S 130: Ultra-miniature photoelectric switches for new sensing opportunities

S 130 ultra-miniature photoelectric switches can provide an alternative for users of fibre-optic systems. In many cases, they represent the better choice. The S 130 offers many advantages, depending on the requirements of specific applications for compact design:

- improved performance thanks to integrated optics,
- smaller mounting depth (F-type = 3.2 mm) with greater scanning ranges,
- extremely small bending radius thanks to connection slots,
- mark sensors with high resolution (7 grey tones) thanks to focused optics and choice of red or green sender LED (S 130 mark sensor).

A real highlight is the S 130’s optical heads with focused optics, available with a spot size of 1 x 1 mm or 1 x 4 mm at a scanning distance of 16 mm. If used in combination with the accompanying system evaluation unit SI 130, only one basic type is required for all optics heads.

All electrical and mechanical values satisfy the standard for low-voltage devices. e.g.

\[ V_S = 10 \ldots 30 \text{ V DC, PNP or NPN switching output.} \]

Typical areas of application are:

- electronic component and printed circuit board production,
- the packaging and printing industries,
- assembly and handling systems,
- the construction of special-purpose machines.

The S 130 is available in two different housing versions:

- S = ultra-slim or F = ultra-flat (mounting depth only 3.2 mm).

The S 130 system modules and their scanning ranges:

- SS/SE 130 through-beam photoelectric switch: 150 cm (S-type); 30 cm (F-type),
- ST 130 photoelectric proximity switch, energetic: 150 mm (S-type); 50 mm (F-type).
High-resolution S 130 mark sensors with red or green sender LED used for reliable detection of print marks.

Ultra-miniature photoelectric proximity switch monitoring the supply of parts to a bottle capping machine in the pharmaceutical industry.

The S 130 photoelectric proximity switch detects markings and ensures that printed circuit boards are precisely positioned.

The presence of biscuits in blister packs is continuously checked before the package is sealed.
ST 130 "Slim" photoelectric proximity switches, background blanking, red light – DC

- Ultra-miniature housing
- Focused optics, small light spot
- Extremely flexible connection cable
- Red light and LED signal strength indicator as alignment aids

### Dimensional drawing

1. Centre of transmitter’s optical axis
2. Centre of receiver’s optical axis
3. LED indicator, red, light reception

Mounting bracket BEF-130-SM included.

### Connection type

- ST 130-S 13
- ST 130-S 23

### Accessories

- Mounting brackets* 510

* included with delivery
### Technical data

<table>
<thead>
<tr>
<th>Photoelectric proximity switches</th>
<th>ST 130-S13</th>
<th>ST 130-S23</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI 130 in &quot;NORM&quot; mode,</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scanning distance, max. typical</th>
<th>5…30 mm</th>
<th>(object with 90 % remission)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating distance</td>
<td>14…18 mm</td>
<td>(object with 6 % remission)</td>
</tr>
<tr>
<td>Background blanking</td>
<td>From approx. 45 mm</td>
<td>(object with 90 % remission)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Light source ¹, light type</th>
<th>LED, visible red light</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light spot size</td>
<td>Approx. 1 x 4 mm w. focal point 16 mm</td>
</tr>
<tr>
<td>Angle of dispersion, sender</td>
<td>Focused, focal point 16 mm ± 0.5 mm</td>
</tr>
<tr>
<td>Power supply and evaluation unit</td>
<td>ST 130 only functional in combination</td>
</tr>
<tr>
<td></td>
<td>with separate interpreter (SI 130), see page 44</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supply voltage $V_S$</th>
<th>See SI 130, page 44</th>
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</thead>
<tbody>
<tr>
<td>Switching outputs</td>
<td>See SI 130, page 44</td>
</tr>
<tr>
<td>Output current $I_P$, max.</td>
<td>See SI 130, page 44</td>
</tr>
<tr>
<td>Light receiver, switching mode</td>
<td>See SI 130, page 44</td>
</tr>
<tr>
<td>Response time ²</td>
<td>See SI 130, page 44</td>
</tr>
<tr>
<td>Max. switching frequency ³</td>
<td>See SI 130, page 44</td>
</tr>
</tbody>
</table>

| Connection type                   | PVC cable, 2 m ⁴ (screened), (cannot be extended) |

