

THINK ELECTRICAL

INDUSTRIAL AUTOMATION

SHORTFORM CATALOGUE '18



PREVIEW OF THE NEW '18|19 MAIN CATALOGUE



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# PLC TRAINING

For more information email: [FarrelS@acdc.co.za](mailto:FarrelS@acdc.co.za) or call 076 240 5504

Discover how much more Unitronics can do for you!  
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**Book TODAY**  
**Limited Seats available!**



Courses include: CD Manual & Programming Software - on certain options - PLC's & Programming Cables are included where specified

## Courses Available

Tea & Lunch provided.

Registration closes 1 week prior to course date.

Please confirm dates on booking.

### HARDWARE REQUIREMENTS:

Laptop with serial port, alternatively USB to serial converter.

Additional requirements for advanced courses:

Micro SD Card (1Gb will be sufficient) & Micro SD Card Reader

## Training Centre & Time

**ACDC DYNAMICS ELEPHANT ROOM**

26 Nguni Drive, Longmeadow West  
Business Estate, Edenvale

**TIME:** 8:30 - 16:30 Daily

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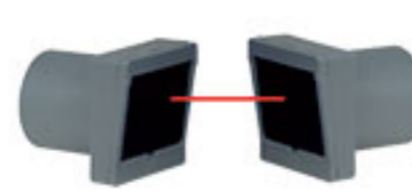
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## LIMIT PRESSURE SWITCHES & SENSORS

**NEW**

## UNISTREAM 5"



Connect directly via Ethernet or USB, or use VNC to connect mobile phone, tablet or PC. Use your browser to surf to Unistream's built-in webserver

| Code                         | Inputs             |                                |   |  | Outputs                            |                  |       |  | Operating Voltage |
|------------------------------|--------------------|--------------------------------|---|--|------------------------------------|------------------|-------|--|-------------------|
|                              | Digital (Isolated) | HSC/Shaft-encoder <sup>1</sup> | Analog  | Temperature inputs, RTD/TC   | Transistor <sup>2</sup> (Isolated) | PWM <sup>2</sup> | Relay | Analog   |                   |
| US5-B5-B1<br>US5-B10-B1*     | -                  | -                              | -   | -  | -                                  | -                | -     | -  | 12/24VDC          |
| US5-B5-TR22<br>US5-B10-TR22* | 10 Sink/Source     | -                              | 2<br>0-10V, 0-20mA,<br>4-20mA 12-bit            | -  | 2 Sink (npn)                       | 2<br>30kHz       | 8     | -  | 24VDC             |
| US5-B5-T24<br>US5-B10-T24*   | 10 Sink/Source     | -                              | 2<br>0-10V, 0-20mA,<br>4-20mA 12-bit            | -  | 12 Source (npn)                    | 2<br>3kHz        | -     | -  | 24VDC             |
| US5-B5-RA28<br>US5-B10-RA28* | 14 Sink/Source     | 2<br>90kHz 32-bit              | 2 (Isolated)<br>0-10V, 0-20mA,<br>4-20mA 14-bit | 2 (Isolated)<br>Thermocouple,<br>PT100 / NI100 /<br>NI120 / PT1000 /<br>NI1000 | -                                  | -                | 8     | 2<br>0-10V 12-Bit<br>±10V 11-Bit +<br>Sign<br>0-20mA,<br>4-20mA 12-Bit | 24VDC             |
| US5-B5-TA30<br>US5-B10-TA30* | 14 Sink/Source     | 2<br>90kHz 32-bit              | 2 (Isolated)<br>0-10V, 0-20mA,<br>4-20mA 14-bit | 2 (Isolated)<br>Thermocouple,<br>PT100 / NI100 /<br>NI120 / PT1000 /<br>NI1000 | 10 Source (npn)                    | 2<br>3kHz        | -     | 2<br>0-10V 12-Bit<br>±10V 11-Bit +<br>Sign<br>0-20mA,<br>4-20mA 12-Bit | 24VDC             |
| US5-B5-R38<br>US5-B10-R38    | 24 Sink/Source     | 4<br>90kHz 32-bit              | 2 0-10V,<br>0-20mA,<br>4-20mA<br>12-bit         | -  | -                                  | -                | 12    | -  | 24VDC             |
| US5-B5-T42<br>US5-B10-T42    | 24 Sink/Source     | 4<br>90kHz 32-bit              | 2 0-10V,<br>0-20mA,<br>4-20mA<br>12-bit         | -  | 16 Source (pnp)                    | 2<br>3kHz        | -     | -  | 24VDC             |

<sup>1</sup> This module utilizes two high speed blocks that can each be assigned to the inputs or to the outputs

<sup>2</sup> Two outputs are high speed, up to 250kHz, and may function as normal or high-speed PWM outputs (same frequency and different duty cycles).

\* Note: 5" Pro versions include AudioJack, Webserver, Video, RTSP, and SQL Client

**NEW**

## UNISTREAM COMMUNICATION MODULES

| Unistream Models          | Canbus Module                | RS232 Module        | 2 x RS232        | RS485 Module        | 1 x RS232 & 1 x RS485 |
|---------------------------|------------------------------|---------------------|------------------|---------------------|-----------------------|
| Unistream 5"              | <b>UAC-CX-01CAN</b>          | <b>UAC-CX-01RS2</b> | -                | <b>UAC-CX-01RS4</b> | -                     |
| Unistream 7, 10.4 & 15.6" | Incl in CPU <b>USC-P-B10</b> | <b>UAC-01RS2</b>    | <b>UAC-02RS2</b> | -                   | <b>UAC-02RSC</b>      |

**NEW**

## UNISTREAM EXPANSION KITS SHORT & LONG RANGE

| Code (7" - 15.6")   | Description  | Code (5")            | Description                   |
|---------------------|--|----------------------|-------------------------------|
| <b>UAG-XKP125</b>   | Short Range Expansion Kit with embedded PSU, 125cm | <b>UAG-CX-XKP125</b> | UniStream CX IO Exp.Kit 125cm |
| <b>UAG-XKP300</b>   | Short Range Expansion Kit with embedded PSU, 300cm | <b>UAG-CX-XKP300</b> | UniStream CX IO Exp.Kit 300cm |
| <b>UAG-XKPL1200</b> | Long range power supply expansion kit, 1200cm      |                      |                               |

### UniLogic Top Features

- **All-in-one Ergonomic Design** - Everything is visible
- **Structs** - Tag Database on Steroids
- **Speed Ladder Programming** - Plus "C" Power
- **Power Data Tools** - Data Sampler, Data Tables, Recipes, \*SQL
- **Web Server: Web pages** - No HTML Required
- **Design Beautiful HMI Displays** - Stream Video, Audio, PDF
- **Built-it-Once, then Reuse** - the Ultimate Time Saver
- **Languages** - from Italian to Chinese at the touch of a button
- **Built-in Alarms** - Easily Boost Application Safety
- **Communications** - Configuration not Programming



**UAG-XKP125**

INSTRUMENTS & TELEMETRY

NEW

# UNISTREAM 7" - 15.6"



| Code  | HMI Panel | USP-070-B10  | USP-104-B10   | USP-156-B10 |
|---|-----------|--|---|-------------|
|   | CPU       | USC-P-B10  | USC-P-B10   | USC-P-B10   |
| Number of I/Os per CPU (On-board, local and remote)             |           | Up to 2,048  |   |             |
| On-board Uni-I/O™ or Uni-COM Modules (All-in-one configuration) |           | Snap on up to 3 slim or 2 wide modules <sup>(1)</sup>  | Snap on up to 5 slim or 3 wide modules <sup>(1)</sup> |             |
| Local Uni-I/O™ Expansion  |           | Use Local Expansion Adapters to add up to 80 slim modules or 50 wide modules <sup>(1)</sup>  |   |             |
| Remote I/O Expansion  |           | Use EX-RC1 adapters to further extend the number of I/Os <sup>(4)</sup>  |   |             |
| Bit Operation   |           | 0.13 μs  |   |             |
| Ladder Memory   |           | 1 MB   |   |             |
| External Memory   |           | microSD and USB Flash drive  |   |             |
| Video   |           | Show MPEG-4 videos on the HMI screen   |   |             |
| Audio   |           | Play MP3 audio files via internal speaker, or external speakers via audio-out jack   |   |             |
| Power Supply  |           | 12/24VDC   |   |             |
| Backup Battery  |           | CR2032 Back-up RTC values, system data and retained tags   |   |             |
| <b>Communication</b>  |           |  |   |             |
| Ports   |           | 2 Ethernet • 1 RS485 • 1 CANbus<br>2 USB host ports • 1 USB device port for programming  |   |             |
| Protocols   |           | MODBUS, EtherNet/IP™, CANopen, SNMP, FTP, BACnet(2), RTSP, VNC, UniCAN, GSM (SMS, GPRS), KNX, Message Composer for 3rd party protocols |   |             |

NEW

## UNISTREAM EXPANDIBILITY

Select the perfect combination of Uni-I/O™ modules and configure them to fit your application. Snap up to 5 modules onto a 10.4" or 15.6" HMI Panel, up to 3 onto a 7" panel. Expand further either locally or remotely.

**Notes:**

- This module utilizes two high speed blocks that can be assigned either to the inputs or to the outputs.
- 2 Outputs are high-speed, up to 250KHz: Function as normal or high speed PWM (same freq. and different duty cycles)
- Width: 1 'wide' I/O module = 1,5 'slim' I/O modules
- Note that the high-speed inputs are included in the total number of digital inputs
- Note that the high-speed outputs are included in the total number of digital outputs
- Not isolated



|                               | Code                     | Inputs             |                                |                                       |                                    | Output                                      |                                |       |        |
|-------------------------------|--------------------------|--------------------|--------------------------------|---------------------------------------|------------------------------------|---|--------------------------------|-------|--------|
|                               |                          | Digital (Isolated) | HSC/Shaft Encoder <sup>4</sup> | Analog                                | Temperature                        | Transistor <sup>5</sup> (Isolated)          | PWM/HSO <sup>5</sup>           | Relay | Analog |
| Digital                       | UID-1600                 | 16 Sink/Source     | -                              | -                                     | -                                  | -   | -                              | -     | -      |
|                               | UID-0808T                | 8 Sink/Source      | -                              | -                                     | -                                  | 8 Sink/Source                               | -                              | -     | -      |
|                               | UID-W1616T <sup>3</sup>  | 16 Sink/Source     | -                              | -                                     | -                                  | 16 Sink/Source                              | -                              | -     | -      |
|                               | UID-0808THS <sup>1</sup> | 8 Sink/Source      | 2. 250kHz 32-bit               | -                                     | -                                  | 8 Sink/Source                               | 2. 250kHz, 2.3kHz <sup>2</sup> | -     | -      |
|                               | UID-0016T                | -                  | -                              | -                                     | -                                  | 16 Sink/Source                              | -                              | -     | -      |
|                               | UID-0808R                | 8 Sink/Source      | -                              | -                                     | -                                  | -   | -                              | 8     | -      |
|                               | UID-W1616R <sup>3</sup>  | 16 Sink/Source     | -                              | -                                     | -                                  | -   | -                              | 16    | -      |
|                               | UID-0016R                | -                  | -                              | -                                     | -                                  | -   | -                              | 16    | -      |
| Analog & Temperature          | UIA-0006                 | -                  | -                              | -                                     | -                                  | -   | -                              | -     | 6      |
|                               | UIA-0402N                | -                  | -                              | 4.<br>0-10V,0-20mA,<br>4-20mA. 13-bit | -                                  | -   | -                              | -     | 2      |
|                               | UIA-0800N                | -                  | -                              | 8.<br>0-10V,0-20mA,<br>4-20mA. 13-bit | -                                  | -   | -                              | -     | -      |
|                               | UIS-04PTN                | -                  | -                              | -                                     | 4. PT100/NI100/NI120               | -   | -                              | -     | -      |
|                               | UIS-04PTKN               | -                  | -                              | -                                     | 4.<br>PT1000/NI1000/NI200          | -   | -                              | -     | -      |
|                               | UIS-08TC                 | -                  | -                              | -                                     | 8. Thermocouple                    | -   | -                              | -     | -      |
| Digital, Analog & Temperature | UIS-WCB1 <sup>1,3</sup>  | 10 Sink/Source     | 2. 10kHz 32-bit                | 2.<br>0-10V,0-20mA,<br>4-20mA. 14-bit | 2 (Isolated).<br>PT100/NI100/NI120 | 2 Sink (NPN) <sup>6</sup>                   | -                              | 8     | 2      |
|                               | UIS-WCB2 <sup>1,3</sup>  | 10 Sink/Source     | 2. 10kHz 32-bit                | 2.<br>0-10V,0-20mA,<br>4-20mA. 14-bit | 2 (Isolated).<br>PT100/NI100/NI120 | 8 Source (PNP)<br>2 Sink (NPN) <sup>6</sup> | -                              | -     | 2      |

**VISION PLC AND HMI IN ONE UNIT IP65**

**Vision** - Colour 3.5" Touchscreen & Vision 130 - Graphic 2.4" Display OPLC Series with expandable I/O - **Expandable up to 256 (V130)**  
Colour 4.3" Touchscreen - **Expandable up to 512 (V350/V430)**

**Free Visilogic Ladder Software Including Programming Cable**



Standard Size (mm)  
96 x 96

**Vision 130/350/430 Features**

**HMI:**

- 1024 user designed screens & 250(V350)/400(V130) images per application
- Built in alarm screens (V350)

- Troubleshoot via the HMI, no PC needed

**PLC:**

- I/O options include high-speed, temperature & weight measurement
- Expandable via IO cards
- Recipe programs & data logging via Data tables
- Micro SD card - log, backup, clone & more
- Communication:**
- GPRS/GSM/CDMA enabled
- TC/IP via Ethernet
- Web server: view & edit PLC data via the Internet
- SMS and e-mail function
- MODBUS protocol
- CANbus: CANopen, UniCAN SAE J1939 & more
- Supplied with RS232/RS485 ports. 2 ports may be added: 1 Serial/Ethernet/Profibus & 1 CANbus



V130-J Flat Panel



V350-J Flat Panel



V430-J Panel

| Code                    | V130-J-X                              | B1  | TR20                             | R34                              | TR34                             | TR6                              | RA22   | TRA22   | T2                               | T38                              | TA24  |
|-------------------------|---------------------------------------|---|----------------------------------|----------------------------------|----------------------------------|----------------------------------|--|---|----------------------------------|----------------------------------|---|
|                         | V350-J-X                              |   | RH2                              | R34                              | TR34                             | RH6                              | RA22   | TRA22   | T2                               | T38                              | TA24  |
| Inputs                  | Digital                               |   | 12                               | 22                               | 22                               | 8                                | 12   | 12  | 12                               | 22                               | 12  |
|                         | HSC/Shaft Encoder/max, Freq. Measurer |   | 3.                               | 3.                               | 3.                               | 1.                               | 1.   | 1.  | 3.                               | 2.                               | 1.  |
|                         | Analog                                | NO onboard I/O's. HMI Only  | 2. 10-bit, 0-10V, 0-20mA, 4-20mA | 2. 10-bit, 0-10V, 0-20mA, 4-20mA | 2. 10-bit, 0-10V, 0-20mA, 4-20mA | 2. 10-bit, 0-10V, 0-20mA, 4-20mA | 2. 14-bit, 0-10V, 0-20mA, 4-20mA<br>4. 10-bit 0-20mA, 4-20mA | 2. (2 modes) Normal: 14-bit 0-10V, 0-20mA, 4-20mA<br>Fast: 12-bit 0-10V, 0-20mA, 4-20mA | 2. 10-bit, 0-10V, 0-20mA, 4-20mA | 2. 10-bit, 0-10V, 0-20mA, 4-20mA | 2. (2 modes) Normal: 14-bit 0-10V, 0-20mA, 4-20mA<br>Fast: 12-bit 0-10V, 0-20mA, 4-20mA |
| Temperature Measurement |                                       |   | -                                | -                                | -                                | -                                | 2. PT100/TC  | 2. PT100/TC   | -                                | -                                | 2. PT100/TC   |
| Outputs                 | Relay PNP                             |   | 6                                | 12                               | 8                                | 6                                | 8  | 4   | -                                | -                                | -   |
|                         | High-Speed Outputs/PWM                |   | -                                | -                                | 4 NPN, (3 PTO) 200Khz            | -                                | -  | 4 PNP, (2 PTO) 200Khz   | 7                                | 7                                | 5   |
|                         | Analog                                |   | 2 NPN, (2 PTO) 200Khz            | -                                | -                                | 2 NPN, (2 PTO) 200Khz            | -  | 2. 12-bit 0-10V, 4-20mA   | -                                | -                                | 2. 12-bit 0-10V, 4-20mA   |
| Power Supply            |                                       | 24VDC* except V350-35-B1, V130-33-B1 and V430-J-B1 which are 12/24VDC |                                  |                                  |                                  |                                  |  |   |                                  |                                  |   |

\*12VDC available in V120 Range For Power Supplies see page 10

**SAMBA™ IP66**

**Samba™** - Improve your competitive advantage. Great look incredible price - **Expandable via remote I/O's via CANbus**

**Free Visilogic Ladder Software Including Programming Cable**



**HMI:**

- 24 user-designed screens and 40 images per application
- Built in alarm screens
- Troubleshoot via the HMI panel, no PC needed

**PLC:**

- I/O options include: Digital, Analog and High speed
- Auto-Tune PID, 2 independent loops
- Recipe programs and data logging via Data Tables
- Communication:**
- TCP/IP via Ethernet
- Send e-mail function
- SMS messaging
- GPRS/GSM
- MODBUS protocol support
- CANbus: Canopen, UniCAN, SAE J1939 and more
- 2 ports may be added: 1 Serial (RS232/RS485)/ Ethernet & 1 CANbus



SAMBA35™



SAMBA43™



SAMBA70™

| Code         | SM35-J-X<br>SM43-J-X<br>SM70-J-X | R20                             | T20   | RA22                               | TA22  |
|--------------|----------------------------------|---------------------------------|---|------------------------------------|---|
| Inputs       | Digital                          | 10                              | 10  | 10                                 | 10  |
|              | HSC/Shaft Encoder                | 1. 30kHz 32-bit                 | 3. 30kHz 32-bit                               | 1. 30kHz 32-bit                    | 1. 30kHz 32-bit                               |
|              | Analog                           | 2. 10-bit 0-10v, 0-20mA, 4-20mA | 2. 10-bit 0-10v, 0-20mA, 4-20mA               | 2. 12/14-bit 0-10v, 0-20mA, 4-20mA | 2. 12/14-bit 0-10v, 0-20mA, 4-20mA            |
| Temperature  | -                                | -                               | 2. PT100/TC                                   | 2. PT100/TC                        |   |
| Outputs      | Digital                          | 8 Relay                         | 8 PNP   | 8 Relay                            | 8 PNP   |
|              | Analog                           | -                               | -   | 2. 12-bit 0-10v, 4-20mA            | 2. 12-bit 0-10v, 4-20mA                       |
|              | High -Speed Outputs/PWM          | -                               | Outputs 0-7 can be used as PWM outputs 0.5kHz | -                                  | Outputs 0-5 can be used as PWM outputs 0.5kHz |
| Power Supply | 24VDC                            |                                 |   |                                    |   |

INSTRUMENTS & TELEMETRY

EXTENDED RANGE

# VISION COLOUR GRAPHIC TOUCH OPLC

## Vision Series Advanced Colour, Graphic and Touch OPLC's 12/24VDC

- Vision 1210/1040 with an integrated colour touchscreen. Snap in and expansion I/O's up to 1000
- Vision 570 with an integrated 5.7" colour touchscreen. Snap in and expansion I/O's up to 1000
- Vision 230/280 with an integrated Operator Panel (Graphic or Touch). Snap in and expansion I/O's up to 316



Free U90 Ladder Software Including Programming Cable

Mono Graphics ↓ ↓

### Vision 1210/1040/570 Features

- HMI:**
- Up to 1024 user designed screens
  - 500 images per application
  - Built in alarm screens
  - Troubleshoot via the HMI, no PC needed
- PLC:**
- I/O options include high-speed, temperature & weight measurement
  - Auto-tune PID, up to 24 independent loops
  - Recipe programs & data logging via Data tables
  - Micro SD card - log, backup, clone & more
- Communication:**
- GPRS/GSM/CDMA enabled
  - TCP/IP via Ethernet
  - SMS and e-mail function
  - MODBUS protocol
  - CANbus: CANopen, UniCAN, SAE J1939 & more
  - Supplied with 2 isolated RS232/RS485 and 1 CANbus, 1 USB programming port\*, 1 port may be added for serial/Ethernet



| Code                  | V1210-T20BJ   | V1040-T20B                   | V700-T20BJ   | V570-57-T20B-J   | V560-T25B  | V280-18-B20B          |
|-----------------------|---|------------------------------|--|------------------|--|-----------------------|
| <b>Operator Panel</b> |   |                              |  |                  |  |                       |
| Display Size          | 12.1"   | 10.4"                        | 7"   | 5.7"             |  | 4.7"                  |
| Type                  | TFT LCD   |                              |  |                  |  | B&W FSTN LCD          |
| Touch Screen          | Resistive Analogue  |                              |  |                  |  |                       |
| <b>Keyboard</b>       |   |                              |  |                  |  |                       |
| Number of keys        | Virtual Keypad  | 9 Programmable Function keys | Virtual keyboard                                     | Virtual keyboard | 24 Programmable Function keys                        | 27 user labelled keys |
| <b>I/O Options</b>    |   |                              |  |                  |  |                       |
| Snap-in I/O Modules   | Snap onto the back of the Vision units to create a self-contained PLC with up to 62 I/O Local or remote I/O's |                              |  |                  |  |                       |
| I/O Expansion         | Local or Remote may be added via expansion port or via CANbus   |                              |  |                  |  |                       |
| <b>Program</b>        |   |                              |  |                  |  |                       |
| Application Memory    | Application Logic: 2MB<br>Images: 80MB<br>Fonts: 1MB  |                              | Application Logic: 2MB<br>Images: 40MB<br>Fonts: 1MB |                  | Application Logic: 2MB<br>Images: 12MB<br>Fonts: 1MB |                       |
| SD Card (Micro)       | Storage Datalogs, Alarm History, Data Tables, Trend data, Export to excel. Clone PLC's                        |                              |  |                  |  | -                     |

For Power Supplies see page 10.

\*Only applicable for V1210, V1040 & V570

# SNAP-IN I/O MODULES FOR VISION SERIES IP20

## "Snap-In" I/O Modules

- Plug a Snap-In Module Directly into the back of a Vision PLC. Compatible with all V200, V500, V1040 and V1210 Vision Series Models

## Example of "Snap-In" Module



## "Snap-In" Module



| Code         | Input                            |                                      |  | Output                                     |                                 |                                      |                                     |
|--------------|----------------------------------|--------------------------------------|--|--|---------------------------------|--------------------------------------|-------------------------------------|
|              | Digital NPN/PNP                  | Analog                               | Temperature Measurement  | Digital                                    | Relay                           | Analogue                             |                                     |
| V200-18-E1B  | Including 2 Shaft Encoder Inputs | 3. 10-bit<br>0-10v, 0-20mA<br>4-20mA | -  | 4 NPN/PNP (including 2 high-speed outputs) | 10                              | -                                    |                                     |
| V200-18-E2B  |                                  | 2. 10-bit<br>0-10v, 0-20mA<br>4-20mA | -  |  |                                 | 2. 12-bit<br>0-10v, 0-20mA<br>4-20mA |                                     |
| V200-18-E3XB |                                  | 18                                   | 4. isolated<br>12-bit 0-10v,<br>0-20mA<br>4-20mA                               | 4 TC/PT100                                 | 2 NPN/PNP high-speed            | 15                                   | 4. 12-bit 0-10v,<br>4-20mA isolated |
| V200-18-E4XB |                                  |                                      |  |  |                                 |                                      |                                     |
| V200-18-E5B  |                                  | 18                                   | 3. 10-bit<br>0-10v, 0-20mA<br>4-20mA   | -  | 15 PNP 2 NPN/PNP (2 high-speed) | -                                    | -                                   |
| V200-18-E6B  |                                  | 18                                   | 3. 10-bit<br>0-10v, 0-20mA<br>4-20mA &<br>2. 14-bit<br>0-10v, 0-20mA<br>4-20mA | 2 TC/PT100                                 |                                 |                                      |                                     |
| V200-18-E46B |                                  |                                      |  |  |                                 |                                      |                                     |
| V200-18-E62B | 30                               | 2. 10-bit<br>0-10v, 0-20mA<br>4-20mA | -  | 28 PNP 2 NPN/PNP High-speed                | -                               | -                                    |                                     |

## M91 PLC & HMI IN ONE UNIT IP65

M91 Palm size PLC and textual HMI with up to 38 onboard I/O's - **Expandable up to 150**

**Free Visilogic Ladder Software  
Including Programming Cable**

Training courses available  
for all Unitronics PLC's

**M91 Features**

- HMI:**
- Up to 80 user-designed screens
  - Multilingual: supports over 15 languages & 20 graphic symbols
  - Scroll between pre-programmed recipes/menus
  - Troubleshoot via the HMI, no PC needed
- PLC:**
- Shaft-Encoder inputs and PWM outputs
  - Direct temperature inputs
  - Database
  - Auto-tune PID, up to 4 loops
- Communication:**
- SMS messaging via GSM
  - PC access via MODBUS or OPC server. MODBUS networking
  - CANbus (on C Models)
  - RS232/RS485 built in port



| Code                        | M91-2-R1                        | M91-2-R2C                       | M91-2-R6C   | M91-2-R34                       | M91-2-T1   | M91-2-T38 | M91-2-T2C                       | M91-2-UA2                       | M91-2-RA22  |
|-----------------------------|---------------------------------|---------------------------------|---|---------------------------------|--|-----------|---------------------------------|---------------------------------|---|
| <b>Inputs</b>               |                                 |                                 |   |                                 |  |           |                                 |                                 |   |
| Digital PNP/NPN             | 10                              | 10                              | 6   | 22                              | 12   | 22        | 12                              | 12                              | 12  |
| HSC/Shaft                   | 3.                              | 3.                              | 1.  | 3.                              | 2.   | 2.        | 3.                              | 1.                              | 1.  |
| Encoder/max, Freq. Measurer | 10kHz                           | 10kHz                           | 10kHz   | 30kHz                           | 10kHz  | 30kHz     | 10kHz                           | 30kHz                           | 30kHz   |
| Analog                      | 16-bit                          | 16-bit                          | 16-bit  | 16-bit                          | 16-bit   | 16-bit    | 16-bit                          | 16-bit                          | 16-bit  |
| Temperature Measurement     | 1. 10-bit 0-10V, 0-20mA, 4-20mA | 2. 10-bit 0-10V, 0-20mA, 4-20mA | 6. 10-bit 0-10V, 0-20mA, 4-20mA and 4. 0-20mA, 4-20mA | 2. 10-bit 0-10V, 0-20mA, 4-20mA | -  | -         | 2. 10-bit 0-10V, 0-20mA, 4-20mA | 2. 14-bit 0-10V, 0-20mA, 4-20mA | 2. 14-bit 0-10V, 0-20mA, 4-20mA and as 2 PT100/TC |
| <b>Outputs</b>              |                                 |                                 |   |                                 |  |           |                                 |                                 |   |
| Digital                     | 6 Relay                         |                                 |   | 12 Relay                        | 12 PNP   | 16 PNP    | 12 PNP                          | 10 PNP                          | 8 Relay   |
| High-Speed/PWM              |                                 |                                 |   |                                 | 2, first 2 outputs can function as HSO, 0.5kHz max |           |                                 |                                 |   |
| Analog                      |                                 |                                 |   |                                 |  |           |                                 | 2 12-bit, 0-10V, 4-20mA         |   |
| Power Supply                | 12/24VDC                        |                                 |   | 24VDC                           | 12/24VDC   | 24VDC     | 12/24VDC                        | 24VDC                           | 12/24VDC  |

## JAZZ<sup>®</sup> MICRO OPLC™ IP65

New Jazz 2 Series. Much more than a "smart relay"  
Full function PLC & HMI with up to 40 onboard I/O's -  
**Non Expandable**

**Free U90 Ladder Software**

**Jazz Features**

- HMI:**
- Up to 60 user-designed screen
  - Multilingual: supports over 15 languages & 20 graphic symbols
  - Scroll between pre-programmed recipes/menus
- PLC:**
- Ladder Logic Programming
  - Functions include: interrupt, loops, maths, store & compare functions
  - High-speed counters & PWM outputs
  - Direct temperature inputs
  - Auto-tune PID, up to 4 loops
- Communication:**
- SMS messaging via GSM
  - PC access via MODBUS or OPC server. MODBUS networking



Jazz-J Flat Panel



Jazz Classic Panel

**Accessories**

**Ethernet Comm. Port**



**MJ20-ET1**

Ethernet add on port supported by Jazz 2 series only

**COM Port Kit**



**JZ-RS4**

RS232/RS485 Add-on port (isolated)

**Program Cloner Module**



**MJ20-MEM1**

Copy applications from PLC to PLC

**USB Cable**



**USB - CAB200**

USB Programming Cable

| Classic Code            | JZ20-R10         | JZ20-R16   | JZ20-R31   | JZ20-T10   | JZ20-T18                                     | JZ10-11-T40 | JZ10-11-UN20                                | JZ10-11-UA24         | JZ10-11-PT15      |
|-------------------------|------------------|--|------------|------------|--|-------------|---|----------------------|-------------------|
| Flat Code               | JZ20-J-R10       | JZ20-J-R16   | JZ20-J-R31 | JZ20-J-T10 | JZ20-J-T18                                   | JZ10-J-T40  | JZ10-J-UN20                                 | JZ10-J-UA24          | JZ10-J-PT15       |
| <b>Inputs</b>           |                  |  |            |            |  |             |   |                      |                   |
| Digital PNP/NPN         | 6                | 8  | 18         | 6          | 8  | 18          | 11  | 11                   | 6                 |
| High-S Counter          | 2. 10kHz, 16-bit |  |            |            |  |             | 1. 5kHz, 16-bit                             |                      |                   |
| Analog                  | -                | 2. 10 or 12-bit, 0-10V & 2. 10-bit, 0-20mA, 4-20mA |            | -          | 2. 10-bit, 0-10V & 2. 10-bit, 0-20mA, 4-20mA |             | 2. 10-bit, 0-10V & 2. 10-bit 0-20mA, 4-20mA |                      | 3. 10-bit 0-10V   |
| Temperature Measurement | -                |  |            |            |  |             | 1 PT100/TC                                  | 2 PT100/TC           | 3 PT1000/ NI1000  |
| <b>Outputs</b>          |                  |  |            |            |  |             |   |                      |                   |
| Digital                 | 4 Relay          | 6 Relay  | 11 Relay   | 4 PNP      | 8 PNP  | 20 PNP      | 5 Relay, 2 PNP                              |                      | 5 Relay 1 PNP/NPN |
| High-Speed/PWM          |                  |  |            |            |  | 2 PMW       |   |                      | 1 HSO             |
| Analog                  |                  |  |            |            |  |             |   | 2. 12-bit 10V,4-20mA |                   |
| Power Supply            | 24VDC            |  |            |            |  |             |   |                      |                   |

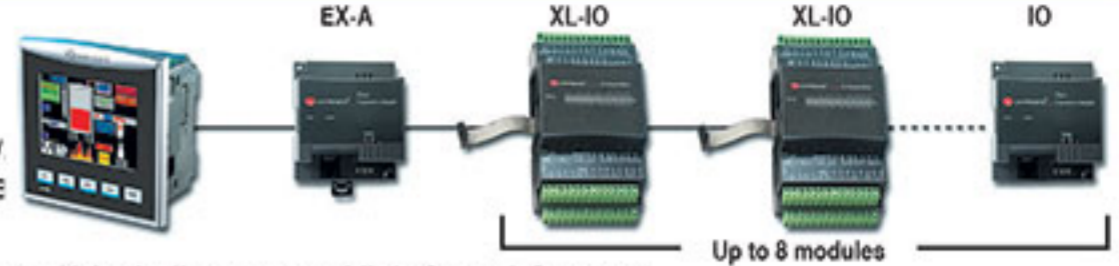


## I/O EXPANSION & COMMUNICATION MODULES

### High-Speed Remote I/O Module

| Code     | Description  |
|----------|--|
| EXF-RC15 | <b>9 Digital Inputs PNP/NPN</b> , including 3 high-speed counter, <b>4 NPN Transistor Outputs</b> , may function as high-speed PWM/PTO, <b>2 relay outputs</b> . |

**Note:** Expand your system with local or remote I/O expansion modules. Vision series support both local & remote I/O modules. M91 support local module only.  
**Note:** 12VDC I/O modules also available



\* Including up to 1 High Speed Counter. \*\* Including up to 2 High Speed Counter  
 \*\*\* EX90 is housed in an open casing. Only one EX90 can be connected per PLC, as a single expansion module

### I/O Expansion Module Adapters

| Code   | Description  |
|--------|--|
| EX-A2X | Local I/O module adaptor. Galvanic isolation. Connect up to 8 modules per adaptor. 12/24VDC.   |
| EX-RC1 | Remote I/O module adaptor via CANbus. Multiple adaptors can be connected to a single PLC. Connect up to 8 modules per adaptor. 12/24VDC. |

| Code                       | Digital & Analogue Modules | Input                     |                                  |             | Output              |  |                               |
|----------------------------|----------------------------|---------------------------|----------------------------------|-------------|---------------------|--|-------------------------------|
|                            |                            | Digital PNP/NPN           | Analog                           | AC 110/220V | Digital PNP         | Relay                                      | Analog                        |
| I/O                        | IO-DI8-TO18                | 8*                        | -                                | -           | 8                   | -  | -                             |
|                            | IO-DI8-RO4                 | 8*                        | -                                | -           | -                   | 4  | -                             |
|                            | IO-DI8-RO8                 | 8*                        | -                                | -           | -                   | 8  | -                             |
|                            | IO-DI16                    | 16*                       | -                                | -           | -                   | -  | -                             |
|                            | IO-RO8                     | -                         | -                                | -           | -                   | 8  | -                             |
|                            | IO-RO16                    | -                         | -                                | -           | -                   | 16   | -                             |
|                            | IO-TO16                    | -                         | -                                | -           | 16                  | -  | -                             |
|                            | IO-DI8ACH                  | -                         | -                                | 8           | -                   | -  | -                             |
|                            | IO-D16A3-RO16              | 16**                      | 3. 10-bit 0-20mA or 4-20mA       | -           | -                   | 16   | -                             |
|                            | IO-D16A3-TO16              | 16**                      | 3. 10-bit 0-20mA or 4-20mA       | -           | 15+1 PNP/NPN or HSO | -  | -                             |
| I/O with Expansion Adaptor | EX-D16A3-R08               | 16**                      | 3. 10-bit 0-20mA or 4-20mA       | -           | -                   | 8  | -                             |
|                            | EX-D16A3-TO16              | 16**                      | 3. 10-bit 0-20mA or 4-20mA       | -           | 15+1 PNP/NPN or HSO | -  | -                             |
|                            | EX90-DI8-RO8***            | 8*                        | -                                | -           | -                   | 8  | -                             |
|                            | IO-AI4-AO2                 | -                         | 4. 12-bit 0-10V 0-20mA or 4-20mA | -           | -                   | -  | 2. 0-10V 0-20mA 4-20mA 12-bit |
| IO-AI8                     | -                          | 8. 0-10V or 14-bit 0-20mA | -                                | -           | -                   | -  |                               |
| IO-AO6X                    | -                          | -                         | -                                | -           | -                   | 6. Isolated, 0-10V, 0-20mA, 4-20mA, 12-bit |                               |

### Temperature and Weight/Strain Measurements

| Code              | Description   |
|-------------------|---|
| IO-PT400          | <b>4 PT100/NI100/NI120 Inputs</b><br>Range: PT100 (-50° to 460°)<br>Range: NI100 (-50° to 232°)<br>Range: NI120 (-50° to 172°) 12-bit                   |
| IO-PT4K           | <b>4 PT1000/NI1000 Inputs</b><br>Range PT000 (-50° to 460°)<br>Range NI1000 (-50° to 232°) 12-bit   |
| IO-ATC8           | <b>8 Thermocouple / Analogue Inputs</b> , T/C, J, K, T, B, E, N, R, S. 0-10v, 0-20mA, 4-20mA. 12/14-bit   |
| IO-LC1 and IO-LC3 | <b>1-3 Loadcell / Strain gauge Inputs</b><br>Input voltage ranges: ± 20mV, ± 80mV Excitation: AC/DC, <b>1 Digital PNP Input, 2 Setpoint PNP Outputs</b> |

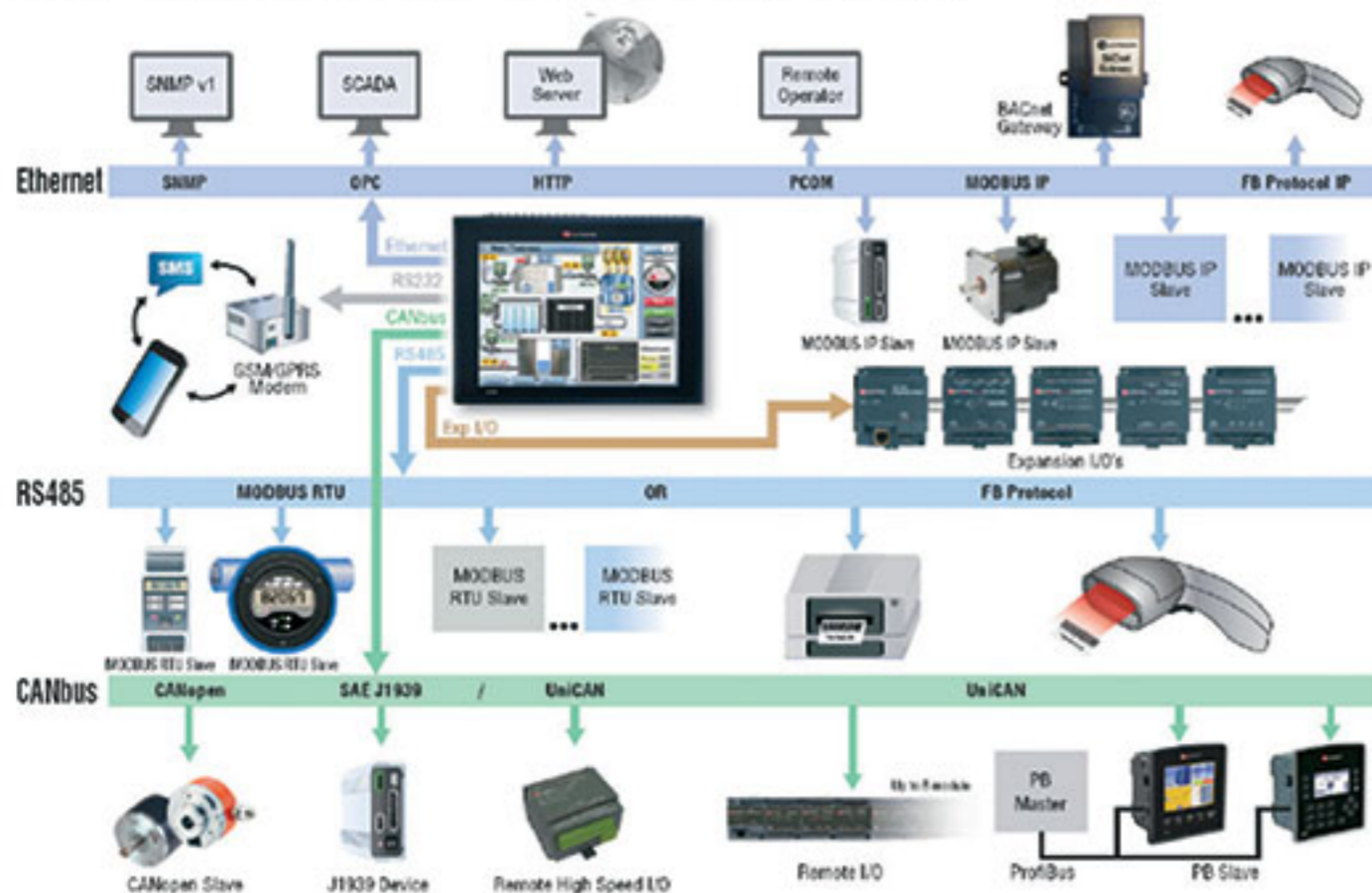
## COMMUNICATION MODULES

| Vision Model             | Ethernet    | RS232/RS485 | Isolated RS232/RS485 | CANbus      | Profibus               |
|--------------------------|-------------|-------------|----------------------|-------------|------------------------|
| V130, V350, V430, Samba  | V100-17-ET2 | V100-17-RS4 | V100-17-RS4X         | V100-17-CAN | V100-17-PB1 (Not V430) |
| V200, V500, V1040, V1210 | V200-19-ET2 | V200-19-RS4 | V200-19-RS4X         | -           | -                      |

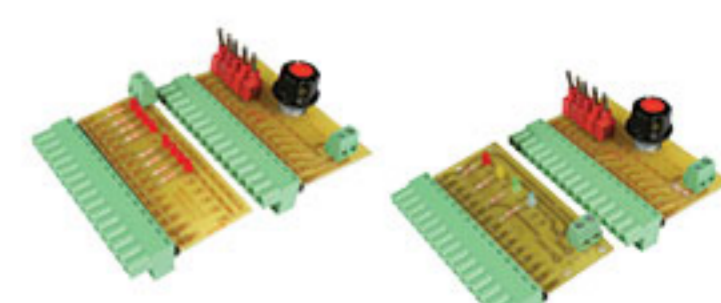
### Configure your Network

Collect & communicate data. Display, access, and remotely control your application.

