Diffuse laser sensors
Series 16

### Diffuse contrast sensor

**Tw 250 mm**

#### Technical data

- **Optimum operating range:**
  - 0% diffuse reflection up to mirror reflection
  - 10% diffuse reflection up to mirror reflection

- **Input parameters:**
  - Tw 250 mm
  - 250 mm
  - ≤0.05 ms
  - 200 mA
  - ≤0.3 A
  - 2.15 VDC
  - 14 turn pot
  - yes
  - yes
  - yes
  - yes
  - ≤1.8 VDC
  - ≤0.55 ms
  - 14 turn pot
  - yes
  - yes
  - yes
  - IP 67
  - -10...+50°C

- **Output state:**
  - Object present
  - Object not present

- **Connection diagram**
  - PNP
  - Analog
  - NPN

- **Signal chart**
  - OZDM 16P1801

- **Accessories**
  - Mounting bracket 113917

#### Analog input

- **PNP light operate**
  - OZDM 16P1001

- **NPN light operate**
  - OZDM 16P3001/S14

#### Technical data complementary

- **Analog output:**
  - 0.04 ms
  - 4 - 10 mA
  - ≤0.1 mA

- **Temperature drift reference room temperature:**
  - 1°F = ≤3.5°F/1°C
  - ± within linear range at 0°C
  - ± within linear range at 25°C

#### Series 16

- **Diffuse laser contrast sensor**
- **Accurate detection of printing marks, object edges etc.**
- **Digital switching and analog current output**
- **Adjustable sensitivity**
- **Visible red light for alignment aid**

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**Preferential types**

- **PNP light operate**
  - OZDM 16P1001

- **NPN light operate**
  - OZDM 16P3001/S14
### Diffuse contrast sensor

**Tw 250 mm**

- **Diffuse laser contrast sensor**
- **Accurate detection of printing marks, object edges etc.**
- **Digital switching and analog current output**
- **Adjustable sensitivity**
- **Visible red light for alignment aid**

#### Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimum operating range</td>
<td>0% - 100% at 40 mm sensing distance</td>
</tr>
<tr>
<td>Sensing distance</td>
<td>adjustable, 40 to 80 mm</td>
</tr>
<tr>
<td>Beam focal point</td>
<td>60 mm</td>
</tr>
<tr>
<td>Residual reflection factor</td>
<td>0% diffuse reflection up to mirror reflect. 10% diffuse reflection up to mirror reflect.</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>adjustable</td>
</tr>
<tr>
<td>Voltage range</td>
<td>12 - 30 VDC</td>
</tr>
<tr>
<td>Current range</td>
<td>40 mA / 60 mA</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-10 °C to +50 °C</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP 67</td>
</tr>
<tr>
<td>Power consumption</td>
<td>2 W</td>
</tr>
</tbody>
</table>

#### Analog output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog output</td>
<td>4 - 20 mA</td>
</tr>
<tr>
<td>Reaction time</td>
<td>≤ 6 ms</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0% diffuse reflection up to mirror reflect.</td>
</tr>
<tr>
<td>Repeatability at constant temperature</td>
<td>≤ 0.05% F.S. (linear range)</td>
</tr>
<tr>
<td>Temperature drift</td>
<td>0.05% F.S. (linear range)</td>
</tr>
</tbody>
</table>

#### Digital output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital output</td>
<td>PNP = HIGH NPN = LOW</td>
</tr>
<tr>
<td>Reaction time</td>
<td>0.1 ms (max)</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0% diffuse reflection up to mirror reflect.</td>
</tr>
<tr>
<td>Repeatability at constant temperature</td>
<td>≤ 0.05% F.S. (linear range)</td>
</tr>
<tr>
<td>Temperature drift</td>
<td>0.05% F.S. (linear range)</td>
</tr>
</tbody>
</table>

#### Connection diagram

- **Light operate**
  - PNP = HIGH NPN = LOW
  - Analog output
  - Reaction time 0.1 ms
- **Dark operate**
  - PNP = LOW NPN = HIGH

#### Beam diameter chart

- ES 33AP2 (right angle) 2 m PUR
- ES 34AP2 (straight) 2 m PUR

#### Signal chart

- OZDM 16P1001
  - Laser beam
  - Beam diameter chart

#### Accessory

- Mounting bracket: 113917

#### Technical data complementary

- **Visible red light**
  - 0.1 mW max.
  - Wavelength: 630 - 680 nm
- **Laser emission**
  - 150 kHz Pulsed red laser diode
  - 15% - 30% of full power

#### Output state

- **Object present**
  - PNP = HIGH NPN = LOW
  - Analog output
  - Digital output
- **Object not present**
  - PNP = LOW NPN = HIGH

#### Diffuse contrast sensor Series 16

- Series 16
- Diffuse laser contrast sensor
- Analog output
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- Analog output
- Repeatability at constant temperature
- Temperature drift
- Reference room temperature
- Digital switching and analog current output
- Adjustable sensitivity
- Visible red light for alignment aid
- Series 16 diffusion laser contrast sensor
- Analog output
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- Analog output
- Repeatability at constant temperature
- Temperature drift
- Reference room temperature
- Digital switching and analog current output
- Adjustable sensitivity
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**Notes:**
- *amitter axis 10 mm
- **receiver axis 25.5 mm
- ***When detecting shiny objects, it is recommended to tilt the sensor 5° to 20° from perpendicular to the sensing plane.*