<table>
<thead>
<tr>
<th>VDE protection class</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit protection ⁵</td>
<td>A</td>
</tr>
<tr>
<td>Enclosure rating</td>
<td>IP 65</td>
</tr>
<tr>
<td>Ambient temperature $T_A$</td>
<td>Operation – 25 °C…+ 55 °C</td>
</tr>
<tr>
<td></td>
<td>Storage – 40 °C…+ 70 °C</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 23 g</td>
</tr>
<tr>
<td>Housing material</td>
<td>Housing: ABS/optics: PC</td>
</tr>
</tbody>
</table>

1) Average service life 100,000 h at $T_A = + 25 ^\circ$ C
2) Signal transit time with resistive load
3) With light/dark ratio 1:1
4) Do not bend below 0 °C
5) $A = V_S$ connections reverse-polarity protected

#### Scanning distance

<table>
<thead>
<tr>
<th>Scanning distance on black, 6 % remission</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scanning distance on grey, 18 % remission</td>
<td>2</td>
</tr>
<tr>
<td>Scanning distance on white, 90 % remission</td>
<td>3</td>
</tr>
</tbody>
</table>

---

### Order information

<table>
<thead>
<tr>
<th>Type</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST 130-S13</td>
<td>6 011 083</td>
</tr>
<tr>
<td>ST 130-S23</td>
<td>6 011 085</td>
</tr>
</tbody>
</table>
ST 130 "Slim" photoelectric proximity switches, energetic, red light – DC

- Ultra-miniature housing
- Large scanning distance
- Extremely flexible connection cable
- Red light and LED signal strength indicator as alignment aids

### Scanning distance
0...200 mm

### Photoelectric proximity switches

### Dimensional drawing

1. Centre of transmitter’s optical axis
2. Centre of receiver’s optical axis
3. Mounting hole Ø 3.1 mm
4. LED indicator, red, light reception

Mounting bracket BEF-130-SP included.

### Connection type

ST130-S 13

### Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting brackets*</td>
<td>510</td>
</tr>
</tbody>
</table>

* included with delivery
### Technical data

<table>
<thead>
<tr>
<th>ST 130-S33</th>
<th>0...200 mm ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>0...150 mm ²</td>
<td></td>
</tr>
<tr>
<td>LED, visible red light</td>
<td></td>
</tr>
<tr>
<td>Approx. 13 x 13 mm at 150 mm</td>
<td></td>
</tr>
<tr>
<td>Approx. 5°</td>
<td></td>
</tr>
</tbody>
</table>

#### Scanning distance

| Scanning distance on white, 90% remission |
| Scanning distance on grey, 18% remission |
| Scanning distance on black, 6% remission |

#### Power supply and evaluation unit

ST 130 only functional in combination with separate interpreter (SI 130), see page 44

#### Supply voltage $V_S$

See SI 130, page 44

#### Switching outputs

See SI 130, page 44

#### Output current $I_X$ max.

See SI 130, page 44

#### Light receiver, switching mode

See SI 130, page 44

#### Response time $^3$

See SI 130, page 44

#### Max. switching frequency $^4$

See SI 130, page 44

#### Connection type

PVC cable, 2 m $^5$ (screened), (cannot be extended)

#### VDE protection class

$^7$

#### Circuit protection $^6$

A

#### Enclosure rating

IP 65

#### Ambient temperature $T_A$

- **Operation**: –25 °C...+ 55 °C
- **Storage**: –40 °C...+ 70 °C

#### Weight with cable 2 m

ST 130-S 33: approx. 23 g

ST 130-F 43: approx. 20 g

#### Housing material

Housing: ABS/opics: PC

---

1) Object with 90% remission (based on standard white to DIN 5033)
2) Average service life 100,000 h at $T_A = +25°C$
3) Signal transit time with resistive load
4) With light/dark ratio 1:1
5) Do not bend below 0°C
6) $A = V_S$ connections reverse-polarity protected

### Scanning distance

| Scanning distance on black, 6% remission |
| Scanning distance on grey, 18% remission |
| Scanning distance on white, 90% remission |