### Example of DIN Rail Expansion



Input/Output Cards for Testing Purposes



| Code | V350-PC/SET | JAZZ-PC/SET |
|------|-------------|-------------|
|------|-------------|-------------|

24VDC

## SMART RELAY GENIE™-NX

|   |  | Genie-NX Base Module                               |                                   | Comms Module                               |                                   | Expansion Module                   |   |
|---|--|--|-----------------------------------|--|-----------------------------------|------------------------------------|---|
| <p>48 I/O Max</p>   |  |  |                                   |  |                                   |                                    |   |
| Code  |  | G7DDT9   | G8DDT9                            | G7XDTR4                                    | G8XDTR4                           | G7DDT6E                            | G8DDT6E   |
| General   |  |  |                                   |  |                                   |                                    |   |
| Supply Voltage  |  | 110-240VAC   | 12-24VDC                          | 110-240VAC                                 | 12-24VDC                          | 110-240VAC                         | 12-24VDC  |
| Size W x H x D  |  | 72 x 90 x 65 mm                                    |                                   | 36 x 90 x 60 mm                            |                                   | 72 x 90 x 65 mm                    |   |
| Mounting  |  | Base/DIN Mount                                     |                                   | Base/DIN Mount                             |                                   | Base/DIN Mount                     |   |
| Reserve (Clock)   |  | 150h at -10°C to 55°C                              |                                   | -  |                                   | -                                  |   |
| I/O's   |  |  |                                   |  |                                   |                                    |   |
| Max Exp. Modules  |  | 3 x Expansion Modules                              |                                   | -  |                                   | -                                  |   |
| Digital Input   |  | 8 (0-50VAC) Off,<br>(80-265VAC) On                 | 6 (0-4VDC) Off,<br>(8-26.4VDC) On | TTL Level 1                                |                                   | 8 (0-50VAC) Off,<br>(80-265VAC) On | 8 (0-4VDC) Off,<br>(8-26.4VDC) On                       |
| Analogue Input  |  | N/A  | 2 (can be used for Analogue)      | -  |                                   | -                                  |   |
| Output  |  | -  |                                   | RS485 Protocol (2 Wires, D+, D-)           |                                   | -                                  |   |
| Relay Output  |  | 4 x NO 8A  | 4 x NO 8A                         | -  |                                   | 4 x NO 8A                          | 4 x NO 5A   |
| Communication   |  |  |                                   |  |                                   |                                    |   |
| RS 485 PROTOCOL   |  | -  |                                   | RS485 (2 Wires, D+, D-)                    |                                   | <p><b>Accessories</b></p>          |   |
| Modbus Comms  |  | -  |                                   | YES (RTU)(SLAVE)                           |                                   |                                    |   |
| DST   |  | -  |                                   | -  |                                   |                                    |   |
| LED Indication  |  | -  |                                   | Red LED's for Tx & Rx. Green LED for Power |                                   |                                    |   |
| Number of Nodes   |  | -  |                                   | 32 std Unit Loads                          |                                   |                                    |   |
| Baud Rate   |  | -  |                                   | 300, 600, 1200, 2400, 4800, 9600           |                                   |                                    |   |
| Programming   |  |  |                                   |  |                                   |                                    |   |
| Ladder Programming  |  | 250 Lines  |                                   |  |                                   |                                    |   |
| Function Blocks   |  |  |                                   |  |                                   |                                    |   |
| Timers  |  | 16 (on delay, interval, cyclic, on-off, off delay) |                                   |  |                                   |                                    |   |
| Counters  |  | 16 (Up/Down, Retentive selectable)                 |                                   |  |                                   |                                    |   |
| Time Switches   |  | 16 (Weekly/Daily)                                  |                                   |  |                                   |                                    |   |
| Compare Counters  |  | 16   |                                   |  |                                   |                                    |   |
| Analogue Functions  |  |  |                                   |  |                                   |                                    |   |
| Soft Text Messages  |  | N/A 16 (Priority Driven) 12                        |                                   |  |                                   |                                    |   |
| AUX Relays  |  | 64   |                                   |  |                                   |                                    |   |
|   |  |  |                                   | Code                                       | Description                       | Code                               | Description   |
|   |  |  |                                   | GFDNN3M                                    | Memory Card                       | GFDNN1                             | USB Cable   |
|   |  |  |                                   | GFDNN2S                                    | RS 232 Serial Communication Cable | GNXNN1                             | GENIE NX Software Windows 98, 2000, XP, Vista & Windows |
| Features  |  |  |                                   |  |                                   |                                    |   |
| <ul style="list-style-type: none"> <li>Supports up to 32 Digital Inputs &amp; 16 Digital Outputs</li> <li>250 lines of ladder programming</li> <li>16 Messages, Time Switches, Compare Counters, Timers, Counters &amp; (12 analogue functions - G8DDT9 only)</li> <li>DST Feature available</li> <li>PC software for programming, online &amp; offline simulation, documentation &amp; printing</li> </ul> |  |  |                                   |  |                                   |                                    |   |

## SWITCHED MODE POWER SUPPLIES

| Code                    |  | 24AS244D6D       | 24AS126D6D       | 24BS24AD4E          | 24BS241D2F          | 24BS241D2F          | 24BS241D2F          | 24BS241D2F          | 24BS051D1F          | 24BS051D1F          | 24BS051D1F          |
|-------------------------|--|------------------|------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Supply Voltage          |  | 230V, 50Hz       | 230V, 50Hz       | 100-240V, 50/60Hz   | 100-240V, 50/60Hz   | 100-240V, 50/60Hz   | 100-240V, 50/60Hz   | 100-240V, 50/60Hz   | 100-240V, 50/60Hz   | 100-240V, 50/60Hz   | 100-240V, 50/60Hz   |
| Output Voltage          |  | 24VDC            | 12VDC            | 24VDC               | 24VDC               | 24VDC               | 24VDC               | 24VDC               | 5VDC                | 5VDC                | 5VDC                |
| Rated Current           |  | 5A               | 6A               | 2.5A                | 1A                  | 1A                  | 1A                  | 1A                  | 1A                  | 1A                  | 1A                  |
| Accuracy                |  | ±1%              | ±1%              | ±1%                 | ±1%                 | ±1%                 | ±1%                 | ±1%                 | ±1%                 | ±1%                 | ±1%                 |
| Line/Load Regulation    |  | 1%               | 1%               | 1%                  | 1%                  | 1%                  | 1%                  | 1%                  | 1%                  | 1%                  | 1%                  |
| Ripple, Noise           |  | 150mV (P-P)      | 100mV (P-P)      | 150mV (P-P)         | 150mV (P-P)         | 150mV (P-P)         | 150mV (P-P)         | 150mV (P-P)         | 100mV (P-P)         | 100mV (P-P)         | 100mV (P-P)         |
| Oversvoltage Protection |  | 26-33V           | 13-16V           | 160% of Full Load   | 160% of Full Load   | 160% of Full Load   | 160% of Full Load   | 160% of Full Load   | 180% of Full Load   | 180% of Full Load   | 180% of Full Load   |
| Overload Capacity       |  | 168% for 10s Max | 130% for 10s Max | 150-250% for 5s Max | 120-175% for 5s Max | 120-175% for 5s Max | 120-175% for 5s Max | 120-175% for 5s Max | 120-140% for 5s Max | 120-140% for 5s Max | 120-140% for 5s Max |
| Dimensions              |  | 108 x 90 x 58mm  | 108 x 90 x 58mm  | 72 x 90 x 58mm      | 36 x 90 x 60mm      | 36 x 90 x 60mm      | 36 x 90 x 60mm      | 36 x 90 x 60mm      | 48 x 90 x 58mm      | 48 x 90 x 58mm      | 48 x 90 x 58mm      |

# PL-100 MINI PROGRAMMABLE LOGIC CONTROLLER

## PL-100 Base Module

## Expansion Module



| Code   | PC10161D1              | PC10142D1                               | Code               | Description  | DIN Width |
|--|------------------------|---|--------------------|--|-----------|
| <b>General Specifications</b>                  |                        |   | <b>EDCI8</b>       | 8 Digital Inputs                                       | 2MOD.     |
| Voltage  | 24VDC                  |   | <b>EDCRO8</b>      | 8 Relay Outputs  | 2MOD.     |
| Internal Current Consumption                   | 65mA @ 24VDC           | 60mA @ 24VDC                            | <b>EDCI8RO8</b>    | 8 Digital Inputs and 8 Relay Outputs                   | 4MOD.     |
| Inrush Current                                 | 2.5A @VDC              |   | <b>EDCTLO8</b>     | 8 Transistor Low Side Outputs                          | 2MOD.     |
| Battery Backup                                 | 30 Days                |   | <b>EDCTHO8</b>     | 8 Transistor High Side Outputs                         | 2MOD.     |
| Separate Power Supply for Outputs              | Not Required           | 19.2 - 26.4VDC                          | <b>EANIV4C4</b>    | 4 Analog Inputs (0-10v / 4-20mA)                       | 2MOD.     |
| DIN Width                                      | 4MOD.                  | 4MOD.                                   | <b>EANOV2C2</b>    | 2 Analog Outputs (0-10V / 4-20mA)                      | 2MOD.     |
| Max No of I/O's                                | 100                    |   |                    |  |           |
| Max No of Expansion Modules                    | 6                      |   |                    |  |           |
| <b>I/O's - Onboard</b>                         |                        |   |                    |  |           |
| Digital Inputs                                 | 8 (Sinking / Sourcing) | 6 + 2 High Speed                        | <b>Accessories</b> |  |           |
| Input voltage Range                            | 0 - 26.4VDC            |   | <b>Code</b>        | <b>Description</b>                                     |           |
| Level (Logic 0)                                | Max 7VDC               |   | <b>28D33B0</b>     | USB Cable  |           |
| Level (Logic 1)                                | Min 16VDC              |   | <b>PC10AC2</b>     | RS232 Communication Cable PLC- HMI / SCADA             |           |
| Input Current                                  | 1.2mA Max Per Unit     |   | <b>PC10AC3</b>     | RS485 Communication Cable PLC- HMI / SCADA             |           |
| Input Frequency                                | 10Hz Max               |   | <b>PL-SOFT</b>     | Programming Software Windows 98, 2000, XP, 7, 8, Vista |           |
| Digital Outputs                                | 8Relay (NO)            | 4 + 2 High Speed MOSFET Low Side Driver |                    |  |           |
| Rated Load                                     | 5A @ 230VAC / 30VDC    | 24VDC 500mA                             |                    |  |           |
| Max Load Per Common                            | 10A                    | -                                       |                    |  |           |
| <b>Communications, Features &amp; Benefits</b> |                        |   |                    |  |           |

- PC Port - USB (Type B)
- HMI Port (RS232 / RS485) - RJ11 (for HMI or any MODbus Device)
- Communication Parameters - Software Selectable
- HMI Port Comm. Protocol - MODbus Master/Slave
- Supports up to 100 I/O's
- Relay Base & MOSFET Low Side Base Modules
- Stacking using FRC cable. Max 6 Expansion Modules
- Isolated Digital Inputs with Sourcing & Sinking
- Isolated Digital Transistorized Outputs
- High Speed Inputs - Single / Quadrature

- Programming Language: Ladder
- High Speed Outputs (PTO / PWM / S-Profile)
- Analogue Inputs & Outputs 0-10v / 4-20mA
- Online & Offline Simulation
- Standard RS232/RS485 Port with RJ11 for HMI / SCADA Interface
- MODbus RTU Support
- 128 Weekly, Monthly & Yearly Time Switches
- Multiple Timers, Counters. Hour meters and many more function blocks

## NEW COMMUNICATION ACCESSORIES AND PROTOCOL CONVERTERS



| Code   | Description  |
|--|--|
| <b>40B2BAVAA</b>   | 24VDC GSM Modem for Mini PLC PL-100. Includes wire type antenna. Remote Control, monitoring and diagnostics for digital and analog inputs and outputs through SMS messages to and from the GSM modem |
| <b>USB to Serial Converter</b>                                 |  |
| <b>28A11A0</b>   | This converter converts RS232/RS485/RS422 to USB. Includes 1.5kV Galvanic isolation between USB and Serial ports.  |
| <b>28NNN10</b>   | Software CD for Win XP, Vista, Win7, Win8  |
| <b>GSM Controller - Control by Missed call, SMS, IVRS call</b> |  |
| <b>26A11AV</b>   | 180 - 500VAC 3 Phase for remote monitoring and ON/OFF switching of various electrical loads using mobile handsets  |
| <b>26A21AV</b>   | 85 - 265VAC 1 Phase for remote monitoring and ON/OFF switching of various electrical loads using mobile handsets   |
| <b>26100V0</b>   | Wire type antenna  |

| Code                          | 25A11A0   | 25B11A0            |
|-------------------------------|---|--------------------|
| <b>Lynx Gateway</b>           |   |                    |
| <b>General Specifications</b> |   |                    |
| Supply Voltage                | 12-24VDC  |                    |
| Protocol Conversion           | Modbus RTU/ASCII to Modbus TCP                                  | Serial to Ethernet |
| Operation Mode                | Modbus RTU / ASCII (Master Slave), Modbus TCP (Server / Client) | Raw Telnet         |
| Config Management             | HTTP Web Server & Appl. Software                                |                    |
| <b>Serial Interface</b>       |   |                    |
| # of serial Ports             | 1   | 2                  |
| Serial Interface: Port 1      | Screw Term for RS232, RS422, RS485                              |                    |
| Serial Interface: Port 2      | -   | RJ11 for RS232     |
| <b>Serial Interface</b>       |   |                    |
| Port                          | RJ45, Ethernet 10/100 Mbps                                      |                    |
| Network Protocols for coms    | TCP/IP, Modbus  | Raw, Telnet        |

**NEW**

## PROFESSIONAL OPERATION PANEL WITH I/O

- User Friendly Script Language
- High memory and storage capacity
- Project download and upload via USB
- Industry Standard communication networks
- Font support for FreeType and Windows

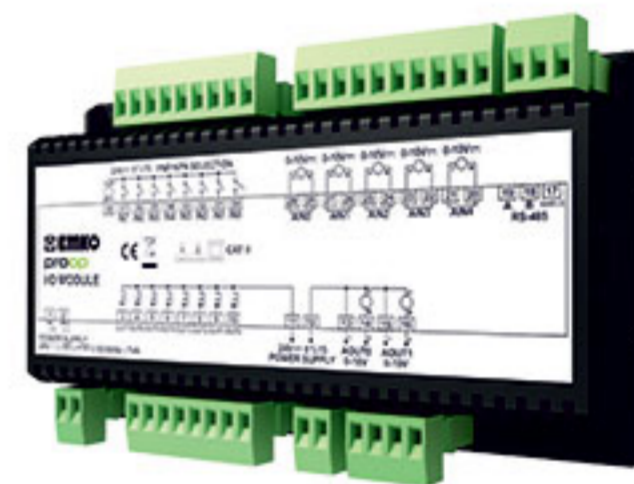
- **Communication Protocols:** Modbus, ASCII, RTU, TCP/IP, MODBUS TCP, UDP, SNMP
- **Siemens S7:** 300/400/1200/1500 PLC Protocol Support
- **USB:** 1xUSB 2.0 (Client), 1xUSB 2.0 (Host)
- **Serial Ports:** 1 x RS485 (Terminal), 1 x RS232 (Terminal), 1 x RS232 (DB-9)
- **Ethernet:** 1 x 10/100 Mbps
- **Power supply:** 18-30VDC
- **MCU:** ARM Cortex-A7, 528Mhz. ARM Cortex-A9, 800Mhz
- **Flash Memory:** 4 GB
- **Ram:** 512 MB DDR3 SDRAM
- **Battery:** CR2032 button cell lithium 3V (removable) with 5 years life

|  | 7" Series                         | 10" Series                        |
|--|-----------------------------------|-----------------------------------|
|  | <b>Free Prop Builder Software</b> | <b>Free Prop Builder Software</b> |
|  |                                   |                                   |

| Code                   | Light     | Control   | Light      | Control    | Process    |
|------------------------|-----------|-----------|------------|------------|------------|
|                        | PROOP-7LE | PROOP-7CE | PROOP-10LE | PROOP-10CE | PROOP-10PE |
| <b>Specifications:</b> |           |           |            |            |            |
| Digital Inputs         | -         | 4         | -          | 5          | 5          |
| Digital Outputs        | -         | 4         | -          | 4          | 4          |
| Analog In 4-20mA       | -         | -         | -          | -          | 2          |
| Analog Out 4-20mA      | -         | -         | -          | -          | 2          |

### Din Rail I/O Expansion Modules

| Code       | Description  |
|------------|--|
| IO-P2213   | 8 Digital In/ 8 Digital Out  |
| IO-P221311 | 8 Digital In/ 5 PT100/ 8 Digital Out/ 2 Analog Out 0/4-20mA              |
| IO-P221312 | 8 Digital In/ 5 PT100/ 8 Digital Out/ 2 Analog Out 0-10Vdc               |
| IO-P221321 | 8 Digital In/ 5 Analog In 0/4-20mA/ 8 Digital Out/ 2 Analog Out 0/4-20mA |
| IO-P221332 | 8 Digital In/ 5 Analog In 0-10Vdc/ 8 Digital Out/ 2 Analog Out 0-10Vdc   |
| IO-P221341 | 8 Digital In/ 5 Analog In 0-50mV/ 8 Digital Out/ 2 Analog Out 0/4-20mA   |
| IO-P221342 | 8 Digital In/ 5 Analog In 0-50mV/ 8 Digital Out/ 2 Analog Out 0-10Vdc    |
| 28D33BO    | USB Programming Cable  |



I/O Expansion Card

- All the above I/O cards use RS485 Communication and require 24VAC/DC Power Supply • GSM Units available on request
- PT100 range: -200 to 650°C. • Analog inputs: 14-Bit. • Analog Outputs = 12-Bit • Connect up to 32 I/O Expansion Modules

**NEW**

## POULTRY AUTOMATION AND CONTROL SYSTEMS

- Emko Cloud Web Management
- Multiple Poultry Visualisations
- Remote Monitoring and Control for Android and IOS
- Alarm SMS's

- **Power Supply:** 24VDC
- **CPU:** ARM Cortex-A9, 800Mhz
- **RAM:** 512MB
- **Flash Memory:** 4GB
- **Ethernet:** 1 x 10/100 Mbps
- **Battery:** CR2032 button cell lithium 3V (removable) with 5 years life

|                        | 10" HMI Touch Panel  | I/O Expansion Modules   | GSM SMS Module                                  | RS485 Humidity and Temp. Sensor  |
|------------------------|--|---|---|--|
|                        |  |   |   |  |
| <b>Code</b>            | EPC-T10  | EPC-N-IO  | EPC-N-GSM                                       | PMD-W-O/O-110  |
| <b>Specifications:</b> | 2 x USB<br>1 x Ethernet<br>1 x RS232 (For GSM Module)<br>1 x RS485 (I/O card) Com Port | 8 Digital Inputs<br>18 Relay Outputs<br>11 Analogue Inputs<br>2 Analogue Outputs<br>2 x RS485 Com Ports (For I/O communication) | GSM SMS Module Antenna + 3m Communication Cable | Wall Mounting Humidity and Temperature Sensor<br>RS485 Communication<br>Temp: -20 to 80°C<br>Humidity: 0 - 100% RH |

INSTRUMENTS & TELEMETRY

NEW

# CHICKEN FARM LIGHTING SYSTEM

LIT



**Programmable Dimmer & Timer** - Input Voltage: 230VAC | IP66 | Support DIY Programming | Auto-Programmable operation setting modes in 24hr cycles | Built-in digital CPU with smart control performance | Leading Edge & Trailing Edge dimmable | 0%-100% Dimmable, dimming precision 1% simulate sunrise - sunset | 7 inch LCD | Easy replacement for traditional lamps, no need to rewire the old existing cable

| Code          | Output Current |
|---------------|----------------|
| AMB-IDS-2000W | 1 x 10A        |
| AMB-IDS-4000W | 2 x 10A        |

**A Series - White End Caps / Triac Dimmable** - Input Voltage: 230VAC | IP65 | V-Shape 270° | CRI > 80 | L80B50 70 000hrs | Full spectrum | Dimming from 0.2% - 100% without flicker to simulate sunrise to sunset | Compatible with intelligent dimmer & timer system | Humidity proof, dust proof, shatter proof | 300mm male and female connector for series connection | Anti-ammonic and acid for poultry industrial lighting | To be used with AMB-IDS controller

| Code Triac     | Wattage | Lumens | Length (mm) |
|----------------|---------|--------|-------------|
| WP4A-T8-20W-D* | 20W     | 2400lm | 1200 x 28   |
| WP5A-T8-24W-D* | 24W     | 2880lm | 1500 x 28   |
| WP6A-T8-28W-D* | 28W     | 3360lm | 1800 x 28   |

\* Add Colour Temperature to Code: ○WW (3000K), ○CW (4200K), ○DL (5000K)

**A Series - White End Caps / 0-10V Dimmable** - Input Voltage: 230VAC | IP65 | V-Shape 270° | CRI > 80 | L80B50 70 000hrs | Full spectrum | Dimming from 3% - 100% without flicker to simulate sunrise to sunset | Humidity proof, dust proof, shatter proof | 300mm male and female connector | Anti-ammonic and acid for poultry industrial lighting | To be used on existing poultry controllers, not compatible with AMD-IDS controllers

| Code 0-10V       | Wattage | Lumens | Length (mm) |
|------------------|---------|--------|-------------|
| WP4A-T8-20W-010* | 20W     | 2400lm | 1200 x 28   |
| WP4A-T8-24W-010* | 24W     | 2880lm | 1500 x 28   |
| WP4A-T8-28W-010* | 28W     | 3360lm | 1800 x 28   |

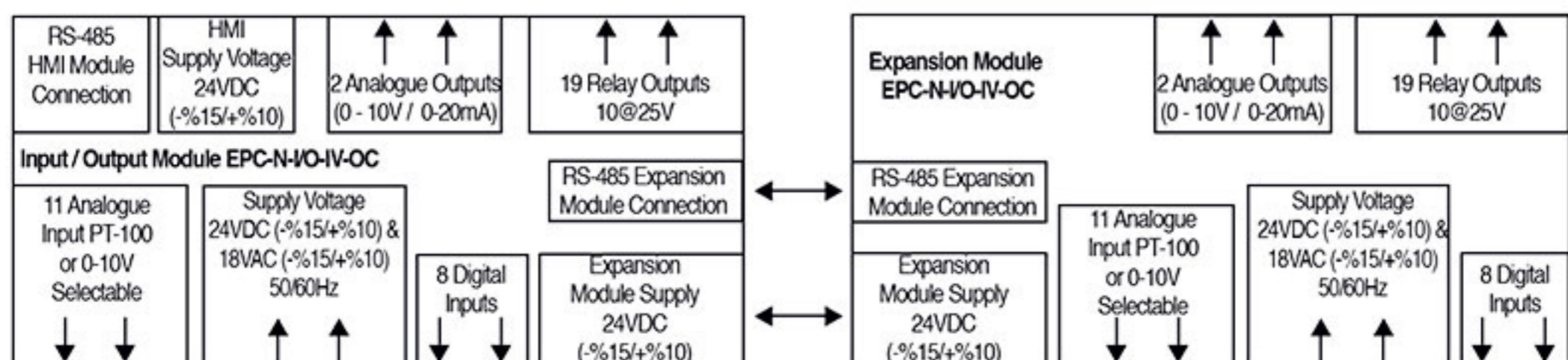
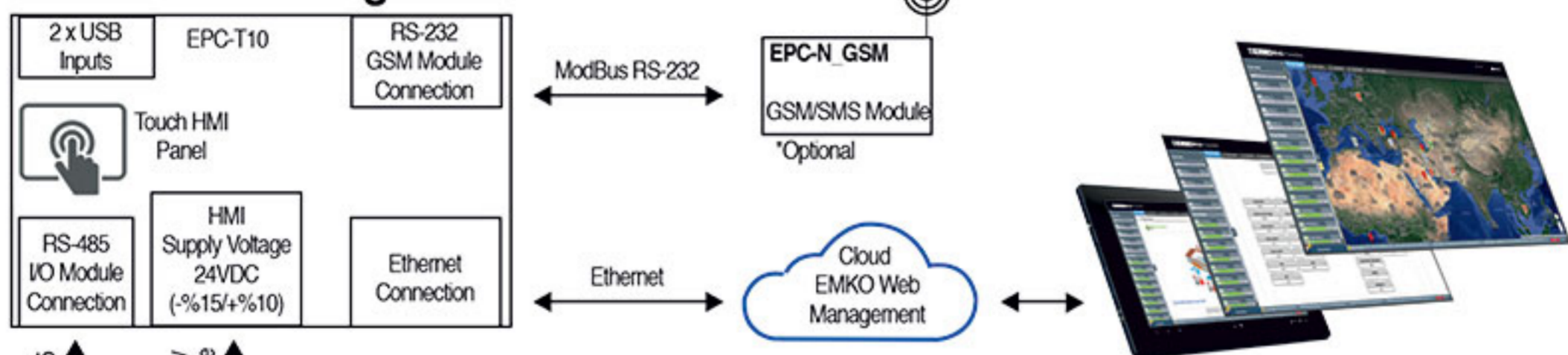
\* Add Colour Temperature to Code: ○WW (3000K), ○CW (4200K), ○DL (5000K)

### Accessories

| Code   | Description                                  |
|--------|--|
| AMB-PE | 1m Power Extension                           |
| AMB-ME | 2.8m Middle Extension                        |
| AMB-TC | "T" Connector                                |
| AMB-SK | Suspended Mounting Kit (Complete for 1 Tube) |
| AMB-CM | Ceiling Mounting Kit (Complete for 1 Tube)   |

### System Example for Poultry Controller

#### EPC-T10 Block Diagram



\*Max. 2 Input/Output modules can be connected to EPC-T10 HMI panel

# AUTOMATION PLC RANGE

|  | Micro PLC   | Mid Range PLC  |
|--|---|--|
| Programming Languages:<br>Ladder, IL & SFC.<br>Compatible with Mitsubishi programming software |   |  |
| <b>Series</b>  | <b>AX1S</b>   | <b>AX2N</b>  |
| Application Notes  | Compatible with Mitsubishi FX1S   | Compatible with Mitsubishi FX2N  |
| Power Specification  | 100-240VAC or 24VDC   | 100-240VAC or 24VDC  |
| Power Consumption  | 21W AC, 8W DC   | 100W AC, 40W DC  |
| Ext Power supply (min)   | 400mA @ 24VDC   | 460mA @ 24VDC  |
| Program Memory   | 2000 steps EEPROM   | 8000 steps RAM   |
| Instructions   | 27 x Basic, 2 x Step ladder diagram, 85 x Applied                           | 27 x Basic, 2 x Step ladder diagram, 132 x Applied   |
| Operating / Processing speed   | Basic Instructions, 0.55-0.7µS<br>Applied Instructions 0-0,037µs            | Basic Instructions, 0.08µS, Applied Instructions 0-0.015µs                                     |
| Clock  | Real time Internal  | Real time Internal   |
| Counter  | 16 bit increment counter: 32 Points   | 16 digits increment counter: 200 Points  |
| Input Specification  | 24VDC, 7mA / 5mA, No Voltage contact or NPN open Collector Transistor input | Same as AX1S- but also with AC input 100-120VAC  |
| Output Specification   | Relay: 2A@250VAC, <30VDC<br>Transistor: 0.5A, 5VDC-30VDC                    | Same as AX1S   |
| Aux Relay, Timer Point   | 512, 64   | 3072, 256  |
| Communication  | RS232C, RS485 x RS422, N:N Network, Parallel Link, Computer Link            | RS232C, RS485 x RS422, N:N Network, Parallel Link, Computer Link, CC-Link(LT), Melsec-I/O Link |

### Base Module Choices for AX1S Series

| Code                     | Input | Output | Dimensions      |
|--------------------------|-------|--------|-----------------|
| AX1S-14M <sup>*-**</sup> | 8     | 6      | 60 x 90 x 75mm  |
| AX1S-30M <sup>*-**</sup> | 16    | 14     | 100 x 90 x 75mm |

\* Add to Code: R for Relay Output or T for Transistor Output  
\*\*Add to Code: ESS for AC Power source or D for DC power source

### Expansion Boards for AX1S Series

Can accommodate one expansion board below the face plate, inside the enclosure



| Code          | Description                                    |
|---------------|--|
| AX1S-4AX-BD   | 4 x 24VDC Inputs                               |
| AX1N-2EYT-BD2 | 2 x Transistor outputs                         |
| AX1N-2AD-BD   | 2 x 0-10VDC 2.5mV res or 4-20mA 8uA res Inputs |
| AX1N-1DA-BD   | 1 x 0-10VDC 2.5mV res or 4-20mA 8uA res Output |
| USB-SC-09-3M  | 5M USB Programming cable for AX series         |
| AX1N-232-BD   | RS232 Half Duplex bi-directional, 15m max      |
| AX1N-422-BD   | RS422 to connect peripheral devices            |
| AX1N-485-BD   | RS485 Half Duplex, single direction, 50m max   |

### HMI Devices



| Code                | USPX-121-6       | USPT-080-4       | USPK-043-10      |
|---------------------|------------------|------------------|------------------|
| Touch panel         | 5 Wire resistive | 4 Wire resistive | 4 Wire resistive |
| Size (mm)           | 351.3x245.8      | 231.5x174.5      | 130x106          |
| Resolution          | 1024x768         | 800x600          | 480x272          |
| Working Memory      | 256MB            | 64MB             | 32MB             |
| Total Mem. Capacity | 1GB              | 8MB NOR          | Flash ROM        |
| Battery Backed Ram  | 1MB              | 128KB (1MB opt.) | 128KB            |
| Comms               | RS232/485/422    | RS232/485/422    | RS232/485/422    |
| CPU                 | 800MHz           | 200MHz           | ARM926/EJ        |
| USB                 | 1                | 1                | 1                |
| Ethernet            | Yes              | Yes              | No               |
| Voltage             | 24VDC            | 24VDC            | 24VDC            |
| IP Rating           | IP66             | IP66             | IP65             |

### Base Module Choices for AX2N Series

| Code                      | Input | Output | Dimensions      |
|---------------------------|-------|--------|-----------------|
| AX2N-32M <sup>*-**</sup>  | 16    | 16     | 150 x 90 x 87mm |
| AX2N-64M <sup>*-**</sup>  | 32    | 32     | 220 x 90 x 87mm |
| AX2N-128M <sup>*-**</sup> | 64    | 64     | 350 x 90 x 87mm |

\* Add to Code: R for Relay Output or T for Transistor Output  
\*\*Add to Code: ESS for AC Power source or D for DC power source

### Expansion Boards for AX2N Series

| Code        | Description   |
|-------------|---|
| AX2N-CNV-BC | AX2N Expansion module converter cable (connect AX0N 65EC) |
| AX2N-65EC0  | AX2N Expansion cable 0.65M                                |
| AX2N-485-BD | RS 485 Interface board for AX2N                           |
| AX2N-422-BD | RS 422 Interface board for AX2N                           |
| AX2N-232-BD | RS 232 Interface board for AX2N                           |

### AX2N-Series I/O Extension Unit

| Code       | Description                                 |
|------------|---|
| AX2N-8EX   | Ext. Unit, 8 Inputs                         |
| AX2N-8ER   | Ext. Unit, 4 Inputs, 4 Relay Outputs        |
| AX2N-8EYR  | Ext. Unit, 8 Relay Outputs                  |
| AX2N-8EYT  | Ext. Unit, 8 Transistor Outputs             |
| AX2N-16EX  | Ext. Unit, 16 Inputs                        |
| AX2N-16ER  | Ext. Unit, 8 Inputs, 8 Relay Outputs        |
| AX2N-16EYR | Ext. Unit, 16 Relay Outputs                 |
| AX2N-16EYT | Ext. Unit, 16 Transistor Outputs            |
| AX2N-32ER  | Ext. Unit, 16 Inputs, 16 Relay Outputs      |
| AX2N-32ET  | Ext. Unit, 16 Inputs, 16 Transistor Outputs |
| AX2N-48ER  | Ext. Unit, 24 Inputs, 24 Relay Outputs      |
| AX2N-48ET  | Ext. Unit, 24 Inputs, 24 Transistor Outputs |



### AX2N-Series Analogue Extension Unit

| Code        | Description                                  |
|-------------|--|
| AX2N-2AD    | Extension Unit, 2 x Inputs: 0-10V, 4-20mA    |
| AX2N-2DA    | Extension Unit, 2 x Outputs: 0-10V, 4-20mA   |
| AX2N-4AD    | Extension Unit, 4 x Inputs: 0-10V, 4-20mA    |
| AX2N-4DA    | Extension Unit, 4 x Outputs: 0-10V, 4-20mA   |
| AX2N-4AD-PT | Extension Unit, 2 Temperature (PT100)        |
| AX2N-4AD-TC | Extension Unit, 2 Temperature (THERMOCOUPLE) |



## GSM CONTROLLERS



### GSM-Pro GSM controller - DIN Rail Mounting

| Code         | GSM-PRO   |
|--------------|---|
| Size         | 88 x 95 x 77mm  |
| Inputs       | 8 x Configurable Inputs - Analogue: 0-10VDC / Digital: 24VDC (10-30VDC) |
| Outputs      | 4 Relay outputs 5A max @240VAC  |
| GSM Bands    | 850/900/1800/1900MHz  |
| Supply       | 10-30VDC, 275mA   |
| Status LED's | Run/Coms/Busy   |
| Coms         | USB and GSM   |

#### Inputs & Outputs

- SMS or email notifications of change of state of inputs or when measured values exceed predefined limits.
- Status of inputs/outputs can be queried via SMS.
- Outputs can be controlled remotely by missed call or SMS.
- Outputs can also be switched internally based on the state of an input.

#### Over the Air Capabilities

Initial configuration is done via USB. APN settings are specified during the initial configuration. Unit can then be accessed via the internet for remote configuration. Firmware can be updated over the air.

#### Logging Capability

Event logging and time based logging of analogue values.

#### Smart Phone Application

Free application downloadable for Android or IOS

#### Portal Software

| Code  | GSM-PRO-PORTAL |
|---|----------------|
| GSM-PRO portal software can be installed on any PC. It enables an overall view of the status of all GSM-PRO Modules in the field. All modules can be centrally monitored and controlled in real time. |                |



Remote Monitoring and Configuration



Enables remote monitoring and control of assets like refrigerated trucks or vending machines

### Remote Asset Management Unit/Controller

| Code        | ACDC/GSM-DC   | ACDC/GSM-DC-G | ACDC/GSM-AC | ACDC/GSM-AC-G |
|-------------|---|---------------|-------------|---------------|
| Voltage     | 0-35VDC   | 0-35VDC       | 210-240VAC  | 210-240VAC    |
| GPS         | No  | Yes           | No          | Yes           |
| Description | <ul style="list-style-type: none"> <li>• GSM / GPRS</li> <li>• RS232 / TTL</li> <li>• Acceleration Meter</li> <li>• 2 x Analogue Inputs (0-10V)</li> <li>• 2 x Digital Inputs</li> </ul> <ul style="list-style-type: none"> <li>• Configuration and monitoring through the internet dashboard</li> <li>• This device requires GPRS connection to function properly</li> <li>• IP Rating: <b>IP20</b></li> </ul> |               |             |               |

Note: Unit is supplied with 3 months access to online dashboard. For continued access see below.

| Code   | ACDC/GSM-WA-1Y |
|--|----------------|
| One Year subscription to access online dashboard |                |

## NEW INDUSTRIAL HIGH SPEED ROUTERS

### WLINK

- IOT Mobile Broadband Router and machine to machine (M2M) Industrial Cellular Routers.
- With Remote Management



| Code               | WLR100H4  | WLR100LF    | WLR200H4W | WLR200LFW   | WLR210HD  | WLR520H4D        | WLR520LFD        |
|--------------------|-----------|-------------|-----------|-------------|-----------|------------------|------------------|
| Network type       | 3G        | 3G/4G (LTE) | 3G        | 3G/4G (LTE) | 3G        | 3G               | 3G/4G (LTE)      |
| Wi-Fi              | No        | No          | Yes       | Yes         | Yes       | Yes              | Yes              |
| Supply Voltage     | 5-32VDC   | 5-32VDC     | 5-32VDC   | 5-32VDC     | 5-32VDC   | 5-36VDC          | 5-36VDC          |
| SIM                | Single    | Single      | Single    | Single      | Dual      | Dual             | Dual             |
| Ethernet           | 1 x LAN   | 1 x LAN     | 2 x LAN   | 2 x LAN     | 2 x LAN   | 4 x LAN, 1 x WAN | 4 x LAN, 1 x WAN |
| Digital In/Outputs | -         | -           | -         | -           | 2DI, 1DO  | -                | -                |
| Serial Port        | 1 x RS232 | 2 x RS232   | -         | -           | 1 x RS232 | 1 x RS232        | 1 x RS232        |

# GSM / TELEMETRY CONTROLLERS

Supply Voltage 10-24VDC.

A product range used for PLC-Type Telemetry applications. Allows users to be notified of remote events and enables the user to control remote equipment - all from a cell phone. No PLC required, complete standalone unit. Easy to configure and install.



## GSM Commander - Base Unit

| Standard Code          | GC0101-*      | GC0321-*      | GC0641-*      | GC1281-*      |
|------------------------|---------------|---------------|---------------|---------------|
| 3G Enabled Code        | GC0101-3G-*   | GC0321-3G-*   | GC0641-3G-*   | GC1281-3G-*   |
| Type                   | Micro         | LITE          | STANDARD      | PROFESSIONAL  |
| Onboard Inputs         | 1             | 2             | 2             | 2             |
| Onboard Outputs        | 1             | 2             | 2             | 2             |
| Max. Extendable I/O    | None          | 12/12         | 22/22         | 32/32         |
| GPRS Functionality     | Lite          | Lite          | Full          | Full          |
| No. of Statements      | 10            | 32            | 64            | 128           |
| Setup Memory           | 2kB           | 2kB           | 4kB           | 8kB           |
| Temp Probes Supported  | 0             | 2             | 2(10)         | 2(10)         |
| Analogue Inputs        | 0             | 1             | 1(9)          | 1(9)          |
| Battery/Power Monitors | Yes           | Yes           | Yes           | Yes           |
| USB Configuration      | Yes           | Yes           | Yes           | Yes           |
| DTMF Decoder           | No            | No            | Yes           | Yes           |
| SIM Card Slots         | 1             | 1             | 1             | 2 (Dual)      |
| Size (mm)              | 126 x 72 x 26 | 148 x 86 x 28 | 148 x 86 x 28 | 148 x 86 x 28 |

Specify if you would like to order a kit or only a base unit.

\* Add to code: **OEM** (base unit only) or **BOX** (kit including basic antenna, power supply, USB cable and software CD).

| Features:         | Description   |
|-------------------|---|
| Digital Inputs    | Opto-isolated. Can accept DC signals of any type. (Dry Contacts, Open Collector (PNP/NPN), DC Voltage (10-20V)).  |
| Digital Outputs   | SPDT 8A @ 10-48VDC or 4A @ 110-400VAC   |
| Supply Voltage    | 10-24VDC (12VDC) Can accommodate a 12V 1.2Ah backup battery. Code for battery <b>BATT1.2AH</b> . c/w built-in charger.  |
| Consumption       | 60mA Acquiscent   |
| DTMF Decoder      | If present the unit is able to detect and respond to key presses during a voice call.   |
| No. of Statements | A measure of the complexity that can be programmed into the unit. Each statement is in the form IF <ABC Happens> THEN <do something>. e.g. IF Input 1 goes active THEN send "Generator tripped" to 083 123 1234 |
| Programming       | Unit can be programmed using the software supplied via USB or via SMS   |

## Expansion Units



| Code    | Description  |
|---------|--|
| GX0505  | 5 x Input and 5 x relay Output Expansion Module Dimensions: 147 x 103 x 28mm                             |
| GX1000  | Expansion unit with interface cable: 10 x Opto-isolated Inputs   |
| GXS081A | 8 x Input analogue expansion 4-20mA 10-30V<br>(Serial Interface only for <b>GC0641</b> & <b>GC1281</b> ) |
| GXS082T | 8 (4 groups of 2 each) Temperature Probe Expansion (only <b>GC0641</b> & <b>GC1281</b> )                 |



| Code   | Description   |
|--------|---|
| CTM001 | Cable theft monitor for 3 phase & Single phase cable.       |
| IVS002 | Intelligent Vibration Sensor - Adjustable (normally closed) |
| DCR-03 | DC Reflector for use with <b>CTM001</b>                     |



| Code    | Description   |
|---------|---|
| GT002   | Temperature interface to connect 2x temp. probes to units (Probes not included) |
| GT001-1 | 2 to 100°C Temperature Probe with 2m Cable. Type TR2 (Requires <b>GT002</b> )   |
| GT001-2 | 2 to 100°C Temperature Probe with 4m Cable. Type TR2 (Requires <b>GT002</b> )   |
| GT011-1 | -15 to 35°C Temperature Probe with 2m Cable (Requires <b>GT002</b> )            |
| GT011-2 | -15 to 35°C Temperature Probe with 4m Cable (Requires <b>GT002</b> )            |
| GT011-3 | -15 to 35°C Temperature Probe with 8m Cable (Requires <b>GT002</b> )            |
| GT003A  | Primary Sensor for <b>GXS082T</b> -50 to 120°C 1m Cable                         |
| GT003B  | Secondary Sensor for <b>GXS082T</b> -50 to 120°C 1m Cable                       |



| Code   | Description                               |
|--------|---|
| GS005  | 5m Low Loss Extensions Lead for Antenna   |
| GS020  | Expansion Ribbon Cable 20cm               |
| GS030  | Serial (RS232) Communication Cable        |
| GS040  | Serial (RS232) to USB Converter / Adaptor |
| CON-01 | Cable & Connector set GSM Commander       |



| Code      | Description  |
|-----------|--|
| DRA18-12  | 1.25A 12V Regulated DIN Mount Power Supply                                 |
| PSU1417   | 1700mA 14V Metal Switching Power Supply                                    |
| BATT1.2AH | 12V 1.2AH Sealed Lead Acid Battery   |
| BP001     | Battery Protector – Protects batteries against under-voltage, over-current |

INSTRUMENTS & TELEMETRY



## GSM CONTROLLER ACCESSORIES



### Antennas

|       |   |
|-------|---|
| GA002 | 3dBi Magnetic base Antenna with 1m Cable                      |
| GA004 | 5dBi Outdoor Antenna - Screw Mount. 3.5m Cable                |
| GA007 | 2dBi Knobby Antenna - Screw Mount                             |
| GA008 | 12dBi Outdoor Yagi Antenna                                    |
| GA009 | 5dBi Magbase Antenna with 1m cable                            |
| GA012 | 12dBi Magbase Antenna with 3m cable                           |
| GA200 | Stealth Outdoor 2dBi Pentaband Antenna (ultra-rugged) Stealth |
| GA210 | Outdoor 2dBi Pentaband Antenna with vibration sensor          |

NEW

## GSM / TELEMETRY KITS

The Makulu is a complete panel, ready to go. Designed with lazer-cut and electroplated brackets, it is set up with all the goodies you normally need in an installation. NO HOLES to be drilled by you! EVER!



### Standard Kits include:

- 7 inputs / 7 outputs
- Optional expansion space for 1 temperature or 1 analogue or 1 cable theft monitor expansion
- Space for 1 I/O expansion
- 7 AH Battery with protector (Solar Makulu includes 1 extra 12V 7AH Battery)
- Built in temperature module (GT002)
- **Dimensions 300x400x250mm**

### Makulu - Direct 230V Power

| Code      | Description  |
|-----------|--|
| RTM-M0321 | GC0321 - LITE Version Ready to Mount Solution.         |
| RTM-M0641 | GC0641 - STANDARD Version Ready to Mount Solution.     |
| RTM-M1281 | GC1281 - PROFESSIONAL Version Ready to Mount Solution. |

### Makulu - Solar Powered (Use Max 1x20 Watt Panel)

|           |  |
|-----------|--|
| SOL-M0321 | GC0321 - LITE Version Solar Ready to Mount Solution.         |
| SOL-M0641 | GC0641 - STANDARD Version Solar Ready to Mount Solution.     |
| SOL-M1281 | GC1281 - PROFESSIONAL Version Solar Ready to Mount Solution. |

### Specifications

- 6 x 8A SPDT Relay outputs (expandable up to 32\*)
- 1 x 30Amp SPDT Relay outputs
- 7 x Optically Isolated inputs (expandable up to 32\*)
- 2 x Temperature Inputs (expandable up to 10\*\*)
- 1 x Analog input (expandable to 9\*\*)
- 2 x Pulse Stretchers (on input 6 and 7)
- Dedicated Battery Charger\*\*\*
- 25W Rugged Meanwell AC-DC Switching PSU\*\*\*
- AC/DC Filter with Surge Protection\*\*\*
- External 2 dBi Knobby Antenna
- Door Switch and Temperature Expansion
- User dedicated DIN-Rail Space

\*Only space for 1 x I/O expansion unit inside Makulu. Additional expansions to be located separately. Dependant on model.  
 \*\* EITHER the Analog OR the Temperature inputs can be expanded, not both at the same time.  
 \*\*\* Not included in Solar Makulu.

**Note: Solar Panels & Regulator not included, use SLP020-12 & LS0512EU**

The Pico is a small, complete panel, ready to go. Designed with lazer-cut and electroplated brackets, it is set up with the goodies you need for a minimalistic installation. NO HOLES to be drilled by you! Ever!



