects caused by reflections in the background, for example, resulting from reflective metal surfaces, windows and safety vests and ignores cross-talk from an adjacent sensor. In addition, the sensing distance can be increased up to 18 m with the reflector version WLT280L-2 Long Range.

At a glance

- WTT280L-2 Long Range: Background suppression sensing distance up to 4 m
- Complete background suppression: very small black/white shift, insensitive against reflections from the background (e.g. shiny metal, window, safety vest)
- Ignores cross talk from adjacent sensors
- Visible red Class 1 laser
- Version 1: with 1 x switching output and light/dark switch, Version 2: with 2 x switching outputs and light/dark switch
- Reliable detection also in very fast production processes thanks to the switching frequency of 1,000 Hz
- Disable laser by wire

Your benefits

- Reliable target detection with difficult target colors, angles and color transitions (black/white shift)
- One sensor with two outputs and two status LEDs improves application flexibility and reduces the number of sensors needed
- Quick and easy commissioning with sensing range adjustment potentiometers and status LEDs - one for each output
- Quick and easy alignment with a red Class 1 laser
- Rotatable connector and light/dark switch for mounting and installation flexibility

Additional information

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### Features

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<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor principle</td>
<td>Photoelectric proximity sensor</td>
</tr>
<tr>
<td>Detection principle</td>
<td>Background suppression</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>23.5 mm x 76 mm x 55.8 mm</td>
</tr>
<tr>
<td>Housing design (light emission)</td>
<td>Rectangular</td>
</tr>
<tr>
<td>Sensing range max.</td>
<td>200 mm ... 4,000 mm</td>
</tr>
<tr>
<td>Type of light</td>
<td>Visible red light</td>
</tr>
<tr>
<td>Light source</td>
<td>Laser</td>
</tr>
<tr>
<td>Light spot (distance)</td>
<td>Ø 12 mm (3 m)</td>
</tr>
<tr>
<td>Sensing distance adjustment</td>
<td>Potentiometer</td>
</tr>
<tr>
<td>Laser class</td>
<td>1 (EN 60825-1:2008-5, IEC 60825-1:2007-03)</td>
</tr>
</tbody>
</table>

1) Object with 90 % reflectance (referred to standard white DIN 5033)
2) Objects to be sensed with 6 % reflectivity (based on black)
3) Average service life 100,000 h at Ta = +25 °C.

### Mechanics/electronics

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>10 V DC ... 30 V DC</td>
</tr>
<tr>
<td>Residual ripple</td>
<td>≤ 3 V&lt;sub&gt;pp&lt;/sub&gt;</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 70 mA</td>
</tr>
</tbody>
</table>
| Switching output               | 1 x PNP, Light/dark-switching, selectable via light/dark rotary switch, open collector
|                                | 1 x NPN, Light/dark-switching, selectable via light/dark rotary switch, open collector
|                                | 2 x PNP, Light/dark-switching, selectable via light/dark rotary switch, open collector
|                                | 2 x NPN, Light/dark-switching, selectable via light/dark rotary switch, open collector
|                                | (depending on type)           |
| Output current<sub>max</sub>   | ≤ 100 mA                      |
| Response time                  | ≤ 0.5 ms                      |
| Switching frequency            | 1,000 Hz                      |
| Connection type                | Connector
|                                | Cable, 2 m, PVC, 0.18 mm², Ø 3.8 mm
|                                | (depending on type)           |
| Circuit protection             | A<sup>7</sup>                  |
|                                | B<sup>8</sup>                  |
|                                | C<sup>9</sup>                  |
|                                | D<sup>10</sup>                 |
| Protection class               |                                |
| Weight                         |                                |
| Cable, 2 m, 5-pin, 2 m, PVC    | 200 g                          |
| Connector M12, 5-pin           | 150 g                          |
| Housing material               | ABS                            |
| Optics material                | PMMA                           |
| Enclosure rating               | IP 67                          |
## Items supplied

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting bracket</td>
<td>BEF-W280</td>
</tr>
</tbody>
</table>

## EMC

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN 60947-5-2</td>
<td></td>
</tr>
</tbody>
</table>

## Ambient operating temperature

<table>
<thead>
<tr>
<th>Description</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>-10 °C ... +50 °C</td>
<td></td>
</tr>
</tbody>
</table>

## Ambient storage temperature

<table>
<thead>
<tr>
<th>Description</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40 °C ... +70 °C</td>
<td></td>
</tr>
</tbody>
</table>

1) Limit values, operation in short-circuit protected network max. 8 A.
2) May not exceed or fall short of Vc.
3) Without load.
4) Signal transit time with resistive load.
6) Do not bend below 0 °C.
7) A = Vc connections reverse-polarity protected.
8) B = output reverse-polarity protected.
9) C = interference suppression.
10) D = outputs overcurrent and short-circuit protected.
11) The devices meet the interference suppression requirements for industrial use (interference suppression class A). When used in residential areas it can cause interference.

