UNIVERSAL MINIATURE SENSORS

# BASIC LINE OF MINIATURE PHOTOELECTRIC SENSORS IN FAR-EAST STANDARD

*actual dimensions*

- ***New 50-250 mm background suppression***
- ***1 m proximity, 15 cm with narrow beam***
- ***4 m polarised retroreflex***
- ***15 m through beam***
- ***Standard 3 wire output configuration***

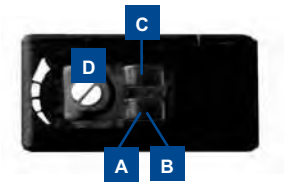
# S3Z SERIES

The high operating distances and cost-effective price, makes the **S3Z** series in the miniature format with dimensions and standard fixing affirmed in the market, in particular in Far-East.
Different models are available: 15 through beam, 4 m polarised retroreflex, 70 cm diffuse proximity and narrow beam for between 50 and 150 mm. Moreover, a new 5 to 25 cm background suppression model with multi-turn mechanical trimmer setting is available. Versions with NPN or PNP output, with dark or light operating mode and with cable or M8 connection are foreseen. The plastic housing is completely overprinted, guaranteeing maximum mechanical protection also in presence of frequent washing.

DATASENSOR
value through detection

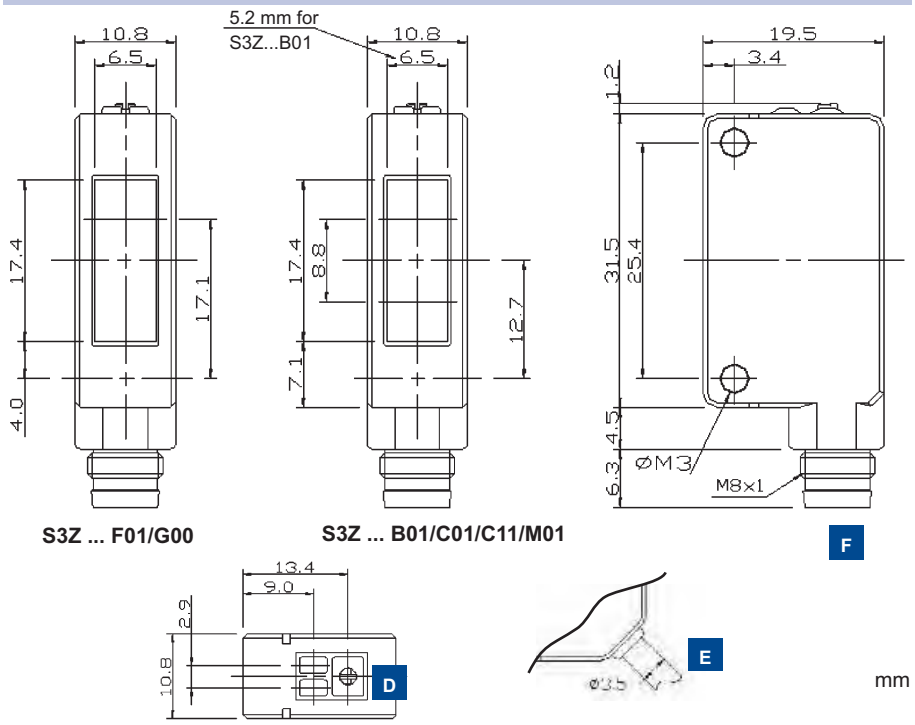
# S3Z UNIVERSAL MINI SENSORS

## INDICATORS AND SETTINGS




| | |
|---|---|
| A | Output status LED |
| B | Power on LED (S3Z...G00) |
| C | Stability LED |
| D | Sensitivity trimmer |
| E | Cable output |
| F | M8 connector output |