### Standard Kits include:

- 2 inputs / 2 outputs
- 1.2AH Battery with protector (replaced with 12V 7AH Battery for Solar Makulu)
- **Dimensions 200x250x50mm**

### Pico - Direct 230V Power

| Code      | Description  |
|-----------|--|
| RTM-P0321 | GC0321 - LITE Version Ready to Mount Solution.         |
| RTM-P0641 | GC0641 - STANDARD Version Ready to Mount Solution.     |
| RTM-P1281 | GC1281 - PROFESSIONAL Version Ready to Mount Solution. |

### Pico - Solar Powered (Use Max 1x10 Watt Panel)

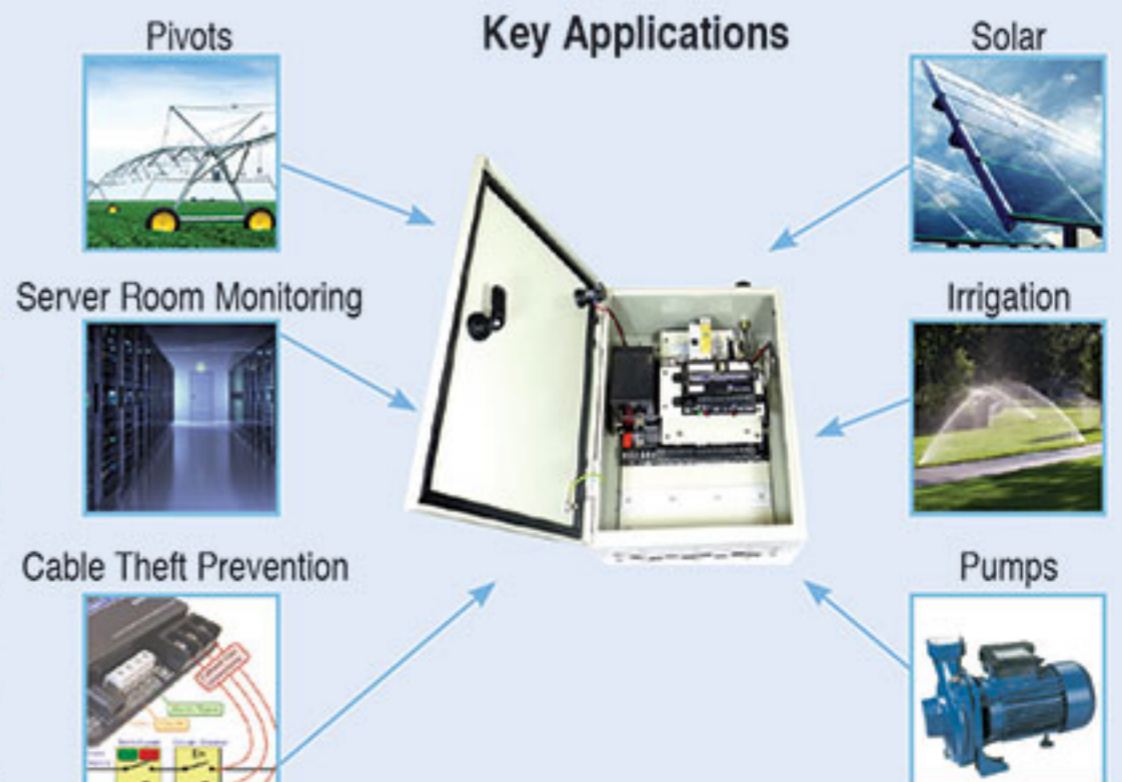
|           |  |
|-----------|--|
| SOL-P0321 | GC0321 - LITE Version Solar Ready to Mount Solution.         |
| SOL-P0641 | GC0641 - STANDARD Version Solar Ready to Mount Solution.     |
| SOL-P1281 | GC1281 - PROFESSIONAL Version Solar Ready to Mount Solution. |

### Specifications

- 2 x 8A SPDT Relay outputs (expandable up to 32\*)
- 2 x Optically Isolated inputs (expandable up to 32\*)
- 1 x Analog input (expandable to 9\*)
- 25W Rugged Meanwell AC-DC Switching PSU\*\*
- Optional Built-in 400V-220V Transformer\*\*
- External 2 dBi Knobby Antenna
- Door Switch

\*No space inside the Pico for expanded I/O. Any expansion units must be located outside of the box in a separate enclosure. Dependant on model.  
 \*\* Not included in Solar Pico

**Note: Solar Panels & Regulator not included, use SLP010-12 & LS0512EU**



## STAINLESS STEEL FLOAT SWITCHES IP65



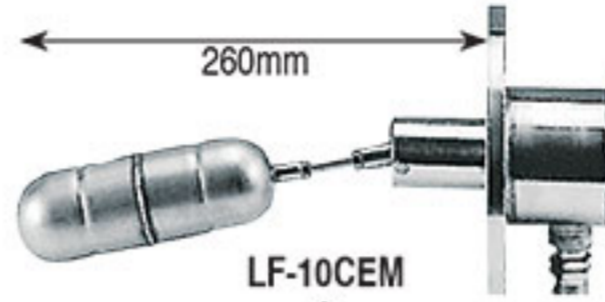
Side Mount - RF-3002D



Top or bottom mount - RF-3001



LF-10CEQ



LF-10CEM & FF-70SSS



FD-MH16A



FD-4022 (brass)

| Code                      | Top/Bottom               | Side Mount | LF-10CEM                                      | LF-10CEQ         | FF-70SSS               | FD-MH16A                 | FD-4022             |
|---------------------------|--------------------------|------------|---|------------------|------------------------|--------------------------|---------------------|
|                           | RF-3001                  | RF-3002D   |   |                  |                        |                          |                     |
| Mounting                  | 1/8" PF                  | 1/8" PF    | Flange  | 1 1/2" PT        | Explosion Proof Flange | 1/2" PT Adaptor          | 1"                  |
| Thread Size               | 1/8" PF                  | 1/8" PF    | Flange  | 1 1/2" PT        | Explosion Proof Flange | 1/2" PT Adaptor          | 1"                  |
| Length of Cable           | 300mm                    |            |   | -                |                        | 300mm                    | -                   |
| Switching Voltage Max.    | 240VAC/200VDC            |            |   | 250VAC/200VDC    |                        | 250VAC                   | 250VAC              |
| Switching Current Max.(A) | 0,5A                     |            |   | 2A               |                        | 0.5A                     | 5A                  |
| Carry Current Max.(A)     | 1A                       |            |   | 5A               |                        | 1A                       | 16A                 |
| Switch Type               | Reed Switch N.O. or N.C. |            |   | Reed Switch 1C/O |                        | Reed Switch N.O.         | Micro Switch C/O.   |
| Max. Pressure             | 8.5 Bar                  |            |   | 12.8 Bar         |                        | 4.2 Bar                  | 10 Bar              |
| Operating Temperature     | -20°C to 120°C           |            |   | -25 to 100°C     |                        | -10 to 120°C             | -10 to 120°C        |
| Material                  | 304 Stainless Steel      |            | Housing: Aluminium IP65. Wetted parts 304 S/S |                  |                        | 304 Stainless Steel      | Brass               |
| Suitable Specific Gravity | 0.75 S.G.                |            |   | 0.65 S.G.        |                        | 0,8 S.G.                 | 0,8 S.G.            |
| Resistance to:            | Water & Liquids          |            | Water, Acids & Oils                           |                  |                        | Seawater, Corrosive Liq. | Non-Aggressive Liq. |

## LEVEL PROBES & SENSORS

| More Float Switches  | Probe Assemblies  | Probe Components   | Conductive Probe Kits IP65   |  |
|--|---|--|--|--|
| <p>RF-OV61<br/>1 x Reed</p> <p>RF-PV2<br/>2 x Reed</p>   | <p>APS - 3C    APS - 5C</p>   | <p>PS-5S    APS-3    AF-12</p> <p>PF-101   PF-102   PF-103   PF-104</p> <p>PF-101P</p>   | <p>RHE</p> <p>CP1/C    CP2/C    CP3/C</p> <p>CP1    CP2    CP3</p> <p>• Material: Nylon</p> <p>• Thread: 1.5" BSP</p> <p>• Max Temp: 70°C</p> <p>DD3    EP1/C</p>  |  |
| <p><b>RF-OV61</b></p> <ul style="list-style-type: none"> <li>• Thread Size: 1/8" PF</li> <li>• Output Reed Switch @ 1A 250VAC</li> <li>• Switching 1x Reed Switch N.O.</li> <li>• Max Pressure: 4kg/cm<sup>2</sup></li> <li>• Material: Polypropylene (PP)</li> <li>• Specific Gravity: 0.7 S.G.</li> <li>• -20 to 80°C</li> </ul> | <p><b>RF-PV2</b></p> <ul style="list-style-type: none"> <li>• Switching 2x Reed Switches Top N.O., Bot. N.C.</li> </ul> | <p><b>APS-3C 3-way</b>    <b>APS-5C 5-way</b></p> <ul style="list-style-type: none"> <li>• 3 or 5-way holder</li> <li>• Steel locking ring</li> <li>• 3 or 5 x 1m 204 S/S probes</li> <li>• Suitable for use with all liquid level relays e.g. TE101 – APS-3C, DLR – APS-5C</li> <li>• Max temperature: 100°C</li> <li>• Cut Probes to suit application</li> </ul> | <p><b>Code</b>    <b>Description</b></p> <p><b>APS-3</b>    3 Probe holder only (6 mm thread)</p> <p><b>PS-5S</b>    5 Probe holder only</p> <p><b>AF-12</b>    Steel locking ring for holders - 115mmØ</p> <p><b>PF-101</b>    3 Probe Spacers (porcelain)</p> <p><b>PF-101P</b>    3 Probe Spacers (plastic)</p> <p><b>PF-105</b>    5 Probe Spacers (porcelain)</p> <p><b>PF-102</b>    Connecting nut (304 stainless steel)</p> <p><b>PF-104</b>    Tank probe</p> <p><b>PF-103</b>    1m 304 stainless steel rod 6mmØ</p> | <p><b>Accessories</b></p> <p><b>Code</b>    <b>Description</b></p> <p><b>CP1/CX</b>    1-Way Head only</p> <p><b>CP2/CX</b>    2-Way Head only</p> <p><b>CP3/CX</b>    3-Way Head only</p> <p><b>DD2</b>    2-Way Probe Spacer</p> <p><b>DD3</b>    3-Way Probe Spacer</p> <p><b>EP1/C</b>    Spare 1m s/s Rod coated</p> <p><b>EP1/U</b>    Spare uncoated s/s Rod 1m</p> <p><b>EP1/EXT</b>    M4 Connecting Nut Brass</p> <p>Coating of the rods improves resistance, prevents switching caused by frothing or condensation.</p> |

## PROBE & ROTARY LEVEL SWITCHES

| Optical Level Sensor <b>IP68</b>   |  | Capacitive Level Sensors for Solids  |  | Vibration Probe Switch  | Rotary Paddle Switch   |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
|--|--|--|--|---|--|--------------|-------|-------------|----------------------|----------------------|------------|---------|-----------|------------|--------------|-------------------|----------|----------------|-------------------|----|----------------|------------|------------|------------------|-----------------------|------------|------------------|-----------------------|--|
| <p style="font-size: small;">Optical sensor with infrared light for use in liquids such as oil, water, sewerage, beer, wine etc. (3/8" PT)</p> |  | <p style="font-size: small;">Capacitive level sensor for solid, fluid or granulated substances.<br/>32mm Ø</p> |  |   | <p style="font-size: small;">For use in:<br/>Milk Powder, Cement, Fertilizer, Granulated products, etc.</p> <p style="font-size: small;"><b>RP10C</b>      <b>RP80C</b></p>  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| <b>Code</b>  | SD10G-ARN1 (NPN NO)<br>SD10G-ARP1 (PNP NO) | VP02-230TB<br><i>Un-modulated</i>  | VR1A<br><i>8mm Sensing</i>                         | VR1B<br><i>15mm Sensing</i>                                   | <b>SC1110</b>  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Length of cable  | 2 meters                                   |  | 5 meters (PVC)                                     |   | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #0070C0; color: white;"> <th style="text-align: left;">Code</th> <th style="text-align: center;">RP10C</th> <th style="text-align: center;">RP80C</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Mounting Thread Size</td> <td style="text-align: center;">1"PF</td> <td style="text-align: center;">¾"PF</td> </tr> <tr> <td style="text-align: left;">Torque</td> <td style="text-align: center;">0.5 -1kg</td> <td style="text-align: center;">Adjustable</td> </tr> <tr> <td style="text-align: left;">Gravity</td> <td style="text-align: center;">&gt;0.50 S.G</td> <td style="text-align: center;">&lt;0.3 S.G</td> </tr> <tr> <td style="text-align: left;">Contact Type</td> <td colspan="2" style="text-align: center;">Micro Switch 1C/O</td> </tr> <tr> <td style="text-align: left;">Contact Rating</td> <td style="text-align: center;">5A</td> <td style="text-align: center;">5A</td> </tr> <tr> <td style="text-align: left;">Operating Temp</td> <td style="text-align: center;">-10 - 60°C</td> <td style="text-align: center;">-40 - 85°C</td> </tr> <tr> <td style="text-align: left;">Housing Material</td> <td colspan="2" style="text-align: center;">Aluminium <b>IP65</b></td> </tr> </tbody> </table> | Code         | RP10C | RP80C       | Mounting Thread Size | 1"PF                 | ¾"PF       | Torque  | 0.5 -1kg  | Adjustable | Gravity      | >0.50 S.G         | <0.3 S.G | Contact Type   | Micro Switch 1C/O |    | Contact Rating | 5A         | 5A         | Operating Temp   | -10 - 60°C            | -40 - 85°C | Housing Material | Aluminium <b>IP65</b> |  |
| Code   | RP10C                                      | RP80C  |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Mounting Thread Size   | 1"PF                                       | ¾"PF   |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Torque   | 0.5 -1kg                                   | Adjustable   |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Gravity  | >0.50 S.G                                  | <0.3 S.G   |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Contact Type   | Micro Switch 1C/O                          |  |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Contact Rating   | 5A   | 5A   |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Operating Temp   | -10 - 60°C                                 | -40 - 85°C   |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Housing Material   | Aluminium <b>IP65</b>                      |  |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Switching Voltage  | 10-28VDC (NPN, N.O.)                       | 230VAC (N.O.)  | 20-30VDC (1kΩ)                                     |   | <ul style="list-style-type: none"> <li>• Mounting Thread 1"</li> <li>• Probe Material S/S 304</li> <li>• Housing Alu. <b>IP65</b></li> <li>• Output: 5A @ 250V 1C/O</li> <li>• Supply: 0-110-230VAC</li> <li>• Vibrating Frequency: 360-370Hz</li> <li>• Operating Temp.: -10 to 80°C</li> <li>• Material Density: 0.32g/cm<sup>2</sup></li> </ul>   |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Operating Temperature  | -20°C to 80°C                              |  | 0°C to 70°C  |   | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #0070C0; color: white;"> <th style="text-align: left;">Spare Paddle</th> <th style="text-align: center;">Code</th> <th style="text-align: center;">RP10-PADDLE</th> <th style="text-align: center;">RP80-PADDLE</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Mounting Thread Size</td> <td style="text-align: center;">1"PF</td> <td style="text-align: center;">¾"PF</td> <td style="text-align: center;">¾"PF</td> </tr> </tbody> </table>   | Spare Paddle | Code  | RP10-PADDLE | RP80-PADDLE          | Mounting Thread Size | 1"PF       | ¾"PF    | ¾"PF      |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Spare Paddle   | Code                                       | RP10-PADDLE  | RP80-PADDLE  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Mounting Thread Size   | 1"PF                                       | ¾"PF   | ¾"PF   |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Material   | Polysulphone                               |  | Polyester  |   | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #0070C0; color: white;"> <th style="text-align: left;">Code</th> <th style="text-align: center;">RP10C</th> <th style="text-align: center;">RP80C</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Torque</td> <td style="text-align: center;">0.5 -1kg</td> <td style="text-align: center;">Adjustable</td> </tr> <tr> <td style="text-align: left;">Gravity</td> <td style="text-align: center;">&gt;0.50 S.G</td> <td style="text-align: center;">&lt;0.3 S.G</td> </tr> <tr> <td style="text-align: left;">Contact Type</td> <td colspan="2" style="text-align: center;">Micro Switch 1C/O</td> </tr> <tr> <td style="text-align: left;">Contact Rating</td> <td style="text-align: center;">5A</td> <td style="text-align: center;">5A</td> </tr> <tr> <td style="text-align: left;">Operating Temp</td> <td style="text-align: center;">-10 - 60°C</td> <td style="text-align: center;">-40 - 85°C</td> </tr> <tr> <td style="text-align: left;">Housing Material</td> <td colspan="2" style="text-align: center;">Aluminium <b>IP65</b></td> </tr> </tbody> </table>  | Code         | RP10C | RP80C       | Torque               | 0.5 -1kg             | Adjustable | Gravity | >0.50 S.G | <0.3 S.G   | Contact Type | Micro Switch 1C/O |          | Contact Rating | 5A                | 5A | Operating Temp | -10 - 60°C | -40 - 85°C | Housing Material | Aluminium <b>IP65</b> |            |                  |                       |  |
| Code   | RP10C                                      | RP80C  |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Torque   | 0.5 -1kg                                   | Adjustable   |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Gravity  | >0.50 S.G                                  | <0.3 S.G   |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Contact Type   | Micro Switch 1C/O                          |  |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Contact Rating   | 5A   | 5A   |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Operating Temp   | -10 - 60°C                                 | -40 - 85°C   |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Housing Material   | Aluminium <b>IP65</b>                      |  |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Switching Current Max (A)  | DC: 100mA                                  | AC: 100mA  | 10A @ 250VAC                                       |   | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #0070C0; color: white;"> <th style="text-align: left;">Code</th> <th style="text-align: center;">RP10C</th> <th style="text-align: center;">RP80C</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Torque</td> <td style="text-align: center;">0.5 -1kg</td> <td style="text-align: center;">Adjustable</td> </tr> <tr> <td style="text-align: left;">Gravity</td> <td style="text-align: center;">&gt;0.50 S.G</td> <td style="text-align: center;">&lt;0.3 S.G</td> </tr> <tr> <td style="text-align: left;">Contact Type</td> <td colspan="2" style="text-align: center;">Micro Switch 1C/O</td> </tr> <tr> <td style="text-align: left;">Contact Rating</td> <td style="text-align: center;">5A</td> <td style="text-align: center;">5A</td> </tr> <tr> <td style="text-align: left;">Operating Temp</td> <td style="text-align: center;">-10 - 60°C</td> <td style="text-align: center;">-40 - 85°C</td> </tr> <tr> <td style="text-align: left;">Housing Material</td> <td colspan="2" style="text-align: center;">Aluminium <b>IP65</b></td> </tr> </tbody> </table>  | Code         | RP10C | RP80C       | Torque               | 0.5 -1kg             | Adjustable | Gravity | >0.50 S.G | <0.3 S.G   | Contact Type | Micro Switch 1C/O |          | Contact Rating | 5A                | 5A | Operating Temp | -10 - 60°C | -40 - 85°C | Housing Material | Aluminium <b>IP65</b> |            |                  |                       |  |
| Code   | RP10C                                      | RP80C  |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Torque   | 0.5 -1kg                                   | Adjustable   |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Gravity  | >0.50 S.G                                  | <0.3 S.G   |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Contact Type   | Micro Switch 1C/O                          |  |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Contact Rating   | 5A   | 5A   |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Operating Temp   | -10 - 60°C                                 | -40 - 85°C   |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Housing Material   | Aluminium <b>IP65</b>                      |  |  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Max ambient light  | 5000 lux                                   | 100 lux  | For use with amplifier Relay Type <b>CLR2</b> pg 9 |   | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #0070C0; color: white;"> <th style="text-align: left;">Spare Paddle</th> <th style="text-align: center;">Code</th> <th style="text-align: center;">RP10-PADDLE</th> <th style="text-align: center;">RP80-PADDLE</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Mounting Thread Size</td> <td style="text-align: center;">1"PF</td> <td style="text-align: center;">¾"PF</td> <td style="text-align: center;">¾"PF</td> </tr> </tbody> </table>   | Spare Paddle | Code  | RP10-PADDLE | RP80-PADDLE          | Mounting Thread Size | 1"PF       | ¾"PF    | ¾"PF      |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Spare Paddle   | Code                                       | RP10-PADDLE  | RP80-PADDLE  |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| Mounting Thread Size   | 1"PF                                       | ¾"PF   | ¾"PF   |   |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |
| DC Units for use with Relay Type <b>CLR1</b> pg 9  |  | <p style="font-size: x-small;">For 1 Level Control only<br/>Link 5 &amp; 8<br/>Probe 5, 6, 7</p>               |  | <p style="font-size: x-small;">For Filling Link 6 &amp; 9</p> |  |              |       |             |                      |                      |            |         |           |            |              |                   |          |                |                   |    |                |            |            |                  |                       |            |                  |                       |  |

## TUNING FORK LEVEL SWITCH **IP65**

**Vibration Fork Level Switch**

200mm

100mm

100mm

| Code  | SC1420-R   | SC1400-R | SC2406-D |
|---|--|----------|----------|
| <ul style="list-style-type: none"> <li>• Mounting Thread 1" PT</li> <li>• Probe Material 316</li> <li>• Housing Alu. <b>IP65</b></li> <li>• Output: SPDT 5A 250VAC/28VDC</li> <li>• Supply Voltage: 20-250VAC, 50/60Hz VAC/DC</li> <li>• Vibrating Frequency 350~370Hz</li> <li>• Operating Temp in Bin: -40~130C</li> <li>• Material Density: &gt;0.07 g/cm<sup>3</sup></li> <li>• Fail Safe Protection</li> </ul> | <ul style="list-style-type: none"> <li>• Output: 2Wire 3mA</li> <li>• Supply Voltage: 20-250VAC, 50Hz</li> <li>• 2 Wire electronic switch</li> <li>• Fork Length: 100m</li> <li>• Operating Temperature: -40~60°C</li> </ul> |          |          |

## CAPACITIVE LEVEL SWITCH **IP65**

Wire Probe

L

L





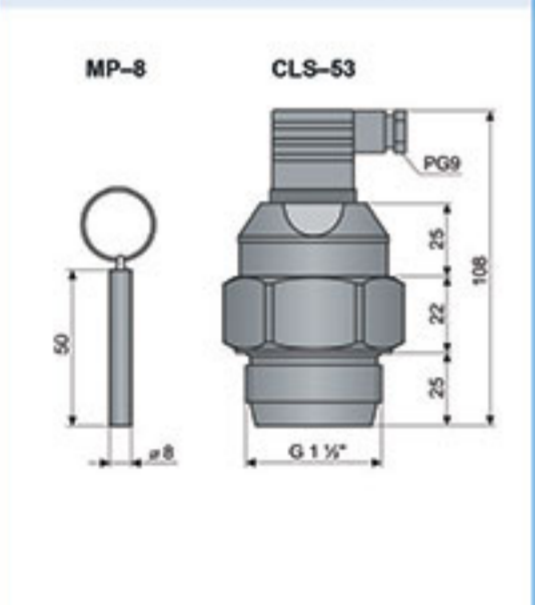
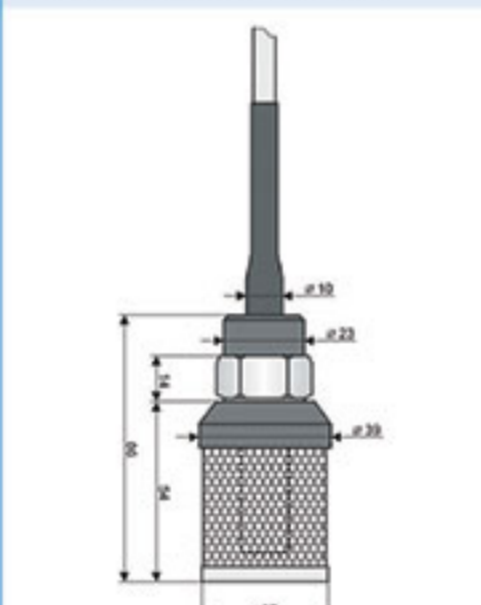
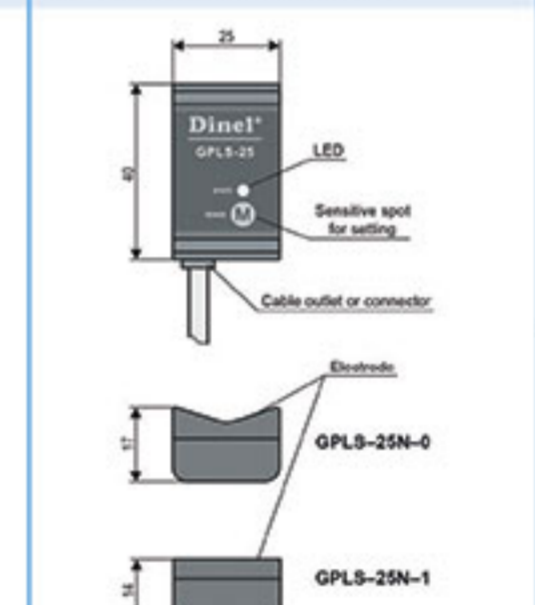
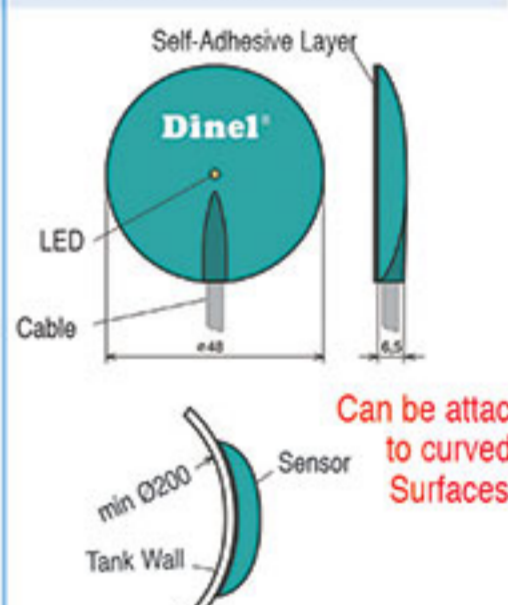
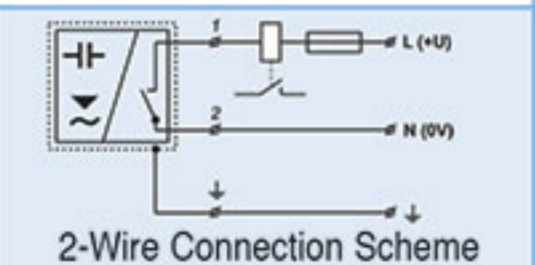
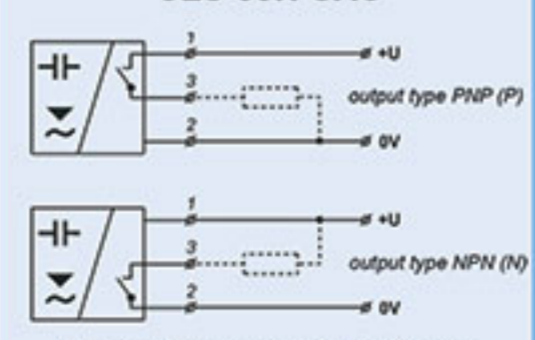
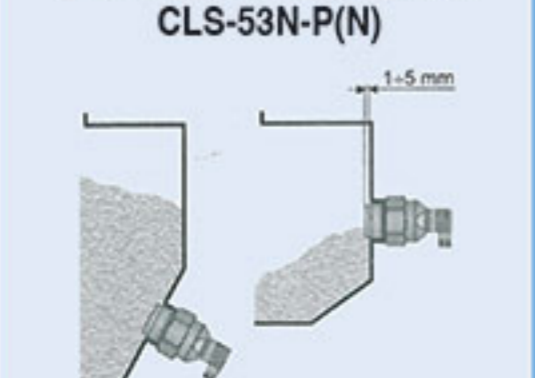
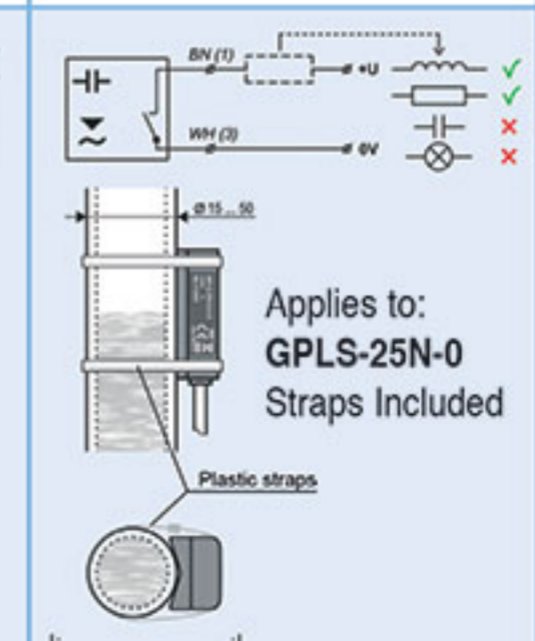


L

**Application**

- High temperature environment
- Corrosive environment
- Tank application

| Code  | SA150A<br>L = 1m  | SA111A-DQ-250<br>L = 250mm | SA110A-DQ-150<br>L = 150mm  |
|---|---|----------------------------|---|
| <ul style="list-style-type: none"> <li>• Mounting Thread 1"PT</li> <li>• Probe Material Stainless Steel 304</li> <li>• Housing Alu. <b>IP65</b></li> <li>• Output: 5A @ 250V, Relay</li> <li>• Supply Voltage 110/230VAC 50/60Hz</li> </ul> | <ul style="list-style-type: none"> <li>• Sensitivity Range 10pf, STD</li> <li>• Operating Temp in Bin: -20°C - 60°C</li> <li>• Operating Pressure: 20kg/cm<sup>3</sup></li> </ul> |                            | <ul style="list-style-type: none"> <li>• Sensitivity Range 10pf, STD</li> <li>• Operating Temp in Bin: -20°C - 60°C</li> <li>• Operating Pressure: 20kg/cm<sup>3</sup></li> </ul> |

**LIMIT LEVEL SENSORS**

|  | Capacitive Level Switch  | Submersible Level Switch   | Thru Wall Level Switch   | Flexible Level Switch   |
|--|--|--|--|---|
|  | For detection of bulk solid, fragmental and extruded materials<br>  | For level detection of water in wells, boreholes, reservoirs and tanks<br>   | For liquids limit level sensing on non-conductive (glass or plastic) gauge pipes, tubes and tank walls<br>  | For limit level sensing of liquids in non-conductive plastic and glass vessels<br> |
| <b>Code</b>                              | <b>CLS-53N-*</b>   | <b>CLS-23S-11-D-S*</b>   | <b>GPLS-25N-<sup>*</sup>-A-S</b>   | <b>FLD-48N</b>  |
| <b>Mounting</b>                          | G1½" Threaded  | Suspended by Cable   | <sup>*0</sup> - Tube Mounting Ø15-50mm<br><sup>*1</sup> - Flat Surface   | Surface-Self Adhesive   |
| <b>Supply Voltage</b>                    | 20-230VAC/DC ( <b>SAC</b> Version)<br>7-36VDC ( <b>P/N</b> Version)  | 6-30VDC  | 6-30VDC  | 6-30VDC   |
| <b>Output Type</b>                       | * Add Output Type to code:<br><b>SAC:</b> NO (2-Wire);<br><b>P:</b> PNP; <b>N:</b> NPN   | * Add Output Type to code:<br><b>O:</b> NO (Low Level)<br><b>C:</b> NC (High Level)  | NO or NC Programmable  | NO or NC Programmable   |
| <b>Switching Current</b>                 | 0.3A ( <b>SAC</b> )<br>0.2A ( <b>P/N</b> )   | 40mA Max<br>(To switch miniature relay only)   | 40mA Max<br>(To switch miniature relay only)   | 40mA Max<br>(To switch miniature relay only)  |
| <b>Settings</b>                          | Simple sensitivity setting by means of magnetic pen (incl)   | -  | Simple sensitivity setting by means of magnetic pen (incl)   | Configuration and adjustment by third programming wire (incl)   |
| <b>Ambient Temperature</b>               | -20° to 60°C   | -20° to 70°C   | -20° to 80°C   | -10° to 60°C  |
| <b>Protection</b>                        | <b>IP65</b>  | <b>IP68</b>  | <b>IP67</b>  | <b>IP67</b>   |
| <b>Housing Material</b>                  | Polypropylene  | Plastic Polypropylene  | Plastic Polypropylene  | Polyurethane  |
| <b>Cable</b>                             | Un-wired connector socket  | PVC 2 x 0.75mm x 10m   | PVC 2 x 0.34mm x 3m  | PUR 3 x 0.14mm x 3m   |
| <b>Dimensions</b>                        |   |    |   |    |
| <b>Wiring Diagrams &amp; Application</b> | <p><b>2-Wire Connection Scheme CLS-53N-SAC</b></p>  <p><b>3-Wire Connection Scheme CLS-53N-P(N)</b></p>   | <p><b>Low Level</b></p> <p>CLS-23S-11-D-SO Closed</p> <p>CLS-23S-11-D-SO Open</p> <p><b>High Level</b></p> <p>CLS-23S-11-D-SC Closed</p> <p>CLS-23S-11-D-SC Open</p> <p>Above configurations suggested for fail safe operation</p> | <p>Applies to: GPLS-25N-0 Straps Included</p>  <p>Applies to: GPLS-25N-1 Self-Adhesive</p>  <p>Max Wall Thickness:<br/>Conductive Liquids: 8mm   Non-Conductive Liquids: 3mm</p> |  <p>Can be attached to curved Surfaces</p>                                       |

LEVEL CONTROL & PUMPS

## ANALOGUE ULTRASONIC LEVEL DETECTION

For continuous no-contact level measurement of various liquid and bulk solid materials in closed or open vessels, sumps, reservoirs etc.



| Output Type | Sensing Distance |           |           |           |
|-------------|------------------|-----------|-----------|-----------|
|             | 0,2 - 2m         | 0,25 - 6m | 0,4 - 10m | 0,5 - 20m |

Factory Set Non-Adjustable Output Type **IP68** c/w 5m Cable

|                      |              |              |              |              |
|----------------------|--------------|--------------|--------------|--------------|
| 4 - 20mA (2-Wire)    | ULM-53L-02-I | ULM-53L-06-I | ULM-53L-10-I | ULM-53L-20-I |
| 0 - 10V (3-Wire)     | ULM-53L-02-U | ULM-53L-06-U | ULM-53L-10-U | ULM-53L-20-U |
| Modbus RS-485 Output | ULM-53L-02-M | ULM-53L-06-M | ULM-53L-10-M | ULM-53L-20-M |

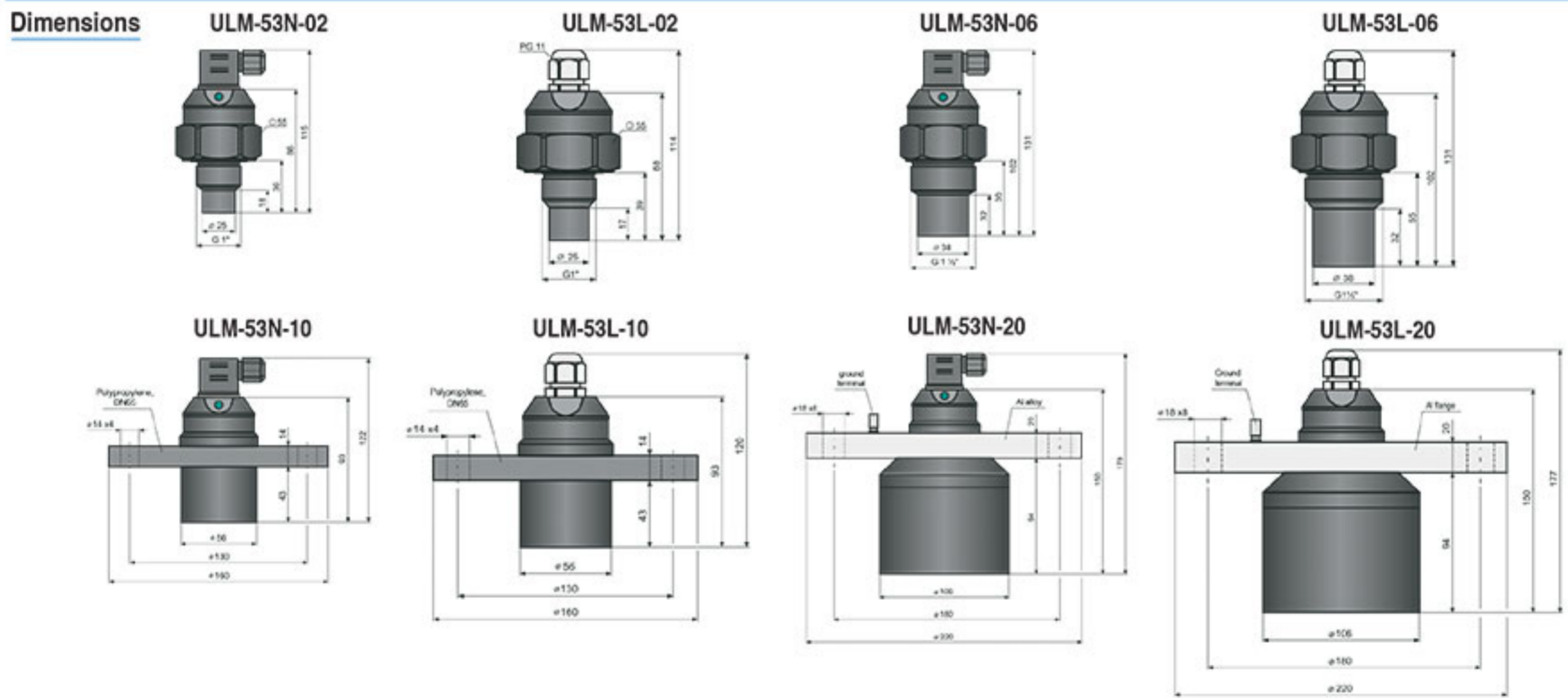
Field Adjustable Output Type **IP67** c/w Connector Socket

|                   |              |              |              |              |
|-------------------|--------------|--------------|--------------|--------------|
| 4 - 20mA (2-Wire) | ULM-53N-02-I | ULM-53N-06-I | ULM-53N-10-I | ULM-53N-20-I |
| 0 - 10V (3-Wire)  | ULM-53N-02-U | ULM-53N-06-U | ULM-53N-10-U | ULM-53N-20-U |

Explosionproof Field Adjustable Type - Must be used with **IRU-420** (Below) c/w Connector Socket

|                                    |   |   |   |  |
|------------------------------------|---|---|---|--|
| 4 - 20mA (2-Wire)<br>EX Rating<br> | ULM-53XI-02-I<br>Suitable for explosive areas (combustible gases or vapours)<br>Ex II 1/2G Ex ia IIB T5 Ga/Gb with isolating repeater ( <b>IRU-420</b> ) the whole level meter – zone 1, front head part – zone 0 | ULM-53XI-06-I<br>Suitable for explosive areas (combustible gases or vapours)<br>Ex II 1/2G Ex ia IIB T5 Ga/Gb with isolating repeater ( <b>IRU-420</b> ) the whole level meter – zone 1, front head part – zone 0 | ULM-53XI-10-I<br>Suitable for explosive areas (combustible gases or vapours)<br>Ex II 1/2G Ex ia IIA T5 Ga/Gb with isolating repeater ( <b>IRU-420</b> ) the whole level meter – zone 1, front head part – zone 0 | ULM-53XI-20-I<br>Suitable for explosive areas (combustible gases or vapours)<br>Ex II 2G Ex ia IIA T5 Gb with isolating repeater ( <b>IRU-420</b> ) the whole level meter – zone 1 |
|------------------------------------|---|---|---|--|

|                     |   |      |               |                        |
|---------------------|---|------|---------------|------------------------|
| Mounting Type       | G1"                                     | G1½" | Polypropylene | Aluminium Alloy Flange |
| Supply Voltage      | 18 - 36VDC (18 - 30VDC For XI Versions) |      |               |                        |
| Accuracy            | 0.20%                                   |      |               |                        |
| Ambient Temperature | -30° to 70°C                            |      | -30° to 60°C  |                        |



Isolating Repeater - for use with ULM-53XDI

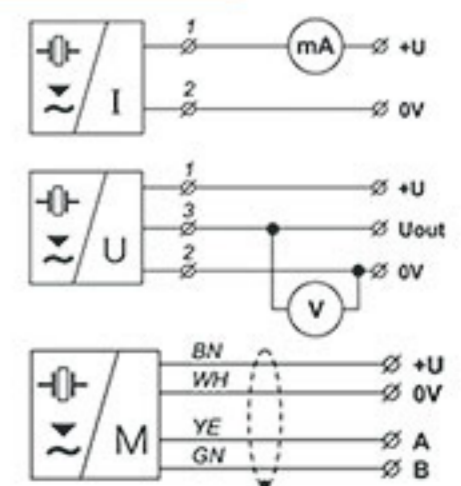
| Code  | IRU-420-I* | IRU-420-H* | IRU-420-U* |
|---|------------|------------|------------|
| Input Signal                                    | 0/4 - 20mA | 4 - 20mA   | 4 - 20mA   |
| Output Signal                                   | 0/4 - 20mA | 4 - 20mA   | 0 - 10V    |
| Bi-directional Trans Communication signal HART™ | NO         | YES        | NO         |

\*Add Voltage to Code: 24V (18-30VAC/18-40VDC) 230V (60-230VAC/85-230VDC)

II(1)G[EEEx ia] IIB /IIC

I(M1)G[EEEx ia] I

Wiring Diagrams



(versions with RS-485 Output)



## THERMAL DISPERSION FLOW SWITCHES

| Type  | Compact Model  | High Temp Model   | Economy Model   |
|---|--|---|---|
| <ul style="list-style-type: none"> <li>Measures the velocity of liquid inside a pipe or channel</li> <li>High sensitivity and accuracy</li> <li>Can be calibrated for liquids with different density and purity</li> <li>Pmax: 100 Bar</li> </ul> | <div style="display: flex; justify-content: center; align-items: center;"> <div style="margin-right: 10px;">40.5mm</div> </div> <div style="display: flex; justify-content: center; align-items: center;"> <div style="margin-right: 10px;">31mm</div> </div>  | <div style="display: flex; justify-content: center; align-items: center;"> <div style="margin-right: 10px;">72.5mm</div> </div> <div style="display: flex; justify-content: center; align-items: center;"> <div style="margin-right: 10px;">31mm</div> </div> | <div style="display: flex; justify-content: center; align-items: center;"> <div style="margin-right: 10px;">69mm</div> </div> <div style="display: flex; justify-content: center; align-items: center;"> <div style="margin-right: 10px;">31mm</div> </div> |
| Code  | <b>SP200-0-BU-* -2</b>   | <b>SP202-L-BU-* -2</b>  | <b>SP220-0-BU-* -2</b>  |
| Output Type:<br>*Add to Code:   | <b>N:</b> NPN Open Collector (400mA Max)<br><b>P:</b> PNP Open Collector (400mA Max)<br><b>A:</b> NO (1A@30VDC)<br><b>B:</b> NC (1A@30VDC)   | <b>N:</b> NPN Open Collector (400mA Max)<br><b>P:</b> PNP Open Collector (400mA Max)<br><b>A:</b> NO (1A@30VDC)<br><b>B:</b> NC (1A@30VDC)  | <b>N:</b> NPN Open Collector (400mA Max)<br><b>P:</b> PNP Open Collector (400mA Max)<br><b>A:</b> NO (1A@30VDC)<br><b>B:</b> NC (1A@30VDC)  |
| Connection Thread   | ½" NPT   | ½" NPT  | ½" NPT  |
| Measuring Range   | Water: 1 - 150 cm/s / Oil: 3-300 cm/s  | Water: 1 - 150 cm/s / Oil: 3-300 cm/s   | Water: 1 - 150 cm/s / Oil: 3-300 cm/s   |
| Operating Voltage   | 19-30VDC   | 19-30VDC  | 19-30VDC  |
| Operating Temperature   | -20° to 80°C   | -20° to 120°C   | -20° to 80°C  |
| Protection Degree   | <b>IP67</b>  | <b>IP67</b>   | <b>IP65</b>   |
| Housing Material  | SUS304   | SUS316L   | SUS304/Plastic  |
| Connection Type   | 4-Pole M12 Connector (c/w 2m Cable)  | 4-Pole M12 Connector (c/w 2m Cable)   | 4-Pole M12 Connector (c/w 2m Cable)   |
| LED Indication  |  |   |   |
|   | <b>Wiring Diagrams</b><br><div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <br/>           NPN output type wiring<br/> <b>3 Wire</b> </div> <div style="text-align: center;"> <br/>           PNP output type wiring<br/> <b>3 Wire</b> </div> <div style="text-align: center;"> <br/>           Relay output type wiring (NC)<br/> <b>4 Wire</b> </div> <div style="text-align: center;"> <br/>           Relay output type wiring (NO)<br/> <b>4 Wire</b> </div> </div> |   |   |

