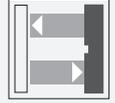




## Diffuse mode sensor

WTS10-12-4016/103/105



- Specifically for quality checks on welding caps
- Upper and lower welding caps checked simultaneously
- High position and angle tolerance insensitivity of the welding cap
- Stability alarm indication
- Scratch resistant mineral glass lens

Diffuse mode sensor



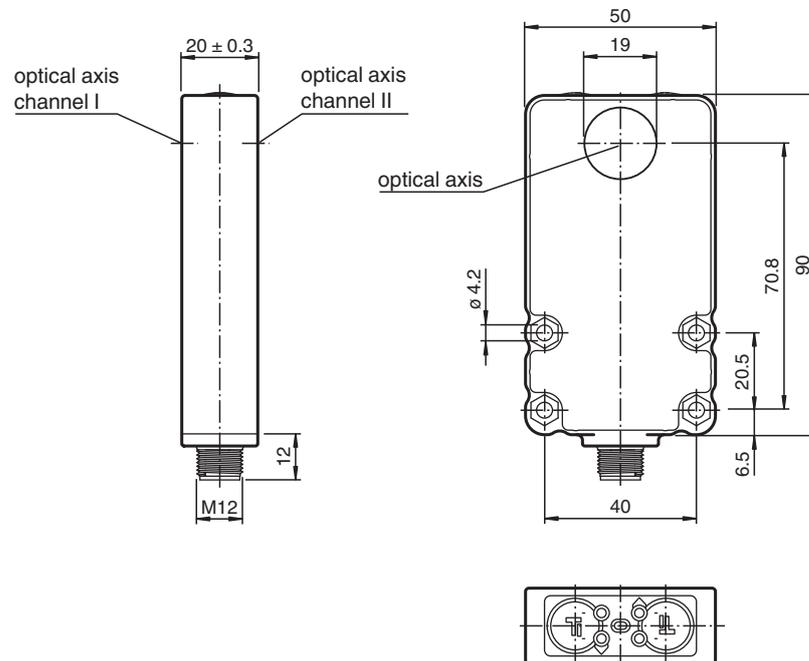
### Function

The welding tip sensor WTS10 series is a contrast evaluation sensor with a large and homogeneous light spot fitted to check the quality of the welding cap's face after milling of the welding tip and which is widely used for industrial welding robots. After the milling process of the welding cap, both tips of the welding gun are inspected and defects such as inclusions, faulty milling or burrs are detected.

Simultaneous control of the quality of both welding tip caps with one sensor is possible by providing two optical outputs on either side of the sensor housing.

The WTS10 features an extended detection area of 11 mm diameter, an uniform lightspot over the full sensing range due to coaxial optics beam path, a new display concept, high switching accuracy, a homogenous light spot and improved position and tilting angle tolerance.

## Dimensions



## Technical Data

| General specifications     |   |
|----------------------------|---|
| Detection range            | 2 ... 12 mm   |
| Reference target           | Copper welding-electrode Diameter: 16 mm , Front end: 6 mm  |
| Light source               | LED   |
| Light type                 | modulated visible red light , 640 nm  |
| Ambient light limit        | continuous light 40000 Lux , Modulated light 5000 Lux   |
| Tilting angle              | ± 1.5 °   |
| Position tolerance         | ± 2 mm  |
| Indicators/operating means |   |
| Operation indicator        | LED green: Power on   |
| Function indicator         | LED yellow: switching state<br>LED red: Stability alarm indicator   |
| Teach-In indicator         | LED, green/yellow flashing (approx. 4 Hz)<br>Teach Error: LED green/yellow non equiphase flashing; 8.0 Hz |
| Control elements           | Teach-In key  |
| Electrical specifications  |   |
| Operating voltage          | $U_B$ 10 ... 30 V DC  |
| No-load supply current     | $I_0$ ≤ 70 mA   |
| Input                      |   |
| Function input             | Enable keys (EK)  |
| Output                     |   |
| Switching type             | light-on  |