## DIMENSIONS







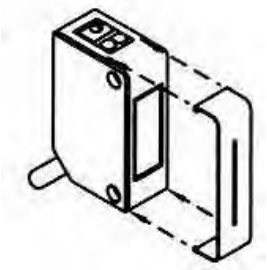


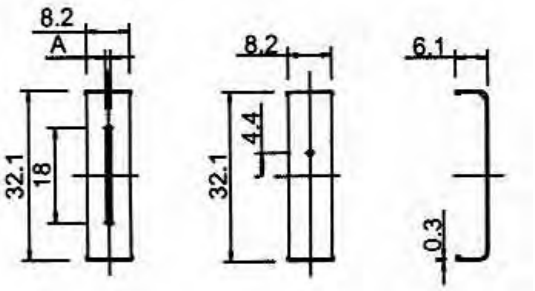

mm

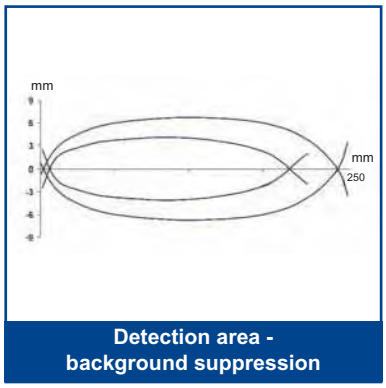
## SLIT

Two different slit models, with rectangular or circular slot, can be easily mounted on the front side of the through beam sensors to reduce the emission beam. The resolution and the minimum object detectable can be improved with the slit positioned on the receiver (S3Z...F01). The installation of the two aligned sensor couples is eased by mounting the slit also on the emitter (S3Z...G00), avoiding reciprocal interference.
The slit reduces the operating distance as shown in the following table.

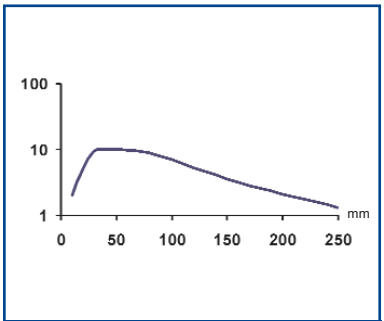
| Slit | | Operating distance (m) | | Minimum object detectable (mm) | |
|---|---|---|---|---|---|
| Model | Width (mm) | Used on F01 | Used on F01 and G00 | Used on F01 | Used on F01 and G00 |
| S3Z-SLIT1 | Ø 0.5 | 0.8 | 0.08 | 5 | 0.3 |
| S3Z-SLIT2 | Ø 1 | 1.5 | 0.3 | 5 | 0.6 |
| S3Z-SLIT3 | Ø 2 | 2.5 | 1.2 | 5 | 1.5 |
| S3Z-SLIT4 | 0.5x18 | 2.5 | 1 | 7 | 0.5 |
| S3Z-SLIT5 | 1x18 | 3.5 | 1.5 | 7 | 1 |
| S3Z-SLIT6 | 2x18 | 6 | 3.5 | 7 | 2 |



