The **S90** series, in a compact 41x49x15 mm metal housing, offers all the application and universal optic functions also with safety class 1 laser emission. The series includes polarised retroreflex models with coaxial optics for the detection of reflective and transparent objects, background and foreground suppression versions, contrast sensor with white light emission for colour mark detection, ultraviolet sensor for luminescent object detection. Basic models are available with class 1 laser emission for high-resolution detection.

The **S90** models with universal proximity, retroreflex and through beam optic functions have trimmer sensitivity adjustment. More sophisticated models are microprocessor controlled and offer the patent-covered *EASYtouch™* setting procedure for rapid and precise automatic setting of the switching threshold, with remote control, keyboard lock and output delay activation functions.

NPN or PNP versions are available with standard M12 connector that can be rotated in 4 different positions.
The polarised retroreflex model and the version for transparent object detection are available also with coaxial optics guaranteeing a more accurate axis detection as well as the elimination of the blank zone near to the sensor. The coaxial optics is also present in the contrast sensor with white light LED emission and in the luminescence sensor with ultraviolet light LED emission, improving the precision and depth of field. The biaxial optics which is present in the background suppression models, including laser versions, allows the triangulation for a precise detection.

### DIMENSIONS

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### ACCESSORIES

For dedicated accessories refer to the ACCESSORIES section of this catalogue.

Refer also to Connectors (A.03) and Fixing Brackets (A.04) of the General Catalogue.

### INDICATORS AND SETTINGS

- **A** STABILITY LED
- **B** Output status LED
- **C** POWER ON LED
- **D** READY/ERROR LED
- **E** Trimmer
- **F** SET push-button *
- **G** M12 connector output, orientable in 4 positions

* Teach-in push-button for setting. EASYtouch™ provides two setting modes: standard or fine. Please refer to instructions manual for operating details.

### CONNECTIONS

**S90** COMPACT METAL SENSORS

**DIMENSIONS**

**BIAXIAL OPTICS**

**COAXIAL OPTICS**

**ACCESSORIES**

**CONNECTIONS**

**S90**...B01 / B51 / C01 / C11 / F01 / T51
**S90-ML**... B01 / C01 / F01

**S90**... M / N / U / W / **S90-ML**... M

**S90...G00**

**S90-PL**... G00

Versions and options: refer to **MODEL SELECTION TABLE**
## TECHNICAL DATA

### Operating distance:

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<th>Type</th>
<th>Min.</th>
<th>Max.</th>
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<tr>
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<td>20 m</td>
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<tr>
<td>Laser through beam</td>
<td>0 m</td>
<td>60 m</td>
</tr>
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<td>Polarised retroreflex</td>
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<td>6 m</td>
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<td>Coaxial polarised retroreflex</td>
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<td>3 m</td>
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<tr>
<td>Laser polarised retroreflex</td>
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<td>20 m</td>
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<td>Medium proximity</td>
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<tr>
<td>Background suppression</td>
<td>2  m</td>
<td>20  m</td>
</tr>
<tr>
<td>Laser background suppression</td>
<td>5  m</td>
<td>10  m</td>
</tr>
</tbody>
</table>

### Contrast sensor:
- Operating distance: 19 mm ± 2 mm

### Luminescence sensor:
- Operating distance: 40 mm

### Power supply:
- 10 Vdc - 30 Vdc
- Ripple: 2 Vpp
- Consumption: 30 mA max.
-内部 lenses: polycarbonate
- Internal lenses: glass and PC in ML-B01, C01, F01, M vers.

### Light emission:
- red LED 680 nm
- infrared LED 880 nm
- red LED 670 nm
- UV LED 370 nm
- white LED 400 - 700 nm
- red LASER 650 nm