## Ordering information

<table>
<thead>
<tr>
<th>Sensing range max.</th>
<th>Output function</th>
<th>Switching mode</th>
<th>Connection</th>
<th>Model name</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 mm ... 4,000 mm</td>
<td>1 x PNP</td>
<td>Light/dark-switching</td>
<td>Connector M12, 5-pin</td>
<td>WTT280L-2P2531</td>
<td>6048061</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cable, 2 m, 5-pin, 2 m, PVC</td>
<td>WTT280L-2P1531</td>
<td>6048065</td>
</tr>
<tr>
<td>200 mm ... 3,000 mm</td>
<td>1 x NPN</td>
<td>Light/dark-switching</td>
<td>Connector M12, 5-pin</td>
<td>WTT280L-2N2531</td>
<td>6048063</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cable, 2 m, 5-pin, 2 m, PVC</td>
<td>WTT280L-2N1531</td>
<td>6048067</td>
</tr>
<tr>
<td>200 mm ... 3,000 mm</td>
<td>2 x PNP</td>
<td>Light/dark-switching</td>
<td>Connector M12, 5-pin</td>
<td>WTT280L-2P2536</td>
<td>6048062</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cable, 2 m, 5-pin, 2 m, PVC</td>
<td>WTT280L-2P1536</td>
<td>6048066</td>
</tr>
<tr>
<td>200 mm ... 3,000 mm</td>
<td>2 x NPN</td>
<td>Light/dark-switching</td>
<td>Connector M12, 5-pin</td>
<td>WTT280L-2N2536</td>
<td>6048064</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cable, 2 m, 5-pin, 2 m, PVC</td>
<td>WTT280L-2N1536</td>
<td>6048068</td>
</tr>
</tbody>
</table>

1) Object with 90 % reflectance (referred to standard white DIN 5033)
2) Objects to be sensed with 6 % reflectivity (based on black)
**Dimensional drawing**

1. Center of optical axis, receiver
2. Center of optical axis, sender
3. Mounting hole, Ø 4.3 mm
4. Connector M12, 5-pin, rotatable by 90°
5. Cable, 2 m, 5-pin, Ø 3.8 mm

**Adjustments**

**WT280L-2xxxx1**

6. LED indicator green: Stability indicator
7. Status indicator LED, yellow: Status of received light beam
9. Sensing range adjustment: Potentiometer
11. Light/dark selector

**WT280L-2xxxx6**

8. LED indicator green: Stability indicator
7. Status indicator LED, yellow: Status of received light beam (switching output 1)
9. Sensing range adjustment: Potentiometer for switching output 1
11. Light/dark selector

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Subject to change without notice
Connection diagram

WTT280L-2x2531, Connector

WTT280L-2x1531, Cable

WTT280L-2x2536, Connector

WTT280L-2x1536, Cable

Operating reserve

Sensing range

1. Sensing range on black, 6% remission
2. Sensing range on grey, 18% remission
3. Sensing range on white, 90% remission
Product description

The reflector version WLT280L-2 Long Range is capable of a 18 m sensing distance and offers simple commissioning. The option of 2 independant switching outputs allows feedback of low and high detection points. Setup is easy through an intuitive sensing range adjustment potentiometer and indicating LED for each switching output. A visible red Class 1 laser ensures that the alignment is quick and precise. An integrated protective system in the W280L-2 Long Range allows to ignore cross talk from an adjacent sensor. In addition, the WTT280L-2 Long Range supplements the range, while it comes without a reflector and offers a sensing distance up to 4 m.