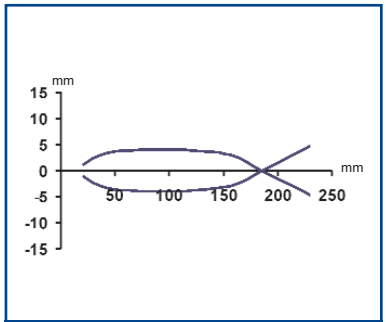



Detection area - background suppression



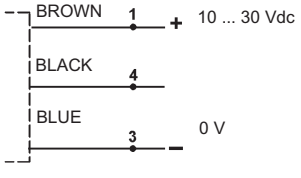

Excess gain - narrow beam proximity



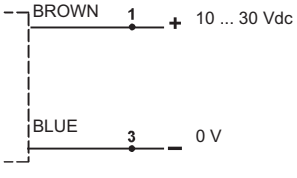

Detection area - narrow beam proximity

## CONNECTIONS

**S3Z...B01/C01/C11/F01/M01**




**S3Z...G00**




**M8 STECKER**

## TECHNICAL DATA

| | | S3Z-PR-2-B01 | S3Z-PR-2-C01 | S3Z-PR-2-C11 | S3Z-PR-2-F01 | S3Z-PR-2-G00 | S3Z-PR-2-M01 | S3Z-PR-5-B01 | S3Z-PR-5-C01 | S3Z-PR-5-C11 | S3Z-PR-5-F01 | S3Z-PR-5-G00 | S3Z-PR-5-M01 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Narrow beam proximity operating distance:** | 50 ... 150 mm | | ● | | | | | | ● | | | | |
| **Diffuse proximity operating distance:** | 0 ... 70 cm | | | ● | | | | | | ● | | | |
| **Polarised retroreflex operating distance:** | 0.05 ... 4 m (on R5) | ● | | | | | | ● | | | | | |
| **Through beam operating distance:** | 0 ... 15 m | | | | ● | ● | | | | | ● | ● | |
| **Background suppression distance:** | 50 ... 250 mm | | | | | | ● | | | | | | ● |
| **Power supply:** | 10 ... 30 Vdc [1] | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Consumption:** | 30 mA max. | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Light emission [2] :** | red LED 665 nm | ● | ● | | | | ● | ● | ● | | | | ● |
| | infrared LED 870 nm | | | ● | | ● | | | | ● | | ● | |
| **Setting:** | sensitivity trimmer | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | ● |
| **Indicators:** | yellow OUTPUT LED | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | ● |
| | green STABILITY LED | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | ● |
| | green POWER ON LED | | | | | ● | | | | ● | | | |
| **Output type:** | PNP or NPN *(refer to table)* | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | ● |
| **Operating mode:** | dark or light *(refer to table)* | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | ● |
| **Saturation voltage:** | ≤ 2 V | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | ● |
| **Response time:** | 1 ms | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | ● |
| **Switching frequency:** | 500 Hz | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | ● |
| **Output current:** | ≤ 100 mA | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | ● |
| **Connection:** | 2 m cable, Ø 3.5 mm | ● | ● | ● | ● | ● | ● | | | | | | |
| | 4-pole M8 connector | | | | | | | ● | ● | ● | ● | ● | ● |
| **Mechanical protection:** | IP67 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Protection devices:** | A, B [3] | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Housing material:** | PC / PBT | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Lens material:** | PMMA | ● | | | | | | ● | | | | | |
| | PC | | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● |
| **Weight:** | 10 g | | | | | | | ● | ● | ● | ● | ● | ● |
| | 50 g | ● | ● | ● | ● | ● | ● | | | | | | |
| **Operating temperature:** | -25 ... +55°C | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Storage temperature:** | -25 ... +70°C | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Standard reference:** | EN 60947-5-2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

CE

## TECHNICAL NOTES

[1] *Limit values*

[2] *Average life of 100.000 h with $T_A$ = +25 °C*

[3] *A - reverse polarity protection*
*B - overload and short-circuit protection (B01/C01/C11/F01 vers.)*

## SELECTION TABLE

| narrow beam proximity | | |
|---|---|---|
| S3Z-PR-2-C01-PL | 95B010040 | PNP - light |
| S3Z-PR-5-C01-PL | 95B010050 | PNP - light |
| S3Z-PR-2-C01-PD | 95B010060 | PNP - dark |
| S3Z-PR-5-C01-PD | 95B010070 | PNP - dark |
| S3Z-PR-2-C01-NL | 95B010200 | NPN - light |
| S3Z-PR-5-C01-NL | 95B010210 | NPN - light |
| S3Z-PR-2-C01-ND | 95B010220 | NPN - dark |
| S3Z-PR-5-C01-ND | 95B010230 | NPN - dark |