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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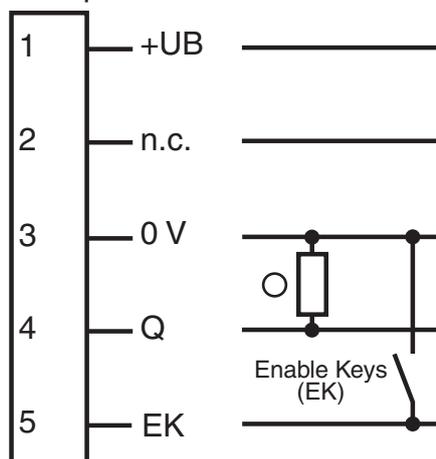
 PEPPERL+FUCHS

## Technical Data

|   |   |  |
|---|---|--|
| Signal output                                   |   | switching output PNP NO contact AND logic coupling of both sensor channels short-circuit protected reverse polarity protected        |
| Switching current                               |   | max. 100 mA  |
| Switching frequency                             | f | 100 Hz   |
| Response time                                   |   | 5 ms   |
| <b>Conformity</b>                               |   |  |
| Product standard                                |   | EN 60947-5-2   |
| <b>Compliance with standards and directives</b> |   |  |
| Standard conformity                             |   |  |
| Shock and impact resistance                     |   | IEC / EN 60068. half-sine, 50 g in each X, Y and Z directions  |
| Vibration resistance                            |   | IEC / EN 60068-2-6. Sinus. 10 -150 Hz, 5 g in each X, Y and Z directions   |
| <b>Approvals and certificates</b>               |   |  |
| Protection class                                |   | II, rated voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1  |
| UL approval                                     |   | cULus Listed   |
| CCC approval                                    |   | CCC approval / marking not required for products rated ≤36 V   |
| <b>Ambient conditions</b>                       |   |  |
| Ambient temperature                             |   | 0 ... 50 °C (32 ... 122 °F)<br>The switching accuracy will remain, if the temperature after Teach-In does not varies more than ±7 °C |
| Storage temperature                             |   | -20 ... 70 °C (-4 ... 158 °F)  |
| <b>Mechanical specifications</b>                |   |  |
| Degree of protection                            |   | IP67   |
| Connection                                      |   | 5-pin, M12 x 1 connector   |
| Material  |   |  |
| Housing   |   | PC + ABS   |
| Optical face                                    |   | Scratch resistant mineral glass lens   |
| Mass  |   | 80 g   |

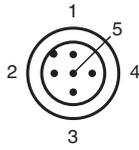
## Connection Assignment

Option:

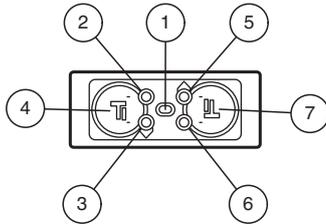


- = Light on
- = Dark on

## Connection Assignment

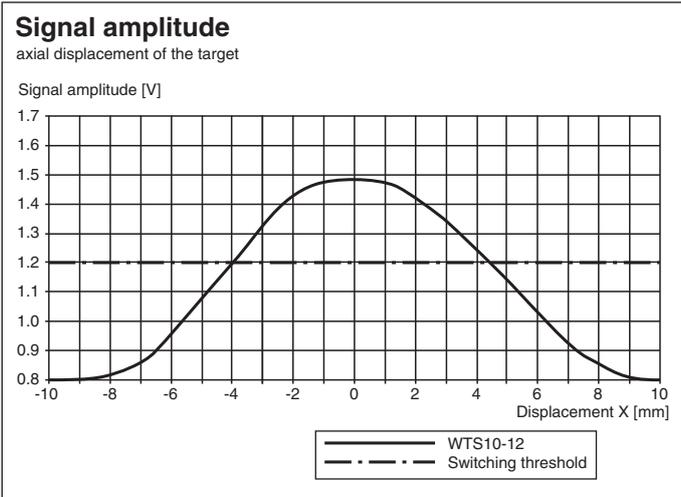
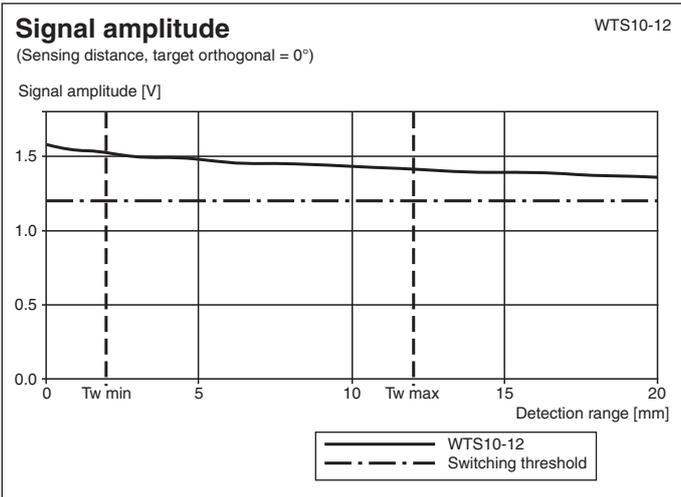