At a glance

- WLT280L-2: Sensing distance up to 18 m with reflector P250
- Visible red Class 1 laser
- 2 x switching outputs and light/dark switch
- Disable laser by wire

Your benefits

- One sensor with two outputs and two status LEDs improves application flexibility and reduces the number of sensors needed
- Quick and easy commissioning with sensing range adjustment potentiometers and status LEDs - one for each output
- Quick and easy alignment with a red Class 1 laser
- Rotatable connector and light/dark switch for mounting and installation flexibility

Additional information

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For more information, just enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.
## Detailed technical data

### Features

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<tr>
<th>Feature</th>
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<tbody>
<tr>
<td>Sensor principle</td>
<td>Photoelectric proximity sensor</td>
</tr>
<tr>
<td>Detection principle</td>
<td>Background suppression</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>23.5 mm x 76 mm x 55.8 mm</td>
</tr>
<tr>
<td>Housing design (light emission)</td>
<td>Rectangular</td>
</tr>
<tr>
<td>Sensing range max. 1)</td>
<td>200 mm ... 18,000 mm</td>
</tr>
<tr>
<td>Sensing range</td>
<td>200 mm ... 18,000 mm</td>
</tr>
<tr>
<td>Type of light</td>
<td>Visible red light</td>
</tr>
<tr>
<td>Light source 2)</td>
<td>Laser</td>
</tr>
<tr>
<td>Light spot (distance)</td>
<td>Ø 50 mm (18 m)</td>
</tr>
<tr>
<td>Sensing distance adjustment</td>
<td>Potentiometer</td>
</tr>
<tr>
<td>Laser class</td>
<td>1 (EN 60825-1:2008-5, IEC 60825-1:2007-03)</td>
</tr>
</tbody>
</table>

1) Reflector P250, PL80A.
2) Average service life 100,000 h at Ta = +25 °C.

### Mechanics/electronics

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage 1)</td>
<td>10 V DC ... 30 V DC</td>
</tr>
<tr>
<td>Residual ripple 2)</td>
<td>≤ 3 Vpp</td>
</tr>
<tr>
<td>Power consumption 3)</td>
<td>≤ 70 mA</td>
</tr>
<tr>
<td>Switching output</td>
<td>2 x PNP, Light/dark-switching, selectable via light/dark rotary switch, open collector</td>
</tr>
<tr>
<td></td>
<td>2 x NPN, Light/dark-switching, selectable via light/dark rotary switch, open collector (depending on type)</td>
</tr>
<tr>
<td>Output current I_{max.}</td>
<td>≤ 100 mA</td>
</tr>
<tr>
<td>Response time 4)</td>
<td>≤ 2 ms</td>
</tr>
<tr>
<td>Switching frequency 5)</td>
<td>250 Hz</td>
</tr>
<tr>
<td>Connection type</td>
<td>Cable, 2 m, PVC, 0.18 mm², Ø 3.8 mm 6)</td>
</tr>
<tr>
<td></td>
<td>Connector (depending on type)</td>
</tr>
<tr>
<td>Circuit protection</td>
<td>A 7)</td>
</tr>
<tr>
<td></td>
<td>B 8)</td>
</tr>
<tr>
<td></td>
<td>C 9)</td>
</tr>
<tr>
<td></td>
<td>D 10)</td>
</tr>
<tr>
<td>Protection class</td>
<td>☀</td>
</tr>
<tr>
<td>Weight</td>
<td>Cable, 2 m, 5-pin, 2 m, PVC Connector M12, 5-pin tape</td>
</tr>
<tr>
<td></td>
<td>200 g</td>
</tr>
<tr>
<td></td>
<td>150 g</td>
</tr>
<tr>
<td>Housing material</td>
<td>ABS</td>
</tr>
<tr>
<td>Optics material</td>
<td>PMMA</td>
</tr>
</tbody>
</table>
Enclosure rating | IP 67
---|---
Items supplied | Mounting bracket BEF-W280
EMC 1) | EN 60947-5-2
Ambient operating temperature | –10 °C ... +50 °C
Ambient storage temperature | –40 °C ... +70 °C

1) Limit values, operation in short-circuit protected network max. 8 A.
2) May not exceed or fall short of Vω.
3) Without load.
4) Signal transit time with resistive load.
6) Do not bend below 0 °C.
7) A = Vω connections reverse-polarity protected.
8) B = output reverse-polarity protected.
9) C = interference suppression.
10) D = outputs overcurrent and short-circuit protected.
11) The devices meet the interference suppression requirements for industrial use (interference suppression class A). When used in residential areas it can cause interference.