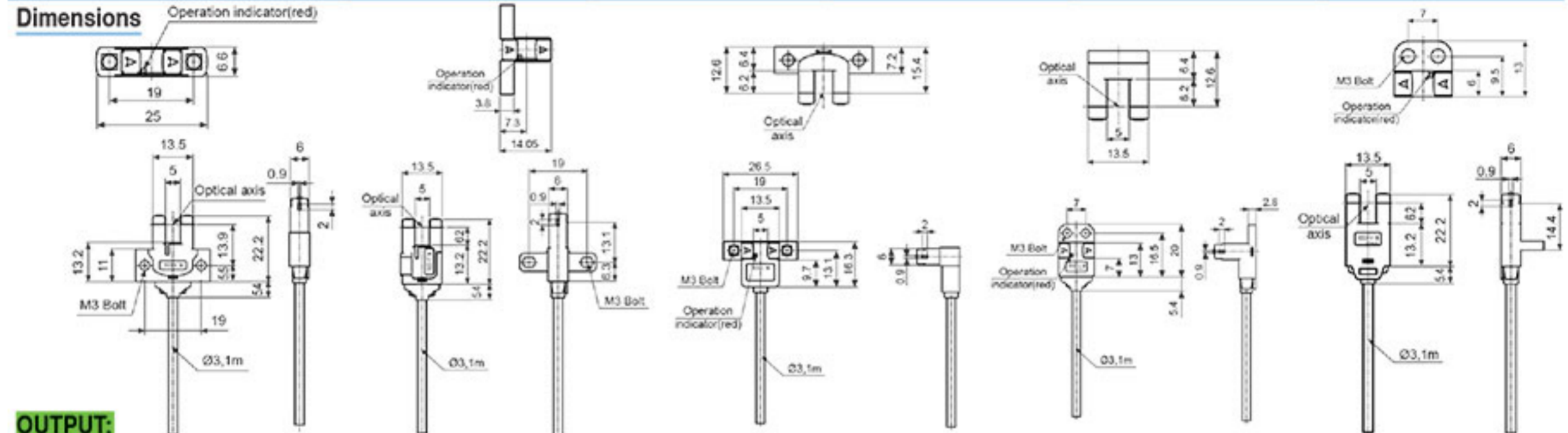
## FLOW SWITCHES FOR WATER & AIR

| Flow Switches for Water  | Flow Switch for Air   | Bargraph Panel Meter   |  |   |   |
|--|---|--|--|---|---|
| Paddle:<br>140 x 25mm<br>  | Paddle:<br>175 x 80mm<br>   | 48 x 144<br>Bezel<br>  |  |   |   |
| FS-80  | FS-2533   | AS-2614  | PM5022R3   | PB-1471   | 1B94M-B   |
| <ul style="list-style-type: none"> <li>Housing Material: Aluminium (<b>IP65</b>)</li> <li>Paddle Material: 304 S/S</li> <li>Switch: SPDT, 60W @ 230VAC</li> <li>Operating temperature: -30 to 150 °C</li> <li>Operating Max Pressure: 355 PSI</li> <li>Pressure drop allowance: 3 PSI</li> <li>Set point tolerance: ±25%</li> <li>Repeatability difference: ±5%</li> <li>Connecting: 1" PT screw</li> <li>Weight: 850g</li> <li>Spare Paddle: <b>FS-80 PADDLE</b></li> </ul> | <ul style="list-style-type: none"> <li>3 Different Paddle lengths, 57, 88 &amp; 167mm</li> <li>Housing material: ABS (<b>IP64</b>)</li> <li>Paddle material: 304 S/S</li> <li>Switch: SPDT, 16A@230VAC</li> <li>Connecting: 1" PT screw Brass</li> <li>Operating temperature: -20 to 120 °C</li> <li>Operating pressure Max: 10kg/cm<sup>2</sup></li> <li>Set point tolerance: ±25%</li> <li>Repeatability difference: ±5%</li> <li>For piping 1" to 8"</li> <li>Adjustable setting</li> <li>Weight: 660g</li> <li>Spare Paddle: <b>FS-2533 PADDLE</b></li> </ul> | <ul style="list-style-type: none"> <li>Housing material: ABS (<b>IP64</b>) with steelbase</li> <li>Paddle material: Tinned S/S</li> <li>Brass Lever</li> <li>Switch: SPDT, 16A@230VAC</li> <li>Operating Temperature: -20 to 80 °C</li> <li>Min cut-in value 2m/sec</li> <li>Min cut-out value 1m/sec</li> <li>Weight: 400g</li> <li>Spare Paddle: <b>AS-PADDLE</b></li> </ul> | Input<br>4 - 20mA<br>Output<br>4 - 20mA<br><ul style="list-style-type: none"> <li>4 point alarm (HH, H, L, LL) relay outputs (5A/250VAC)</li> <li>Scaling function: (0 - 1099)</li> <li>Alarm Delay: On/Off 0 - 3sec adjustment</li> <li>Under/over range indication</li> <li>Accuracy 0.1%</li> <li>Built in 24VDC/50mA sensor supply</li> <li>See page 55 &amp; 394 for Level Sensors</li> </ul> | Input<br>0 - 10V<br><ul style="list-style-type: none"> <li>Input: 4 - 20mA</li> <li>Display: 0 - 100%</li> <li>Accuracy: 1%</li> <li>Response Time: &lt;500ms</li> <li>Size: 96 x 24mm</li> <li>Cutout: 92 x 23mm</li> <li>Complete with 230/24VDC power supply</li> <li>See page 55 &amp; 394 for Level Sensors</li> </ul> | <ul style="list-style-type: none"> <li>Input: 4 - 20mA</li> <li>Display: 0 - 100%</li> <li>Accuracy: 1%</li> <li>Response Time: &lt;500ms</li> <li>Size: 96 x 24mm</li> <li>Cutout: 92 x 23mm</li> <li>Complete with 230/24VDC power supply</li> <li>See page 55 &amp; 394 for Level Sensors</li> </ul> |

NEW

## MICRO PHOTO SENSORS IP50

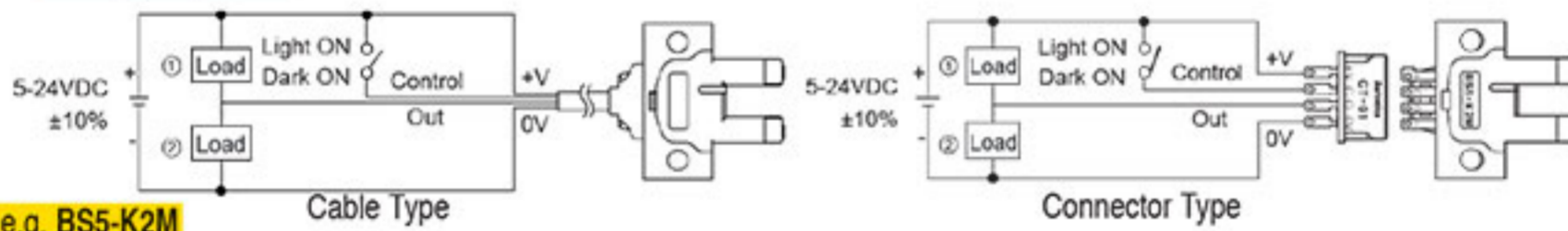
|  |                  |                    |                    |                    |                    |                    |
|--|------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Type DC<br><b>BTS Series</b><br>• Nominal Voltage: 5-24VDC<br>• Output: NPN or PNP<br>• Load current: 100mA Max<br>• Housing material: PBT<br> |                  |                    |                    |                    |                    |                    |
|  | Sensing Distance | 5mm                | 5mm                | 5mm                | 5mm                | 5mm                |
|  | Supply Voltage   | 5-24VDC            | 5-24VDC            | 5-24VDC            | 5-24VDC            | 5-24VDC            |
|  | Emission         | Infrared LED 950nm | Infrared LED 950nm | Infrared LED 950nm | Infrared LED 950nm | Infrared LED 950nm |
|  | Operation Mode   | Light On / Dark On | Light on / Dark On | Light On / Dark On | Light On / Dark On | Light On / Dark On |
| Output LED   | Red LED          | Red LED            | Red LED            | Red LED            | Red LED            |                    |
| Switching Frequency  | 2kHz             | 2kHz               | 2kHz               | 2kHz               | 2kHz               |                    |



|           |                   |                   |                   |                   |                   |
|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| PNP Cable | <b>BS5-K1*M-P</b> | <b>BS5-T1*M-P</b> | <b>BS5-L1*M-P</b> | <b>BS5-Y1*M-P</b> | <b>BS5-V1*M-P</b> |
| NPN Cable | <b>BS5-K1*M</b>   | <b>BS5-T1*M</b>   | <b>BS5-L1*M</b>   | <b>BS5-Y1*M</b>   | <b>BS5-V1*M</b>   |

Socket : CT-01 or CT-02  
 Connect the unit using socket. If it is soldered on terminal pin directly without socket, it may cause product damage.

**Wiring Diagrams**



**Plug Type**



\*For plug type replace 1 with 2 e.g. BS5-K2M

NEW

## ULTRA SLIM PHOTOELECTRIC SENSORS IP67

|  |                    |                       |                     |               |
|--|--------------------|-----------------------|---------------------|---------------|
| Type DC<br><b>BTF Series</b><br>• Nominal Voltage: 12-24VDC<br>• Output: NPN or PNP<br>• Load current: 50mA Max<br>• Housing material: PBT&PMA<br>• Cable length: 2m<br> | <b>Diffuse</b>     | <b>BGS Reflective</b> | <b>Through Beam</b> |               |
|  |                    |                       |                     |               |
|  | Sensing Distance   | 30mm                  | 15mm                | 1m            |
|  | DC Supply Voltage  | 12-24VDC              | 12-24VDC            | 12-24VDC      |
|  | Emission           | Red LED 650nm         | Red LED 650nm       | Red LED 650nm |
| Output LED   | Red/Green          | Red/Green             | Red/Green           |               |
| Operation Mode   | Light On / Dark On | Light on / Dark On    | Light On / Dark On  |               |
| Dimensions (mm)  | W13 x H24 x L4.6   | W13 x H24 x L4.6      | W13 x H19 x L4.6    |               |

**Wiring Diagrams**



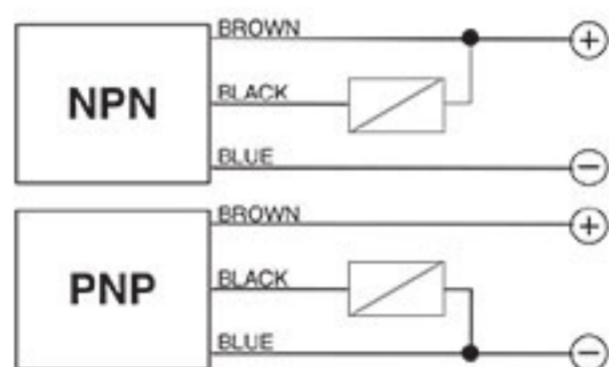
**OUTPUT:**

|           |                     |                     |                     |
|-----------|---------------------|---------------------|---------------------|
| PNP Light | <b>BTF30-DDTL-P</b> | <b>BTF15-BDTL-P</b> | <b>BTF1M-TDTL-P</b> |
| PNP Dark  | <b>BTF30-DDTD-P</b> | <b>BTF15-BDTD-P</b> | <b>BTF1M-TDTD-P</b> |
| NPN Light | <b>BTF30-DDTL</b>   | <b>BTF15-BDTL</b>   | <b>BTF1M-TDTL</b>   |
| NPN Dark  | <b>BTF30-DDTD</b>   | <b>BTF15-BDTD</b>   | <b>BTF1M-TDTD</b>   |
| Bracket   | SUS304              | -                   | -                   |
| Bolt      | SWCH10A             | -                   | -                   |

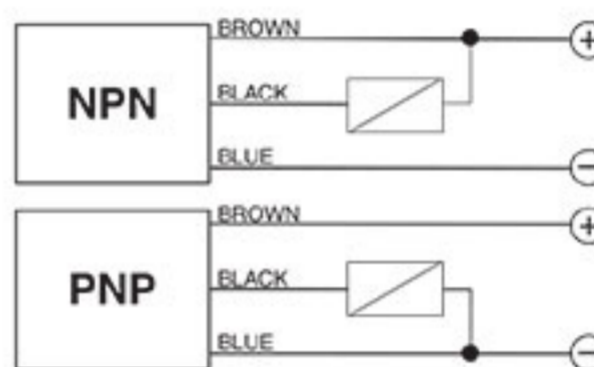
## NEW ULTRA COMPACT BUILT IN AMPLIFIER PHOTOELECTRIC SENSOR IP67

| Type DC<br>BT Series   | Convergent Reflective Type            |                | Retroreflective                       | Through Beam                          |
|--|---------------------------------------|----------------|---------------------------------------|---------------------------------------|
| <ul style="list-style-type: none"> <li>- Nominal Voltage 12-24VDC</li> <li>- Output NPN or PNP</li> <li>- Cable Length 2m</li> </ul> |                                       |                |                                       |                                       |
|  | Sensing Distance                      | 15mm      30mm | 200mm (MS-6)                          | 1m                                    |
| DC Supply Voltage  | 12-24 VDC                             |                | 12-24 VDC                             | 12-24 VDC                             |
| Emission   | Red LED 650nm                         |                | Red LED 650nm                         | Red LED 650nm                         |
| Output LED   | Red - Operational / Green - Stability |                | Red - Operational / Green - Stability | Red - Operational / Green - Stability |
| Operation Mode   | Light On / Dark On                    |                | Light On / Dark On                    | Light On / Dark On                    |
| Dimensions (mm)  | W7.2 x H24.6 x L10.8                  |                | W7.2 x H24.6 x L10.8                  | W7.2 x H18.6 x L9.5                   |

### Wiring Diagram



Convergent Reflective Type



Retroreflective

### OUTPUT:

|              |              |              |               |              |
|--------------|--------------|--------------|---------------|--------------|
| PNP Light On | BTS15-LDTL-P | BTS30-LDTL-P | BTS200-MDTL-P | BTS1M-TDTL-P |
| PNP Dark On  | BTS15-LDTD-P | BTS30-LDTD-P | BTS200-MDTD-P | BTS1M-TDTD-P |
| NPN Light On | BTS15-LDTL   | BTS30-LDTL   | BTS200-MDTL   | BTS1M-TDTL   |
| NPN Dark On  | BTS15-LDTD   | BTS30-LDTD   | BTS200-MDTD   | BTS1M-TDTD   |

## NEW M18 FRONT / M3 SIDE MOUNT PHOTOELECTRIC SENSORS IP67

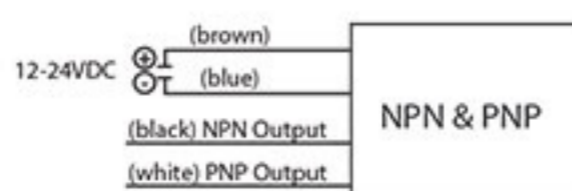
### Ultimate Installation Flexibility

| Type DC<br>BH Series  | Diffuse Reflective Type                  |                     | Polarized Retroreflective | Through Beam        |
|---|--|---------------------|---------------------------|---------------------|
| <ul style="list-style-type: none"> <li>- Nominal Voltage 12-24VDC</li> <li>- Output NPN &amp; PNP</li> <li>- Load Current 100mA</li> <li>- Housing Material Polycarbonate</li> <li>- Cable Length 2m</li> </ul> |  |                     |                           |                     |
|   | Sensing Distance                         | 300mm      1m       | 4m (MS-2A reflector)      | 20m                 |
| DC Supply Voltage   | 12-24 VDC                                |                     | 12-24 VDC                 | 12-24 VDC           |
| Current Consumption. Max  | 30mA                                     | 35mA                | 30mA                      | 20mA                |
| Emission  | Red LED 660nm                            | Infrared LED 850nm  | Red LED 660nm             | Red LED 660nm       |
| Setting   | Sensitivity trimmer                      | Sensitivity trimmer | Sensitivity trimmer       | Sensitivity trimmer |
| Output LED  | Red - Operation/Green - Stability        |                     |                           |                     |
| Operation Mode  | Light ON / Dark ON selectable via switch |                     |                           |                     |
| Dimensions (mm)   | W14 x H34.5 x L28                        | W14 x H34.5 x L28   | W14 x H34.5 x L28         | W14 x H34.5 x L28   |

### Wiring Diagram



Diffuse Reflective Type



Polarized Retroreflective



Through Beam

### OUTPUT:

|           |           |          |          |           |
|-----------|-----------|----------|----------|-----------|
| NPN & PNP | BH300-DDT | BH1M-DDT | BH4M-PDT | BH20M-TDT |
|-----------|-----------|----------|----------|-----------|



## COMPACT RECTANGULAR/SQUARE INDUCTIVE SENSORS IP67

### 3 Wire DC Inductive Sensors



### 2 Wire DC Inductive



|                                  | PS17-5DN  | PS17-8DN             | PFI25-8DN    | PSN25-5DN  | PSN30-10DN           | PSN30-15DN           | PSN40-20DN           | PS50-30DN            | NO Output                |
|----------------------------------|---|----------------------|--------------|--|----------------------|----------------------|----------------------|----------------------|--------------------------|
| <b>NPN NO</b>                    | PS17-5DN  | PS17-8DN             | PFI25-8DN    | PSN25-5DN  | PSN30-10DN           | PSN30-15DN           | PSN40-20DN           | PS50-30DN            | NO Output                |
| <b>PNP NO</b>                    | PS17-5DP  | PS17-8DP             | PFI25-8DP    | PSN25-5DP  | PSN30-10DP           | PSN30-15DP           | PSN40-20DP           | PS50-30DP            | PST17-5DO                |
| <b>NPN NC</b>                    | PS17-5DN2   | PS17-8DN2            | PFI25-8DN2   | PSN25-5DN2   | PSN30-10DN2          | PSN30-15DN2          | PSN40-20DN2          | PS50-30DN2           | NC Output                |
| <b>PNP NC</b>                    | -   | -                    | PFI25-8DP2   | PSN25-5DP2   | PSN30-10DP2          | PSN30-15DP2          | PSN40-20DP2          | PS50-30DP2           | PST17-5DC                |
| Switching distance               | 5mm ±10%  | 8mm ±10%             |              | 5mm ±10%   | 10mm ±10%            | 15mm ±10%            | 20mm ±10%            | 30mm ±10%            | 5mm ±10%                 |
| Hysteresis                       | Max. 10% of switching distance                        |                      |              |  |                      |                      |                      |                      |                          |
| Standard detecting target        | 18 x 18 x 1mm (Iron)                                  | 25 x 25 x 1mm (Iron) |              |  | 30 x 30 x 1mm (Iron) | 45 x 45 x 1mm (Iron) | 60 x 60 x 1mm (Iron) | 90 x 90 x 1mm (Iron) | 18 x 18 x 1mm (Iron)     |
| Response frequency               | 700Hz   | 200Hz                |              | 300Hz  | 250Hz                | 200Hz                | 100Hz                | 50Hz                 |                          |
| Dimensions                       | 17 x 17 x 31  |                      | 26 x 10 x 49 | 25 x 25 x 39   | 30 x 30 x 53         |                      | 40 x 40 x 53         | 53 x 53 x 35         | 17 x 17 x 31             |
| Protection circuit               | Surge protection circuit. Reverse polarity protection |                      |              | Surge protection circuit. Reverse polarity protection. Overload & short-circuit protection |                      |                      |                      |                      | Surge Protection Circuit |
| Power supply (Operation voltage) | 12-24VDC (10-30VDC)                                   |                      |              |  |                      |                      |                      |                      |                          |
| Leakage current                  | Max. 10mA   |                      |              |  |                      |                      |                      |                      |                          |
| Residual voltage                 | Max. 1.5V   |                      |              |  |                      |                      |                      |                      |                          |
| Affection by Temp.               | -25 to +70°C  |                      |              |  |                      |                      |                      |                      |                          |
| Control output                   | 200mA   |                      |              |  |                      |                      |                      |                      |                          |
| Insulation resistance            | Min. 50MΩ (at 500VDC)                                 |                      |              |  |                      |                      |                      |                      |                          |
| Indicator                        | Operation indicator (Red LED)                         |                      |              |  |                      |                      |                      |                      |                          |
| Ambient temperature              | -25 – +70°C (at non-freezing status)                  |                      |              |  |                      |                      |                      |                      |                          |

### 2 Wire AC Inductive Sensors



|                                  | PSN25-5AO   | PSN30-10AO           | PSN30-15AO           | PSN40-20AO           |
|----------------------------------|---|----------------------|----------------------|----------------------|
| <b>NO Output</b>                 | PSN25-5AO   | PSN30-10AO           | PSN30-15AO           | PSN40-20AO           |
| <b>NC Output</b>                 | PSN25-5AC   | PSN30-10AC           | PSN30-15AC           | PSN40-20AC           |
| Switching distance               | 5mm ±10%  | 10mm ±10%            | 15mm ±10%            | 20mm ±10%            |
| Hysteresis                       | Max. 10% of switching distance  |                      |                      |                      |
| Standard detecting target        | 25 x 25 x 1mm (Iron)  | 30 x 30 x 1mm (Iron) | 45 x 45 x 1mm (Iron) | 60 x 60 x 1mm (Iron) |
| Dimensions                       | 25 x 25 x 39  | 30 x 30 x 53         | 30 x 30 x 53         | 40 x 40 x 53         |
| Power supply (Operation voltage) | 100-240VAC (85-264VAC)  |                      |                      |                      |
| Leakage current                  | Max. 2.5mA  |                      |                      |                      |
| Response frequency               | 20Hz  |                      |                      |                      |
| Residual voltage                 | Max. 10V  |                      |                      |                      |
| Affection by Temp.               | ±10% Max. for detecting distance at +20°C within temperature range of -25 – +70°C |                      |                      |                      |
| Control output                   | 5-200mA   |                      |                      |                      |
| Insulation resistance            | Min. 50MΩ (at 500VDC)   |                      |                      |                      |
| Indicator                        | Operation indicator (Red LED)   |                      |                      |                      |
| Ambient temperature              | -25 to +70°C (at non-freezing status)   |                      |                      |                      |
| Protection Circuit               | Surge protection circuit  |                      |                      |                      |

## AUTO DOOR SENSOR



### Auto Door Sensor

| Code              | ADS-A   |
|-------------------|---|
| Supply Voltage    | 24-240VAC   |
| Relay Output      | 0.1A @ 50VDC  |
| Mounting Height   | 2-2.7m (max. detecting distance: 3m)  |
| Output Delay Time | 2/7/15 sec selectable by dip switch   |
| Detection         | Four angles for front detection area, 7.5°, 14.5°, 21.5°, 28.5°<br>Right/Left detection area elimination function |

Also see page 397

# MAGNETIC PROXIMITY SWITCHES IP67

## Reed Contact Magnetic Switches

(Cable length 2m)



## Nickel Plated Brass Housing

| Diameter/Length | Code N/O | Amps  |        | Code N/O+N/C | Amps  |        | Code N/O | Amps  |        | Code N/O+N/C | Amps  |        |
|-----------------|----------|-------|--------|--------------|-------|--------|----------|-------|--------|--------------|-------|--------|
|                 |          | 30VDC | 250VDC |              | 30VDC | 250VDC |          | 30VDC | 250VDC |              | 30VDC | 250VDC |
| 12 40mm         | -        | -     | -      | SM08         | 0.1A  | 0.01A  | SM09     | 1.6A  | 0.2A   | -            | -     | -      |
| 12 70mm         | -        | -     | -      | -            | -     | -      | SM13     | 3A    | 0.4A   | SM14         | 3A    | 0.4A   |
| 18 70mm         | -        | -     | -      | -            | -     | -      | SM17     | 3A    | 0.4A   | SM18         | 2A    | 0.25A  |

## Plastic Housing

| Diameter/Length | N/O  | N/O+N/C |      |   | N/O  | Bistable N/O |      |
|-----------------|------|---------|------|---|------|--------------|------|
| 12 100mm        | SM19 | 1.6A    | 0.2A | - | SM21 | 3A           | 0.4A |
|                 |      |         |      |   | SM22 | 3A           | 0.4A |

## Specifications

- Max Voltage: 230VAC
- Switching Frequency: 200Hz
- Delay on Activation: 2mS
- Repeatability:  $\pm 0.3\text{mm}$
- Temperature Limits:  $-20^{\circ}\text{C}$  to  $60^{\circ}\text{C}$
- Cable section (N/O):  $2 \times 0.50\text{mm}^2$
- Cable section (N/O N/C):  $3 \times 0.50\text{mm}^2$

## Wiring Diagrams

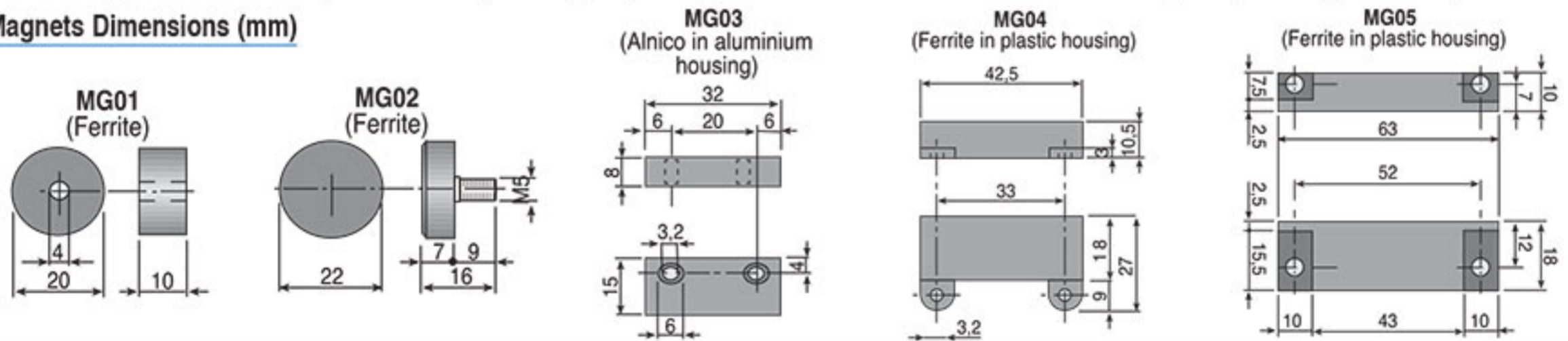


## Reed Contact Switch / Magnet Switching distances (mm)

| Code                 | MG01     |            | MG02     |            | MG03     |            | MG04     |            | MG05     |            |
|----------------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|
|                      | Distance | Hysteresis | Distance | Hysteresis | Distance | Hysteresis | Distance | Hysteresis | Distance | Hysteresis |
| Diameter 12 (L=40mm) | 24       | 5          | 22       | 5          | 6        | 2.5        | 22       | 9          | 20       | 9          |
| Diameter 12 (L=70mm) | 12       | 7          | 10       | 6          | -        | -          | 22       | 9          | 20       | 9          |
| Diameter 18          | 12       | 7          | 10       | 6          | -        | -          | 22       | 9          | 20       | 9          |

**Warning:** The data specified in this table has an approximate value because it depends on the magnet position, the material on which it is applied (ferromagnetic or not) and because it is related to the magnet during the frontal approach. Reed contact sensors can also be activated laterally considering that switching distances are always influenced by the magnet position, orientation and the material on which it is applied (ferromagnetic or not).

## Magnets Dimensions (mm)



## Omnipolar & Gear Wheel Series Proximity Magnetic Sensors - IP65

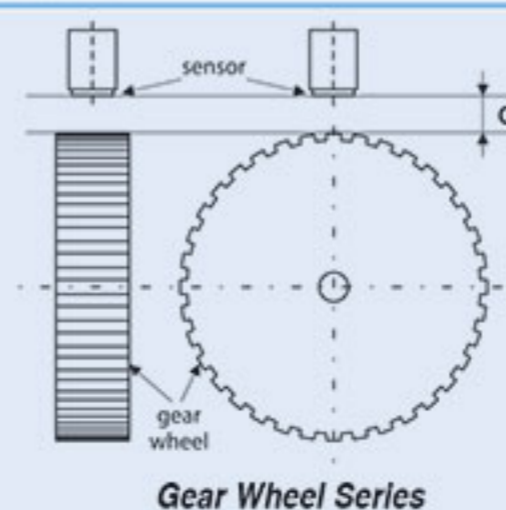
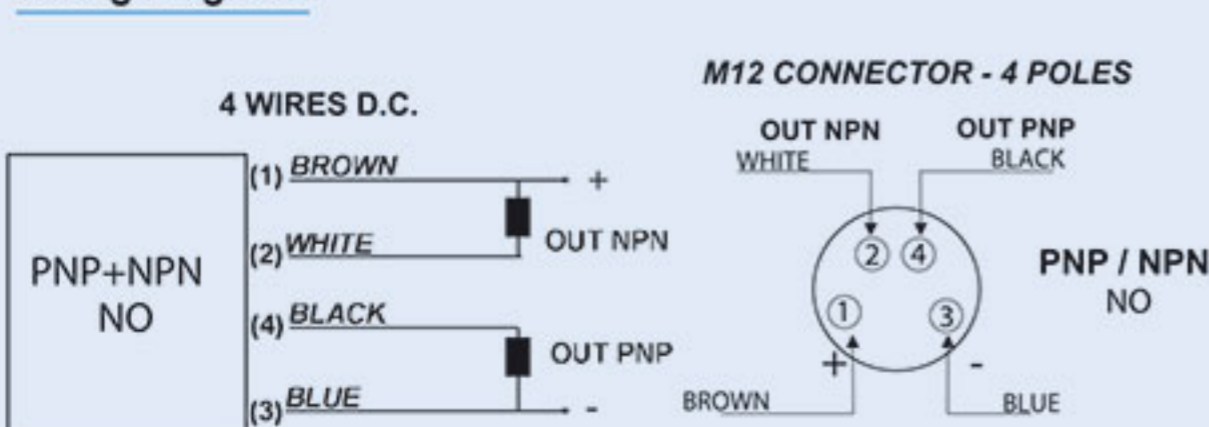
| Omnipolar Series                  |              | Gear Wheel Series |              |
|-----------------------------------|--------------|-------------------|--------------|
| M12                               | M18          | M12               | M18          |
| Metal Body - PNP + NPN NO Cable   |              |                   |              |
| BZ0112-PNNO*                      | BZ0118-PNNO* | BZ3112-PNNO*      | BZ3118-PNNO* |
| Plastic Body - PNP + NPN NO Cable |              |                   |              |
| BZ0212-PNNO*                      | BZ0218-PNNO* | -                 | -            |

\*For M12 plug type add 5 to code e.g. BZ0112-PNNO5

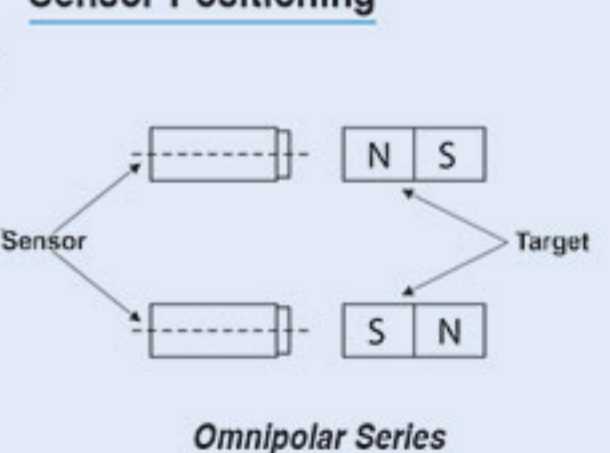
## Specifications

- Voltage: 10-30VDC
- Maximum Load: 250mA
- Switching Frequency: 10 kHz
- Rising Time: 1  $\mu\text{s}$
- Falling Time: 1.8  $\mu\text{s}$
- Cable:  $4 \times 0.35\text{mm}$
- Max Working Air Gap for Gear Wheel Series: 3.5mm

## Wiring Diagrams

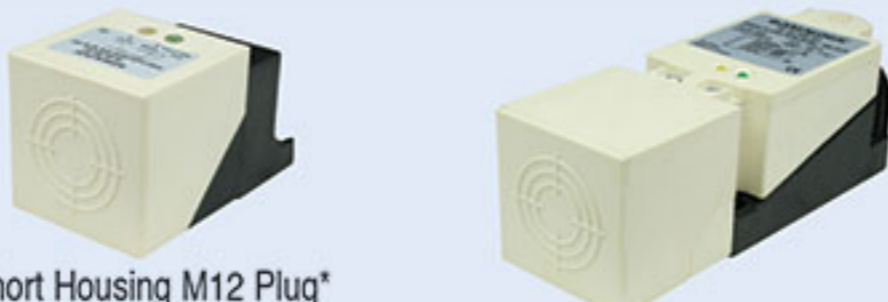





## Sensor Positioning


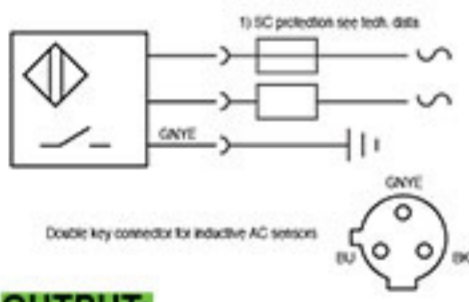
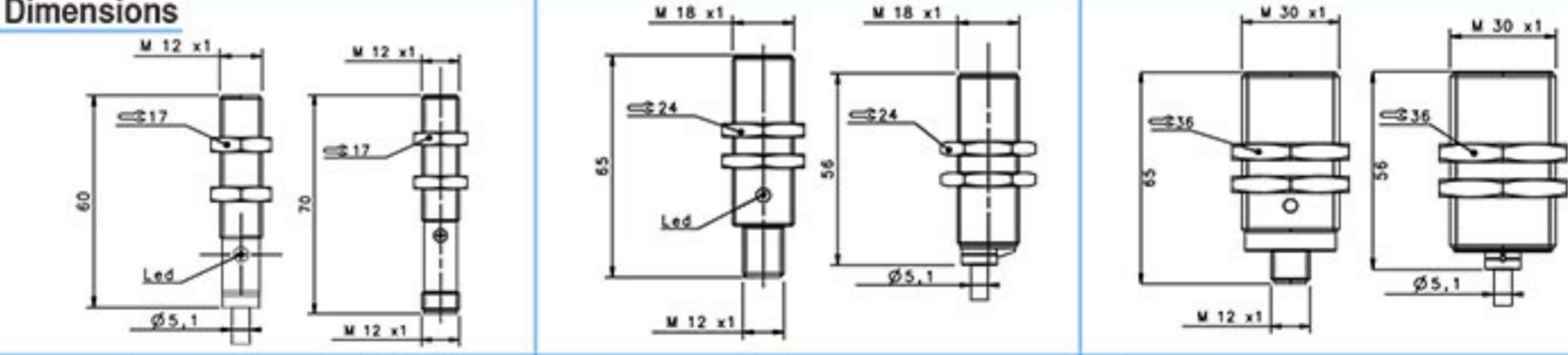


LIMIT & PRESSURE SWITCHES & SENSORS

## SQUARE INDUCTIVE/CAPACITIVE PROXIMITY SWITCHES IP67

|   | Inductive 40x40mm   |              | Capacitive - 40x40mm   |              | Inductive 80x80mm  | Inductive 8x8mm   |                 |
|---|---|--------------|--|--------------|--|---|-----------------|
| <ul style="list-style-type: none"> <li>• PBT (resin) or Nickel-plated Brass Housing</li> <li>• Operating Distance 1.5 ... 50mm</li> <li>• Cable, M8/M12 Connector or Terminal Block</li> <li>• 2 or 3 Wires</li> <li>• PNP, PNP/NPN, NO, NC, NO/NC</li> </ul> |  <p>Short Housing M12 Plug*</p> |              |  <p>NEW SCA</p> |              |  <p>SCA</p> |  |                 |
| Available   | Shielded  | Not Shielded | Shielded   | Not Shielded | Not Shielded   | -   | -               |
| Switching Distance (Sn)   | 15mm  | 30mm         | 15mm   | 30mm         | 30mm   | 50mm  | 1.5mm           |
| Operating Voltage   | 10-30VDC  |              | 20-250 VAC/DC  |              | 10-30VDC   | 12-48VDC  | 10-30VDC        |
| Max Output Current  | 200mA   |              | 200mA  |              | 200mA  | 200mA   | 200mA           |
| Operation LED   | Yes   |              | Yes  |              | Yes  | -   | Yellow          |
| Switching Frequency   | 100Hz   |              | 25Hz AC; 40Hz Dc Terminal  |              | -  | 100Hz   | 500Hz           |
| Connection  | M12 Plug*, Terminal Block   |              | Block  |              | Terminal   | Cable   | *M8 Plug, Cable |
| <b>OUTPUT:</b>  |   |              |  |              |  |   |                 |
| PNP NO  | -   | -            | -  | -            | -  | -   | IS-88-Q1-03*    |
| NPN NO + NC   | IS-40-W6-03   | IS-40-Y6-03  | -  | -            | -  | AS80-50DN3  | -               |
| NPN NO + NC Short Housing M12 Plug*   | IS-40-X6-S2   | -            | -  | -            | -  | -   | -               |
| PNP NO + NC   | IS-40-W5-03   | IS-40-Y5-03  | -  | -            | CQP2-4030P-54U   | AS80-50P3   | -               |
| PNP NO + NC Short Housing M12 Plug*   | IS-40-X5-S2   | -            | -  | -            | -  | -   | -               |
| 2 Wires AC/DC NO  | -   | -            | IS-40-W7-03  | IS-40-Y7-03  | -  | -   | -               |
| 2 Wires AC/DC NC  | -   | -            | IS-40-W8-03  | IS-40-Y8-03  | -  | -   | -               |
| *For M8 plug type replace 03 with S1 e.g. IS-88-Q1-S1 For sensor cable and accessories see pages 68-71  |   |              |  |              |  |   |                 |

## NEW 20-250VAC INDUCTIVE PROXIMITY SWITCHES IP67



|   | Ø12  | Ø18                                | Ø30                                |
|---|--|------------------------------------|------------------------------------|
| <ul style="list-style-type: none"> <li>• Nominal Voltage 20-250VAC</li> <li>• Output NO</li> <li>• Output Current 500mA Max</li> <li>• Housing Material Nickel Plated Brass</li> <li>• Cable Length 2m</li> </ul> |  |                                    |                                    |
| Sensing Distance  | 2mm  | 5mm                                | 10mm                               |
| VAC Supply Voltage  | 20-250VAC  | 20-250VAC                          | 20-250VAC                          |
| Max Output Current  | 500mA  | 500mA                              | 500mA                              |
| Switching Frequency   | 25Hz   | 25Hz                               | 25Hz                               |
| Connection  | Cable 2m, M12 Double key connector   | Cable 2m, M12 Double key connector | Cable 2m, M12 Double key connector |
| Operation LED   | Present Yellow   | Present Yellow                     | Present Yellow                     |
| <b>Wiring Diagrams</b>  |    |                                    |                                    |
| <b>Dimensions</b>   |  |                                    |                                    |
| NO Cable Version  | IS-12-A15-03   | IS-18-A15-03                       | IS-30-A15-03                       |
| NO M12 Double Key Connector   | IS-12-A15-S2   | IS-18-A15-S2                       | IS-30-A15-S2                       |
| For M12 Double key plug connector and cable use part number CS-A1-21-R-03/05 (03=3m Cable, 05=5m Cable)   |  |                                    |                                    |

## DC SENSOR TESTER



| For M12 Connector, Cable & Terminal DC Sensors |  |
|--|--|
| Code   | Description  |
| ST-02  | <ul style="list-style-type: none"> <li>• PNP (sourcing) and NPN (sinking) Testing</li> <li>• M12-5-Pin Plug Input</li> <li>• Terminal Inputs</li> <li>• Two Output LED's</li> <li>• Battery Powered</li> </ul> |

**24-250VAC/VDC INDUCTIVE PROXIMITY SWITCHES NO OR NC IP67**

| Diameter  | Ø 12                |                   |                    |                     | Ø 18                |                     |                   |                   | Ø 30                |                     |                     |                     |
|---|---------------------|-------------------|--------------------|---------------------|---------------------|---------------------|-------------------|-------------------|---------------------|---------------------|---------------------|---------------------|
| ●Shielded ○Non Shielded   | ●                   |                   | ○                  |                     | ●                   |                     | ○                 |                   | ●                   |                     | ○                   |                     |
| • Current output 200mA max  |                     |                   |                    |                     |                     |                     |                   |                   |                     |                     |                     |                     |
|  |                     |                   |                    |                     |                     |                     |                   |                   |                     |                     |                     |                     |
|  |                     |                   |                    |                     |                     |                     |                   |                   |                     |                     |                     |                     |
| Switching Distance  | 2mm                 | 4mm               | 4mm                | 8mm                 | 5mm                 | 8mm                 | 8mm               | 16mm              | 10mm                | 16mm                | 15mm                | 25mm                |
| Nominal Voltage   | 20-250VAC/VDC       |                   |                    |                     | 20-250VAC/VDC       |                     |                   |                   | 20-250VAC/VDC       |                     |                     |                     |
| Max Output Current  | 200mA               |                   |                    |                     | 200mA               |                     |                   |                   | 200mA               |                     |                     |                     |
| Switching Frequency   | 25Hz AC/ 35Hz DC    |                   |                    |                     | 25Hz AC/ 35Hz DC    |                     |                   |                   | 25Hz AC/ 35Hz DC    |                     |                     |                     |
| Operating Temperature   | -25°C to 75°C       |                   |                    |                     | -25°C to 75°C       |                     |                   |                   | -25°C to 75°C       |                     |                     |                     |
| Sensing Face  | PBT                 |                   |                    |                     | PBT                 |                     |                   |                   | PBT                 |                     |                     |                     |
| Housing   | Nickel Plated Brass |                   |                    |                     | Nickel Plated Brass |                     |                   |                   | Nickel Plated Brass |                     |                     |                     |
| Connection  | Cable 2m, M12 Plug  |                   |                    |                     | Cable 2m, M12 Plug  |                     |                   |                   | Cable 2m, M12 Plug  |                     |                     |                     |
| Operation LED   | Present             |                   |                    |                     | Present             |                     |                   |                   | Present             |                     |                     |                     |
| <b>Wiring Diagram</b>   |                     |                   |                    |                     |                     |                     |                   |                   |                     |                     |                     |                     |
| <b>Dimensions</b>   |                     |                   |                    |                     |                     |                     |                   |                   |                     |                     |                     |                     |
| NO Output (Cable Type)  | IPS12-S2U060*-A2P   | IPS12-N4U060*-A2P | IPS18-S5U055**-A2P | IPS18-N8U055**-A2P  | IPS30-S10U055**-A2P | IPS30-N15U055**-A2P | IPS12-S4U060*-A2P | IPS12-N8U060*-A2P | IPS18-S8U055**-A2P  | IPS18-N16U055**-A2P | IPS30-S16U055**-A2P | IPS30-N25U055**-A2P |
| Double Sensing  | IPS12-S4U060*-A2P   | IPS12-N8U060*-A2P | IPS18-S8U055**-A2P | IPS18-N16U055**-A2P | IPS30-S16U055**-A2P | IPS30-N25U055**-A2P | IPS12-S2UC60*-A2P | IPS12-N4UC60*-A2P | IPS18-S5UC55**-A2P  | IPS18-N8UC55**-A2P  | IPS30-S10UC55**-A2P | IPS30-N15UC55**-A2P |
| NC Output (Cable Type)  | IPS12-S2UC60*-A2P   | IPS12-N4UC60*-A2P | IPS18-S5UC55**-A2P | IPS18-N8UC55**-A2P  | IPS30-S10UC55**-A2P | IPS30-N15UC55**-A2P | IPS12-S4UC60*-A2P | IPS12-N8UC60*-A2P | IPS18-S8UC55**-A2P  | IPS18-N16UC55**-A2P | IPS30-S16UC55**-A2P | IPS30-N25UC55**-A2P |
| Double Sensing  | IPS12-S4UC60*-A2P   | IPS12-N8UC60*-A2P | IPS18-S8UC55**-A2P | IPS18-N16UC55**-A2P | IPS30-S16UC55**-A2P | IPS30-N25UC55**-A2P |                   |                   |                     |                     |                     |                     |





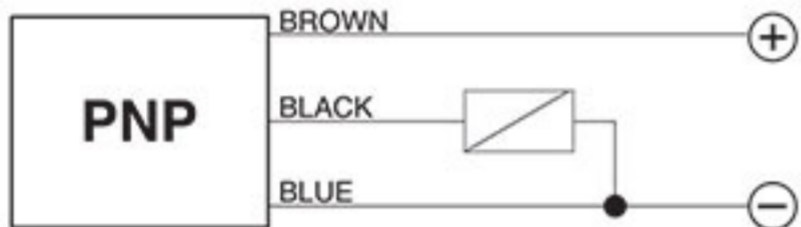
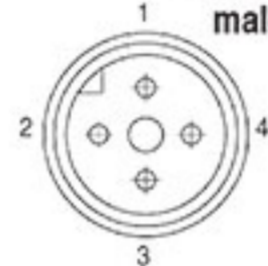
\*For plug type replace 0-A2P with 8-A12 For sensor cable and accessories see pages 68-71