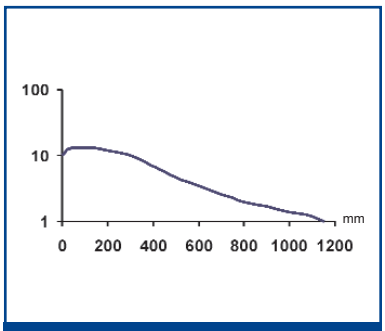
| diffuse proximity | | |
|---|---|---|
| S3Z-PR-2-C11-PL | 95B010000 | PNP - light |
| S3Z-PR-5-C11-PL | 95B010010 | PNP - light |
| S3Z-PR-2-C11-PD | 95B010020 | PNP - dark |
| S3Z-PR-5-C11-PD | 95B010030 | PNP - dark |
| S3Z-PR-2-C11-NL | 95B010160 | NPN - light |
| S3Z-PR-5-C11-NL | 95B010170 | NPN - light |
| S3Z-PR-2-C11-ND | 95B010180 | NPN - dark |
| S3Z-PR-5-C11-ND | 95B010190 | NPN - dark |

| polarised retroreflex | | |
|---|---|---|
| S3Z-PR-2-B01-PL | 95B010080 | PNP - light |
| S3Z-PR-5-B01-PL | 95B010090 | PNP - light |
| S3Z-PR-2-B01-PD | 95B010100 | PNP - dark |
| S3Z-PR-5-B01-PD | 95B010110 | PNP - dark |
| S3Z-PR-2-B01-NL | 95B010240 | NPN - light |
| S3Z-PR-5-B01-NL | 95B010250 | NPN - light |
| S3Z-PR-2-B01-ND | 95B010260 | NPN - dark |
| S3Z-PR-5-B01-ND | 95B010270 | NPN - dark |

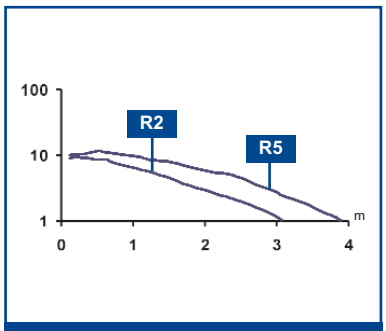
| through beam | | |
|---|---|---|
| S3Z-PR-2-FG01-PL | 95B010120 | PNP - light |
| S3Z-PR-5-FG01-PL | 95B010130 | PNP - light |
| S3Z-PR-2-FG01-PD | 95B010140 | PNP - dark |
| S3Z-PR-5-FG01-PD | 95B010150 | PNP - dark |
| S3Z-PR-2-FG01-NL | 95B010280 | NPN - light |
| S3Z-PR-5-FG01-NL | 95B010290 | NPN - light |
| S3Z-PR-2-FG01-ND | 95B010300 | NPN - dark |
| S3Z-PR-5-FG01-ND | 95B010310 | NPN - dark |

| background suppression | | |
|---|---|---|
| S3Z-PR-2-M01-PL | 95B010330 | PNP - light |
| S3Z-PR-5-M01-PL | 95B010350 | PNP - light |
| S3Z-PR-2-M01-NL | 95B010320 | NPN - light |
| S3Z-PR-5-M01-NL | 95B010340 | NPN - light |