### Order information

<table>
<thead>
<tr>
<th>Type</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST 130-S 33</td>
<td>6 011 081</td>
</tr>
</tbody>
</table>
**ST 130 "Flat" photoelectric proximity switches, energetic, red light – DC**

### Photoelectric proximity switches
- Ultra-miniature housing, mounting depth 3.2 mm
- Large scanning distance
- Extremely flexible connection cable
- Red light and LED signal strength indicator as alignment aids

### Scanning distance
0...60 mm

### Dimensional drawing

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21.7</td>
</tr>
<tr>
<td>2</td>
<td>3.2</td>
</tr>
<tr>
<td>3</td>
<td>19.1</td>
</tr>
<tr>
<td>4</td>
<td>5.3</td>
</tr>
<tr>
<td>5</td>
<td>6.8</td>
</tr>
<tr>
<td>6</td>
<td>5.6</td>
</tr>
<tr>
<td>7</td>
<td>4.9</td>
</tr>
<tr>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td>23</td>
</tr>
<tr>
<td>10</td>
<td>2.2</td>
</tr>
<tr>
<td>11</td>
<td>0.8</td>
</tr>
<tr>
<td>12</td>
<td>3.8</td>
</tr>
</tbody>
</table>

1. LED indicator, red: light reception
2. Centre of transmitter's optical axis
3. Centre of receiver's optical axis

### Connection type
**ST 130-F43**

### Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting brackets*</td>
<td>510</td>
</tr>
</tbody>
</table>

* included with delivery
Scanning distance, max. typical     0...60 mm 1)
Operating distance                  0...50 mm 1)

Light source 2), light type          LED, visible red light
Light spot size                       Approx. 35 mm at 50 mm
Angle of dispersion, sender          Approx. 38°

Power supply and evaluation unit    ST 130 only functional in combination
                                     with separate interpreter (SI 130),
                                     see page 44

Supply voltage $V_S$                 See SI 130, page 44
Switching outputs                   See SI 130, page 44
Output current $I_{\text{max.}}$     See SI 130, page 44
Light receiver, switching mode      See SI 130, page 44
Response time 3)                     See SI 130, page 44
Max. switching frequency 4)          See SI 130, page 44

Connection type                     PVC cable, 2 m 5) (screened),
                                     (cannot be extended)

VDE protection class                
Circuit protection                  A
Enclosure rating                    IP 66
Ambient temperature $T_A$           Operation – 25 °C...+ 55 °C
                                     Storage – 40 °C...+ 70 °C
Weight with cable 2 m               ST 130-S 33: approx. 23 g
                                     ST 130-F 43: approx. 20 g

Housing material                    Housing: ABS/optics: PC

1) Object with 90 % remission
   (based on standard white to DIN 5033)
2) Average service life 100,000 h
   at $T_a = +25 ^\circ C$
3) Signal transit time with resistive load
4) With light/dark ratio 1:1
5) Do not bend below 0 °C
6) A = $V_s$ connections reverse-polarity
   protected
### ST 130 Contrast scanners, red/green light – DC

- **Ultra-miniature housing**
- **Resolution:** 7 grey tones
- **Red or green sender LED**
- **Focused optics, small light spot**
- **Extremely flexible connection cable**

#### Scanning distance

16 mm

#### Contrast scanners

- **ST 130 Contrast scanners, red/green light – DC**
  - **red** – **wht**
  - **red** – **shield**
  - **wht** – **shield**

#### Dimensional drawing

- **Centre of transmitter’s optical axis**
- **Centre of receiver’s optical axis**
- **LED indicator, red; light reception**

Mounting bracket BEF-130-SM included.