\*\*For plug type replace 55-A2P with 79-A12






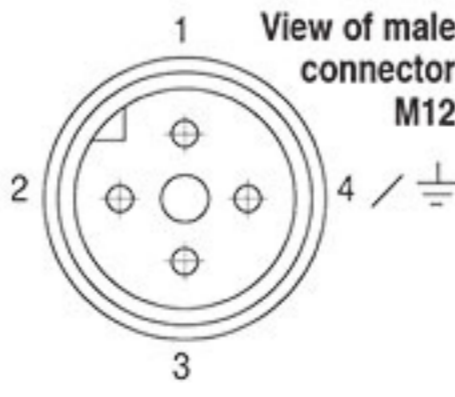
**ANALOG INDUCTIVE PROXIMITY SWITCHES IP67**

| Diameter                   | Ø 12                    |                 | Ø 18                    |                  | Ø 30                    |                  |
|----------------------------|-------------------------|-----------------|-------------------------|------------------|-------------------------|------------------|
| ●Shielded ○Non Shielded    | ●                       |                 | ○                       |                  | ○                       |                  |
| Measuring Distance         | 0.6-6mm                 | 3.1-10mm        | 3.1-10mm                | 7.3-20mm         | 7.3-20mm                | 17.6-40mm        |
| Nominal Voltage            | 18-30VDC                |                 | 18-30VDC                |                  | 18-30VDC                |                  |
| Load Resistor              | V: > 2 kOhm, A: 400 Ohm |                 | V: > 2 kOhm, A: 400 Ohm |                  | V: > 2 kOhm, A: 400 Ohm |                  |
| Output Following Frequency | 100Hz                   |                 | 100Hz                   |                  | 100Hz                   |                  |
| Operating Temperature      | 0°C to 70°C             |                 | 0°C to 70°C             |                  | 0°C to 70°C             |                  |
| Sensing Face               | PBT                     |                 | PBT                     |                  | PBT                     |                  |
| Housing                    | Nickel Plated Brass     |                 | Nickel Plated Brass     |                  | Nickel Plated Brass     |                  |
| Connection                 | Cable 2m                |                 | Cable 2m                |                  | Cable 2m                |                  |
| <b>Wiring Diagram</b>      |                         |                 |                         |                  |                         |                  |
| <b>Dimensions</b>          |                         |                 |                         |                  |                         |                  |
| Voltage 0-10V              | IA12-S6V010-2NP         | IA12-N6V010-2NP | IA18-S10V010-2NP        | IA18-N20V010-2NP | IA30-S20V010-2NP        | IA30-N40V010-2NP |
| Current 4-20mA             | IA12-S6I420-2NP         | IA12-N6I420-2NP | IA18-S10I420-2NP        | IA18-N20I420-2NP | IA30-S20I420-2NP        | IA30-N40I420-2NP |




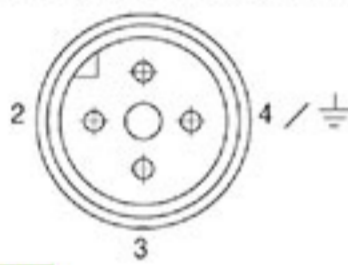
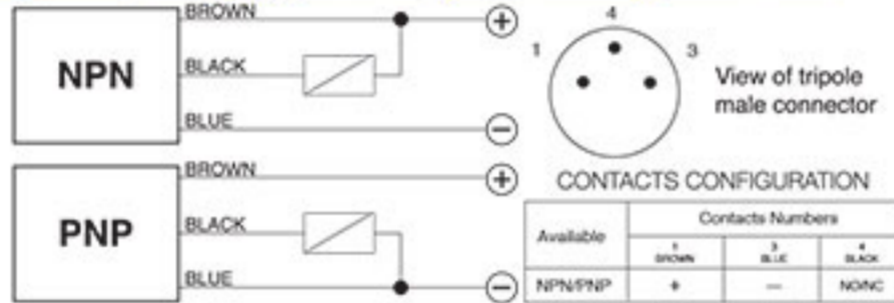
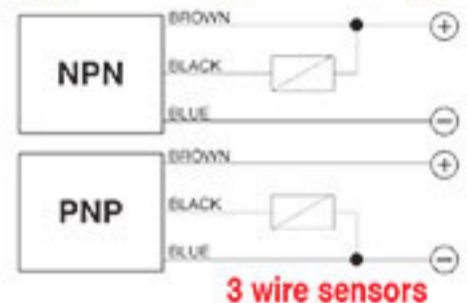
## SPECIAL DC INDUCTIVE PROXIMITY SWITCHES IP67

|   | Weld Field Immune   |              |  |              | Metal Face  |             |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
|---|---|--------------|--|--------------|---|-------------|---|-------------|-----------|-------------|--|--|--|---|---|---|---|----|---|--|---|----|
|   | Ø12   |              | Ø18  |              | Ø12   |             | Ø18   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
| Diameter  |   |              |  |              |   |             |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
| ● Shielded ○ Non Shielded   | ●   | ○            | ●  | ○            | ●   | ○           | ●   | ○           |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
| <ul style="list-style-type: none"> <li>• Nominal Voltage: 10-30VDC</li> <li>• Max. Output Current: 200mA</li> <li>• Temp. Range: -25 to 70°C</li> <li>• Housing Material: Stainless Steel</li> <li>• Weld field immune is intrinsically safe and used in welding bays.</li> </ul> |    |              |  |              |  |             |  |             |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
| <b>CE</b>   |   |              |  |              |   |             |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
| Switching Distance  | 2mm   | 4mm          | 5mm  | 8mm          | 2mm   | 4mm         | 5mm   | 8mm         |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
| Operation LED   | Present   |              | Present  |              | Present   |             | Present   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
| Switching Frequency   | 2000Hz  | 1000Hz       | 1000Hz   | 500Hz        | 2000Hz  | 1000Hz      | 1000Hz  | 500Hz       |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
| Active Face Material  | ETFE  |              | ETFE   |              | Stainless Steel   |             | Stainless Steel   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
| <b>Wiring Diagrams</b>  | <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 30%;"> <p><b>PNP</b></p>  </div> <div style="width: 30%;"> <p>View of quadripole male connector M12</p>  </div> <div style="width: 30%;"> <p>Configuration of Contacts</p> <table border="1" style="font-size: small;"> <thead> <tr> <th rowspan="2">Available</th> <th colspan="4">N. contacts</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>NO</td> <td>+</td> <td></td> <td>-</td> <td>no</td> </tr> </tbody> </table> </div> </div> |              |  |              |   |             |   |             | Available | N. contacts |  |  |  | 1 | 2 | 3 | 4 | NO | + |  | - | no |
| Available   | N. contacts   |              |  |              |   |             |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
|   | 1   | 2            | 3  | 4            |   |             |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
| NO  | +   |              | -  | no           |   |             |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
| <b>OUTPUT:</b>  |   |              |  |              |   |             |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |    |
| PNP NO M12 Plug   | IS-F12-S1-S2  | IS-F12-T1-S2 | IS-F18-S1-S2   | IS-F18-T1-S2 | IS-12-I1-S2   | IS-12-L1-S2 | IS-18-I1-S2   | IS-18-L1-S2 |           |             |  |  |  |   |   |   |   |    |   |  |   |    |





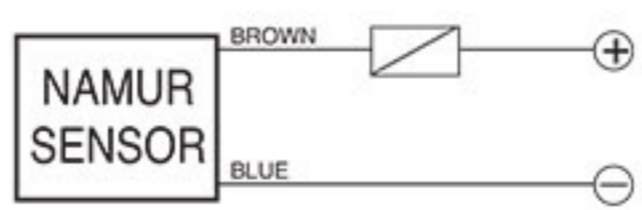
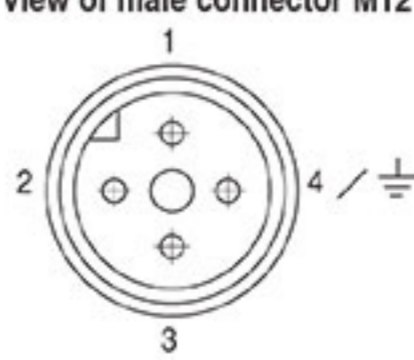
## DC 2 WIRE INDUCTIVE PROXIMITY SWITCHES IP67

|   | DC Ø12  |             | DC Ø18  |             | DC Ø30  |             |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
|---|---|-------------|---|-------------|---|-------------|-----------|-------------|--|--|--|---|---|---|---|----|---|--|---|--|----|--|--|---|--|
|   | Diameter  |             |   |             |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
| ● Shielded ○ Non Shielded   | ●   | ○           | ●   | ○           | ●   | ○           |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
| <ul style="list-style-type: none"> <li>• Nominal Voltage: 10-30VDC</li> <li>• Max. Output Current: 100mA</li> <li>• Residual Current: 1.6mA</li> <li>• Temperature Range: -25 to 70°C</li> <li>• Housing Material: Nickel Plated Brass</li> <li>• Cost Effective</li> </ul> |    |             |  |             |  |             |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
| <b>CE</b>   |   |             |   |             |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
| Switching Distance  | 2mm   | 4mm         | 5mm   | 8mm         | 10mm  | 15mm        |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
| Operation LED   | Yellow  |             | Yellow  |             | Yellow  |             |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
| Switching Frequency   | 200Hz   |             | 200Hz   |             | 250Hz   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
| Cable Length  | 2m  |             | 2m  |             | 2m  |             |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
| <b>Wiring Diagrams</b>  | <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 30%;"> <p><b>NO</b></p>  <p><b>NC</b></p>  </div> <div style="width: 30%;"> <p>View of male connector M12</p>  </div> <div style="width: 30%;"> <p>Configuration of Contacts</p> <table border="1" style="font-size: small;"> <thead> <tr> <th rowspan="2">Available</th> <th colspan="4">N. contacts</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>NO</td> <td>+</td> <td></td> <td>-</td> <td></td> </tr> <tr> <td>NC</td> <td></td> <td></td> <td>+</td> <td></td> </tr> </tbody> </table> </div> </div> |             |   |             |   |             | Available | N. contacts |  |  |  | 1 | 2 | 3 | 4 | NO | + |  | - |  | NC |  |  | + |  |
| Available   | N. contacts   |             |   |             |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
|   | 1   | 2           | 3   | 4           |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
| NO  | +   |             | -   |             |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
| NC  |   |             | +   |             |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
| <b>OUTPUT:</b>  |   |             |   |             |   |             |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
| NO-NC programmable (Cable Type)   | IS-12-A9-03   | IS-12-C9-03 | IS-18-A9-03   | IS-18-C9-03 | IS-30-A9-03   | IS-30-C9-03 |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |
| NO-NC programmable (M12 connector)  | IS-12-A9-S2   | IS-12-C9-S2 | IS-18-A9-S2   | IS-18-C9-S2 | IS-30-A9-S2   | IS-30-C9-S2 |           |             |  |  |  |   |   |   |   |    |   |  |   |  |    |  |  |   |  |

## DC INDUCTIVE PROXIMITY SWITCHES STANDARD & SHORT »

| Diameter  | NPN or PNP  | Ø5  | DC                  | Ø6.5  | DC           | Ø8  |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
|---|---|---|---------------------|---|--------------|---|--------------|---|-------|---|---|---|---|-------|---|---|---|---|------|---|---|---|---|-------|---|---|---|---|--|--|--|
| ● Shielded ○ Non Shielded   |   | ●   | ●                   | ○   |              | ●   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| <ul style="list-style-type: none"> <li>• Nominal Voltage 10-30VDC</li> <li>• 4 Wire programming type</li> <li>• 3 Wire plug and cable type</li> <li>• Standard &amp; Short Housing versions</li> </ul> <p><b>For Sensor Cable &amp; Accessories see pages 68-71</b></p> |   |  |                     |  |              |  |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| <b>CE</b>   |   |   |                     |   |              |   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| Nominal Switching Distance (Sn)   |   | 0.8mm   | 1.5mm               | 2mm   |              | 2mm   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| Max. Output Current   |   | 100mA   | 200mA               |   |              | 200mA   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| Operation LED   |   | Present   | Present             |   |              | Present (Yellow)  |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| Switching Frequency   |   | 2000Hz  | 1000Hz              |   |              | 1000Hz  |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| Temperature Limits  |   | -25 to 60°C   | -25 to 70°C         |   |              | -20 to 60°C   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| Cable Length  |   | 2m  | 2m                  |   |              | 2m  |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| Housing Material  |   | Stainless Steel   | Nickel-plated brass |   |              | Nickel plated brass   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| View of male connector M12  | <b>Wiring Diagrams</b> <i>For plug type M8 change '03' to 'S1' e.g. IS-65-A3-S1</i>   |   |                     | <i>For plug type M12 change 'S1' to 'S2' e.g. IS-08-G3-S2</i>                       |              |   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
|    |  <p><b>CONTACTS CONFIGURATION</b></p> <table border="1"> <thead> <tr> <th>Available</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>BROWN</td> <td>+</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>BLACK</td> <td>-</td> <td>+</td> <td>-</td> <td>-</td> </tr> <tr> <td>BLUE</td> <td>-</td> <td>-</td> <td>+</td> <td>-</td> </tr> <tr> <td>BLACK</td> <td>-</td> <td>-</td> <td>-</td> <td>+</td> </tr> </tbody> </table> <p><i>View of tripole male connector</i></p> |   |                     | Available   | 1            | 2   | 3            | 4 | BROWN | + | - | - | - | BLACK | - | + | - | - | BLUE | - | - | + | - | BLACK | - | - | - | + |  <p><b>3 wire sensors</b></p> |  |  |
| Available   | 1   | 2   | 3                   | 4   |              |   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| BROWN   | +   | -   | -                   | -   |              |   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| BLACK   | -   | +   | -                   | -   |              |   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| BLUE  | -   | -   | +                   | -   |              |   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| BLACK   | -   | -   | -                   | +   |              |   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| <b>OUTPUT:</b>  |   |   |                     |   |              |   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| NPN & PNP, (NO & NC) Cable type (4 Wire)  | -   | -   | -                   | -   | -            | Cable Type  | M8 Plug Type |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| NPN & PNP, (NO & NC) M12 connector (4 Wire)   | -   | -   | -                   | -   | -            |   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| PNP NO output (3 Wire)  | IS-05-A1-03*  | IS-65-A1-03*  | IS-65-C1-03*        | IS-08-G1-03   | IS-08-G1-S1* |   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| PNP NC output (3 Wire)  | -   | IS-65-A2-03*  | IS-65-C2-03*        | IS-08-G2-03   | IS-08-G2-S1* |   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| NPN NO output (3 Wire)  | IS-05-A3-03*  | IS-65-A3-03*  | IS-65-C3-03*        | IS-08-G3-03   | IS-08-G3-S1* |   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |
| NPN NC output (3 Wire)  | -   | IS-65-A4-03*  | IS-65-C4-03*        | IS-08-G4-03   | IS-08-G4-S1* |   |              |   |       |   |   |   |   |       |   |   |   |   |      |   |   |   |   |       |   |   |   |   |  |  |  |

## NAMUR INDUCTIVE PROXIMITY SWITCHES IP67

| Diameter   | DC   | Ø8  | DC | Ø12   | DC | Ø18   | DC   | Ø30   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
|--|--|---|----|---|----|---|--|---|--|-----------|-------------|--|--|--|---|---|---|---|-------|---|---|---|---|
| ● Shielded ○ Non Shielded                                  |  | ● ○   |    | ● ○   |    | ● ○   |  | ● ○   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
|  |  |  |    |   |    |  |  |  |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
| <b>CE</b>  |  |   |    |   |    |   |  |   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
| Switching Distance (± 20%)                                 |  | 1mm 2mm   |    | 2mm 4mm   |    | 5mm 8mm   |  | 10mm 15mm   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
| Nominal Voltage (Load Resistance 1K)                       |  | 7.7-9VDC  |    | 7.7-9VDC  |    | 7.7-9VDC  |  | 7.7-9VDC  |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
| Supply Voltage   |  | 5-24VDC   |    | 5-24VDC   |    | 5-24VDC   |  | 5-24VDC   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
| Switching Frequency  |  | 2000Hz  |    | 2000Hz  |    | 1000Hz  |  | 500Hz   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
| Cable  |  | IS-08-A20-03 IS-08-C20-03   |    | IS-12-A20-03 IS-12-C20-03   |    | IS-18-A20-03 IS-18-C20-03   |  | IS-30-A20-03 IS-30-C20-03   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
| Plug-in (M12 Connector)                                    |  | IS-08-A20-S2 IS-08-C20-S2   |    | IS-12-A20-S2 IS-12-C20-S2   |    | IS-18-A20-S2 IS-18-C20-S2   |  | IS-30-A20-S2 IS-30-C20-S2   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
| NPN NO-NC  |  | -   |    | -   |    | -   |  | -   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
| PNP NO-NC  |  | -   |    | -   |    | -   |  | -   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
| Relay Output: 18 to 240VAC/DC                              |  | -   |    | -   |    | -   |  | -   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
| <b>Wiring Diagrams</b>                                     |  |   |    |  |    |   | <b>Configuration of Contacts</b> <table border="1"> <thead> <tr> <th rowspan="2">Available</th> <th colspan="4">N. contacts</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>NAMUR</td> <td>+</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table> |   |  | Available | N. contacts |  |  |  | 1 | 2 | 3 | 4 | NAMUR | + | - | - | - |
| Available  | N. contacts  |   |    |   |    |   |  |   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
|  | 1  | 2   | 3  | 4   |    |   |  |   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
| NAMUR  | +  | -   | -  | -   |    |   |  |   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |
| <b>For Sensor Cable &amp; Accessories see pages 03-405</b> |  |   |    |   |    |   | <p><i>Note: Can only be used with AC/DC NAMUR Relay 'NS1' or instruments with NAMUR inputs</i></p>   |   |  |           |             |  |  |  |   |   |   |   |       |   |   |   |   |

LIMIT & PRESSURE SWITCHES & SENSORS

» HOUSING 3 WIRE OR 4 WIRE PROGRAMMABLE OUTPUT IP67

| DC Ø12              |     |     |     | DC Ø18              |     |      |     | DC Ø30              |      |      |      |      |      |      |      |
|---------------------|-----|-----|-----|---------------------|-----|------|-----|---------------------|------|------|------|------|------|------|------|
|                     |     |     |     |                     |     |      |     |                     |      |      |      |      |      |      |      |
| 2mm                 | 4mm | 8mm | 4mm | 5mm                 | 8mm | 16mm | 8mm | 14mm                | 28mm | 10mm | 15mm | 30mm | 15mm | 20mm | 40mm |
| 200mA               |     |     |     | 200mA               |     |      |     | 200mA               |      |      |      |      |      |      |      |
| Present (Yellow)    |     |     |     | Present (Yellow)    |     |      |     | Present (Yellow)    |      |      |      |      |      |      |      |
| 1000Hz              |     |     |     | 1000Hz              |     |      |     | 300Hz               |      |      |      |      |      |      |      |
| -25 to 70°C         |     |     |     | -25 to 70°C         |     |      |     | -25 to 70°C         |      |      |      |      |      |      |      |
| 2m                  |     |     |     | 2m                  |     |      |     | 2m                  |      |      |      |      |      |      |      |
| Nickel plated brass |     |     |     | Nickel plated brass |     |      |     | Nickel plated brass |      |      |      |      |      |      |      |



\*For plug type M12 change '03' to 'S2' e.g. IS-12-A3-S2

Housing Lengths (mm)

|     | Standard  |    |       |    | Short     |    |       |    |
|-----|-----------|----|-------|----|-----------|----|-------|----|
|     | Connector |    | Cable |    | Connector |    | Cable |    |
|     | SH        | NS | SH    | NS | SH        | NS | SH    | NS |
| M12 | 68        | 72 | 58    | 64 | 48        | 54 | 42    | 48 |
| M18 | 73        | 82 | 70    | 78 | 56        | 65 | 47    | 56 |
| M30 | 74        | 85 | 70    | 82 | 56        | 68 | 49    | 56 |

| 4 wire sensors programmable output |              |              |              | 3 wire sensors |              |              |              |              |              |              |              |
|------------------------------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| IS-12-A0-03                        | IS-12-E0-03  | IS-12-C0-03  | IS-12-F0-03  | IS-18-A0-03    | IS-18-E0-03  | IS-18-C0-03  | IS-18-F0-03  | IS-30-A0-03  | IS-30-E0-03  | IS-30-C0-03  | IS-30-F0-03  |
| IS-12-A0-S2                        | IS-12-E0-S2  | IS-12-C0-S2  | IS-12-F0-S2  | IS-18-A0-S2    | IS-18-E0-S2  | IS-18-C0-S2  | IS-18-F0-S2  | IS-30-A0-S2  | IS-30-E0-S2  | IS-30-C0-S2  | IS-30-F0-S2  |
| IS-12-A1-03*                       | IS-12-G1-03* | IS-12-C1-03* | IS-12-H1-03* | IS-18-A1-03*   | IS-18-G1-03* | IS-18-C1-03* | IS-18-H1-03* | IS-30-A1-03* | IS-30-G1-03* | IS-30-C1-03* | IS-30-H1-03* |
| IS-12-A2-03*                       | IS-12-G2-03* | IS-12-C2-03* | IS-12-H2-03* | IS-18-A2-03*   | IS-18-G2-03* | IS-18-C2-03* | IS-18-H2-03* | IS-30-A2-03* | IS-30-G2-03* | IS-30-C2-03* | IS-30-H2-03* |
| IS-12-A3-03*                       | IS-12-G3-03* | IS-12-C3-03* | IS-12-H3-03* | IS-18-A3-03*   | IS-18-G3-03* | IS-18-C3-03* | IS-18-H3-03* | IS-30-A3-03* | IS-30-G3-03* | IS-30-C3-03* | IS-30-H3-03* |
| IS-12-A4-03*                       | IS-12-G4-03* | IS-12-C4-03* | IS-12-H4-03* | IS-18-A4-03*   | IS-18-G4-03* | IS-18-C4-03* | IS-18-H4-03* | IS-30-A4-03* | IS-30-G4-03* | IS-30-C4-03* | IS-30-H4-03* |

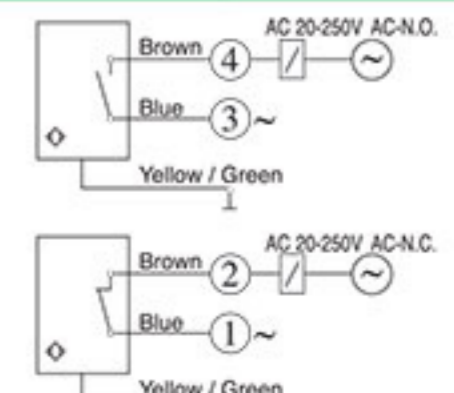
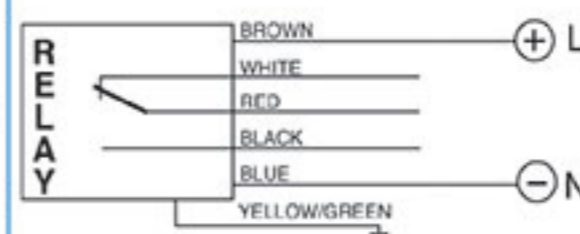
CAPACITIVE PROXIMITY SENSORS IP67

| DC Ø18                        |        | DC Ø30                        |        | AC Ø30                       |                | AC Ø18/Ø30 Available                |                        |
|-------------------------------|--------|-------------------------------|--------|------------------------------|----------------|-------------------------------------|------------------------|
|                               |        |                               |        |                              |                |                                     |                        |
| 1-5mm                         | 1-10mm | 1-20mm                        | 1-25mm | 1-20mm                       | 2-30mm         | 2-8mm                               | *2-20mm 2-15mm *2-30mm |
| 12-30VDC (-15/+10%)           |        | 12-30VDC (-15/+10%)           |        | 18-230VAC/DC (-15/+10%) 50Hz |                | 20-250VAC/DC (-15/+10%) 50Hz        |                        |
| 10Hz                          |        | 10Hz                          |        | 10Hz                         |                | 25Hz (Ø18) 25Hz (Ø18)               |                        |
| Standard Supply Atex Approved |        | Standard Supply Atex Approved |        | -                            |                | N/O CCM1-1808A-A3L2 CCM2-1815A-A3L2 |                        |
| -                             |        | -                             |        | -                            |                | N/C CCM1-1808A-B3L2 CCM2-1815A-B3L2 |                        |
| CS-07                         | CS-13  | CS-09                         | CS-15  | -                            | -              | *2-20mm(Ø30) *2-30mm(Ø30)           |                        |
| CS-08                         | CS-14  | CS-10                         | CS-16  | -                            | -              | N/O CCM1-3020A-A3L2 CCM2-3020A-A3L2 |                        |
| -                             | -      | -                             | -      | CS-31*/CS-31TE               | CS-32*/CS-32TE | N/C CCM1-3020A-B3L2 CCM2-3020A-B3L2 |                        |

Ex Class II



\*with 1s-5m time activating delay. Relay Output



Above Capacitive Sensors are Cable type only. For Plug type units see page 372

## DC INDUCTIVE SENSORS

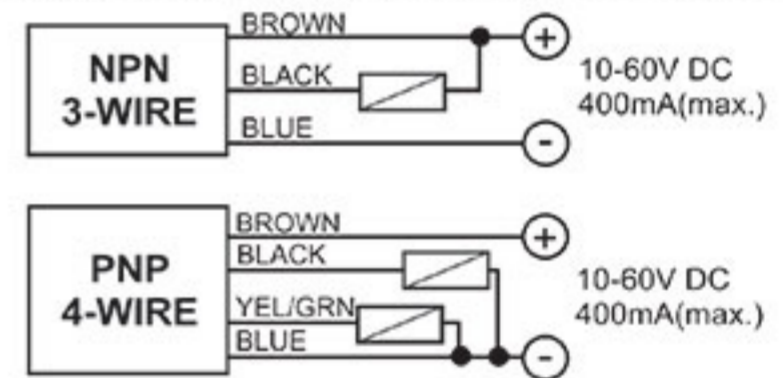
| Diameter            |  | ØM12                |        | ØM18                |        | ØM30               |        | ØM40               |        |
|---------------------|--|---------------------|--------|---------------------|--------|--------------------|--------|--------------------|--------|
| ● Flush ○ Surface   |  | ●                   | ○      | ●                   | ○      | ●                  | ○      | ●                  | ○      |
|                     |  |                     |        |                     |        |                    |        |                    |        |
|                     |  | IP67                |        | IP67                |        | IP68               |        | IP68               |        |
| Sensing Distance    |  | 2mm                 | 4mm    | 5mm                 | 8mm    | 10mm               | 15mm   | 20mm               | 25mm   |
| Supply Voltage      |  | 10 - 30VDC          |        | 10 - 30VDC          |        | 10 - 30VDC         |        | 10 - 30VDC         |        |
| Current Consumption |  | < 8 mA              |        | < 8 mA              |        | ≤ 10 mA            |        | ≤ 10 mA            |        |
| Output Current      |  | 200 mA              |        | 200 mA              |        | 400 mA             |        | 400 mA             |        |
| Voltage Drop        |  | < 1,5 V @ 200 mA    |        | < 1,5 V @ 200 mA    |        | ≤ 2V               |        | ≤ 2V               |        |
| Switching Frequency |  | 1000 Hz             | 500 Hz | 300 Hz              | 500 Hz | 100 Hz             | 500 Hz | 1000 Hz            | 500 Hz |
| Operating Temp.     |  | -25 to +70 °C       |        | -25 to +70 °C       |        | -20 to +70 °C      |        | -20 to +70 °C      |        |
| Hysteresis          |  | 3 ...15%            |        | 3 ...15%            |        | 3 ...15%           |        | 3 ...15%           |        |
| Cable length        |  | 2 meters, PVC       |        | 2 meters, PVC       |        | 2 meters, PVC      |        | 2 meters, PVC      |        |
| Cable section       |  | 3 Wire              |        | 3 Wire              |        | 3 Wire, 4 Wire(NX) |        | 3 Wire, 4 Wire(NX) |        |
| Housing Material    |  | Nickel Plated Brass |        | Nickel Plated Brass |        | Aluminium          |        | Aluminium          |        |

### Wiring Diagram

#### 3 Wire sensors



#### 3 and 4 Wire (NX) sensors 4 Wire NX sensors available in M12 and M18



For Sensor Cables see pages 68-71

|                  | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         |
|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| PNP NO, Cable    | IS4-1202F-NOMTC | IS4-1204S-NOMTC | IS4-1805F-NOMTC | IS4-1808S-NOMTC | RI4-3010F-NOMTC | RI4-3015S-NOMTC | RI4-4020F-NOMTC | RI4-4025S-NOMTC |
| PNP NC, Cable    | IS4-1202F-NCMTC | IS4-1204S-NCMTC | IS4-1805F-NCMTC | IS4-1808S-NCMTC | RI4-3010F-NCMTC | RI4-3015S-NCMTC | RI4-4020F-NCMTC | RI4-4025S-NCMTC |
| PNP NO/NC, Cable | RI4-1202F-NXMTC | RI4-1204S-NXMTC | RI4-1805F-NXMTC | RI4-1808S-NXMTC | RI4-3010F-NXMTC | RI4-3015S-NXMTC | RI4-4020F-NXMTC | RI4-4025S-NXMTC |
| PNP NO, Plug     | IS4-1202F-NOMTP | IS4-1204S-NOMTP | IS4-1805F-NOMTP | IS4-1808S-NOMTP | RI4-3010F-NOMTP | RI4-3015S-NOMTP | -               | -               |
| PNP NC, Plug     | IS4-1202F-NCMTP | IS4-1204S-NCMTP | IS4-1805F-NCMTP | IS4-1808S-NCMTP | RI4-3010F-NCMTP | RI4-3015S-NCMTP | -               | -               |
| PNP NO/NC, Plug  | RI4-1202F-NXMTP | RI4-1204S-NXMTP | RI4-1805F-NXMTP | RI4-1808S-NXMTP | RI4-3010F-NXMTP | RI4-3015S-NXMTP | -               | -               |
| NPN NO, Cable    | IS5-1202F-NOMTC | IS5-1204S-NOMTC | IS5-1805F-NOMTC | IS5-1808S-NOMTC | RI5-3010F-NOMTC | RI5-3015S-NOMTC | RI5-4020F-NOMTC | RI5-4025S-NOMTC |
| NPN NC, Cable    | IS5-1202F-NCMTC | IS5-1204S-NCMTC | IS5-1805F-NCMTC | IS5-1808S-NCMTC | RI5-3010F-NCMTC | RI5-3015S-NCMTC | RI5-4020F-NCMTC | RI5-4025S-NCMTC |
| NPN NO/NC, Cable | RI5-1202F-NXMTC | RI5-1204S-NXMTC | RI5-1805F-NXMTC | RI5-1808S-NXMTC | RI5-3010F-NXMTC | RI5-3015S-NXMTC | RI5-4020F-NXMTC | RI5-4025S-NXMTC |
| NPN NO, Plug     | IS5-1202F-NOMTP | IS5-1204S-NOMTP | IS5-1805F-NOMTP | IS5-1808S-NOMTP | RI5-3010F-NOMTP | RI5-3015S-NOMTP | -               | -               |
| NPN NC, Plug     | IS5-1202F-NCMTP | IS5-1204S-NCMTP | IS5-1805F-NCMTP | IS5-1808S-NCMTP | RI5-3010F-NCMTP | RI5-3015S-NCMTP | -               | -               |
| NPN NO/NC, Plug  | RI5-1202F-NXMTP | RI5-1204S-NXMTP | RI5-1805F-NXMTP | RI5-1808S-NXMTP | RI5-3010F-NXMTP | RI5-3015S-NXMTP | -               | -               |

### Intelligent Canline Sensor IP67



The Intelligent Can Line Sensor has been specifically designed and developed for detecting the presence and movement of cans and automated can making and can filling lines. When interfaced with Programmable Logic Controller (PLC) the sensor's integrated intelligence released the PLC from time-consuming computing activities.

| Code            | Description             |
|-----------------|-------------------------|
| RI4-9020F-NOPBC | PNP, N.O., c/w Fly Lead |
| RI4-9020F-NOPBP | PNP, N.O., c/w M.Plug   |
| RI5-9020F-NOPBC | NPN, N.O., c/w Fly Lead |
| RI5-9020F-NOPBP | NPN, N.O., c/w M.Plug   |

The Can Line Sensor is versatile enough to be used in a variety of applications.

- Some of these are:
- Gap-detection (missing cans)
  - Pile-up detection
  - Proximity and motion detection
  - Built-back control
  - Detection of missing tops or crowns on bottling lines

| CAN MATERIAL    | Sn |
|-----------------|----|
| Mild Steel      | 20 |
| Stainless Steel | 15 |
| Aluminium       | 8  |

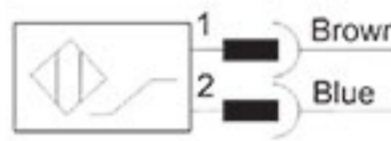


**NAMUR INDUCTIVE & CAPACITIVE SENSORS IP68 (DIN 19234)**

| Diameter                       | ØM12                     |     | ØM18                     |     | ØM30                     |      | ØM40                     |      |
|--------------------------------|--------------------------|-----|--------------------------|-----|--------------------------|------|--------------------------|------|
| ● Flush ○ Surface              | ●                        | ○   | ●                        | ○   | ●                        | ○    | ●                        | ○    |
|                                |                          |     |                          |     |                          |      |                          |      |
| Sensing Distance               | 2mm                      | 4mm | 5mm                      | 8mm | 10mm                     | 15mm | 20mm                     | 25mm |
| Supply Voltage                 | 8,2 - 10VDC (via module) |     | 8,2 - 10VDC (via module) |     | 8,2 - 10VDC (via module) |      | 8,2 - 10VDC (via module) |      |
| Current Consumption            | ≤ 2 mA                   |     | ≤ 2 mA                   |     | ≤ 2 mA                   |      | ≤ 2 mA                   |      |
| Output Current (Metal Present) | 0,8mA Typical            |     | 0,8mA Typical            |     | 0,8mA Typical            |      | 0,8mA Typical            |      |
| Output Current (Metal Absent)  | 4mA Typical              |     | 4mA Typical              |     | 4mA Typical              |      | 4mA Typical              |      |
| Switching Frequency            | 2000Hz                   |     | 1000Hz                   |     | 500Hz                    |      | 500Hz                    |      |
| Operating Temp.                | -20 to +70 °C            |     | -20 to +70 °C            |     | -20 to +70 °C            |      | -20 to +70 °C            |      |
| Hysteresis                     | 3 to 15%                 |     | 3 to 15%                 |     | 3 to 15%                 |      | 3 to 15%                 |      |
| Cable Length                   | 2m                       |     | 2m                       |     | 2m                       |      | 2m                       |      |
| Cable Section                  | 2 Wire                   |     | 2 Wire                   |     | 2 Wire                   |      | 2 Wire                   |      |
| Housing Material               | Aluminium                |     | Aluminium                |     | Aluminium                |      | Aluminium                |      |

For Sensor Cables see pages 68-71

**Wiring Diagram**



Ex ia, Gr T6 NAMUR sensors require a suitably approved control module to operate in intrinsically safe areas. (Please request more information)

**NAMUR control module**



NAMUR sensors require a suitable Slimline Control Module to operate SC300 or SC301

**OUTPUT:**

|                                 | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| NAMUR NC, Cable                 |                 |                 |                 |                 |                 |                 |                 |                 |
| NAMUR NC, Plug                  | RI0-1202F-NCMTC | RI0-1204S-NCMTC | RI0-1805F-NCMTC | RI0-1808S-NCMTC | RI0-3010F-NCMTC | RI0-3015S-NCMTC | RI0-4020F-NCMTC | RI0-4025S-NCMTC |
|                                 | -               | -               | RI0-1805F-NCMTP | RI0-1808S-NCMTP | -               | -               | -               | -               |
| <b>Capacitive NAMUR Sensors</b> |                 |                 |                 |                 |                 |                 |                 |                 |
| NC, Metal, Cable                | -               | -               | -               | -               | RC0-3010F-NCMTC | RC0-3020S-NCMTC | -               | -               |
| NC, Metal, Plug                 | -               | -               | -               | -               | RC0-3010F-NCMTP | RC0-3020S-NCMTP | -               | -               |

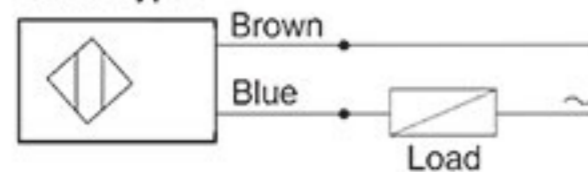
**AC INDUCTIVE SENSORS IP68**

| Diameter            | ØM12          |     | ØM18          |     | ØM30          |      | ØM40          |      |
|---------------------|---------------|-----|---------------|-----|---------------|------|---------------|------|
| ● Flush ○ Surface   | ●             | ○   | ●             | ○   | ●             | ○    | ●             | ○    |
|                     |               |     |               |     |               |      |               |      |
| Sensing Distance    | 2mm           | 4mm | 5mm           | 8mm | 10mm          | 15mm | 20mm          | 25mm |
| Supply Voltage      | 20 - 250VAC   |     | 20 - 250VAC   |     | 20 - 250VAC   |      | 20 - 250VAC   |      |
| Current Consumption | ≤ 2 mA        |     | ≤ 2 mA        |     | ≤ 2 mA        |      | ≤ 2 mA        |      |
| Output Current      | 400mA         |     | 400mA         |     | 400mA         |      | 400mA         |      |
| Switching Frequency | 10Hz          |     | 10Hz          |     | 10Hz          |      | 10Hz          |      |
| Operating Temp.     | -20 to +70 °C |     | -20 to +70 °C |     | -20 to +70 °C |      | -20 to +70 °C |      |
| Hysteresis          | 3 to 15%      |     | 3 to 15%      |     | 3 to 15%      |      | 3 to 15%      |      |
| Cable Length        | 2m            |     | 2m            |     | 2m            |      | 2m            |      |
| Cable Section       | 2 Wire        |     | 2 Wire        |     | 2 Wire        |      | 2 Wire        |      |
| Housing Material    | Aluminium     |     | Aluminium     |     | Aluminium     |      | Aluminium     |      |

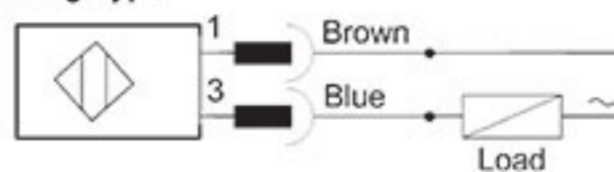
For Sensor Cables see pages 68-71

**Wiring Diagram**

**Cable Type**



**Plug Type**



**Note:** These sensors are not protected against sustained current fault conditions. The fitting of an external inline 0, 4A fuse is therefore advised.

**OUTPUT:**

|           | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| NO, Cable | RI1-1202F-NOMTC | RI1-1204S-NOMTC | RI1-1805F-NOMTC | RI1-1808S-NOMTC | RI1-3010F-NOMTC | RI1-3015S-NOMTC | RI1-4020F-NOMTC | RI1-4025S-NOMTC |
| NC, Cable | RI1-1202F-NCMTC | RI1-1204S-NCMTC | RI1-1805F-NCMTC | RI1-1808S-NCMTC | RI1-3010F-NCMTC | RI1-3015S-NCMTC | RI1-4020F-NCMTC | RI1-4025S-NCMTC |
| NO, Plug  | RI1-1202F-NOMTP | RI1-1204S-NOMTP | RI1-1805F-NOMTP | RI1-1808S-NOMTP | RI1-3010F-NOMTP | RI1-3015S-NOMTP | -               | -               |
| NC, Plug  | RI1-1202F-NCMTP | RI1-1204S-NCMTP | RI1-1805F-NCMTP | RI1-1808S-NCMTP | RI1-3010F-NCMTP | RI1-3015S-NCMTP | -               | -               |

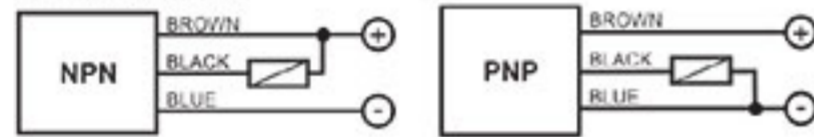
**CAPACITIVE SENSORS IP67**

| Diameter            | ØM12                |     | ØM18                |      | ØM30                |      | 1,5 "BSP          |                |
|---------------------|---------------------|-----|---------------------|------|---------------------|------|-------------------|----------------|
| ● Flush ○ Surface   | ●                   | ○   | ●                   | ○    | ●                   | ○    | ○                 |                |
|                     |                     |     |                     |      |                     |      |                   |                |
| Sensing Distance    | 4mm                 | 8mm | 8mm                 | 15mm | 20mm                | 30mm | 20mm              |                |
| Supply Voltage      | 10 - 30VDC          |     | 10 - 30VDC          |      | 10 - 30VDC          |      | 20-250VAC 50/60Hz | 10-60VDC       |
| Current Consumption | <9 mA               |     | <9 mA               |      | <9 mA               |      | 2.5 mA            | 10mA           |
| Output Current      | 200 mA              |     | 200 mA              |      | 200 mA              |      | 400mA (min 10mA)  | 400mA          |
| Voltage Drop        | 2 V @ 200 mA        |     | 2 V @ 200 mA        |      | 2 V @ 200 mA        |      | 2 V @ 200 mA      | 2V @ 200mA     |
| Adjustment          | Multi-turn Pot      |     | Multi-turn Pot      |      | Multi-turn Pot      |      | Multi-turn Pot    | Multi-turn Pot |
| Switching Frequency | 100 Hz              |     | 100 Hz              |      | 100 Hz              |      | 10 Hz             | 80 Hz          |
| Operating Temp.     | -25 to +70 °C       |     | -25 to +70 °C       |      | -25 to +70 °C       |      | -10 to +65 °C     | -10 to +65°C   |
| Hysteresis          | < 4 %               |     | < 4 %               |      | < 4 %               |      | < 5 %             | < 5 %          |
| Cable Length        | 2 meters, PVC       |     | 2 meters, PVC       |      | 2 meters, PVC       |      | Terminal          | Terminal       |
| Cable Section       | 3 wire              |     | 2 wire or 3 wire    |      | 2 wire or 3 wire    |      | Connection        | Connection     |
| Housing Material    | Nickel Plated Brass |     | Nickel Plated Brass |      | Nickel Plated Brass |      | PVC               | PVC            |

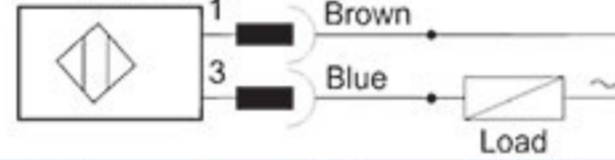
For Sensor Cables see pages 68-71

**Wiring Diagram**

**3 Wire Sensors**



**AC 2 Wire**



**NAMUR**



**OUTPUT:**

| DC Sensors                | Flush           | Surface         | Flush           | Surface         | Flush           | Surface         |
|---------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| PNP NO, Plug              | CS4-1204F-NOMTP | CS4-1208S-NOMTP | CS4-1808F-NOMTP | CS4-1815S-NOMTP | CS4-3020F-NOMTP | CS4-3030S-NOMTP |
| PNP NC, Plug              | CS4-1204F-NCMTP | CS4-1208S-NCMTP | CS4-1808F-NCMTP | CS4-1815S-NCMTP | CS4-3020F-NCMTP | CS4-3030S-NCMTP |
| NPN NO, Plug              | CS5-1204F-NOMTP | CS5-1208S-NOMTP | CS5-1808F-NOMTP | CS5-1815S-NOMTP | CS5-3020F-NOMTP | CS5-3030S-NOMTP |
| NPN NC, Plug              | CS5-1204F-NCMTP | CS5-1208S-NCMTP | CS5-1808F-NCMTP | CS5-1815S-NCMTP | CS5-3020F-NCMTP | CS5-3030S-NCMTP |
| <b>AC Sensors</b>         |                 |                 |                 |                 |                 |                 |
| 2 Wire NO Cable 20-250VAC | -               | -               | CS1-1808F-NOMTC | CS1-1815S-NOMTC | CS1-3020F-NOMTC | CS1-3030S-NOMTC |
| 2 Wire NC Cable 20-250VAC | -               | -               | CS1-1808F-NCMTC | CS1-1815S-NCMTC | CS1-3020F-NCMTC | CS1-3030S-NCMTC |

Code: RC0-4020S-NCPBT (NC)

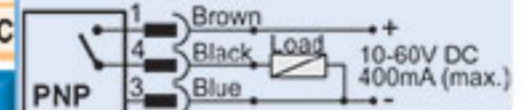
**AC 2 Wire**

0.4A fuse protection required



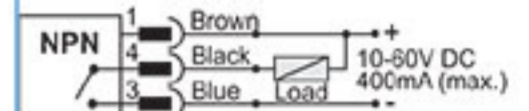
Code: RC1-4020S-NOPBT (NO) -NCPBT (NC)

**DC PNP 3 Wire**



Code: RC4-4020S-NOPBT (NO) -NCPBT (NC)

**DC PNP 3 Wire**



Code: RC5-4020S-NOPBT (NO) -NCPBT (NC)

**NAMUR**

Requires a suitable control module to operate

**2 Wire AC**

Supply Voltage: 20 to 250VAC, 50/60Hz

Minimum Load Current: 10mA

Continuous Load Current: 400mA

Off-state Quiescent Current:

≤2,5mA at 250VAC

These sensors are not protected against sustained over current fault conditions. The fitting of an external inline 0,4A fuse is therefore advised.