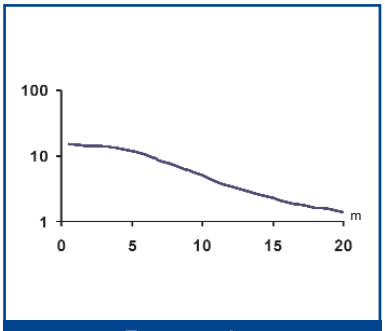
## DETECTION DIAGRAMS



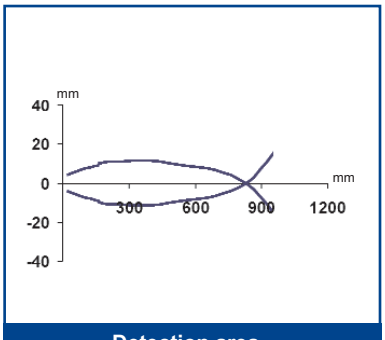

**Excess gain - diffuse proximity**



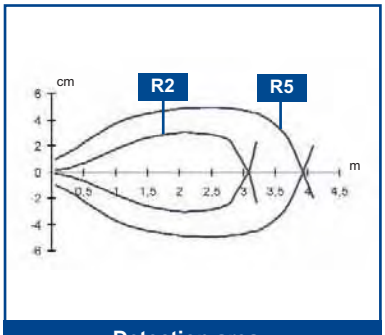

**Excess gain - polarised retroreflex**



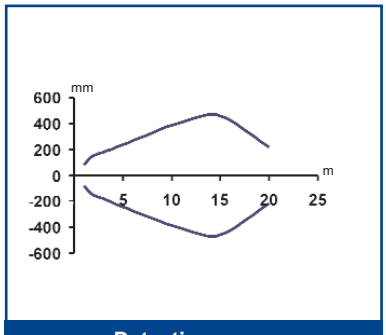

**Excess gain - through beam**




**Detection area - diffuse proximity**




**Detection area - polarised retroreflex**



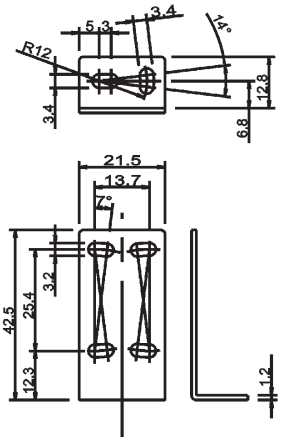

**Detection area - through beam**

## MODEL SELECTION AND ORDER INFORMATION

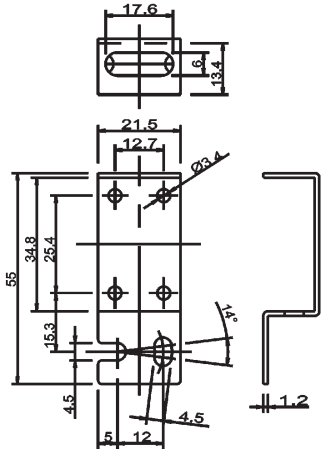
| MODEL | FUNCTION | CONNECTION | OUTPUT | ORDER N° |
|---|---|---|---|---|
| S3Z-PR-2-C01-PL | narrow beam proximity | cable | PNP - light | 95B010040 |
| S3Z-PR-5-C01-PL | narrow beam proximity | M8 connector | PNP - light | 95B010050 |
| S3Z-PR-2-C01-PD | narrow beam proximity | cable | PNP - dark | 95B010060 |
| S3Z-PR-5-C01-PD | narrow beam proximity | M8 connector | PNP - dark | 95B010070 |
| S3Z-PR-2-C01-NL | narrow beam proximity | cable | NPN - light | 95B010200 |
| S3Z-PR-5-C01-NL | narrow beam proximity | M8 connector | NPN - light | 95B010210 |
| S3Z-PR-2-C01-ND | narrow beam proximity | cable | NPN - dark | 95B010220 |
| S3Z-PR-5-C01-ND | narrow beam proximity | M8 connector | NPN - dark | 95B010230 |
| S3Z-PR-2-C11-PL | diffuse proximity | cable | PNP - light | 95B010000 |
| S3Z-PR-5-C11-PL | diffuse proximity | M8 connector | PNP - light | 95B010010 |
| S3Z-PR-2-C11-PD | diffuse proximity | cable | PNP - dark | 95B010020 |
| S3Z-PR-5-C11-PD | diffuse proximity | M8 connector | PNP - dark | 95B010030 |
| S3Z-PR-2-C11-NL | diffuse proximity | cable | NPN - light | 95B010160 |
| S3Z-PR-5-C11-NL | diffuse proximity | M8 connector | NPN - light | 95B010170 |
| S3Z-PR-2-C11-ND | diffuse proximity | cable | NPN - dark | 95B010180 |
| S3Z-PR-5-C11-ND | diffuse proximity | M8 connector | NPN - dark | 95B010190 |
| S3Z-PR-2-B01-PL | polarised retroreflex | cable | PNP - light | 95B010080 |
| S3Z-PR-5-B01-PL | polarised retroreflex | M8 connector | PNP - light | 95B010090 |
| S3Z-PR-2-B01-PD | polarised retroreflex | cable | PNP - dark | 95B010100 |
| S3Z-PR-5-B01-PD | polarised retroreflex | M8 connector | PNP - dark | 95B010110 |
| S3Z-PR-2-B01-NL | polarised retroreflex | cable | NPN - light | 95B010240 |
| S3Z-PR-5-B01-NL | polarised retroreflex | M8 connector | NPN - light | 95B010250 |
| S3Z-PR-2-B01-ND | polarised retroreflex | cable | NPN - dark | 95B010260 |
| S3Z-PR-5-B01-ND | polarised retroreflex | M8 connector | NPN - dark | 95B010270 |
| S3Z-PR-2-FG01-PL | through beam | cable | PNP - light | 95B010120 |
| S3Z-PR-5-FG01-PL | through beam | M8 connector | PNP - light | 95B010130 |
| S3Z-PR-2-FG01-PD | through beam | cable | PNP - dark | 95B010140 |
| S3Z-PR-5-FG01-PD | through beam | M8 connector | PNP - dark | 95B010150 |
| S3Z-PR-2-FG01-NL | through beam | cable | NPN - light | 95B010280 |
| S3Z-PR-5-FG01-NL | through beam | M8 connector | NPN - light | 95B010290 |
| S3Z-PR-2-FG01-ND | through beam | cable | NPN - dark | 95B010300 |
| S3Z-PR-5-FG01-ND | through beam | M8 connector | NPN - dark | 95B010310 |
| S3Z-PR-2-M01-PL | background suppression | cable | PNP - light | 95B010330 |
| S3Z-PR-5-M01-PL | background suppression | M8 connector | PNP - light | 95B010350 |
| S3Z-PR-2-M01-NL | background suppression | cable | NPN - light | 95B010320 |
| S3Z-PR-5-M01-NL | background suppression | M8 connector | NPN - light | 95B010340 |