## Assembly



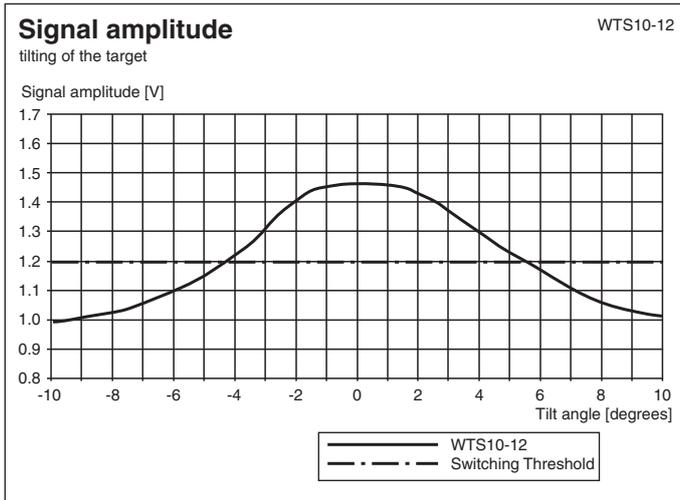
|   |                     |        |
|---|---------------------|--------|
| 1 | LED Power On        | green  |
| 2 | LED channel I       | red    |
| 3 | LED channel I       | yellow |
| 4 | Teach-In channel I  |        |
| 5 | LED channel II      | yellow |
| 6 | LED channel II      | red    |
| 7 | Teach-In channel II |        |

## Characteristic Curve



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## Characteristic Curve



## Teach-In

To enable the teach-in keys, pin 5 (enable keys, EK) must be continuously connected to 0 V (bridge between pin 5 and pin 3).

1. Position the reference welding cap in front of the optical system of the desired sensor channel (channel I or channel II).
2. Press and hold the corresponding teach-in button. The sensor confirms the keystroke by the green signal indicator being extinguished briefly (200 ms). After 2 s the sensor switches to teach-in mode: both switching outputs are deactivated. The sensor is taught the properly milled welding cap as a reference sample for the selected sensor channel.
3. When the green signal indicator and the yellow signal indicator that belongs to the selected sensor channel flash simultaneously, release the teach-in button. Teach-in is completed. The green signal indicator and the yellow signal indicator that belongs to the selected sensor channel flash alternately for 2 s.

**Teach-in successful:** The taught reference welding cap is permanently saved. The sensor switches back to switching mode.

**Teach-in unsuccessful:** The green signal indicator and the yellow signal indicator that belongs to the selected sensor channel flash quickly (approx. 8 Hz) and alternately for 5 s. The sensor discards the taught values. After 5 s the sensor switches to switching mode and works with the last valid values. For signal levels below the fixed switching threshold, the teach-in mode can't be entered. A teach-in error is indicated.

## Accessories

|   |                     |   |
|---|---------------------|---|
|  | <b>OMH-WTS10-01</b> | Mounting bracket for sensors of WTS10 series                            |
|  | <b>V15-G-2M-PVC</b> | Female cordset single-ended M12 straight A-coded, 5-pin, PVC cable grey |
|  | <b>V15-G-2M-PUR</b> | Female cordset single-ended M12 straight A-coded, 5-pin, PUR cable grey |
|  | <b>V15-W-5M-PVC</b> | Female cordset single-ended M12 angled A-coded, 5-pin, PVC cable grey   |

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