DC Sensors are to be connected to a DC power supply and can switch loads (e.g. Relays, solenoids, PLC's) directly.

Supply Voltage: 10 to 60VDC

Maximum Ripple: 10%

Maximum Load Current: 400mA

Quiescent Current: <10mA

Polarity Protection: Yes

Overload Protection: Yes

Short Circuit Protection: Yes





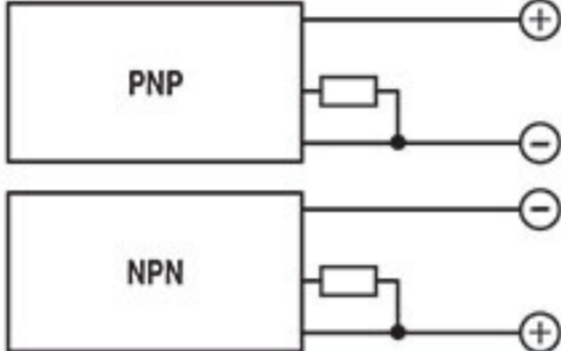

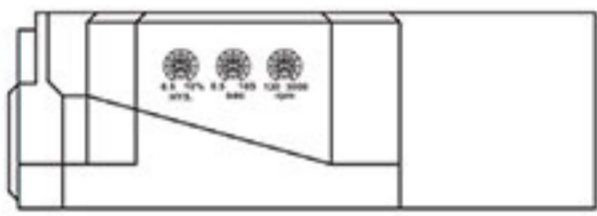
**OPTO ELECTRONIC SENSORS**

| Type   | Opto - Proximity   | Opto - Barrier Sets    |                        | Opto - Fork Sensor  |
|--|--|------------------------|------------------------|---------------------|
|  |  |                        |                        |                     |
| Sensing Distance                                   | 2m   | 10m                    | 5m                     | 3.5mm               |
| Supply Voltage                                     | Select control voltage when ordering SC410 / SC411 control relay |                        |                        |                     |
| Setting  | Sensitivity Trimmer  | Sensitivity Trimmer    |                        | Sensitivity Trimmer |
| Output Current                                     | -  | -                      | -                      | 400mA               |
| Current Consumption                                | -  | -                      | -                      | < 10mA              |
| Voltage Drop                                       | -  | -                      | -                      | 2V max              |
| Operation Mode                                     | Dark or Light  | Dark or Light          | Dark or Light          | Dark or Light       |
| Operating Temperature                              | 0 - 70°C   | 0 - 70°C               | 0 - 70°C               | 0 - 70°C            |
|  |  |                        |                        |                     |
| Front Sensing                                      | RO2-5005P-NOMBC  | RO2-5010B-NOMBC (pair) | RO2-1210B-NOMTC (pair) |                     |
| Side Sensing                                       | RO2-2005P-NOMBC  | RO2-2010B-NOMBC (pair) |                        |                     |
| Fork Sensing PNP                                   |  |                        |                        | RO4-2003B-NOMBC     |
| Fork Sensor PNP with remote sensitivity adjustment |  |                        |                        | RO4-2503B-NOMBC     |
| <b>Separate Parts (i.e. not Tx+Rx)</b>             |  |                        |                        |                     |
| Front Transmitter                                  |  | RO2-5010T-NOMBC        | RO2-1210T-NOMTC        |                     |
| Front Receiver                                     |  | RO2-5010R-NOMBC        | RO2-1210R-NOMTC        |                     |
| Side Transmitter                                   |  | RO2-2010T-NOMBC        |                        |                     |
| Side Receiver                                      |  | RO2-2010R-NOMBC        |                        |                     |

\*\*SC410/SC411 See pg 24 Main Cat

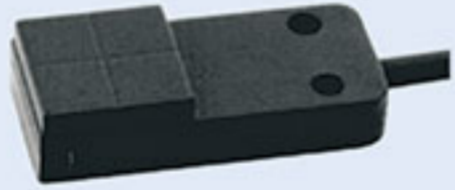

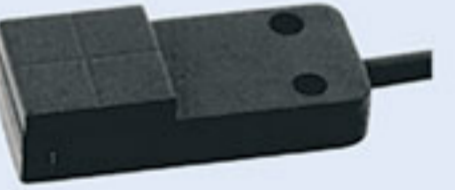
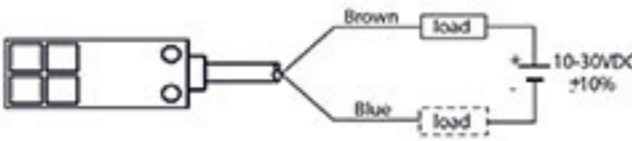
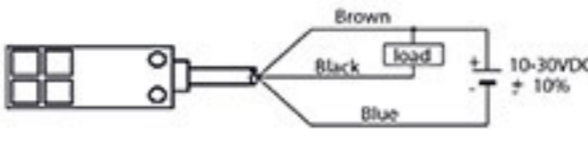
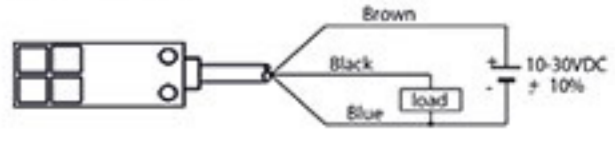
LIMIT & PRESSURE SWITCHES & SENSORS

## DC INDUCTIVE SPEED SENSORS IP67

| Type   | M30 - Cylindrical  |  | 40 x 40 - 5Way Rotatable  |   |
|--|--|--|---|---|
|  | ● Shielded   | ○ Non-Shielded   | ● Shielded  | ○ Non-Shielded  |
| • Nominal Voltage: 10-30VDC<br>• Max. Load Current: 200mA<br><br><b>CE</b>   |     |  |    |    |
| Sensing Distance   | 10mm   | 15mm   | 20mm  | 30mm  |
| Speed Range (1 pulse 1 turn)   | 6-150 targets/minute (slow). 120-3000 targets/minute (fast)                          |  | 6-150 targets/minute (slow). 120-3000 targets/minute (fast)                           |   |
| Power Up Delay   | 0.5-10sec  |  | 0.5-10sec   |   |
| Operation LED  | Present  |  | Present   |   |
| Short Circuit Protection   | YES  |  | YES   |   |
| Hysteresis   | <15%   |  | < 15%   |   |
| Temperature  | -25° to 70°C   |  | -25° to 70°C  |   |
| Housing Material   | Nickel Plated Brass  |  | PBT   |   |
| <b>Wiring Diagrams</b><br>Typical applications include under speed, locked rotor and zero speed detection for shaft, belt or web. Breakage, sequential motor starting or runout detection. |  |  |  |  |
| <b>OUTPUT:</b>   |  |  |   |   |
| PNP N.O.   | FCM1-3010P-A3U2/S*   | FCM2-3015P-A3U2/S*   | FQP1-Q4020P-A3U/S*  | FQP2-Q4030P-A3U/S*  |
| PNP N.C.   | FCM1-3010P-B3U2/S*   | FCM2-3015P-B3U2/S*   | FQP1-Q4020P-B3U/S*  | FQP2-Q4030P-B3U/S*  |
| NPN N.O.   | FCM1-3010N-A3U2/S*   | FCM2-3015N-A3U2/S*   | FQP1-Q4020N-A3U/S*  | FQP2-Q4030N-A3U/S*  |
| NPN N.C.   | FCM1-3010N-B3U2/S*   | FCM2-3015N-B3U2/S*   | FQP1-Q4020N-B3U/S*  | FQP2-Q4030N-B3U/S*  |

\*For fast speed 120-3000 targets/minute change S to F e.g FCM1-3010N-A3U2/F

## DC INDUCTIVE MICRO PROXIMITY SWITCHES IP67

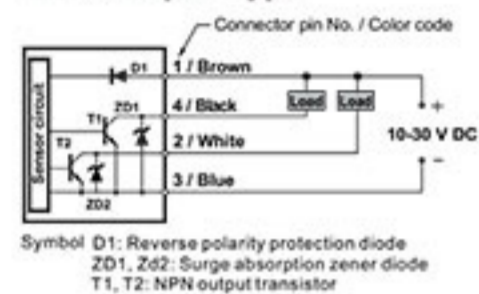
| Diameter  | MPS-8  |   | MPS-10  | MPS-12                              | MPS-15  |                |
|---|--|---|---|-------------------------------------|---|----------------|
|   | ○ Non-Shielded   | ○ Non-Shielded  | ○ Non-Shielded  | ○ Non-Shielded                      | ○ Non-Shielded  | ○ Non-Shielded |
| • Max. Load Current: 100mA  |   |  |  |                                     |   |                |
| <b>CE</b>   |  |   |   |                                     |   |                |
| Sensing Distance  | 2.5mm  | 3mm   | 3mm. 6mm(P/N)   | 8mm                                 |   |                |
| Supply Voltage  | 10-30VDC (3 wire) 10-60VDC (2 wire)  |   | 10-30VDC (3 wire) 10-60VDC (2 wire)   | 10-30VDC (3 wire) 10-60VDC (2 wire) |   |                |
| Switching Frequency   | 1 KHZ (2 wire) 500 HZ (3 wire)   |   | 1 KHZ(2wire) 250HZ(3wire) 500HZ(6mm P/N)  | 1 KHZ (2 wire) 250HZ (3 wire)       |   |                |
| Operation LED   | Present  |   | Present   | Present                             |   |                |
| Short Circuit Protection  | YES  |   | YES   | YES                                 |   |                |
| Temperature   | -25° to 70°C   |   | -25° to 70°C  | -25° to 70°C                        |   |                |
| Housing Material  | Polycarbonate  |   | Polycarbonate   | Polycarbonate                       |   |                |
| Cable Length  | 2m   |   | 2m  | 2m                                  |   |                |
| Dimensions (mm)   | 8 x 7,4 x 20   | 8 x 8 x 23  | 10 x 6 x 27   | 12 x 7,1 x 27                       | 15 x 8 x 32   | 15 x 15 x 30   |
| <b>Wiring Diagrams</b><br>DC 2-Wire      NPN Output      PNP Output |  |   |  |                                     |  |                |
| <b>OUTPUT:</b>  |  |   |   |                                     |   |                |
| PNP NO (3 Wire)   | LQP2-82.5P-AF  | LQP2-82.5P-AT   | LQP2-103P-AF  | LQP2-123P-AF                        | LQP2-156.4P-AF  | LQP2-156.4P-AT |
| PNP NC (3 Wire)   | LQP2-82.5P-BF  | LQP2-82.5P-BT   | LQP2-103P-BF  | LQP2-123P-BF                        | LQP2-156.4P-BF  | LQP2-156.4P-BT |
| NPN NO (3 Wire)   | LQP2-82.5N-AF  | LQP2-82.5N-AT   | LQP2-103N-AF  | LQP2-123N-AF                        | LQP2-156.4N-AF  | LQP2-156.4N-AT |
| NPN NC (3 Wire)   | LQP2-82.5N-BF  | LQP2-82.5N-BT   | LQP2-103N-BF  | LQP2-123N-BF                        | LQP2-156.4N-BF  | LQP2-156.4N-BT |
| NO (2 Wire)   | LQP2-82.5C-AF  | LQP2-82.5C-AT   | LQP2-103C-AF  | LQP2-123C-AF                        | LQP2-156.4C-AF  | LQP2-156.4C-AT |
| NC (2 Wire)   | LQP2-82.5C-BF  | LQP2-82.5C-BT   | LQP2-103C-BF  | LQP2-123C-BF                        | LQP2-156.4C-BF  | LQP2-156.4C-BT |

## M12 DC PHOTOELECTRIC SENSOR PLASTIC & METAL IP67

| Type DC M12 Ø12<br>M12 SERIES  | Diffuse Proximity                          |  | Retro-Reflective                           |  | Through Beam |
|--|--|--|--|--|--------------|
|  |  |  | Non-Polarized                              | Polarized                                  |              |
| <ul style="list-style-type: none"> <li>• Nominal Voltage 10-30VDC</li> <li>• Output: NPN or PNP</li> <li>• Output Current: 150mA</li> <li>• Housing Material: PBT (plastic v) Nickel Plated Brass (metal v)</li> <li>• Temperature Range: -25 to 70°C</li> </ul> |  |  |  |  |              |
| Sensing Distance   | 200mm                                      | 2m   | 1m   | 5.2m                                       |              |
| DC Supply Voltage  | 10-30VDC                                   | 10-30VDC                                   | 10-30VDC                                   | 10-30Vdc                                   |              |
| Emission   | Infrared LED 880nm                         | Infrared LED 880nm                         | Red light 660nm                            | Infrared LED 880nm                         |              |
| Setting  | sensitivity trimmer                        | sensitivity trimmer                        | sensitivity trimmer                        | sensitivity trimmer                        |              |
| Switching Frequency  | 1kHz                                       | 1kHz                                       | 1kHz                                       | 25Hz                                       |              |
| Operation Mode   | Light-ON / Dark-ON selectable <sup>^</sup> | Light-ON / Dark-ON selectable <sup>^</sup> | Light-ON / Dark-ON selectable <sup>^</sup> | Light-ON / Dark-ON selectable <sup>^</sup> |              |

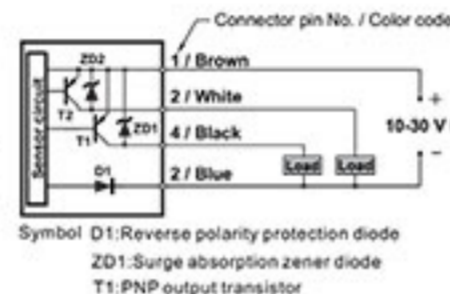
### Wiring Diagrams

#### NPN Output Type



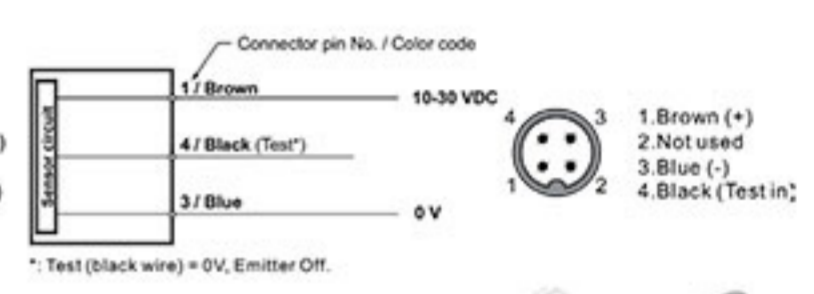
<sup>^</sup>Light/Dark changeover by the A. load or B. load

#### PNP Output Type



<sup>^</sup>Light/Dark changeover by the A. load or B. load

#### Emitter of Thru-beam Mode



### OUTPUT:

|                          | Metal Housing Version  |                        | Plug Type                 |                        |
|--------------------------|------------------------|------------------------|---------------------------|------------------------|
| NPN Cable Version        | M12P*-D0200N-CX9C4U2** | M12P*-L2000N-CX9C4U2** | M12P*-L1000N-CX6C4U2**-PF | M12P*-T5200N-CX9C4U2** |
| PNP Cable Version        | M12P*-D0200P-CX9C4U2** | M12P*-L2000P-CX9C4U2** | M12P*-L1000P-CX6C4U2**-PF | M12P*-T5200P-CX9C4U2** |
| Emitter Cable Version    | -                      | -                      | -                         | M12P*-T5200D-EX9C3L2   |
| Emitter M12 Plug Version | -                      | -                      | -                         | M12P*-T5200D-EX9Q4LE   |



<sup>\*</sup>For metal type replace P with B e.g. M12B-D0200N-CX9C4U2 <sup>\*\*</sup>For plug type replace C4U2 with Q4UE e.g. M12P-D002N-CX9Q4UE

For sensor cable and accessories see pages 68-71

## MINI BEAM PHOTOELECTRIC SENSOR IP67

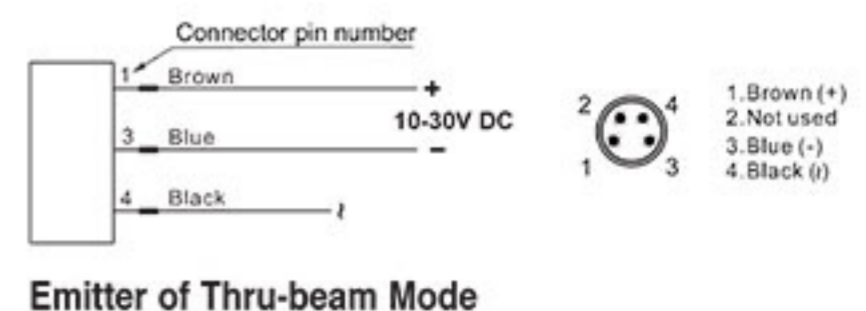
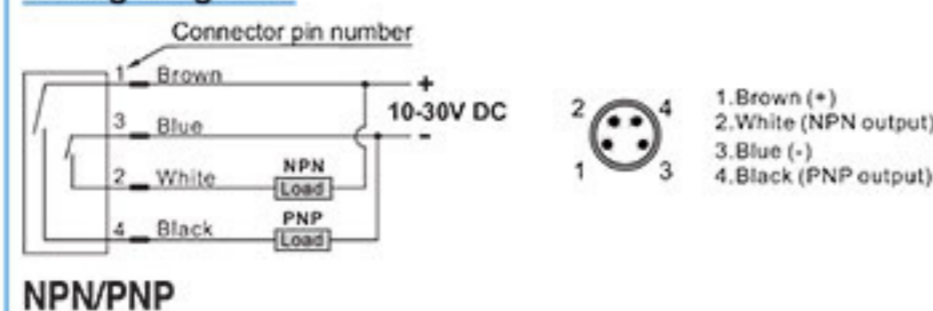
| Type DC<br>MP SERIES   | Diffuse Proximity                |                                  | Retro-Reflective                 |                                  | Through Beam                     |
|--|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
|  | Medium Distance                  | Fixed Focus                      | Non-Polarized                    | Polarized                        |                                  |
| <ul style="list-style-type: none"> <li>• Nominal Voltage 10-30VDC</li> <li>• Output: NPN or PNP Configurable</li> <li>• Output Current: 150mA</li> <li>• Housing Material: Reinforced Thermoplastic Polyester</li> <li>• Temperature Range: -25 to 70°C</li> </ul> |                                  |                                  |                                  |                                  |                                  |
| Sensing Distance   | 380mm                            | 16mm                             | 0.1-5m                           | 2m                               | 0-3m                             |
| DC Supply Voltage  | 10-30VDC                         | 10-30VDC                         | 10-30VDC                         | 10-30VDC                         | 10-30VDC                         |
| Emission   | Infrared LED 880nm               | Infrared LED 880nm               | Red light 650nm                  | Red light 650nm                  | Infrared LED 880nm               |
| Setting  | sensitivity trimmer              |                                  | sensitivity trimmer              | sensitivity trimmer              | sensitivity trimmer              |
| Switching Frequency**  | 1kHz                             | 1kHz                             | 1kHz                             | 1kHz                             | 25Hz                             |
| Operation Mode   | Light-ON / Dark-ON select switch | Light-ON / Dark-ON select switch | Light-ON / Dark-ON select switch | Light-ON / Dark-ON select switch | Light-ON / Dark-ON select switch |

### Pico Style Pigtail Plug Type



### OUTPUT:

### Wiring Diagrams










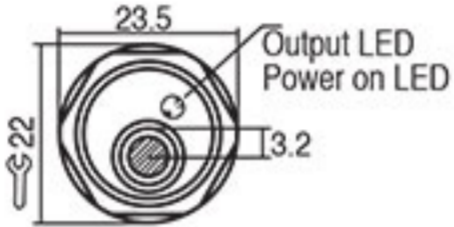
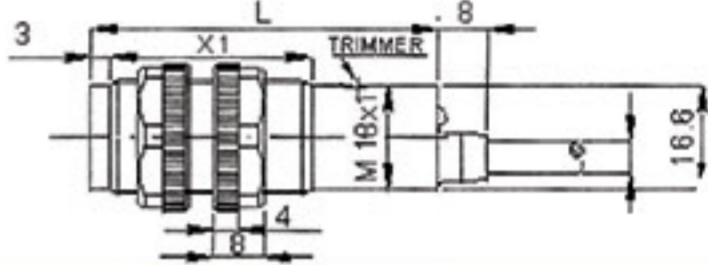
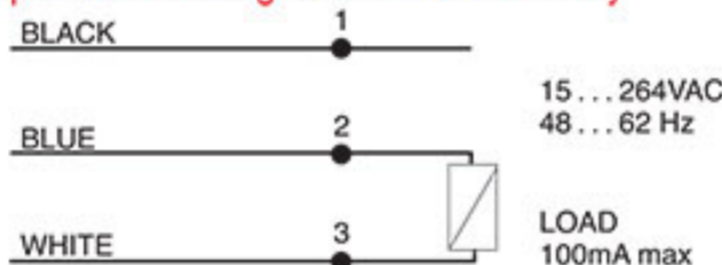


|                             |                   |                   |                   |                      |                    |
|-----------------------------|-------------------|-------------------|-------------------|----------------------|--------------------|
| NPN & PNP Cable Version     | MP-D0380D-CX9C4U2 | MP-C0016D-CX9C4U2 | MP-L5000D-CX6C4U2 | MP-L2000D-CX6C4U2-PF | MP-T3000*D-CX9C4U2 |
| NPN & PNP M8 Pigtail Pico** | MP-D0380D-CX9P4UP | MP-C0016D-CX9P4UP | MP-L5000D-CX6P4UP | MP-L2000D-CX6P4UP-PF | MP-T3000*D-CX9P4UP |
| Emitter Cable Version       | -                 | -                 | -                 | -                    | MP-T3000*D-EX9C3L2 |
| Emitter M8 Pigtail Pico**   | -                 | -                 | -                 | -                    | MP-T3000*D-EX9P4LP |












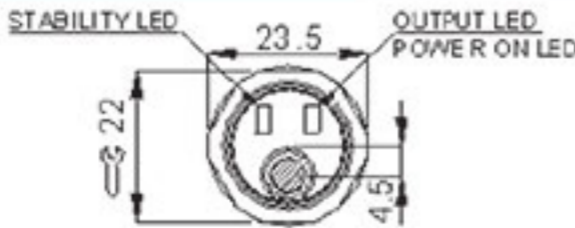
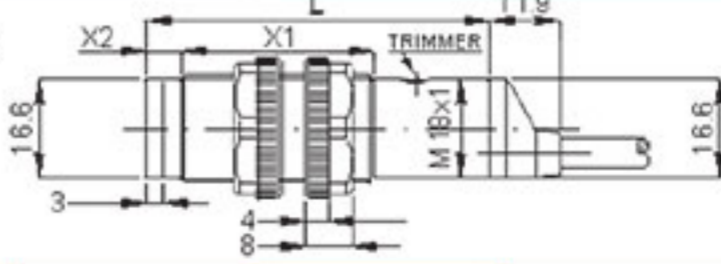
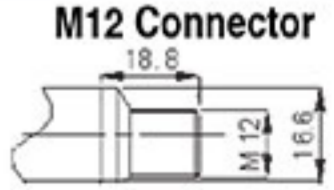
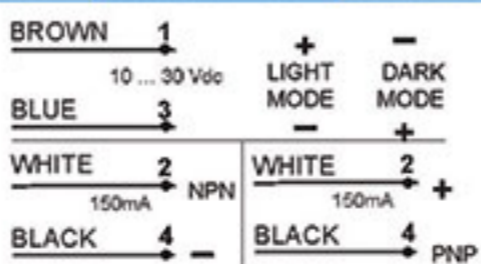
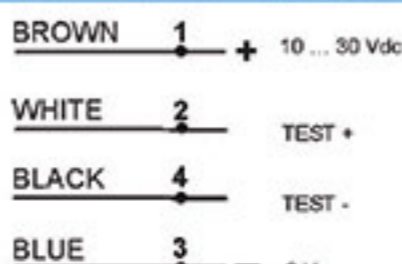

<sup>\*</sup>For units with 30m sensing distance change 3000 to 030M e.g. MP-T030MD-CX9C4U2

For sensor cable and accessories see pages 68-71 <sup>\*\*</sup>High Speed Type available on request

## AC PHOTOELECTRIC SENSORS 3-WIRE DARK/LIGHT MODE IP67

| Type AC M18 Ø18<br>S5 SERIES | Fixed Focus Proximity  | Short Distance Diffuse Proximity  | Medium Distance Diffuse Proximity   | Retro-Reflective  | Through Beam Receiver   | Through Beam Emitter  |   |  |  |  |              |                 |    |    |    |   |    |    |
|------------------------------|--|---|---|---|---|---|---|--|--|--|--------------|-----------------|----|----|----|---|----|----|
|                              | <ul style="list-style-type: none"> <li>Nominal Voltage 15-264VAC</li> <li>Output: SCR + Bridge Rectifier</li> <li>Max. Output Current: 100mA</li> <li>Temperature Range: -25 to 55°C</li> <li>Housing Material: ABS</li> <li>Switching Frequency: 25Hz</li> </ul>   |  |  |  |  |  |  |  |  |  |              |                 |    |    |    |   |    |    |
| Sensing Distance             | 15mm   | 80mm  | 300mm   | 0.1-4m (R2 Reflector*)  | 8m  | 8m  |   |  |  |  |              |                 |    |    |    |   |    |    |
| AC Supply Voltage            | 15-264VAC  | 15-264VAC   | 15-264VAC   | 15-264VAC   | 15-264VAC   | 15-264VAC   |   |  |  |  |              |                 |    |    |    |   |    |    |
| Emission                     | Infrared LED 880nm   | Infrared LED 880nm  | Infrared LED 880nm  | Infrared LED 880nm  | Infrared LED 880nm  | Infrared LED 880nm  |   |  |  |  |              |                 |    |    |    |   |    |    |
| Setting                      | -  | -   | Sensitivity trimmer   | Sensitivity trimmer   | Sensitivity trimmer   | -   |   |  |  |  |              |                 |    |    |    |   |    |    |
| Output LED                   | Red  | Red   | Red   | Red   | Red   | Red   |   |  |  |  |              |                 |    |    |    |   |    |    |
| <b>Dimensions</b>            | <p>AC AXIAL VERSION</p>  <table border="1"> <thead> <tr> <th colspan="3">Models S5</th> </tr> <tr> <th></th> <th>With trimmer</th> <th>Without Trimmer</th> </tr> </thead> <tbody> <tr> <td>X1</td> <td>52</td> <td>42</td> </tr> <tr> <td>L</td> <td>75</td> <td>65</td> </tr> </tbody> </table>  |   |   |   |   |   | Models S5   |  |  |  | With trimmer | Without Trimmer | X1 | 52 | 42 | L | 75 | 65 |
| Models S5                    |  |   |   |   |   |   |   |  |  |  |              |                 |    |    |    |   |    |    |
|                              | With trimmer   | Without Trimmer   |   |   |   |   |   |  |  |  |              |                 |    |    |    |   |    |    |
| X1                           | 52   | 42  |   |   |   |   |   |  |  |  |              |                 |    |    |    |   |    |    |
| L                            | 75   | 65  |   |   |   |   |   |  |  |  |              |                 |    |    |    |   |    |    |
| <b>OUTPUT:</b>               | <p>Dark Mode. Cable Version: S5-1-D15-10, S5-1-C8-10, S5-1-C30-10, S5-1-A2-10, S5-1-F8-10, S5-1-G8-00</p> <p>Light Mode. Cable Version: S5-1-D15-20, S5-1-C8-20, S5-1-C30-20, S5-1-A2-20, S5-1-F8-20</p>   |   |   |   |   |   |   |  |  |  |              |                 |    |    |    |   |    |    |
| <b>Wiring Diagrams</b>       | <p>Light = NO. Dark = NC</p> <p>For Radial Optics 90° Sensing use DEV90 Accessory</p>      |   |   |   |   |   |   |  |  |  |              |                 |    |    |    |   |    |    |

## DC PHOTOELECTRIC SENSORS 4-WIRE DARK/LIGHT MODE IP67

| Type DC M18 Ø18<br>S5 SERIES  | Diffuse Proximity   |   |   |   | Retro-Reflective  |   | Through Beam  |   |
|---|---|---|---|---|---|---|---|---|
|   | Short Distance  | Medium Distance   | Long Distance   | Fixed Focus   | Non-Polarized   | Polarized   | Receiver  | Emitter   |
| <ul style="list-style-type: none"> <li>Nominal Voltage 10-30VDC</li> <li>Output: NPN or PNP Configurable</li> <li>Max. Output Current: ≤150mA</li> <li>Temp. Range: -25 to 55°C</li> <li>Housing Material: ABS</li> </ul>  |    |  |  |  |  |  |  |  |
| Sensing Distance  | 100mm   | 350mm   | 600mm   | 15mm  | 4m(R2 Reflector)*   | 3m(R2 Reflector)*   | 12m   | 12m   |
| Supply Voltage  | 10-30VDC  |   |   |   | 10-30VDC  |   | 10-30VDC  |   |
| Emission  | Infrared LED 880nm  |   | Infrared LED 880nm  |   | Infrared LED 880nm  |   | Red LED 880nm   |   |
| Setting   | Sensitivity trimmer   | -   | -   | Sensitivity trimmer   | Sensitivity trimmer   | -   | -   | Sensitivity trimmer   |
| Output LED  | Red OUTPUT<br>Green STABILITY   |   | Red OUTPUT<br>Green STABILITY   |   | Red OUTPUT<br>Green STABILITY   |   | Red OUTPUT<br>Green STABILITY   | Red Power   |
| Switching Frequency   | 500Hz   |   | 500Hz   |   | 500Hz   |   | 250Hz   |   |
| <b>Dimensions</b>   | <p>For sensor cable and accessories see pages 68-71</p> <p>For Radial Optics 90° Sensing use DEV90 accessory</p>    |   |   |   |   |   |   |   |
| NPN & PNP Dark/Light. Cable Version   | S5-5-C10-30   | S5-5-C35-30   | S5-5-C60-30   | S5-5-D15-30   | S5-5-A4-30  | S5-5-B3-30  | S5-5-F12-30   | S5-5-G12-00   |
| NPN & PNP Dark/Light. M12 plug*   | S5-5-C10-32   | S5-5-C35-32   | S5-5-C60-32   | S5-5-D15-32   | S5-5-A4-32  | S5-5-B3-32  | S5-5-F12-32   | S5-5-G12-02   |
| <b>Plug Type</b>  | <p>Wiring Diagrams</p>      |   |   |   |   |   |   |   |

## DC PHOTOELECTRIC SENSORS SHORT HOUSING PLASTIC >>

| Type DC M18 Ø18<br><b>S15 SERIES</b>   | Diffuse Proximity  |                        |                        |                        |
|--|--|------------------------|------------------------|------------------------|
|  | Short Distance   | Medium Distance        | Long Distance          | Fixed Focus            |
| <ul style="list-style-type: none"> <li>• Nominal Voltage 12-30VDC</li> <li>• Output: NPN or PNP</li> <li>• Output Current: ≤100mA</li> <li>• Temperature Range: -25 to 55°C</li> <li>• New stainless steel models</li> <li>• IP67+IP69K on all models</li> <li>• Johnson Diversey certification for detergents</li> <li>• Atex II 3dg certification</li> </ul> | <br>   | <br>                   | <br>                   | <br>                   |
| Sensing Distance   | 1-10cm   | 1-35cm                 | 1-100cm                | 1-5cm                  |
| DC Supply Voltage  | 12-30VDC   | 12-30VDC               | 12-30VDC               | 12-30VDC               |
| Emission   | Infrared LED 880nm   | Infrared LED 880nm     | Infrared LED 880nm     | Red LED 660nm          |
| Setting  | -  | Sensitivity Trimmer*   | Sensitivity Trimmer*   | -                      |
| Output LED   | Yellow Output LED  | Yellow Output LED      | Yellow Output LED      | Yellow Output LED      |
| Switching Frequency  | 500 Hz   | 500 Hz                 | 500 Hz                 | 1Khz                   |
| Operation Mode   | Light/Dark Selectable^   | Light/Dark Selectable^ | Light/Dark Selectable^ | Light/Dark Selectable^ |
| <p><b>OUTPUT:</b></p>  | <b>Dimensions</b> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p><b>S15-PA-2/3-D50</b></p> </div> <div style="text-align: center;"> <p><b>S15-PA-2/3</b></p> </div> <div style="text-align: center;"> <p><b>S15-PA/NA-5</b></p> </div> </div> |                        |                        |                        |
|  | NPN Cable  | <b>S15-PA-2-C00-NK</b> | <b>S15-PA-2-C10-NK</b> | -                      |
| PNP Cable  | <b>S15-PA-2-C00-PK</b>   | <b>S15-PA-2-C10-PK</b> | -                      | <b>S15-PA-2-D50-PK</b> |
| NPN M12 Plug   | -  | <b>S15-PA-5-C11-NK</b> | <b>S15-PA-5-C31-NK</b> | -                      |
| PNP M12 Plug   | -  | <b>S15-PA-5-C11-PK</b> | <b>S15-PA-5-C31-PK</b> | -                      |
| NPN M12 Plug Stainless Steel   | -  | <b>S15-NA-5-C11-NK</b> | <b>S15-NA-5-C31-NK</b> | -                      |
| PNP M12 Plug Stainless Steel   | -  | <b>S15-NA-5-C11-PK</b> | <b>S15-NA-5-C31-PK</b> | -                      |

\*Sensitivity trimmer on M12 Plug Units Only For sensor cable and accessories see pages 68-71

## DC PHOTOELECTRIC SENSORS PLASTIC AND METAL IP67

| Type DC M18 Ø18<br><b>S50 SERIES</b>  | Diffuse Proximity         |                           |                           |                           |
|---|---------------------------|---------------------------|---------------------------|---------------------------|
|   | Short Distance            | Medium Distance           | Long Distance             | Fixed Focus               |
| <ul style="list-style-type: none"> <li>• Nominal Voltage 10-30VDC</li> <li>• Output: NPN or PNP</li> <li>• Contacts: NO and NC</li> <li>• Output Current: ≤100mA</li> <li>• Housing Material: PBT - Lens PMMA</li> <li>• Temperature Range: -25 to 55°C</li> <li>• "One For All"</li> <li>• Flat plastic or cylindrical metal housing</li> <li>• Versions with Trimmers</li> <li>• Cable or M12 Connection</li> <li>• EN standard NPN or PNP NO-NC configuration</li> </ul> | <br>                      | <br>                      | <br>                      | <br>                      |
| Sensing Distance  | 100mm                     | 400mm                     | 700mm                     | 100mm                     |
| DC Supply Voltage   | 10-30VDC                  | 10-30VDC                  | 10-30VDC                  | 10-30VDC                  |
| Emission  | Red 630nm                 | Infrared LED 880nm        | Infrared LED 880nm        | Red LED 630nm             |
| Minimum Detectable Object   | -                         | -                         | -                         | -                         |
| Setting   | -                         | Sensitivity trimmer       | Sensitivity trimmer       | -                         |
| Output LED  | Yellow                    | Yellow/Green (stability)  | Yellow/Green (stability)  | Yellow                    |
| Switching Frequency   | 1kHz                      | 1kHz                      | 1kHz                      | 1kHz                      |
| Operation Mode  | Dark on NO / Light on NC  | Dark on NO / light on NC  | Dark on NO / Light on NC  | Dark on NO / light on NC  |
| <p><b>Metal Housing Version</b></p>   | <b>Wiring Diagrams</b>    |                           |                           | <b>M12 Connector</b>      |
| <p><b>Plug Type</b></p>   |                           |                           |                           |                           |
| NPN NO-NC Cable   | <b>S50-P**A-2*-C10-NN</b> | <b>S50-P**A-2*-C21-NN</b> | <b>S50-P**A-2*-C01-NN</b> | <b>S50-P**A-2*-D00-NN</b> |
| PNP NO-NC Cable   | <b>S50-P**A-2*-C10-PP</b> | <b>S50-P**A-2*-C21-PP</b> | <b>S50-P**A-2*-C01-PP</b> | <b>S50-P**A-2*-D00-PP</b> |
| Emitter Cable   | -                         | -                         | -                         | -                         |

\*For plug type replace 2 with 5 e.g. S50-PA-5-B01-NN For sensor cable and accessories see pages 68-71

\*\*For metal type replace P with M e.g. S50-MA-5-C10-PK For Radial Optics 90° Sensing use DEV90 Accessory

LIMIT & PRESSURE SWITCHES & SENSORS

## AND STAINLESS STEEL PNP/NPN IP67 & IP69K ATEX II 3dg

| Retro-Reflective       |                        |                        |                        | Through Beam           |                        |
|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Non-Polarized          | Polarized              | Transparents           | Background Suppression | Receiver               | Emitter                |
|                        |                        |                        |                        |                        |                        |
| 0.1-5m (R2 Reflector)  | 0.1-4m (R2 Reflector)  | 0.1-8m (R2 Reflector)  | 40-120mm               | 0-20m                  | 0-20m                  |
| 12-30VDC               | 12-30VDC               | 12-30VDC               | 12-30VDC               | 12-30VDC               | 12-30VDC               |
| Infrared LED 880nm     | Red LED 660nm          | Red LED 660nm          | Red LED 660nm          | -                      | Infrared LED 880nm     |
| Sensitivity Trimmer*   | Sensitivity Trimmer*   | Sensitivity Trimmer*   | Sensitivity Trimmer*   | Sensitivity Trimmer*   | -                      |
| Yellow Output LED      | Yellow Output LED      | Yellow Output LED      | Yellow Output LED      | Yellow Output LED      | Yellow Output LED      |
| 500 Hz                 | 500 Hz                 | 500 Hz                 | 500 Hz                 | 250 Hz                 | -                      |
| Light/Dark Selectable^ | Light/Dark Selectable^ | Light/Dark Selectable^ | Light/Dark Selectable^ | Light/Dark Selectable^ | Light/Dark Selectable^ |

### Wiring Diagrams

**Cable**  
S15...A00/B00/C00/C10/F00/D50

BROWN 1 +12...30 VDC  
WHITE 2 DARK/LIGHT\*  
BLACK 4 OUTPUT  
BLUE 3 -0V

**M12 Connector**  
S15...A01/B01/C11/C31/T01/F01/M01

DARK/LIGHT\* (WHITE) 2  
+12...30VDC (BROWN) 1  
0V- (BLUE) 3  
OUTPUT (BLACK) 4

**S15...G01**

TEST+ (WHITE) 2  
+12...30VDC (BROWN) 1  
0V- (BLUE) 3  
TEST- (BLACK) 4

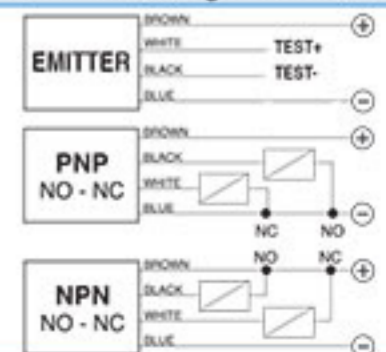
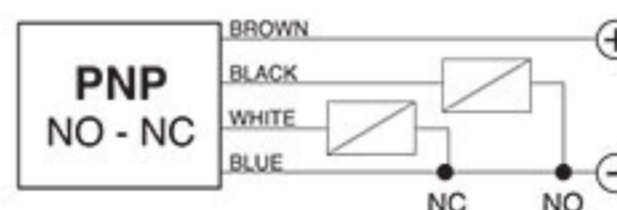
\*With Light/Dark input not connected the Proximity models in the light mode, the retroreflex and through beam models in the Dark mode. The Light mode can be selected connecting the Light/Dark input to +Vdc and the Dark mode connecting it to the 0Vdc.

|                 |                 |                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| S15-PA-2-A00-NK | S15-PA-2-B00-NK | -               | -               | S15-PA-2-F00-NK | S15-PA-2-G00-XG |
| S15-PA-2-A00-PK | S15-PA-2-B00-PK | -               | -               | S15-PA-2-F00-PK |                 |
| S15-PA-5-A01-NK | S15-PA-5-B01-NK | S15-PA-5-T01-NK | S15-PA-5-M01-NK | S15-PA-5-F01-NK | S15-PA-5-G01-XG |
| S15-PA-5-A01-PK | S15-PA-5-B01-PK | S15-PA-5-T01-PK | S15-PA-5-M01-PK | S15-PA-5-F01-PK |                 |
| S15-NA-5-A01-NK | S15-NA-5-B01-NK | S15-NA-5-T01-NK | -               | S15-NA-5-F01-NK | S15-NA-5-G01-XG |
| S15-NA-5-A01-PK | S15-NA-5-B01-PK | S15-NA-5-T01-PK | -               | S15-NA-5-F01-PK |                 |

\*Sensitivity trimmer on M12 Plug Units Only For sensor cable and accessories see pages 68-71

## DC PHOTOELECTRIC SENSORS PLASTIC & METAL IP67

| Retro-Reflective          |                          |                              | Contrast Sensor        | Through Beam             |
|---------------------------|--------------------------|------------------------------|------------------------|--------------------------|
| Non-Polarized             | Polarized                | Retroreflex for Transparents |                        |                          |
|                           |                          |                              |                        |                          |
| 0.1-5m (R2,R5 reflector*) | 4m (R2,R5 reflector*)    | 0.7-1.7m (R2,R5 reflector*)  | 10mm                   | 0-20m                    |
| 10-30VDC                  | 10-30VDC                 | 10-30VDC                     | 10-30VDC               | 10-30VDC                 |
| Infrared LED 880nm        | Red 660nm                | Red LED 660nm                | White LED 400-700nm    | Infrared LED 880nm       |
| -                         | -                        | -                            | 0.5mm                  | -                        |
| -                         | Sensitivity trimmer      | Sensitivity trimmer          | Teach-in push-button   | Sensitivity trimmer      |
| Yellow                    | Yellow/Green (stability) | Yellow                       | Yellow/Green/Red Error | Yellow/Green (stability) |
| 1kHz                      | 1kHz                     | 1kHz                         | 5kHz                   | 250kHz                   |
| Dark on NO / light on NC  | Dark on NO / light on NC | Dark on NO / light on NC     | Dark with EASYtouch™   | Dark on NO / light on NC |



|                    |                    |                    |                    |                    |
|--------------------|--------------------|--------------------|--------------------|--------------------|
| S50-P**A-2*-A00-NN | S50-P**A-2*-B01-NN | S50-P**A-2*-T01-NN | S50-P**A-2*-W03-NN | S50-P**A-2*-F01-NN |
| S50-P**A-2*-A00-PP | S50-P**A-2*-B01-PP | S50-P**A-2*-T01-PP | S50-P**A-2*-W03-PP | S50-P**A-2*-F01-PP |
| -                  | -                  | -                  | -                  | S50-P**A-2*-G00-XG |