#### Connection type

- **ST 130-S 13**
- **ST 130-S 19**
- **ST 130-S 23**
- **ST 130-S 29**

#### Accessories

- **Mounting brackets**
  - Page 510

* included with delivery

#### 2 x 0.8 mm² shielded
**Technical data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST 130-S13</td>
<td>6 011 083</td>
</tr>
<tr>
<td>ST 130-S19</td>
<td>6 011 084</td>
</tr>
<tr>
<td>ST 130-S23</td>
<td>6 011 085</td>
</tr>
<tr>
<td>ST 130-S29</td>
<td>6 011 086</td>
</tr>
</tbody>
</table>

**Mark sensor**
SI 130 in "MARK" mode, see page 44

**Operating distance**
16 mm

**Scanning distance tolerance**
± 2 mm

**Black/white resolution**
7 grey tones

**Light source\(^1\), light type**
- LED, visible red light
- LED, visible green light

**Light spot size**
- Approx. 1 x 4 mm w. focal point 16 mm
- Approx. 1 x 1 mm w. focal point 16 mm

**Angle of dispersion, sender**
Focused, focal point 16 mm ± 0.5 mm

**Order information**

<table>
<thead>
<tr>
<th>Type</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST 130-S13</td>
<td>6 011 083</td>
</tr>
<tr>
<td>ST 130-S19</td>
<td>6 011 084</td>
</tr>
<tr>
<td>ST 130-S23</td>
<td>6 011 085</td>
</tr>
<tr>
<td>ST 130-S29</td>
<td>6 011 086</td>
</tr>
</tbody>
</table>

1) Average service life 100,000 h at \(T_A = +25^\circ\)C
2) Signal transit time with resistive load
3) With light/dark ratio 1:1
4) Do not bend below 0 °C
5) \(A = V_s\) connections reverse-polarity protected

**Power supply and evaluation unit**
- ST 130 only functional in combination with separate interpreter (SI 130), see page 44

**Supply voltage \(V_s\)**
- See SI 130, page 44

**Switching outputs**
- See SI 130, page 44

**Output current \(I_L\) max.**
- See SI 130, page 44

**Light receiver, switching mode**
- See SI 130, page 44

**Response time\(^2\)**
- See SI 130, page 44

**Max. switching frequency\(^3\)**
- See SI 130, page 44

**Connection type**
- PVC cable, 2 m\(^4\) (screened), (cannot be extended)

**VDE protection class**
- /L52746

**Circuit protection\(^5\)**
- A

**Enclosure rating**
- IP 66

**Ambient temperature \(T_A\)**
- Operation – 25 °C...+ 55 °C
- Storage – 40 °C...+ 70 °C

**Weight**
- Approx. 23 g

**Housing material**
- Housing: ABS/optics: PC

- Do not bend below 0 °C
- \(A = V_s\) connections reverse-polarity protected
SS/SE 130 "Slim" through-beam photoelectric switches, red light – DC

- Ultra-miniature housing
- Large scanning range
- Extremely flexible connection cable
- Red light and LED signal strength indicator as alignment aids

**Scanning range**
0...2.2 m

**Through-beam photoelectric switches**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centre of optical axis</td>
<td>Mounting hole ( \phi ) 3.1 mm</td>
<td>LED indicator, red (sender only)</td>
</tr>
</tbody>
</table>

**SS 130**: active. Light reception by **SE 130** receiver \( \geq \) switching threshold

Mounting bracket BEF-130 ST for SS/SE 130-S 33, see accessories (included).

**Dimensional drawing**

**Accessories** | page
---|---
Mounting brackets* | 510
Slotted masks | 556

* included with delivery

**Connection type**

SS/SE 130-S 33

2 x 0.8 mm² shielded
### Technical data

#### SS/SE130-S33

**Type**
- Part no.: 6 011 079

#### Scanning range and operating reserve

<table>
<thead>
<tr>
<th>Scanning range, max. typical</th>
<th>0.5</th>
<th>1</th>
<th>1.5</th>
<th>2</th>
<th>2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.7</td>
<td>1.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Operating range
2. Scanning range, max. typical

### Order information

<table>
<thead>
<tr>
<th>Type</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS/SE 130-S33</td>
<td>6 011 079</td>
</tr>
</tbody>
</table>