### Setting:
- Sensitivity trimmer
- SET push-button

### Setting Procedure:
- EasyTouch

### Indicators:
- Yellow OUTPUT LED
- Green STABILITY LED
- Green POWER ON LED
- Green/red READY/ERROR LED

### Output type:
- 30 Vdc max., NPN or PNP

### Output current:
- ≤ 100 mA

### Saturation voltage:
- ≤ 2 V

### Response time:
- 100 μs
- 250 μs
- 500 μs
- 1 ms

### Switching frequency:
- 500 Hz
- 1 kHz
- 1.5 kHz
- 2 kHz
- 5 kHz

### Connection:
- M12 4-pole connector

### Electrical protection:
- class 2

### Mechanical protection:
- IP67

### Protection devices:
- A, B

### Housing material:
- Zama (Zn-Al alloy)

### Lens material:
- window in PMMA
- window in glass (littled anti-reflection)

### Weight:
- 77 g max.

### Operating temperature:
- -10 °C...+50 °C
- -10 °C...+55 °C
- -25 °C...+55 °C
- -20 °C...+70 °C

### Storage temperature:
- -20 °C...+70 °C

### Reference standard:
- EN 60947-5-2
- EN 60825-1, CDRH21 CFR 1040.10

## SELECTION TABLE

### Receiver:
- S90-MA-5-F01-PP 956301050 PNP
- S90-MA-5-F01-NN 956301210 NPN
- S90-ML-5-F01-PP 956301110 PNP laser
- S90-ML-5-F01-NN 956301280 NPN laser

### Emitter:
- S90-MA-5-G00-XG 956301060 -
- S90-ML-5-G00-XG 956301120 - laser

### Polarised Retroreflex:
- S90-MA-5-B01-PP 956301000 PNP
- S90-MA-5-B01-NN 956301160 NPN
- S90-ML-5-B01-PP 956301090 PNP laser
- S90-ML-5-B01-NN 956301260 NPN laser

### Coaxial Polarised Retroreflex:
- S90-MA-5-B51-PP 956301030 PNP coaxial
type
- S90-MA-5-B51-NN 956301170 NPN coaxial

type

### Retroreflex for Transparencies:
- S90-MA-5-T51-PP 956301040 PNP coaxial
- S90-MA-5-T51-NN 956301180 NPN coaxial

### Diffuse Proximity:
- S90-MA-5-C01-PP 956301010 PNP
- S90-MA-5-C01-NN 956301190 NPN
- S90-MA-5-C01-PP 956301100 PNP laser
- S90-MA-5-C01-NN 956301270 NPN laser

### Background Suppression:
- S90-MA-5-M08-PH 956301070 PNP
- S90-MA-5-M08-NH 956301220 NPN
- S90-MA-5-M08-PH 956301130 PNP laser
- S90-MA-5-M08-NH 956301290 NPN laser

### Foreground Suppression:
- S90-MA-5-N03-PH 956301080 PNP
- S90-MA-5-N03-NH 956301230 NPN
- S90-MA-5-N03-PH 956301140 PNP laser
- S90-MA-5-N03-NH 956301240 NPN laser

### Contrast Sensor:
- S90-MA-5-U08-PH 956301150 PNP coaxial
- S90-MA-5-U08-NH 956301250 NPN coaxial

### Luminescence Sensor:
- S90-MA-5-U08-PH 956301140 PNP coaxial
- S90-MA-5-U08-NH 956301240 NPN coaxial

## TECHNICAL NOTES

1. Limit values
2. Average life of 100,000 h with $T_a = ± 25 °C$
3. 270° single-turn trimmer
4. Connector with 3 position rotation
5. A - reverse polarity protection
   B - overload and short-circuit protection
6. Internal lenses in polycarbonate
   Internal lenses in glass in B51, T51, U, W vers.
   Internal lenses in glass and PC in ML-B01, C01, F01, M vers.
COMPACT METAL SENSORS

DETECTION DIAGRAMS

F01, G00 models

Detection area

Excess gain

L-F01, G00 models

Detection area

Resolution

B01 models

Detection area

Excess gain

L-B01 models

Detection area

Resolution on R7

High efficiency reflectors can be used to obtain larger operating distances. Refer to Reflectors (A.01) of the General Catalogue.
High efficiency reflectors can be used to obtain larger operating distances. Refer to Reflectors (A.01) of the General Catalogue.
DETECTION DIAGRAMS

L-C01 models

Detection area

Resolution

Detection difference with EASYtouch™ acquisition

Setting distance on white 90% background

Detection area

M08 models

W models

Detection area

Detection difference with EASYtouch™ acquisition

Setting distance on white 90% background

Contrast sensor

Luminescence sensor

Relative received signal

N03 models

Detection area

Detection difference

Background suppression area

Foreground suppression area

Relative received signal
### ACCESSORY SELECTION AND ORDER INFORMATION

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<tr>
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<tr>
<td>ST-5019</td>
<td>protection bracket</td>
<td>95ACC5320</td>
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<tr>
<td>ST-5020</td>
<td>fixing bracket</td>
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<td>ST-5021</td>
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<td>ST-5041</td>
<td>short dove-tail fixing bracket</td>
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<td>protection bracket with jointed support</td>
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Refer also to Accessories for Sensors
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