Laser models available on request

## DC PHOTOELECTRIC SENSORS PLASTIC & METAL IP67

| Type DC M18 Ø18<br>S51 SERIES   | CE   | Diffuse Proximity        |                        | Retro-Reflective      |                        | Through Beam       |         |   |  |                          |
|---|--|--------------------------|------------------------|-----------------------|------------------------|--------------------|---------|---|--|--------------------------|
|   |  | Short Distance           | Long Distance          | Non-Polarized         | Polarized              | Receiver           | Emitter |   |  |                          |
| <ul style="list-style-type: none"> <li>Nominal Voltage 10-30VDC</li> <li>Output: NO, NPN or PNP</li> <li>Output Current: ≤100mA</li> <li>Housing Material: PBT (plastic v) Nickel Plated Brass (metal v)</li> <li>Temperature Range: -25 to 55°C</li> <li>Flat plastic or cylindrical metal housing</li> <li>Cable or M12 connection NPN or PNP output</li> <li>Standard 3 wire connection configuration</li> </ul> |  |                          |                        |                       |                        |                    |         |   |  |                          |
| Sensing Distance  | 100mm  | 400mm                    | 0.1-4m (R5 Reflector)  | 0.1-3m (R5 Reflector) | 20m                    |                    |         |   |  |                          |
| DC Supply Voltage   | 10-30VDC   |                          | 10-30VDC               |                       | 10-30VDC               |                    |         |   |  |                          |
| Emission  | Infrared LED 880nm   |                          | Infrared LED 880nm     | Red LED 650nm         | Infrared LED 880nm     |                    |         |   |  |                          |
| Setting   | -  | Sensitivity trimmer      | -                      | Sensitivity trimmer   | -                      |                    |         |   |  |                          |
| Output LED  | -  |                          | -                      |                       | -                      | Yellow Output LED  |         |   |  |                          |
| Switching Frequency   | 500Hz  |                          | 500Hz                  |                       | 120Hz                  |                    |         |   |  |                          |
| Operation Mode  | Dark/Light selectable^   |                          | Dark/Light selectable^ |                       | Dark/Light selectable^ |                    |         |   |  |                          |
| ^With Light/Dark input not connected the Proximity models function in the light mode, the retroreflex and through beam models in the Dark mode. The Light mode can be selected connecting the Light/Dark input to +Vdc and the Dark mode connecting it to the 0Vdc  |  |                          |                        |                       |                        |                    |         |   |  |                          |
| <b>Metal Housing Version</b>  | <b>Wiring Diagrams</b> <table border="0" style="width:100%"> <tr> <td style="width:33%"> <b>S51...A00/B01/C01/C10/C20/F00</b><br/>           BROWN 1 + 10 ... 30 Vdc<br/>           WHITE 2 DARK- / LIGHT+ *<br/>           BLACK 4 N.O. OUTPUT<br/>           BLUE 3 - 0V         </td> <td style="width:33%"> <b>S51...G00</b><br/>           BROWN 1 + 10 ... 30 Vdc<br/>           WHITE 2 TEST +<br/>           BLACK 4 TEST -<br/>           BLUE 3 - 0V         </td> <td style="width:33%"> <b>M12 Connector</b><br/> </td> </tr> </table> |                          |                        |                       |                        |                    |         | <b>S51...A00/B01/C01/C10/C20/F00</b><br>BROWN 1 + 10 ... 30 Vdc<br>WHITE 2 DARK- / LIGHT+ *<br>BLACK 4 N.O. OUTPUT<br>BLUE 3 - 0V | <b>S51...G00</b><br>BROWN 1 + 10 ... 30 Vdc<br>WHITE 2 TEST +<br>BLACK 4 TEST -<br>BLUE 3 - 0V | <b>M12 Connector</b><br> |
| <b>S51...A00/B01/C01/C10/C20/F00</b><br>BROWN 1 + 10 ... 30 Vdc<br>WHITE 2 DARK- / LIGHT+ *<br>BLACK 4 N.O. OUTPUT<br>BLUE 3 - 0V   | <b>S51...G00</b><br>BROWN 1 + 10 ... 30 Vdc<br>WHITE 2 TEST +<br>BLACK 4 TEST -<br>BLUE 3 - 0V   | <b>M12 Connector</b><br> |                        |                       |                        |                    |         |   |  |                          |
| <b>OUTPUT:</b>  |  |                          |                        |                       |                        |                    |         |   |  |                          |
| NPN Cable   | S51-P**A-2*-C10-NK   | S51-P**A-2*-C01-NK       | S51-P**A-2*-A00-NK     | S51-P**A-2*-B01-NK    | S51-P**A-2*-F00-NK     | S51-P**A-2*-G00-XG |         |   |  |                          |
| PNP Cable   | S51-P**A-2*-C10-PK   | S51-P**A-2*-C01-PK       | S51-P**A-2*-A00-PK     | S51-P**A-2*-B01-PK    | S51-P**A-2*-F00-PK     |                    |         |   |  |                          |
|   |  |                          |                        |                       |                        |                    |         |   |  |                          |
| *For plug type replace 2 with 5 e.g. S51-PA-5-B01-PK For sensor cable and accessories see pages 68-71<br>**For metal type replace P with M e.g. S51-MA-5-B01-PK For Radical Optics, replace A with R. E.g. S51-PR-5-B01-PK  |  |                          |                        |                       |                        |                    |         |   |  |                          |

## DC MINIATURE PHOTOELECTRIC SENSORS DARK/LIGHT MODE IP67

| Type DC<br>S3Z SERIES   | CE  | cUL US LISTED                            | Diffuse Proximity  | Polarized Retro-Reflective | Narrow Beam Proximity | Through Beam Set |  |  |  |  |  |  |  |  |
|---|---|--|--|----------------------------|-----------------------|------------------|--|--|--|--|--|--|--|--|
|   |   |  | <ul style="list-style-type: none"> <li>Nominal Voltage 10-30VDC</li> <li>Output: NPN or PNP</li> <li>Output Current: ≤100mA</li> <li>Housing Material: PC/PBT</li> <li>Temperature Range: -25 to 55°C</li> </ul> |                            |                       |                  |  |  |  |  |  |  |  |  |
| Sensing Distance  | 0-700mm   | 0.05-4m (R5 Reflector)*                  | 150mm  | 15m                        |                       |                  |  |  |  |  |  |  |  |  |
| DC Supply Voltage   | 10-30VDC  |  | 10-30VDC   |                            | 10-30VDC              |                  |  |  |  |  |  |  |  |  |
| Emission  | Infrared LED 870nm  | Red LED 665nm                            | Red LED 665nm  | Infrared LED 870nm         |                       |                  |  |  |  |  |  |  |  |  |
| Setting   | Sensitivity trimmer   |  | Sensitivity trimmer  |                            | Sensitivity trimmer   |                  |  |  |  |  |  |  |  |  |
| Output LED  | Yellow/Green (stability)  |  | Yellow/Green (stability)   |                            | -                     |                  |  |  |  |  |  |  |  |  |
| Switching Frequency   | 500Hz   |  | 500Hz  |                            | 500Hz                 |                  |  |  |  |  |  |  |  |  |
| Operation Mode  | Dark or light   |  | Dark or light  |                            | Dark or light         |                  |  |  |  |  |  |  |  |  |
| <b>M8 Connector</b>   | <b>Wiring Diagrams</b> <table border="0" style="width:100%"> <tr> <td style="width:25%"> <b>NPN</b><br/>           BROWN +<br/>           BLACK<br/>           BLUE -         </td> <td style="width:25%"> <b>NPN</b><br/>           BROWN +<br/>           BLACK<br/>           BLUE -         </td> <td style="width:25%"> <b>NPN</b><br/>           BROWN +<br/>           BLACK<br/>           BLUE -         </td> <td style="width:25%"> <b>NPN</b><br/>           BROWN +<br/>           BLACK<br/>           BLUE -         </td> </tr> <tr> <td> <b>PNP</b><br/>           BROWN +<br/>           BLACK<br/>           BLUE -         </td> <td> <b>PNP</b><br/>           BROWN +<br/>           BLACK<br/>           BLUE -         </td> <td> <b>PNP</b><br/>           BROWN +<br/>           BLACK<br/>           BLUE -         </td> <td> <b>PNP</b><br/>           BROWN +<br/>           BLACK<br/>           BLUE -         </td> </tr> </table> |  |  |                            |                       |                  | <b>NPN</b><br>BROWN +<br>BLACK<br>BLUE - | <b>NPN</b><br>BROWN +<br>BLACK<br>BLUE - | <b>NPN</b><br>BROWN +<br>BLACK<br>BLUE - | <b>NPN</b><br>BROWN +<br>BLACK<br>BLUE - | <b>PNP</b><br>BROWN +<br>BLACK<br>BLUE - | <b>PNP</b><br>BROWN +<br>BLACK<br>BLUE - | <b>PNP</b><br>BROWN +<br>BLACK<br>BLUE - | <b>PNP</b><br>BROWN +<br>BLACK<br>BLUE - |
| <b>NPN</b><br>BROWN +<br>BLACK<br>BLUE -  | <b>NPN</b><br>BROWN +<br>BLACK<br>BLUE -  | <b>NPN</b><br>BROWN +<br>BLACK<br>BLUE - | <b>NPN</b><br>BROWN +<br>BLACK<br>BLUE -   |                            |                       |                  |  |  |  |  |  |  |  |  |
| <b>PNP</b><br>BROWN +<br>BLACK<br>BLUE -  | <b>PNP</b><br>BROWN +<br>BLACK<br>BLUE -  | <b>PNP</b><br>BROWN +<br>BLACK<br>BLUE - | <b>PNP</b><br>BROWN +<br>BLACK<br>BLUE -   |                            |                       |                  |  |  |  |  |  |  |  |  |
| <b>OUTPUT:</b>  |   |  |  |                            |                       |                  |  |  |  |  |  |  |  |  |
| PNP Light. Cable Version  | S3Z-PR-2*-C11-PL  | S3Z-PR-2*-B01-PL                         | S3Z-PR-2*-C01-PL   | S3Z-PR-2*-FG01-PL          |                       |                  |  |  |  |  |  |  |  |  |
| PNP Dark. Cable Version   | S3Z-PR-2*-C11-PD  | S3Z-PR-2*-B01-PD                         | S3Z-PR-2*-C01-PD   | S3Z-PR-2*-FG01-PD          |                       |                  |  |  |  |  |  |  |  |  |
| NPN Light. Cable Version  | S3Z-PR-2*-C11-NL  | S3Z-PR-2*-B01-NL                         | S3Z-PR-2*-C01-NL   | S3Z-PR-2*-FG01-NL          |                       |                  |  |  |  |  |  |  |  |  |
| NPN Dark. Cable Version   | S3Z-PR-2*-C11-ND  | S3Z-PR-2*-B01-ND                         | S3Z-PR-2*-C01-ND   | S3Z-PR-2*-FG01-ND          |                       |                  |  |  |  |  |  |  |  |  |
|   |   |  |  |                            |                       |                  |  |  |  |  |  |  |  |  |
| Light = NO. Dark = N.C<br>*For plug type replace 2 with 5 e.g. S3Z-PR-5-C01-PL For sensor cable and accessories see pages 68-71<br>**For plug and cable use part number CS-B1-02-G-05/03 (03 = 3m Cable, 05 = 5m Cable) Laser models available on request |   |  |  |                            |                       |                  |  |  |  |  |  |  |  |  |

LIMIT & PRESSURE SWITCHES & SENSORS

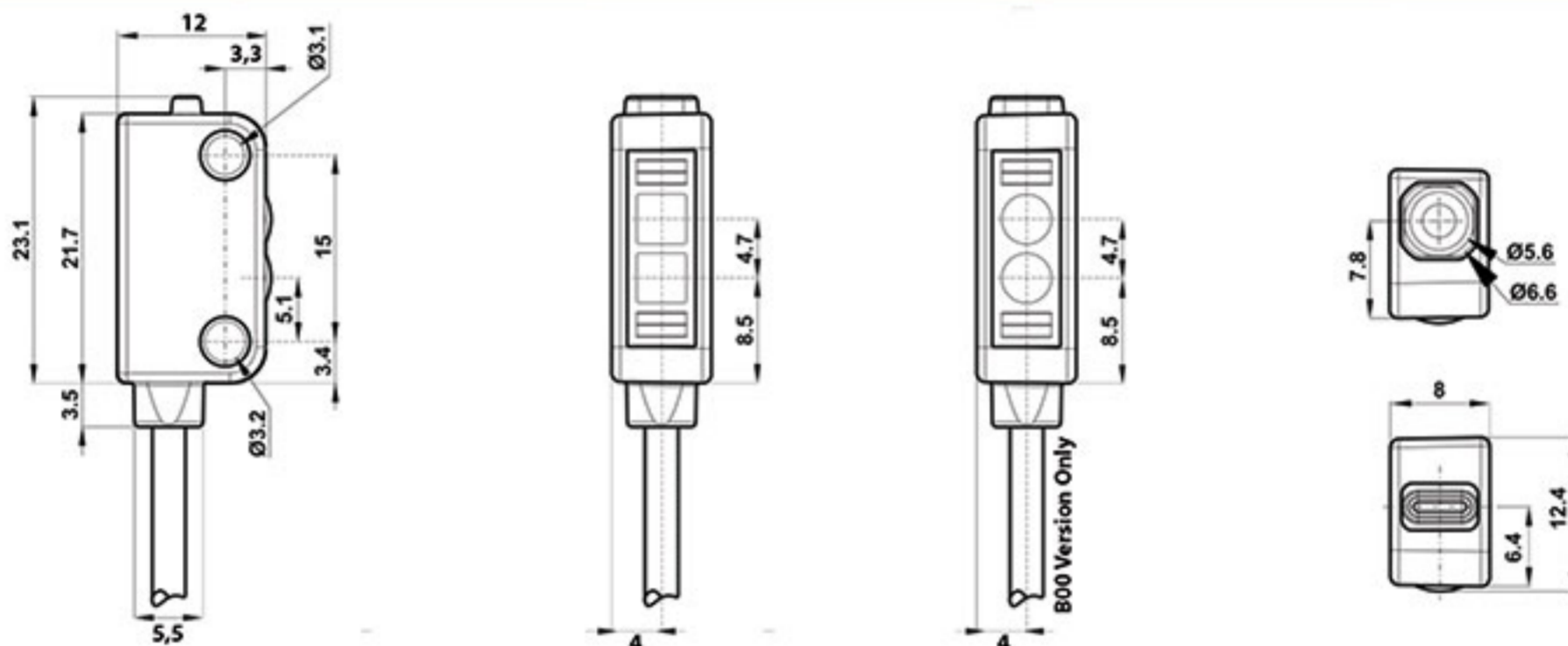


**NEW**

# DC SUBMINIATURE SMALL PHOTOELECTRIC SENSOR IP67

| Type DC<br>SMALL SERIES  | Fixed Focus   |   |   |   |
|--|---|---|---|---|
|  | Short Distance  | Normal Distance   | Medium Distance   | Long Distance   |
| <ul style="list-style-type: none"> <li>Nominal Voltage: 10-30VDC</li> <li>Output: NPN or PNP NO-NC</li> <li>Output Current: 50mA Max</li> <li>Current Consumption 20mA Max</li> <li>Housing Material: Polycarbonate</li> <li>Cable Length: 2m</li> <li>Dimensions (8 x 23 x 12)</li> </ul> |  |  |  |  |
| Sensing Distance   | 15mm  | 20mm  | 30mm  | 50mm  |
| DC Supply Voltage  | 10-30VDC  | 10-30VDC  | 10-30VDC  | 10-30VDC  |
| Emission   | Red LED 640nm   | Red LED 640nm   | Red LED 640nm   | Red LED 640nm   |
| Switching Frequency  | 700Hz   | 700Hz   | 700Hz   | 700Hz   |
| Output LED   | Yellow Output - Green Power   | Yellow Output - Green Power   | Yellow Output - Green Power   | Yellow Output - Green Power   |
| Operation Mode   | Light on NO / Dark on NC  | Light on NO / Dark on NC  | Light on NO / Dark on NC  | Light on NO / Dark on NC  |

**Dimensions**



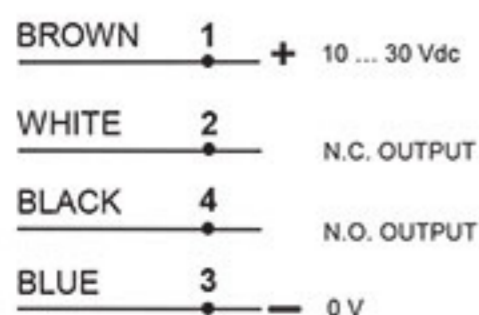
**OUTPUT:**

|           |                |                |                |                |
|-----------|----------------|----------------|----------------|----------------|
| PNP NO-NC | SM-PR-2-D00-PP | SM-PR-2-D10-PP | SM-PR-2-D20-PP | SM-PR-2-D30-PP |
| NPN NO-NC | SM-PR-2-D00-NN | SM-PR-2-D10-NN | SM-PR-2-D20-NN | SM-PR-2-D30-NN |

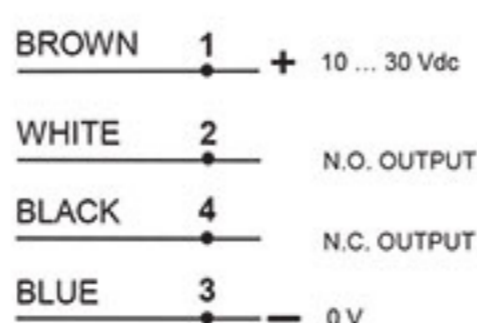
| Type DC<br>SMALL SERIES | Retro-Reflective  |   | Through Beam  |
|-------------------------|---|---|---|
|                         | Non-Polarized   | Polarized   |   |
|                         |  |  |  |
| Sensing Distance        | 300mm   | 1m  | 2m  |
| DC Supply Voltage       | 10-30VDC  | 10-30VDC  | 10-30VDC  |
| Emission                | Red LED 640nm   | Red LED 640nm   | Red LED 640nm   |
| Switching Frequency     | 700Hz   | 700Hz   | 385Hz   |
| Output LED              | Yellow Output - Green Power   | Yellow Output - Green Power   | Yellow Output - Green Power   |
| Operation Mode          | Light on NC / Dark on NO  | Light on NC / Dark on NO  | Light on NC / Dark on NO  |

**Wiring Diagrams**

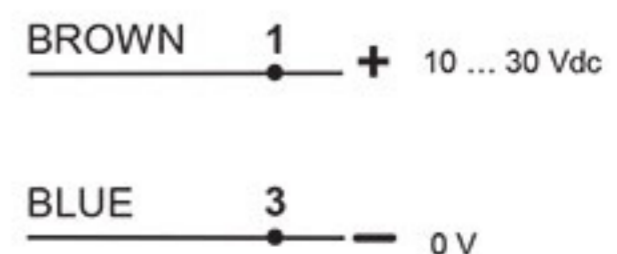
**SM-PR-2-Dx0**



**SM-PR-2-A00/B00/F00**





**SM-PR-2-G00-xx**



**OUTPUT:**

|           |                |                |                |
|-----------|----------------|----------------|----------------|
| PNP NO-NC | SM-PR-2-A00-PP | SM-PR-2-B00-PP | SM-PR-2-F00-PP |
| NPN NO-NC | SM-PR-2-A00-NN | SM-PR-2-B00-NN | SM-PR-2-F00-NN |
| Emitter   | -              | -              | SM-PR-2-G00-XG |

## ECONOMY DC MINIATURE SENSOR PNP/NPN IP67

|   |   |   |   |
|---|---|---|---|
| Type DC<br>S100 SERIES  | Medium Distance   | Long Distance   | Fixed Focus   |
| <ul style="list-style-type: none"> <li>Nominal Voltage: 10-30VDC</li> <li>Output: NPN or PNP</li> <li>Output Current: 100mA</li> <li>Temperature Range: -25 to 55°C</li> <li>Housing Material: ABS (housing) / PMMA (indicators cover)</li> <li>Cost Effective</li> </ul> |  |  |  |
| Sensing Distance  | 300mm   | 500mm   | 70mm  |
| DC Supply Voltage   | 10-30VDC  | 10-30VDC  | 10-30VDC  |
| Emission  | Red LED 632nm   | Red LED 632nm   | Red LED 632nm   |
| Switching Frequency   | 500 Hz  | 500 Hz  | 500 Hz  |
| Operation Mode  | Dark/Light input  | Dark/Light input  | Dark/Light input  |

**Plug Type**



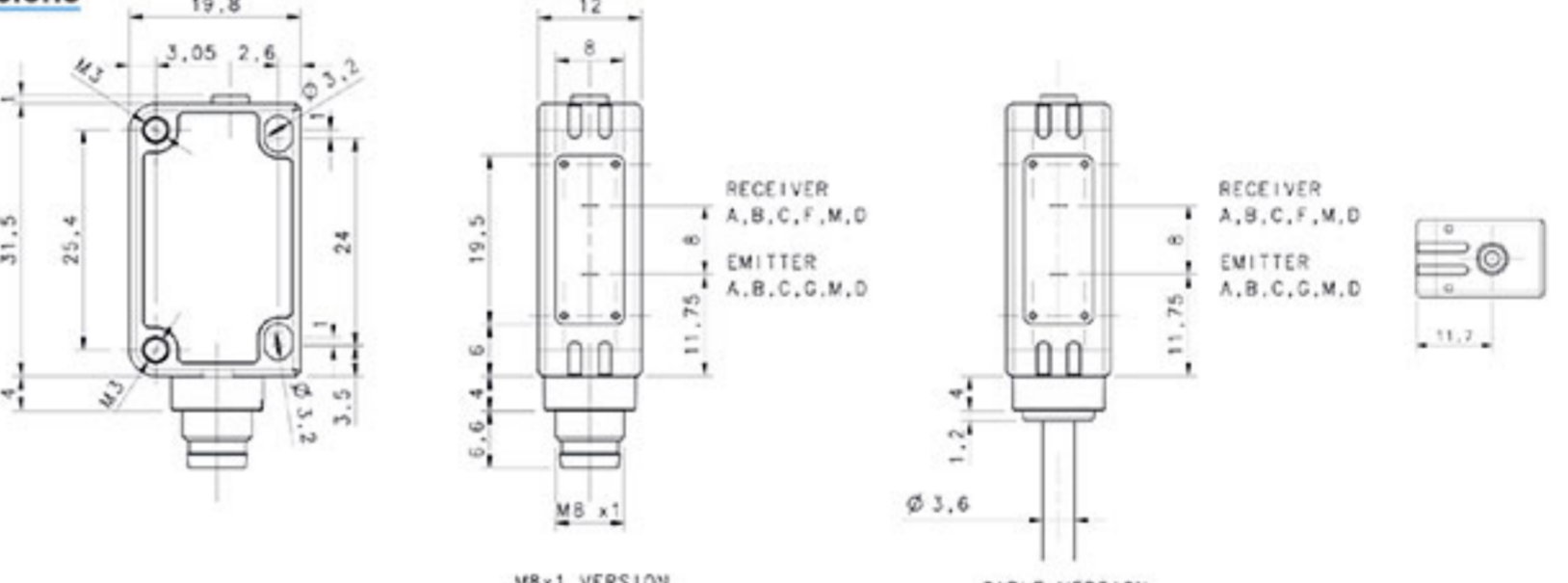
Anti tampering sensor

Two threaded front mounting holes

Two slotted rear mounting holes

**OUTPUT:**

**Dimensions**






M8x1 VERSION

CABLE VERSION

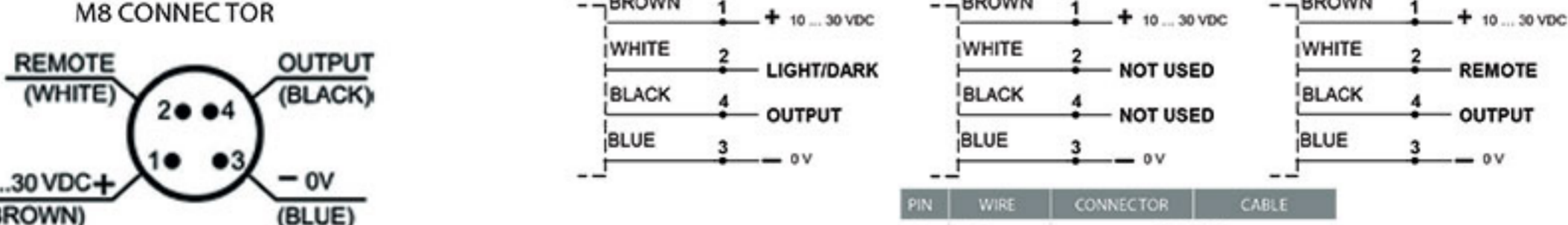
RECEIVER A,B,C,F,M,D

EMITTER A,B,C,G,M,D

|  |                   |                   |                   |
|--|-------------------|-------------------|-------------------|
| PNP Cable  | S100-PR-2*-C00-PK | S100-PR-2*-C10-PK | S100-PR-2*-D00-PK |
| NPN Cable  | S100-PR-2*-C00-NK | S100-PR-2*-C10-NK | S100-PR-2*-D00-NK |
| <p>*For plug type replace 2 with 5 e.g. S100-PR-5-C00-PK For sensor cable and accessories see pages 68-71</p> <p>*For plug and cable, use code CS-B1-02-G-03/05 (03 = 3m Cable, 05 = 5m Cable)</p> |                   |                   |                   |

|   |   |  |   |
|---|---|--|---|
| Type DC<br>S100 SERIES  | Retro-Reflective  | Background Suppression   | Through Beam  |
| <ul style="list-style-type: none"> <li>Nominal Voltage: 10-30VDC</li> <li>Output: NPN or PNP</li> <li>Output Current: 100mA</li> <li>Temperature Range: -25 to 55°C</li> <li>Housing Material: ABS (housing) / PMMA (indicators cover)</li> <li>Cost Effective</li> </ul> | Non-Polarized   | Polarized  |   |
|   |  |  |  |
| Sensing Distance  | 8m  | 6m   | 30-100mm  |
| DC Supply Voltage   | 10-30VDC  | 10-30VDC   | 10-30VDC  |
| Emission  | Infrared LED 860nm  | Red LED 632nm  | Red LED 632nm   |
| Switching Frequency   | 500 Hz  | 500 Hz   | 500 Hz  |
| Operation Mode  | Dark/Light input  | Dark/Light input   | External Teach-In   |

**Wiring Diagrams**



M8 CONNECTOR

REMOTE (WHITE) 2 ● 4

OUTPUT (BLACK) 2 ● 4

10...30 VDC+ (BROWN) 1 ● 3

- 0V (BLUE) 1 ● 3

S100-A00/BX0/CX0/D00/F00

BROWN 1 + 10...30 VDC

WHITE 2 LIGHT/DARK

BLACK 4 OUTPUT

BLUE 3 0V

S100-G00

BROWN 1 + 10...30 VDC

WHITE 2 NOT USED

BLACK 4 NOT USED

BLUE 3 0V

S100-M00

BROWN 1 + 10...30 VDC

WHITE 2 REMOTE








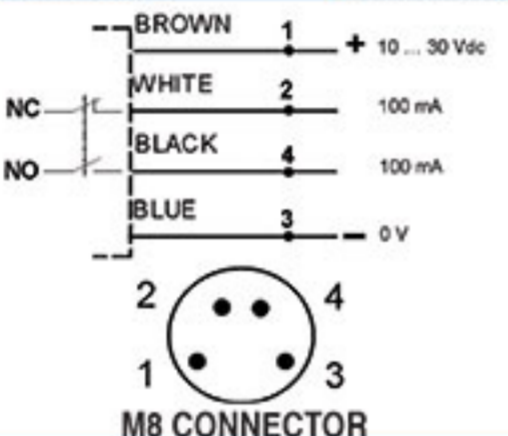
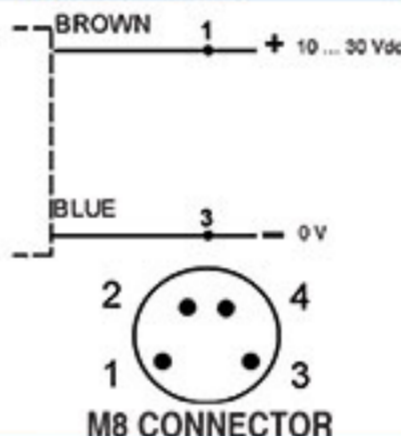
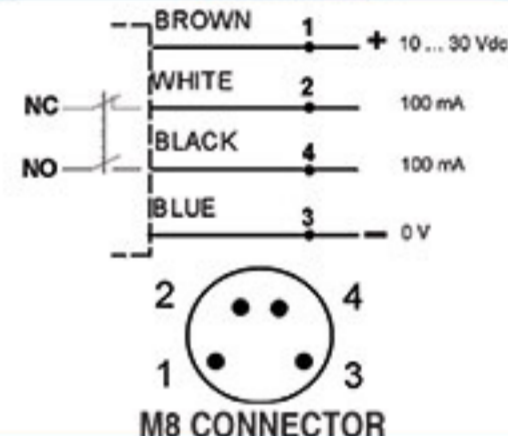

BLACK 4 OUTPUT

BLUE 3 0V








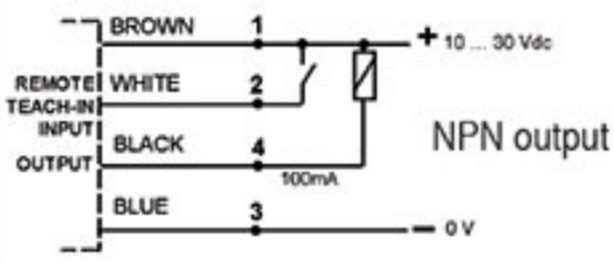
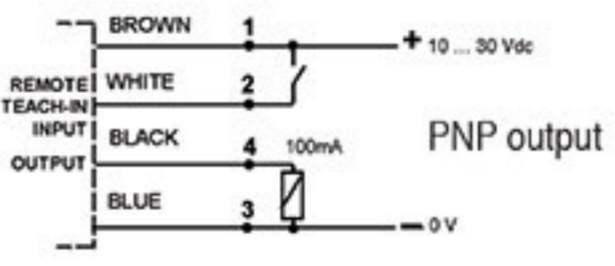
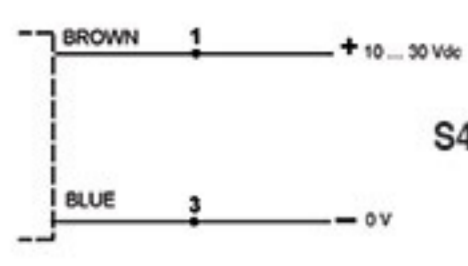

| PIN | WIRE  | CONNECTOR               | CABLE |
|-----|-------|-------------------------|-------|
| 1   | Brown | 10...30 Vdc             |       |
| 2   | White | REMOTE* (L/D, Teach-in) |       |
| 3   | Blue  | 0V                      |       |
| 4   | Black | OUTPUT** (PNP or NPN)   |       |

|  |                   |                   |                   |                    |
|--|-------------------|-------------------|-------------------|--------------------|
| PNP Cable  | S100-PR-2*-A00-PK | S100-PR-2*-B10-PK | S100-PR-2*-M00-PH | S100-PR-2*-FG00-PK |
| NPN Cable  | S100-PR-2*-A00-NK | S100-PR-2*-B10-NK | S100-PR-2*-M00-NH | S100-PR-2*-FG00-NK |
| <p>*For plug type replace 2 with 5 e.g. S100-PR-5-C00-PK For sensor cable and accessories see pages 68-71</p> <p>*For plug and cable, use code CS-B1-02-G-03/05 (03 = 3m Cable, 05 = 5m Cable)</p> |                   |                   |                   |                    |

## MINIATURE PHOTOELECTRIC SENSOR BASIC LINE IP66

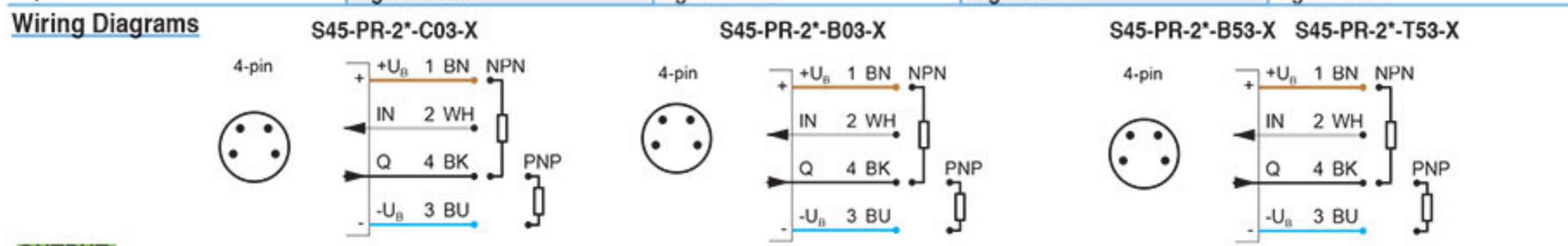
| Type DC<br>S41 SERIES  | Diffuse Proximity  | Retro-Reflective  |   | Through Beam<br>Emitter   | Through Beam<br>Receiver  |
|--|--|---|---|---|---|
|  |  | Polarized   | Transparents  |   |   |
| <ul style="list-style-type: none"> <li>Nominal Voltage 10-30VDC</li> <li>Output: NPN or PNP NO-NC</li> <li>Output Current: 100mA max.</li> <li>Housing Material: PMMA Plastic</li> <li>Temperature Range: -25 to 55°C</li> <li>Models with trimmer setting</li> <li>NPN or PNP output</li> <li>Double NO-NC</li> </ul>  |   |      |    |  |  |
| Sensing Distance   | 0.2-350mm  | 0.1-2.5m (R2 Reflector)   | 0.1-0.7m (R2 Reflector)   | 0.1-6m  | 0.1-6m  |
| Supply Voltage   | 10-30VDC   | 10-30VDC  | 10-30VDC  | 10-30VDC  | 10-30VDC  |
| Emission   | Infrared LED 880nm   | Red LED 660nm   | Red LED 660nm   | Infrared LED 880nm  | Infrared LED 880nm  |
| Setting  | Sensitivity trimmer  | Sensitivity trimmer   | Sensitivity trimmer   | -   | -   |
| Output LED   | Red/Green  | Yellow/Green  | Red/Green   | Red/Green   | Red/Green   |
| Switching Frequency  | 500Hz  | 500Hz   | 500Hz   | 500Hz   | 500Hz   |
| Operation Mode   | Dark or Light  | Dark or Light   | Dark or Light   | Dark or Light   | Dark or Light   |
| <b>Wiring Diagrams</b><br>32H x 12W x 20D<br><br>   |   |  |  |   |   |
| PNP NO-NC Cable  | S41-2*-C-P   | S41-2*-B-P  | S41-2*-T-P  | S41-2*-G  | S41-2*-F-P  |
| NPN NO-NC Cable  | S41-2*-C-N   | S41-2*-B-N  | S41-2*-T-N  | S41-2*-G  | S41-2*-F-N  |
|   | *For plug type replace 2 with 5 e.g. S41-5-C-P For sensor cable and accessories see pages 68-71<br>*For plug and cable use part number CS-B1-02-G-05/03 (03 = 3m Cable. 05 = 5m Cable) |   |   |   |   |

## PHOTOELECTRIC SENSORS MICROPROCESSOR-BASED TEACH-IN IP67

| Type DC<br>S40 SERIES  | Diffuse Proximity  | Retro-Reflective  |   | Background<br>Suppression   |
|--|--|---|---|---|
|  |  | Polarized   | Transparents  |   |
| <ul style="list-style-type: none"> <li>Nominal Voltage 10-30VDC</li> <li>Output: NPN or PNP</li> <li>Output Current: 100mA max.</li> <li>Housing Material: ABS</li> <li>Temperature Range: -20 to 60°C</li> <li>EASYtouch™ microprocessor teach in and Remote setting</li> <li>Cable or M8 connection</li> <li>NPN or PNP</li> </ul>  |   |   |  |  |
| Sensing Distance   | 0.5-300mm  | 0.1-2.5m (R2 Reflector)   | 0.1-7m (R2 Reflector)   | 15-100mm  |
| DC Supply Voltage  | 10-30VDC   | 10-30VDC  |   | 10-30VDC  |
| Emission   | Red LED 660nm  | Red LED 660nm   |   | Red LED 660nm   |
| Setting  | Teach-in button  | Teach-in push-button  |   | Teach-in button   |
| Output LED   | Yellow/Green   | Yellow/Green  |   | Yellow/Green  |
| Switching Frequency  | 4kHz   | 1kHz  |   | 1kHz  |
| Operation Mode   | Dark/light prog.   | Dark/light programmable   |   | Dark/light prog.  |
| <b>M8 Connector</b><br>   | <b>Wiring Diagrams</b>   |   |   |   |
|   |   |  |  |   |
| PNP Cable  | S40-PR-2*-C03-PH   | S40-PR-2*-B03-PH  | S40-PR-2*-T03-PH  | S40-PR-2*-M03-PH  |
| NPN Cable  | S40-PR-2*-C03-NH   | S40-PR-2*-B03-NH  | S40-PR-2*-T03-NH  | S40-PR-2*-M03-NH  |
|   | *For plug type replace 2 with 5 e.g. S40-PR-5-A03-PH For sensor cable and accessories see pages 68-71<br>*For plug and cable use part number CS-B1-02-G-05/03 (03 = 3m Cable. 05 = 5m Cable) Laser models available on request |   |   |   |

**NEW HIGH PERFORMANCE EUROPEAN STYLE MINATURE SENSOR ALL-IN ONE**

|  | Diffuse Proximity           | Retro-Reflective            |                             |                             |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
|  |                             | Polarized                   | Polarized autocollimated    | Transparents autocollimated |
| <ul style="list-style-type: none"> <li>Nominal Voltage 10-30VDC</li> <li>Output NPN or PNP or PUSH PULL</li> <li>Output Current 100mA Max</li> <li>Current Consumption 30mA Max</li> <li>Housing Material ABS</li> <li>Cable Length 2m</li> <li>Dimensions (34x20x12mm)</li> </ul> |                             |                             |                             |                             |
| Sensing Distance   | 800mm                       | 2m                          | 7m                          | 2m                          |
| DC Supply Voltage  | 10-30VDC                    | 10-30VDC                    | 10-30VDC                    | 10-30VDC                    |
| Emission   | Red LED 632nm               | Red LED 632nm               | Red LED 632nm               | Red LED 632nm               |
| Setting  | Teach-in button             | Teach-in button             | Teach-in button             | Teach-in button             |
| Switching Frequency  | 1000Hz                      | 1000Hz                      | 1000Hz                      | 1000Hz                      |
| Output LED   | Yellow Output - Green Power | Yellow Output - Green Power | Yellow Output - Green Power | Yellow Output - Green Power |
| Operation Mode   | Light / Dark                | Light / Dark                | Light / Dark                | Light / Dark                |

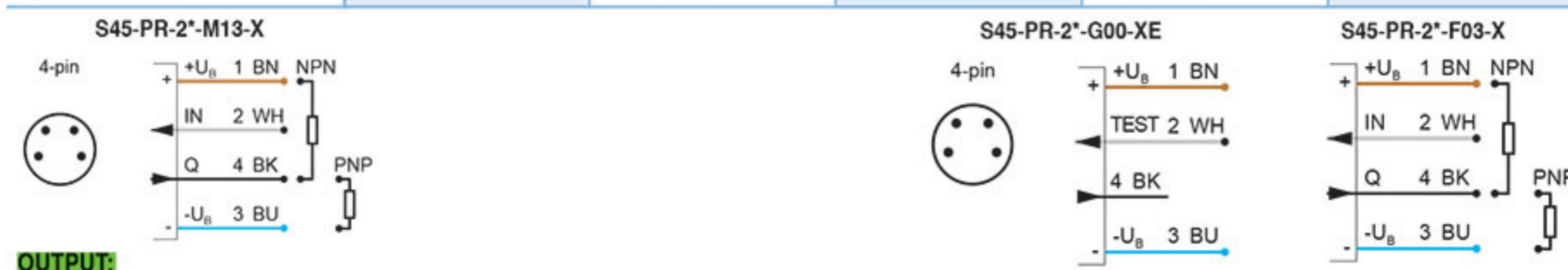


**OUTPUT:**

|                   |                  |                  |                  |                  |
|-------------------|------------------|------------------|------------------|------------------|
| PNP Cable Version | S45-PR-2*-C03-PH | S45-PR-2*-B03-PH | S45-PR-2*-B53-PH | S45-PR-2*-T53-PH |
| NPN Cable Version | S45-PR-2*-C03-NH | S45-PR-2*-B03-NH | S45-PR-2*-B53-NH | S45-PR-2*-T53-NH |

\*For plug type replace 2 with 5 e.g. S45-PR-5-C03-PH For sensor cable and accessories see pages 68-71  
 \*For plug and cable use part number. CS-B1-02-G-05/03 Laser models available on request

| Type DC M18 Ø18<br>SERIES S45  | Background Suppression      | Contrast                    |                             | Distance                    | Through Beam                |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
|  |                             | White Emission              | RGB Emission                |                             |                             |
| <ul style="list-style-type: none"> <li>Nominal Voltage 10-30VDC</li> <li>Output NPN or PNP or PUSH PULL</li> <li>Output Current 100mA Max</li> <li>Current Consumption 30mA Max</li> <li>Housing Material ABS</li> <li>Cable Length 2m</li> <li>Dimensions (34x20x12mm)</li> </ul> |                             |                             |                             |                             |                             |
| Sensing Distance   | 400mm                       | 12mm                        | 12mm                        | 200mm                       | 20m                         |
| DC Supply Voltage  | 10-30VDC                    | 10-30VDC                    | 10-30VDC                    | 10-30VDC                    | 10-30VDC                    |
| Emission   | Red LED 632nm               | White LED                   | RGB LED                     | Red LED 632nm               | Red LED 632nm               |
| Setting  | Teach-in button             | Teach-in button             | Teach-in button             | Teach-in button             | Teach-in button             |
| Switching Frequency  | 1000Hz                      | 25 kHz                      | 25 kHz                      | 1000Hz                      | 1000Hz                      |
| Output LED   | Yellow Output - Green Power | Yellow Output - Green Power | Yellow Output - Green Power | Yellow Output - Green Power | Yellow Output - Green Power |
| Operation Mode   | Light / Dark                | Light / Dark                | Light / Dark                | Light / Dark                | Light / Dark                |



**OUTPUT:**

|                   |                  |                  |                 |                 |                  |
|-------------------|------------------|------------------|-----------------|-----------------|------------------|
| PNP Cable Version | S45-PR-2*-M13-PH | S45-PR-2*-W13-OH | S45-PR-5-W43-OH | S45-PR-5-Y13-PV | S45-PR-2*-F03-PH |
| NPN Cable Version | S45-PR-2*-M13-NH | -                | -               | S45-PR-5-Y13-NV | S45-PR-2*-F03-NH |
| Emitter           | -                | -                | -               | -               | S45-PR-2*-G00-XE |

\*For plug type replace 2 with 5 e.g. S45-PR-5-C03-PH For sensor cable and accessories see pages 68-71  
 \*For plug and cable use part number. CS-B1-02-G-05/03 Laser models available on request

LIMIT & PRESSURE SWITCHES & SENSORS

# DC ADVANCED PHOTOELECTRIC SENSORS IP67 ATEX

| Type DC<br>S8 SERIES   | Diffuse Proximity                  |  | Retro-Reflective                   |                       | Through Beam                       |
|--|------------------------------------|--|------------------------------------|-----------------------|------------------------------------|
|  |                                    |  | Polarized                          | Transparents          |                                    |
| <ul style="list-style-type: none"> <li>Nominal Voltage 12-30VDC</li> <li>Output: NPN or PNP NO</li> <li>Output Current: ≤100mA max.</li> <li>Housing Material: ABS</li> <li>Temperature Range: -10 to 55°C</li> <li>Excellent performances within small dimensions (14x42x25mm)</li> <li>Compact Dimensions</li> <li>Very High Resolution</li> <li>High performance for most challenging applications</li> </ul> |                                    |  |                                    |                       |                                    |
| Sensing Distance   | 500mm                              |  | 5m (R2 Reflector)                  | 50-800mm**            | 25m                                |
| DC Supply Voltage  | 12-30VDC                           |  | 12-30VDC                           |                       | 12-30VDC                           |
| Emission   | Red LED 660nm                      |  | Red LED 660nm                      |                       | Red LED 660nm                      |
| Setting  | Mono turn sensitivity adj. trimmer |  | Mono turn sensitivity adj. trimmer | Set push button (T53) | Mono turn sensitivity adj. trimmer |
| Output LED   | Yellow/Green                       |  | Yellow/Green                       |                       | Yellow/Green                       |
| Response Time  | 500us                              |  | 500us                              | 250us                 | 500us                              |
| Switching Frequency  | 1kHz                               |  | 1kHz                               | 2kHz                  | 1kHz                               |
| Operation Mode   | Dark/Light selectable              |  | Dark/Light selectable              |                       | Dark/Light selectable              |
| Wiring Diagrams  |                                    |  |                                    |                       |                                    |
| PNP M8 Plug*   | S8-PR-5-C01-PP                     |  | S8-PR-5-B01-PP                     | S8-PR-5-T51**-PP      | S8-PR-5-F01-PP                     |
| NPN M8 Plug*   | S8-PR-5-C01-NN                     |  | S8-PR-5-B01-NN                     | S8-PR-5-T51**-NN      | S8-PR-5-F01-NN                     |
| Through Beam Emitter   | -                                  |  | -                                  | -                     | S8-PR-5-G00-XG                     |



Stainless Steel models available on request  
 \*\*For retro-reflective for transparent units with 2000mm sensing distance replace 1 with 3 e.g. S8-PR-5-T53-PP  
 For plug and cable use part number CS-B1-02-G-05/03 (03 = 3m Cable. 05 = 5m Cable)

| Type DC<br>S8 SERIES   | Clear and Shiny Detection           |                | Background Suppression       |                | Contrast              |                |
|--|-------------------------------------|----------------|------------------------------|----------------|-----------------------|----------------|
|  |                                     |                |                              |                |                       |                |
| <ul style="list-style-type: none"> <li>Nominal Voltage 12-30VDC</li> <li>Excellent performances within small dimensions</li> <li>Compact Dimensions</li> <li>Very High Resolution</li> </ul> |                                     |                |                              |                |                       |                |
| Sensing Distance   | 100-300mm                           | 50-150mm       | 50-300mm                     | 20-200mm       | 9mm                   |                |
| DC Supply Voltage  | 12-30VDC                            |                | 12-30VDC                     |                | 12-30VDC              |                |
| Emission   | Red LED 660nm                       | Red Laser      | Red LED 660nm                | Red Laser      | Blue, Green, Red      |                |
| Setting  | 8-turn distance adj. trimmer, Teach |                | 8-turn distance adj. trimmer |                | Teach-in push-button  |                |
| Output LED   | Yellow/Green                        |                | Yellow/Green                 |                | Yellow/Green          |                |
| Response Time  | 1ms                                 |                | 1ms                          | 100us          | 50us                  | 20us           |
| Switching Frequency  | 500Hz                               |                | 500Hz                        | 5kHz           | 10kHz                 | 25kHz          |
| Operation Mode   | Remote Dark/Light selectable        |                | Dark/Light selectable        |                | Dark/Light selectable |                |
| Wiring Diagrams  |                                     |                |                              |                |                       |                |
| PNP M8 Plug*   | S8-PR-5-M53-PP                      | S8-PH-5-M53-PP | S8-PR-5-M01-PP               | S8-PH-5-M01-PP | S8-PR-5-W03-PP        | S8-PR-5-W13-PP |
| NPN M8 Plug*   | -                                   | -              | S8-PR-5-M01-NN               | S8-PH-5-M01-NN | S8-PR-5-W03-NN        | -              |



For plug and cable use part number CS-B1-02-G-05/03 (03 = 3m Cable. 05 = 5m Cable)

All the safety electrical and mechanical regulations and laws have to be respected during sensor functioning. The sensor has to be protected against mechanical damages. Place the given labels in a visible position close to the laser emission.