### Supply voltage $V_S$

- See SI 130, page 44

### Switching outputs

- See SI 130, page 44

### Output current $I_O$ max.

- See SI 130, page 44

### Light source

- LED, red light

### Light spot size

- approx. 180 mm at 1.5 m

### Angle of dispersion, sender

- approx. 7°

### Angle of dispersion, receiver

- approx. 18°

### Light receiver, switching mode

- See SI 130, page 44

### VDE protection class

- 0

### Circuit protection

- A

### Enclosure rating

- IP 66

### Operating range

#### With mask, 0.5 mm wide

- 0.3 m

#### With mask, 1 mm wide

- 0.7 m

#### With mask, 2 mm wide

- 1.0 m

### Ambient temperature $T_A$

- **Operation:** –25 °C...+55 °C
- **Storage:** –40 °C...+70 °C

### Weight

- **With cable (2 m):**
  - Sender: approx. 11 g
  - Receiver: approx. 11 g

### Housing material

- Housing: ABS/optics: PC

---

1. Average service life 100,000 h at $T_A = +25 °C$

2. Signal transit time with resistive load

3. With light/dark ratio 1:1

4. Do not bend below 0 °C

5. A = $V_S$ connections reverse-polarity protected
SS/SE 130 "Flat" through-beam photoelectric switches, red light – DC

Scanning range 0...0.35 m
Through-beam photoelectric switches
- Ultra-miniature housing, mounting depth 3.2 mm
- Large scanning range
- Extremely flexible connection cable
- Red light and LED signal strength indicator as alignment aids

Dimensional drawing

Connection type
SS/SE 130-F33

Accessories page
Mounting brackets* 510

* included with delivery
SS/SE 130

Technical data

"Flat" housing (F)
Scanning range, max. typical 0.35 m
Operating range 0.3 m
Light source1, light type LED, red light
Light spot size Approx. 200 mm at 0.3 m
Angle of dispersion, sender Approx. 36°
Angle of dispersion, receiver Approx. 20°

Power supply and evaluation unit
ST 130 only functional in combination with separate interpreter (SI 130),
see page 44

Supply voltage V_S See SI 130, page 44
Switching outputs See SI 130, page 44
Output current I_max. See SI 130, page 44
Light receiver, switching mode See SI 130, page 44
Response time2) See SI 130, page 44
Max. switching frequency3) See SI 130, page 44

Connection type PVC cable, 2 m4) (screened),
(cannot be extended)

VDE protection class ☐
Circuit protection5) A
Enclosure rating IP 66
Ambient temperature T_A Operation –25 °C...+ 55 °C
Storage –40 °C...+ 70 °C
Weight with cable 2 m Sender: approx. 11 g/
Receiver: approx. 11 g

Housing material Housing: ABS/optics: PC

1) Average service life 100,000 h at T_A = +25 °C
2) Signal transit time with resistive load
3) With light/dark ratio 1:1
4) Do not bend below 0 °C
5) A = V_S connections reverse-polarity protected

Connection type

Order information

Type
Part no.

SS/SE 130-F33
SI 130: Mode "NORM"

0 0.1 0.2 0.3 0.4 0.5
0 1 10 100
0.35

Operating range

Scanning range, max. typical

SS/SE 130-F33
6 011 080
- Basic unit for all S 130 sensors
- Simple connection of sensors
- Mounted on DIN rail
- Selectable light-/dark-switching
- Selectable OFF-delay (40 ms)

### Adjacents possible

1. Protective hood
2. BF-WLL 160 mounting bracket (included)
3. LED signal strength indicator, red
   (lights up when switching threshold is exceeded)
4. LED signal strength indicator, green
   (lights up with reception reserve > 10 %)
5. For releasing/locking connection wires of
   S 130 photoelectric switches/photoelectric
   proximity switches
6. Sender terminals (red), screen (–)
7. Receiver terminals (white), screen (–)
8. Sensitivity scale (270°)
9. Sensitivity control (2 revolutions)
10. Selector switch for "NORM"/"MARK" detection
    (t = 0.5 ms/t ≤ 0.2 ms)
11. Selector switch for light- ("L.ON")/
    dark- ("D.ON") switching
12. Selector switch for OFF-delay "OFF"/
    "OFF DLY", 40 ms fixed

### Connection types

<table>
<thead>
<tr>
<th>SI 130-P 12</th>
<th>SI 130-P 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI 130-N 12</td>
<td>SI 130-N 40</td>
</tr>
</tbody>
</table>