## ACCESSORIES

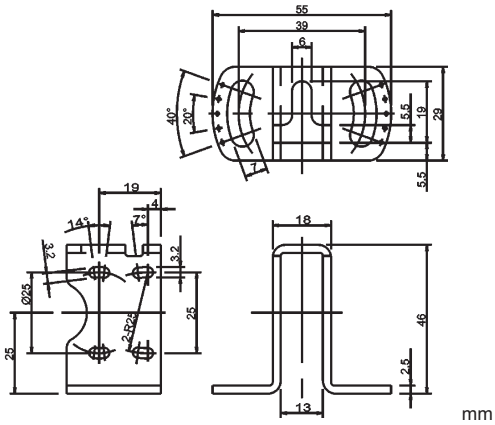
**ST-5039**




**ST-5040**




**ST-5046**

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## ACCESSORY SELECTION AND ORDER INFORMATION

| MODEL | DESCRIPTION | ORDER N° |
|---|---|---|
| ST-5039 | L-shaped fixing bracket | 95ACC2270 |
| ST-5040 | protection bracket with vertical fixing (only for cable versions) | 95ACC2280 |
| ST-5046 | protection bracket with horizontal fixing | 95ACC2370 |
| S3Z-SLIT1 | Ø 0,5 mm slit for through beam | 95ACC2470 |
| S3Z-SLIT2 | Ø 1 mm slit for through beam | 95ACC2480 |
| S3Z-SLIT3 | Ø 2 mm slit for through beam | 95ACC2490 |
| S3Z-SLIT4 | 0,5x18 mm slit for through beam | 95ACC2500 |
| S3Z-SLIT5 | 1x18 mm slit for through beam | 95ACC2510 |
| S3Z-SLIT6 | 2x18 mm slit for through beam | 95ACC2520 |

*Refer also **DATASENSOR connectors** and **reflectors***

UNIVERSAL MINIATURE SENSORS

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