Ordering information

<table>
<thead>
<tr>
<th>Sensing range max. 1)</th>
<th>Output function</th>
<th>Switching mode</th>
<th>Connection</th>
<th>Model name</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 mm ... 18,000 mm</td>
<td>2 x PNP</td>
<td>Light/dark-switching</td>
<td>Cable, 2 m, 5-pin, 2 m, PVC</td>
<td>WLT280L-2P1536</td>
<td>6048071</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Connector M12, 5-pin</td>
<td>WLT280L-2P2536</td>
<td>6048069</td>
</tr>
<tr>
<td></td>
<td>2 x NPN</td>
<td></td>
<td>Cable, 2 m, 5-pin, 2 m, PVC</td>
<td>WLT280L-2N1536</td>
<td>6048072</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Connector M12, 5-pin</td>
<td>WLT280L-2N2536</td>
<td>6048070</td>
</tr>
</tbody>
</table>

1) Reflector P250, PL80A.

Dimensional drawing

1. Center of optical axis, receiver
2. Center of optical axis, sender
3. Mounting hole, Ø 4.3 mm
4. Connector M12, 5-pin, rotatable by 90°
5. Cable, 2 m, 5-pin, Ø 3.8 mm
Adjustments

WLT280L-2xxxx6

LED indicator green: Stability indicator
Status indicator LED, yellow: Status of received light beam (switching output 1)
Status indicator LED, yellow: Status of received light beam (switching output 2)
Sensing range adjustment: Potentiometer for switching output 1
Sensing range adjustment: Potentiometer for switching output 2
Light/dark selector

Connection diagram

WLT280L-2x1536, Cable

Cable connections for WLT280L-2x1536:
- brn: L+
- blk: Q1
- blu: M
- wht: Q2
- gre: MF

WLT280L-2x2536, Connection

Cable connections for WLT280L-2x2536:
- brn: L+
- blk: Q1
- blu: M
- wht: Q2
- gre: MF
## W280L-2 Long Range

### Mounting brackets/plates

<table>
<thead>
<tr>
<th>Figure</th>
<th>Accessory type</th>
<th>Material</th>
<th>Model name</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mounting brackets</td>
<td>Stainless steel 1.4301</td>
<td>BEF-W280</td>
<td>5313885</td>
</tr>
</tbody>
</table>

### Terminal and alignment brackets

<table>
<thead>
<tr>
<th>Figure</th>
<th>Accessory type</th>
<th>Material</th>
<th>Model name</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Universal terminal systems</td>
<td>Steel, zinc coated</td>
<td>BEF-KHS-F01</td>
<td>2022463</td>
</tr>
</tbody>
</table>

### Reflectors

<table>
<thead>
<tr>
<th>Figure</th>
<th>Accessory type</th>
<th>Dimensions (L x W x H)</th>
<th>Material</th>
<th>Model name</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Angular</td>
<td>47 mm x 47 mm</td>
<td>PMMA/ABS</td>
<td>P250</td>
<td>5304812</td>
</tr>
<tr>
<td></td>
<td>Angular</td>
<td>80 mm x 80 mm</td>
<td>PMMA/ABS</td>
<td>PL80A</td>
<td>1003865</td>
</tr>
</tbody>
</table>

### Plug connectors and cables

- Connector type: Female connector

<table>
<thead>
<tr>
<th>Figure</th>
<th>Enclosure rating</th>
<th>Flying leads</th>
<th>Sheath material</th>
<th>Cable length</th>
<th>Model name</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IP 67</td>
<td>Straight</td>
<td>PVC</td>
<td>2 m</td>
<td>DOL-1205-G02M</td>
<td>6008899</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5 m</td>
<td>DOL-1205-G05M</td>
<td>6009868</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10 m</td>
<td>DOL-1205-G10M</td>
<td>6010544</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15 m</td>
<td>DOL-1205-G15M</td>
<td>6029215</td>
</tr>
</tbody>
</table>
Dimensional drawings Mounting brackets/plates

BEF-W280

Dimensional drawings Plug connectors and cables

DOL-1205-G02M
DOL-1205-G05M
DOL-1205-G10M
DOL-1205-G15M

Dimensions in mm (inch)
**Dimensional drawings Terminal and alignment brackets**

**BEF-KHS-F01**

All dimensions in mm (inch)

**Dimensional drawings Reflectors**

**P250**

All dimensions in mm (inch)

**PL80A**

All dimensions in mm (inch)
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- Great Britain
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- México
- Nederland
- Norge
- Österreich
- Polska
- România
- Russia
- Schweiz
- Singapore
- Slovenija
- South Africa
- South Korea
- Suomi
- Sverige
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- United Arab Emirates
- USA

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