- 3 x 0.2 mm²
- 4-pin, M 8

### Accessories

- Cable receptacles: 496
- Mounting brackets*: 510

* included with delivery
<table>
<thead>
<tr>
<th>Technical data</th>
<th>SI 130-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply and evaluation unit</td>
<td>S 130 photoelectric switch series in ultra-miniature housing, see pages 32 to 43</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating mode</td>
<td></td>
</tr>
<tr>
<td>“NORM” mode</td>
<td>All S 130 optics heads in photoelectric switch mode</td>
</tr>
<tr>
<td>“MARK” mode</td>
<td>Optics heads ST 130-S 13, ST 130-S 19, ST 130-S 23, ST 130-S 29 in contrast scanner mode</td>
</tr>
<tr>
<td>Sensitivity, adjustable</td>
<td>Potentiometer, 2 turns with sensitivity scale 270°</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Time delay</td>
<td></td>
</tr>
<tr>
<td>OFF-delay tOFF</td>
<td>40 ms fixed, selectable via sliding switch</td>
</tr>
<tr>
<td>Supply voltage VS</td>
<td>10...30 V DC 1)</td>
</tr>
<tr>
<td>Ripple2)</td>
<td>± 10%</td>
</tr>
<tr>
<td>Current consumption3)</td>
<td>≤ 35 mA</td>
</tr>
<tr>
<td>Switching outputs</td>
<td>PNP, open collector: Q</td>
</tr>
<tr>
<td></td>
<td>NPN, open collector: Q</td>
</tr>
<tr>
<td>Output current Ia max.</td>
<td>100 mA</td>
</tr>
<tr>
<td>Light receiver, switching mode</td>
<td>Light-/dark-switching selectable via sliding switch</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Response time4)/Max. switching frequency5)</td>
<td></td>
</tr>
<tr>
<td>“NORM” mode</td>
<td>≤ 0.5 ms/1000/s</td>
</tr>
<tr>
<td>“MARK” mode</td>
<td>≤ 0.2 ms/2500/s</td>
</tr>
<tr>
<td>Connection types</td>
<td>PVC cable, 2 m6)</td>
</tr>
<tr>
<td></td>
<td>Plug M 8, 4-pin</td>
</tr>
<tr>
<td>VDE protection class</td>
<td></td>
</tr>
<tr>
<td>Circuit protection7)</td>
<td>A, B, C, D</td>
</tr>
<tr>
<td>Enclosure rating</td>
<td>IP 50</td>
</tr>
<tr>
<td>Ambient temperature TA</td>
<td>Operation – 25 °C...+ 55 °C</td>
</tr>
<tr>
<td></td>
<td>Storage – 40 °C...+ 70 °C</td>
</tr>
<tr>
<td>Weight with cable 2 m</td>
<td>Approx. 70 g</td>
</tr>
<tr>
<td></td>
<td>with plug M 8, 4-pin Approx. 30 g</td>
</tr>
<tr>
<td>Housing material</td>
<td>Housing: ABS</td>
</tr>
</tbody>
</table>

1) Limit values 2) May not exceed or fall short of VS tolerances 3) Without load 4) Signal transit time with resistive load 5) With light/dark ratio 1:1 6) Do not bend below 0 °C 7) A = VS connections reverse-polarity protected B = Inputs/outputs reverse-polarity protected C = Interference pulse suppression D = Outputs overcurrent and short-circuit protected

### S 130 function diagram

- **Intensity of reception light**
  - ON
  - OFF
- **Signal strength indicator in S 130 optics head LED red**
  - ON
  - OFF
- **Signal strength indicator in S 130 “separate interpreter” without reserve, LED red**
  - ON
  - OFF
- **Signal strength indicator in S 130 “separate interpreter” without reserve, LED green**
  - ON
  - OFF
- **Switching output light-switching**
  - ON
  - OFF
- **Switching output dark-switching**
  - ON
  - OFF

---

### Order information

<table>
<thead>
<tr>
<th>Type</th>
<th>Part no.</th>
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<tbody>
<tr>
<td>SI 130-P 12</td>
<td>6 011 089</td>
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<tr>
<td>SI 130-P 40</td>
<td>6 011 090</td>
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<tr>
<td>SI 130-N 12</td>
<td>6 011 087</td>
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<tr>
<td>SI 130-N 40</td>
<td>6 011 088</td>
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