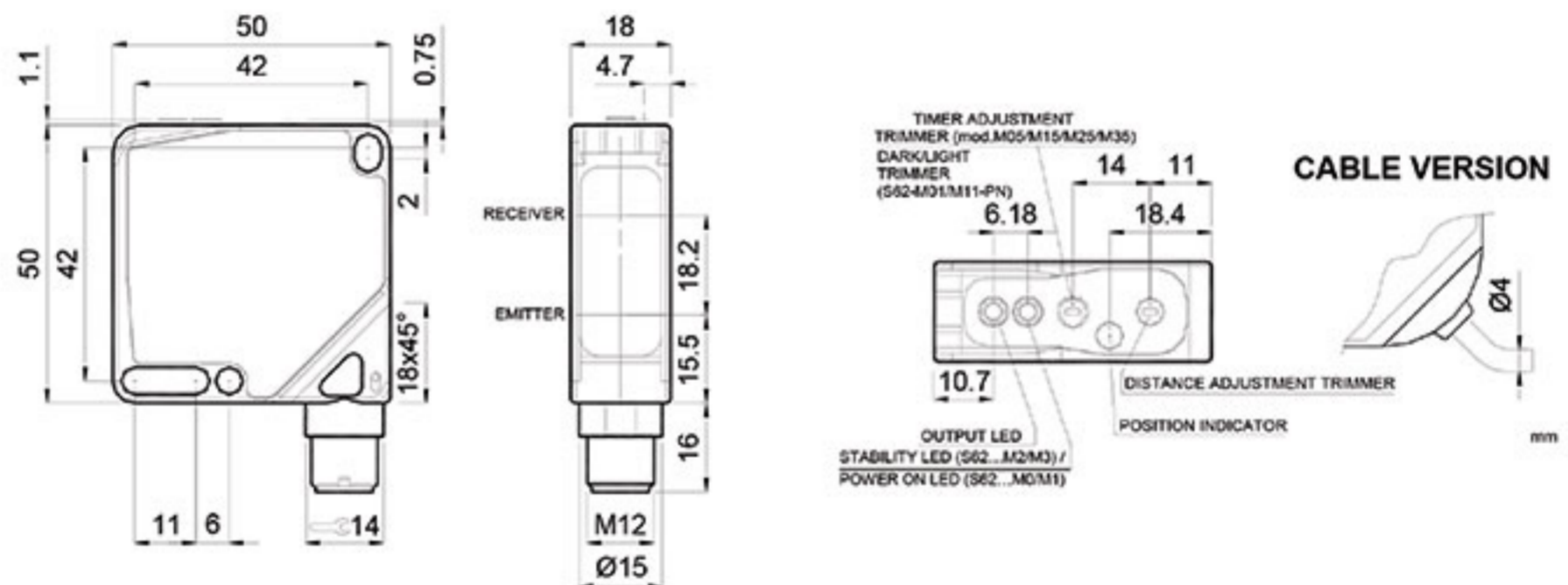
- Do not look directly into the laser beam!
- Do not point the laser beam towards people!
- These sensors are not to be used for safety applications!



# UNIVERSAL SENSOR - 50X50MM HOUSING IP67

| Type DC<br>S62 SERIES  | Diffuse Proximity  |         | Retro-Reflective                |                          | Through Beam              |         |
|--|--|---------|---------------------------------|--------------------------|---------------------------|---------|
|  | C01  | C11     | Non-Polarised                   | Polarised                | Receiver                  | Emitter |
| <ul style="list-style-type: none"> <li>The most complete universal sensor in a compact 50x50mm housing</li> <li>New better modern look 50x50 housing</li> <li>Better performance</li> <li>Retroreflective up to 13m</li> <li>VDC and VAC Models</li> </ul> |  |         |                                 |                          |                           |         |
| Sensing Distance   | 0-900mm  | 0-200cm | 0.1-13m (R2,R5 reflector)       | 0.1-8m (R2,R5 reflector) | 0-25m                     | 0-25m   |
| Supply Voltage   | 10-30VDC / 24-240VAC/24-60VDC**  |         |                                 |                          |                           |         |
| Emission   | RED 640nm  |         |                                 |                          | Red 640nm                 |         |
| Setting  | Mono-turn sensitivity adjustment trimmer. Mono-turn light/dark trimmer (S62-RX/PN)                                 |         |                                 |                          |                           |         |
| Output LED   | OUTPUT LED (yellow) / STABILITY LED (green)  |         |                                 |                          | POWER ON LED (green)      |         |
| Output   | NPN/PNP (S62-PN)DC vers. NPN or PNP NO/NC (S62-PP/NN) DC vers. Relay SPDT 250VAC/30VDC (S62-RX)                    |         |                                 |                          | Test + Test -             |         |
| Output Current   | S62-PA-2/5, S62-M version: ≤100mA (overload and overvoltage protection), S62-PA-1-RX version: 2A Max (resist load) |         |                                 |                          |                           |         |
| Saturation Voltage   | ≤2v S62-PA-2/5 VDC vers  |         |                                 |                          |                           |         |
| Response Time  | 500us max, 25ms (Relay version)  |         | 500us max, 25ms (Relay version) |                          | 1ms, 25ms (Relay version) |         |
| Switching Frequency  | 1kHz, 20Hz (Relay version)   |         | 2kHz, 20Hz (Relay version)      |                          | 50kHz, 20Hz               |         |
| Mechanical Protection  | IP67   |         | IP67                            |                          | IP67                      |         |
| Housing Material   | ABS  |         | ABS                             |                          | ABS                       |         |
| Operating Temperature  | -10 to 55C°  |         | -10 to 55C°                     |                          | -10 to 55C°               |         |

### Dimensions



### OUTPUT:

|                   |                  |                  |                  |                  |                  |                  |
|-------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| NPN NO-NC Cable   | S62-PA-2*-C01-NN | S62-PA-2*-C11-NN | -                | S62-PA-5-B01-NN  | S62-PA-2*-F01-NN | S62-PA-2*-G00-XG |
| PNP NO-NC Cable   | S62-PA-2*-C01-PP | S62-PA-2*-C11-PP | -                | S62-PA-2*-B01-PP | S62-PA-2*-F01-PP |                  |
| NPN/PNP Cable     | S62-PA-2*-C01-PN | S62-PA-2*-C11-PN | S62-PA-2*-A01-PN | S62-PA-2*-B01-PN | S62-PA-2*-F01-PN | S62-PA-1-G00-XX  |
| Relay Cable**(AC) | S62-PA-1-C01-RX  | S62-PA-1-C11-RX  | S62-PA-1-A01-RX  | S62-PA-1-B01-RX  | S62-PA-1-F01-RX  |                  |

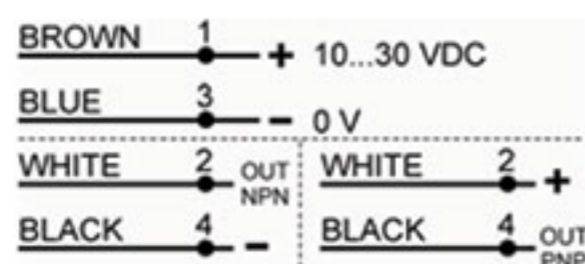
\*For plug type replace 2 with 5 e.g. S62-PA-5-C01-NN Laser models available on request

For sensor cable and accessories see pages 68-71

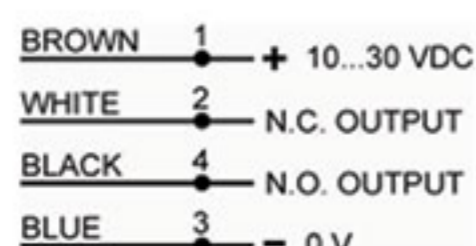
### Wiring Diagrams

#### DC Models

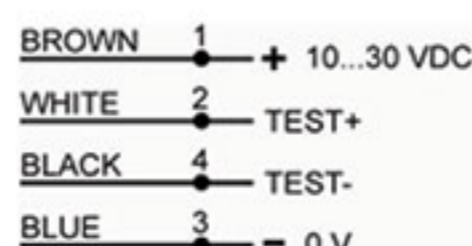
##### S62-PA-2/5-PN



##### S62-PA-2/5-PP/NN

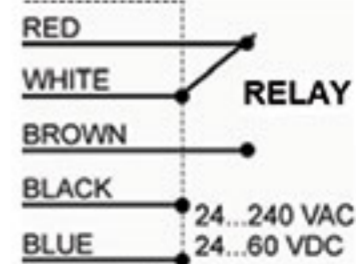


##### S62-PA-2/5-G

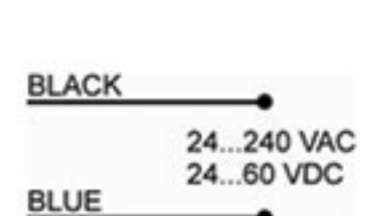


#### AC Models\*\*

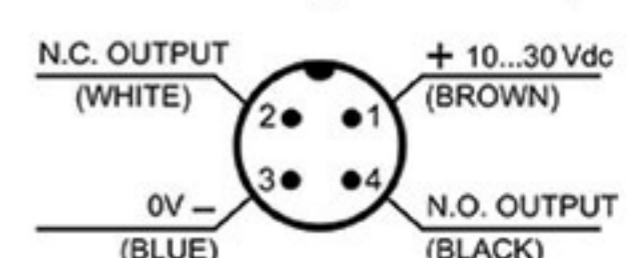
##### S62-PA-1-A/B/C/F



##### S62-PA-1-G



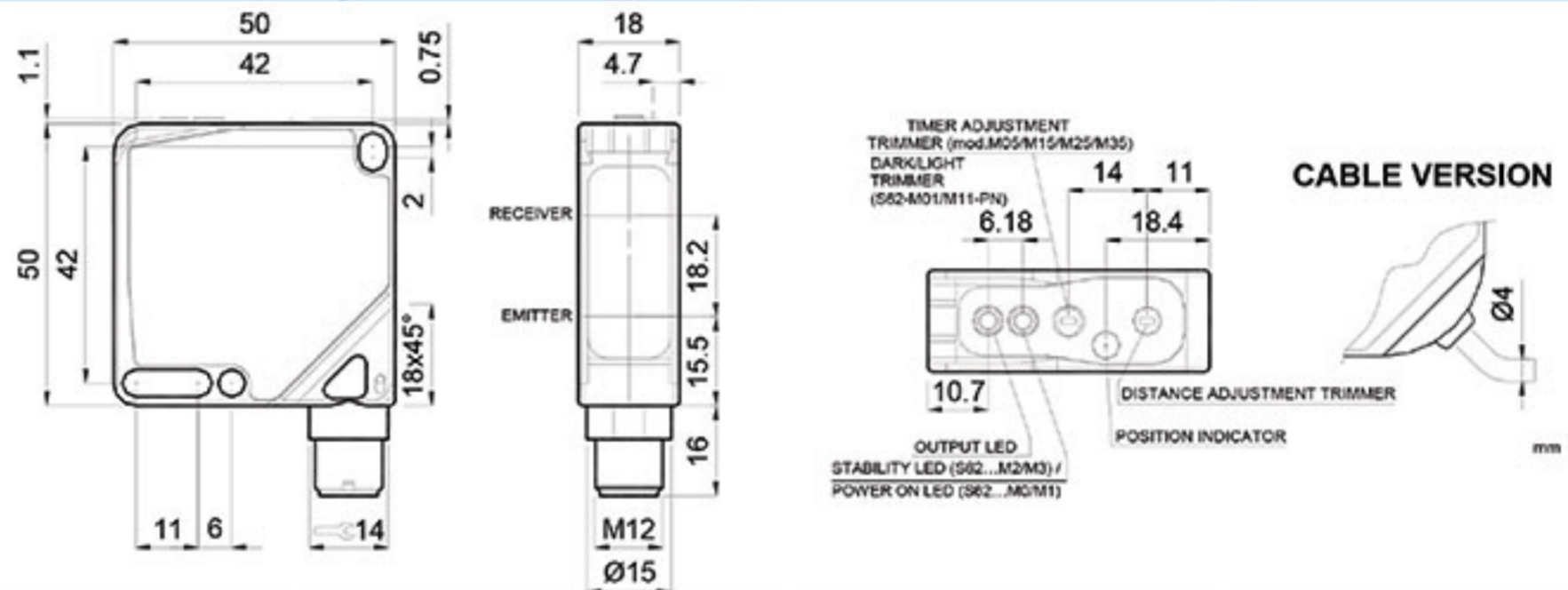
##### S62-PA-5...PP/NN (M12 connector)



# BACKGROUND SUPPRESSION - 50X50MM HOUSING IP67

|  |  |             |                  |             |
|--|--|-------------|------------------|-------------|
| Type DC<br>S62 SERIES  | Background Suppression   |             |                  |             |
| <ul style="list-style-type: none"> <li>Nominal Voltage 10-30VDC</li> <li>Units with time adjustment trimmer</li> <li>Background suppression from 3cm-2m</li> </ul> |  |             |                  |             |
| Sensing Distance   | 30-300mm   | 60-600mm    | 60-1200mm        | 200-2000mm  |
| DC Supply Voltage  | 10-30VDC   | 10-30VDC    | 10-30VDC         | 10-30VDC    |
| Emission   | RED 660nm  |             | Infrared (880nm) |             |
| Setting  | Multi Turn distance adjustment trimmer / Timer adjustment trimmer (S62-M05/M15/M25/M35). Dark/light selection mono turn trimmer (S62-M01/M11-PN) |             |                  |             |
| Output LED   | OUTPUT LED (yellow) / STABILITY LED (green) (S62-M0/M1) POWER ON LED (green) (S62-M2/M3)   |             |                  |             |
| Output   | NPN or PNP NO/NC (S62-PP/NN)   |             |                  |             |
| Output Current   | 100mA (overload and voltage protection)  |             |                  |             |
| Saturation Voltage   | ≤2V  | ≤2V         | ≤2V              | ≤2V         |
| Response Time  | 500us (S62-M0/M1), 1ms (S62-M2) 1,5ms(S62-M3)  |             |                  |             |
| Switching Frequency  | 1kHz (S62-M0/M1), 500Hz (S62-M2), 330Hz (S62-M3)   |             |                  |             |
| Mechanical Protection  | IP67   | IP67        | IP67             | IP67        |
| Housing Material   | ABS  | ABS         | ABS              | ABS         |
| Operating Temperature  | -10 to 55C°  | -10 to 55C° | -10 to 55C°      | -10 to 55C° |

**Dimensions**



**OUTPUT:**

|                    |                  |                  |                  |                  |
|--------------------|------------------|------------------|------------------|------------------|
| PNP NO-NC Cable    | S62-PA-2-M01-PP  | S62-PA-2-M11-PP  | S62-PA-2-M21-PP  | S62-PA-2-M31-PP  |
| NPN NO-NC M12 Plug | S62-PA-5-M01*-NN | S62-PA-5-M11*-NN | S62-PA-5-M21*-NN | S62-PA-5-M31*-NN |
| PNP NO-NC M12 Plug | S62-PA-5-M01*-PP | S62-PA-5-M11*-PP | S62-PA-5-M21*-PP | S62-PA-5-M31*-PP |

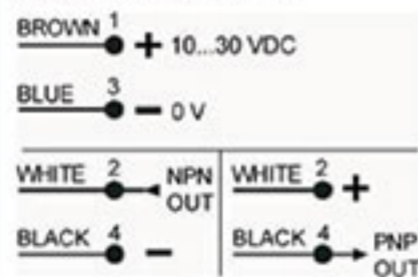
\* For units with timer adjustment trimmer change 1 to 5 e.g. S62-PA-5-M01-NN to S62-PA-5-M05-NN

For sensor cable and accessories see pages 68-71

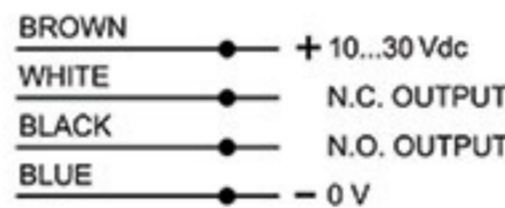
Laser models available on request

**Wiring Diagrams**

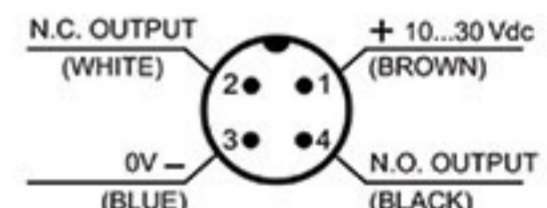
**S62-PA-2/5...PN**



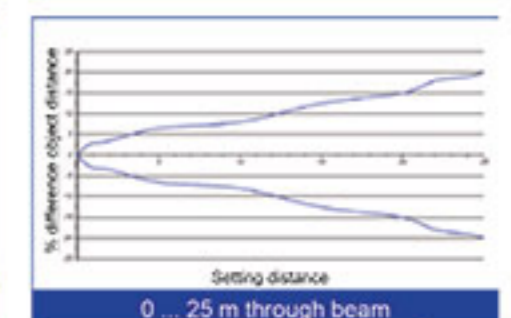
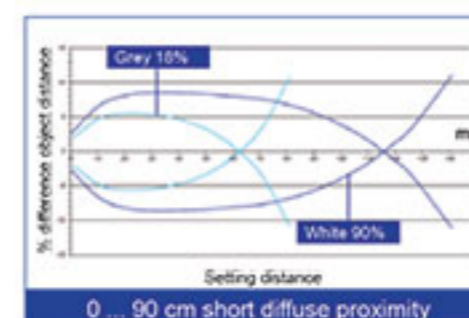
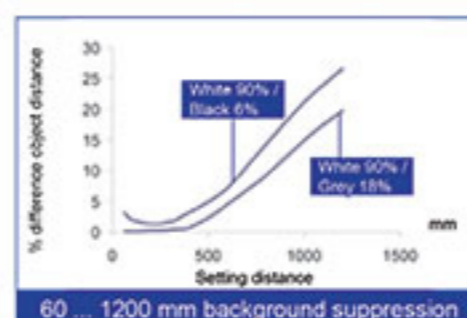
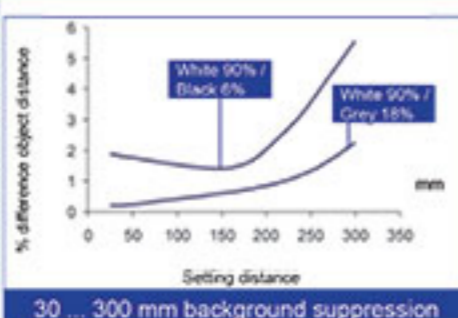
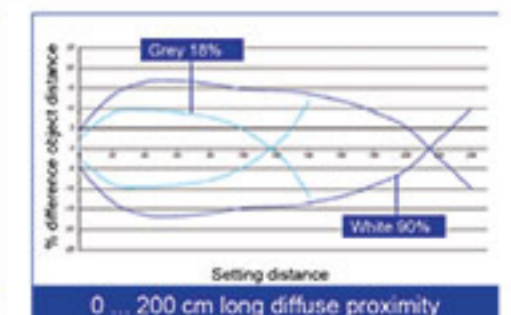
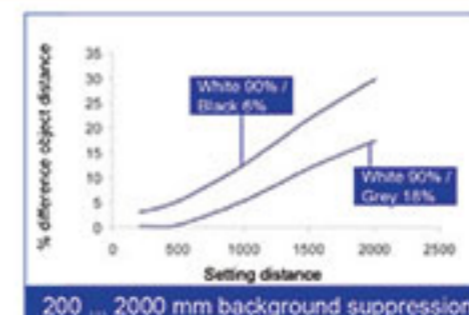
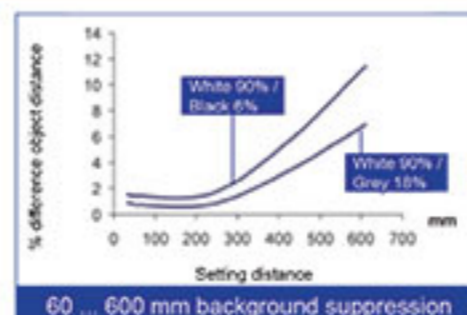
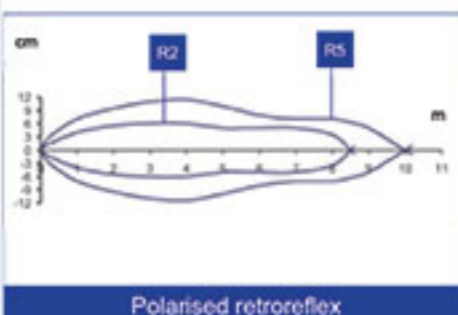
**S62-PA-2...PP/PN**



**S62-PA-5...PP/PN (M12 connector)**



**Detection Diagrams**



# MAXI SENSOR FOR CRITICAL APPLICATIONS VAC/VDC IP67

| Type AC/DC  | Diffuse Proximity  | Polarized Retro-Reflective    | Background Suppression      | Through Beam                   |                    |
|---|--|-------------------------------|-----------------------------|--------------------------------|--------------------|
| S300-PR SERIES  |  |                               |                             | Receiver                       | Emitter            |
| <ul style="list-style-type: none"> <li>• Excellent Optical Performances</li> <li>• Heavy duty industrial plastic housing</li> <li>• Distance trimmer clutch for mechanical background suppression models</li> <li>• Units with defogging functions</li> </ul> |  |                               |                             |                                |                    |
| Sensing Distance  | 5m   | 22m                           | 2.5m                        | 60m                            |                    |
| Supply Voltage  | 24-240VAC / 12-240VDC  |                               |                             |                                |                    |
| Emission  | Infrared LED 940nm   | Infrared LED 880nm            | Infrared LED 880nm          |                                | Infrared LED 880nm |
| Setting   | Mono-turn Sensitivity Trimmer  | Mono-turn Sensitivity Trimmer | Multi-turn Adjustment Screw | Mono-turn Sensitivity Trimmer  |                    |
| Output LED  | Output LED (Yellow) Stability LED (GREEN)  |                               |                             | Output Yellow/ Stability Green | Power On LED Green |
| Output  | NPN & PNP open collector. Relay SPDT electromagnetic relay 250VAC, 30VDC*        |                               |                             |                                |                    |
| Output current  | 100mA (Resistive Load). 3A (Resistive Load)*                                     |                               |                             |                                |                    |
| Saturation Voltage  | <2.4V Max NPN & PNP only   |                               |                             |                                |                    |
| Response Time   | 20ms (AC), 1ms (S300-C, S300-B, S300-F/G) (DC) 2ms (S300-M) (DC)                 |                               |                             |                                |                    |
| Switching Frequency   | 25Hz (AC), 500Hz (S300-B, S300-C, S300-F/G) (DC), 250Hz (S300-M) (DC)            |                               |                             |                                |                    |
| Mechanical Protection   | IP67   |                               |                             |                                |                    |
| Housing Material  | PBT (30% Fibre-reinforced Glass)   |                               |                             |                                |                    |
| Connections   | Terminal Block (Recommended Cable Diameter 8mm – 10mm) (AC), 4-Pin M12 Plug (DC) |                               |                             |                                |                    |
| Operating Temperature   | -40° to 55°C   |                               |                             |                                |                    |

(\*) Axial models. ATEX II 3DG

### Dimensions

| OUTPUT:                          |                     |                     |                     |                     |                      |
|----------------------------------|---------------------|---------------------|---------------------|---------------------|----------------------|
| Relay NO/NC ADJ, No Timer        | S300-PR-1-C01-RX    | S300-PR-1-B01-RX    | S300-PR-1-M01-RX    | S300-PR-1-F01-RX    | S300-PR-1-G00-EX**** |
| Relay NO/NC ADJ, Timer           | S300-PR-1-C06-RX*** | S300-PR-1-B06-RX*** | S300-PR-1-M06-RX*** | S300-PR-1-F06-RX*** | S300-PR-1-G00-EX**** |
| NPN & PNP M12 Plug ADJ, No Timer | S300-PR-5-C01-OC    | S300-PR-5-B01-OC    | S300-PR-5-M01-OC    | S300-PR-5-F01-OC    | S300-PR-5-G00-EX**** |
| NPN & PNP M12 Plug ADJ, Timer    | S300-PR-5-C06-OC    | S300-PR-5-B06-OC    | S300-PR-5-M06-OC    | S300-PR-5-F06-OC    | S300-PR-5-G00-EX**** |

\*24-240VAC/12-240VDC AC voltage units only. \*\*\*For defogging functions, add -M to part number. †No ADJ, No Timer, No Outputs

For sensor cable and accessories see pages 68-71

### Wiring Diagrams

#### Connections G

AC MODELS

DC MODELS

#### Connections B, C, M, F

AC MODELS

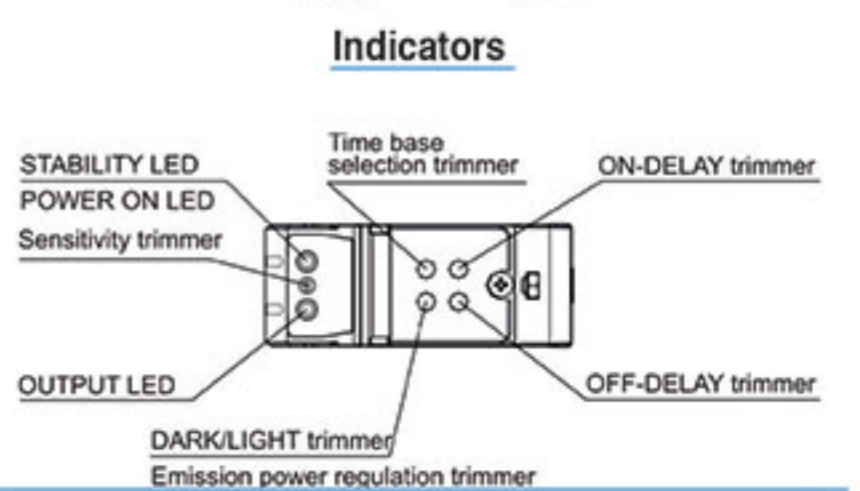
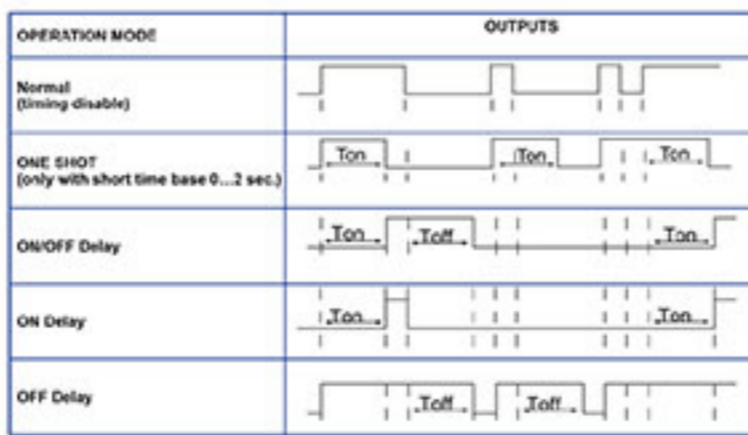
ONLY F MODELS

DC MODELS

#### M12 Connector (only DC models)

### Timing Functions

Four selectable timing functions: one shot, ON delay, OFF delay, ON/OFF delay and normal mode. Trimmer adjustment of the functions is available. The timing functions can be particularly useful in applications where the output signal pulse has to be modified.

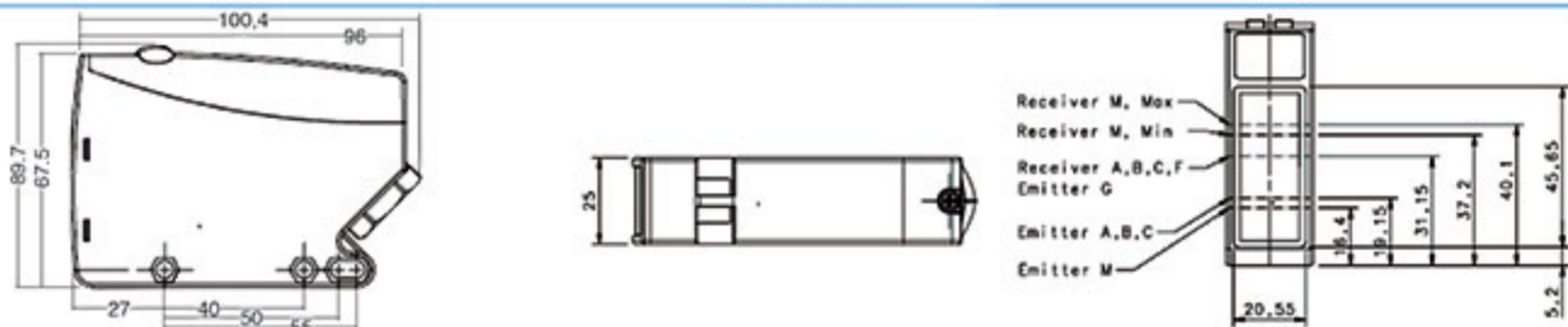




# ADVANCED COST EFFECTIVE MAXI SENSORS VAC/VDC IP67

|   |   |                    |               |   |  |         |
|---|---|--------------------|---------------|---|--|---------|
| Type AC/DC<br><b>S300-PA SERIES</b>   | Diffuse Proximity   | Retro-Reflective   |               | Background Suppression  | Through Beam   |         |
|   |   | Non-Polarized      | Polarized     |   | Receiver   | Emitter |
| <ul style="list-style-type: none"> <li>• Excellent cost/performance ratio</li> <li>• Terminal block for both VDC and VAC/VDC free voltage versions</li> <li>• Sturdy industrial plastic housing IP67</li> <li>• Bracket Included</li> </ul> |   |                    |               |   |  |         |
| Sensing Distance  | 5-200cm   | 01.-15m            | 0.1-10m       | 20-200cm  | 0-50m  |         |
| Supply Voltage  | 12-30VDC or 24-240VAC / 12-60VDC  |                    |               |   |  |         |
| Emission  | Infrared LED 940nm  | Infrared LED 880nm | Red LED 660nm | Infrared LED 880nm  | Infrared LED 880nm   |         |
| Setting   | Mono-turn Sensitivity Trimmer. Dark/Light Dip Switch mode On delay/Off delay/Single pulse (One-Shot)(S300-X06 version only) |                    |               | 7-Turns adjustment screw. Dark/Light Dip Switch. Dip Switch mode On delay/Off delay/On-Off delay/Single pulse (One-Shot (S300-X06 version only) | Mono-turn Sensitivity Trimmer. Dark/Light Dip Switch. Dip Switch mode On delay/Off delay/On-Off delay/Single pulse (One-Shot)(S300-X06 version only) |         |
| Output LED  | OUTPUT LED (Yellow) / STABILITY LED (Green) / POWER ON LED (Green)(S300-G version)  |                    |               |   |  |         |
| Output  | NPN & PNP open collector. Relay SPDT electromagnetic relay 250VAC, 30 VDC*  |                    |               |   |  |         |
| Output Current  | 100mA (resistive load). 3A (resistive load)*  |                    |               |   |  |         |
| Saturation Voltage  | <2.4V Max NPN & PNP only  |                    |               |   |  |         |
| Response Time   | 1ms (DC) 25ms (AC) 2ms (S300-G version)   |                    |               |   |  |         |
| Switching Frequency   | 500Hz (DC) 20Hz (AC) 250Hz (S300-G version)   |                    |               |   |  |         |
| Mechanical Protection   | IP67  |                    |               |   |  |         |
| Housing Material  | PBT 30% fibre-reinforced glass  |                    |               |   |  |         |
| Connections   | Terminal Block (recommended cable diameter 8-10mm)  |                    |               |   |  |         |
| Operating Temperature   | -20 to 55°C   |                    |               |   |  |         |

**Dimensions**



**OUTPUT:**

|                           |                  |                  |                  |                  |                  |                    |
|---------------------------|------------------|------------------|------------------|------------------|------------------|--------------------|
| Relay NO/NC ADJ, No Timer | S300-PA-1-C01-RX | S300-PA-1-A01-RX | S300-PA-1-B01-RX | S300-PA-1-M01-RX | S300-PA-1-F01-RX | S300-PA-1-G00-EX** |
| Relay NO/NC ADJ, Timer    | S300-PA-1-C06-RX | S300-PA-1-A06-RX | S300-PA-1-B06-RX | S300-PA-1-M06-RX | S300-PA-1-F06-RX |                    |
| NPN & PNP ADJ, No Timer   | S300-PA-2-C01-OC | S300-PA-2-A01-OC | S300-PA-2-B01-OC | S300-PA-2-M01-OC | S300-PA-2-F01-OC | S300-PA-2-G00-EX** |
| NPN & PNP ADJ, Timer      | S300-PA-2-C06-OC | S300-PA-2-A06-OC | S300-PA-2-B06-OC | S300-PA-2-M06-OC | S300-PA-2-F06-OC |                    |

\*24-240VAC/24-60VDC AC voltage units only

\*\*No ADJ, No Timer, No Outputs.

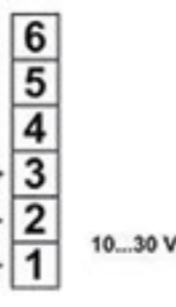
**Wiring Diagrams**

**Connections G**

**AC Modles**



**DC Modles**



**Connections A, B, C, M, F**

**AC Modles**

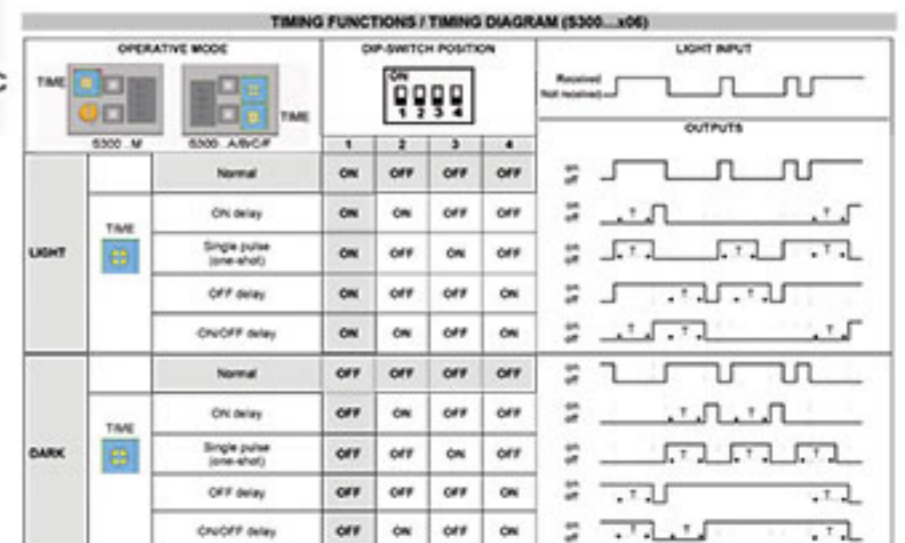


**DC Modles**

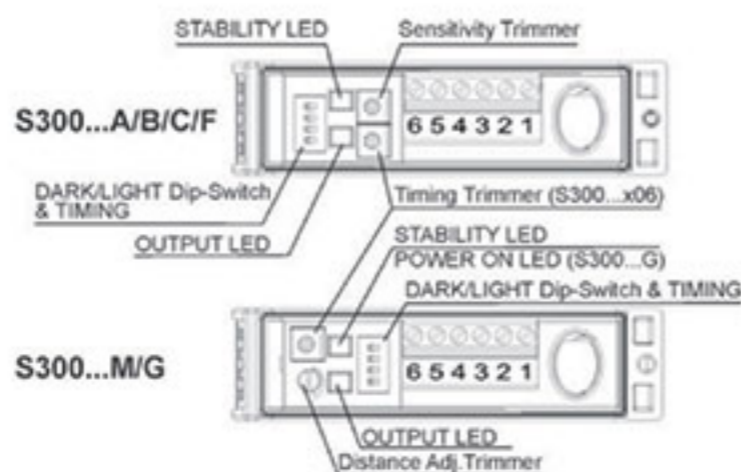


**Timing Functions**

Five selectable timing functions: one shot, ON delay, OFF delay, ON/OFF delay and normal mode. Trimmer adjustment of the functions is available. The timing functions can be particularly useful in applications where the output signal pulse has to be modified.



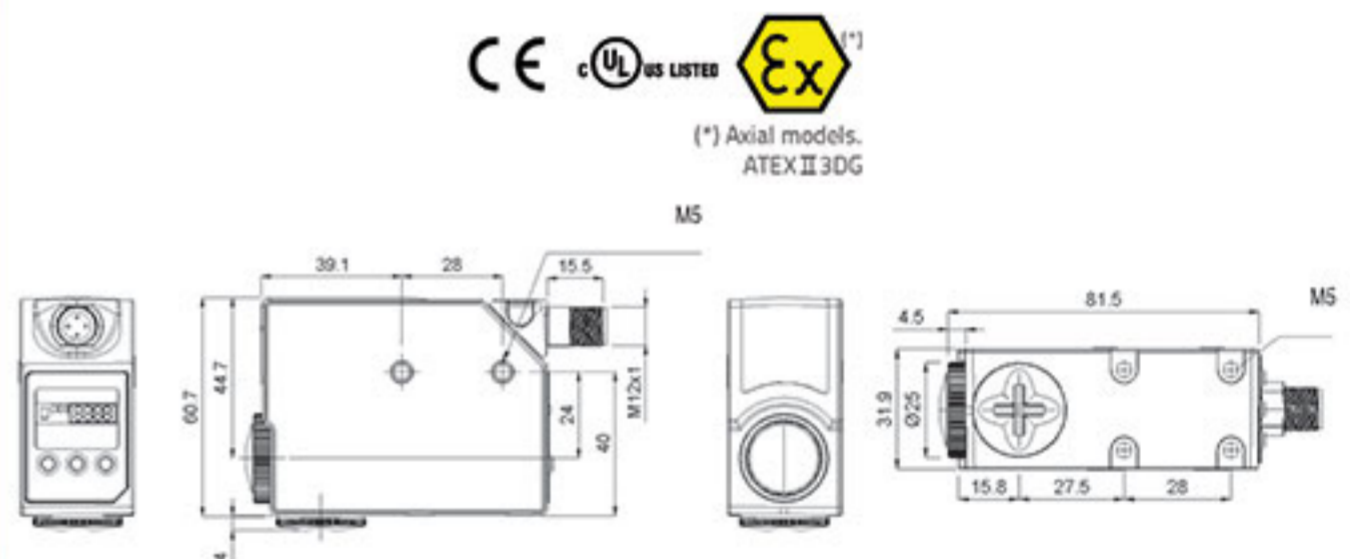
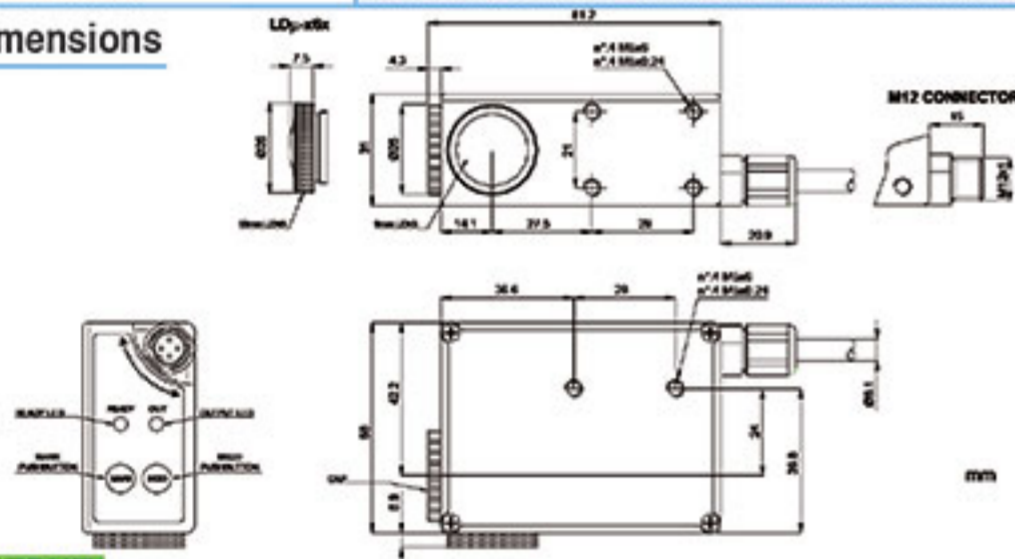
(\*) Axial models. ATEX II 3DG



# COMPLETE RANGE OF CONTRAST, REGISTRATION MARK,»

| Type DC  | TLU Series                                    |            | TL46 Series  |                             |
|--|---|------------|--|-----------------------------|
|  |   |            | Trimmer  | Basic                       |
| <ul style="list-style-type: none"> <li>Nominal Voltage 10-30VDC</li> <li>World leading mark sensors</li> <li>Red/green or white LED emission</li> <li>Rotatable connector</li> </ul> |   |            |  |                             |
| Sensing Distance   | 6-12mm  |            | 6-12mm   | 6-12mm                      |
| DC Supply Voltage  | 10-30VDC                                      |            | 10-30VDC   | 10-30VDC                    |
| Setting  | Teach-in with 2 Pushbuttons / Remote          |            | Multi Turn Digital Trimmer for an easy and quick adjustment of the switching threshold | Automatic                   |
| Output LED   | Red Output / Green Ready                      |            | Yellow Output / Green Ready / Orange Indicator Arrows                                  | Yellow Output / Green Ready |
| Emission   | Red / Green LED                               |            | White 400-700nm  | RGB LED                     |
| Spot   | Vertical                                      | Horizontal | Vertical   | Vertical                    |
| Spot Dimension   | 1.5 x 5mm                                     |            | 1.5 X 5mm  | 1.5 X 5mm                   |
| Output   | NPN and PNP                                   |            | NPN and PNP Programmable   | NPN or PNP Programmable     |
| Analogue Output  | Yes 0-5VDC                                    |            | 0.5-5.5VDC on white target   | 0.5-5.5VDC on white target  |
| Output Current   | 200mA Max                                     |            | <100mA Max   | <100mA Max                  |
| Saturation Voltage   | 1V max (NPN Version) 2V Max (PNP Version)     |            | < 2V   | < 2V                        |
| Response Time  | 50us  |            | 25us   | 33us                        |
| Switching Frequency  | 10KHz   |            | 20KHz  | 15KHz                       |
| Operation Mode   | Automatic Dark/Light Selection                |            | Dark/Light with switch   | Dark/Light selectable       |
| Mechanical Protection  | IP67  |            | IP67   | IP67                        |
| Housing Material   | ZAMA  |            | Aluminium  | Aluminium                   |
| Operating Temperature  | -10° to 55°C                                  |            | -10° to 55°C   | -10° to 55°C                |
| Connections  | 3m 6.1mm Shielded Cable *M12 4-Pole connector |            | *M12 5-Pole Connector  | *M12 5-Pole Connector       |

### Dimensions



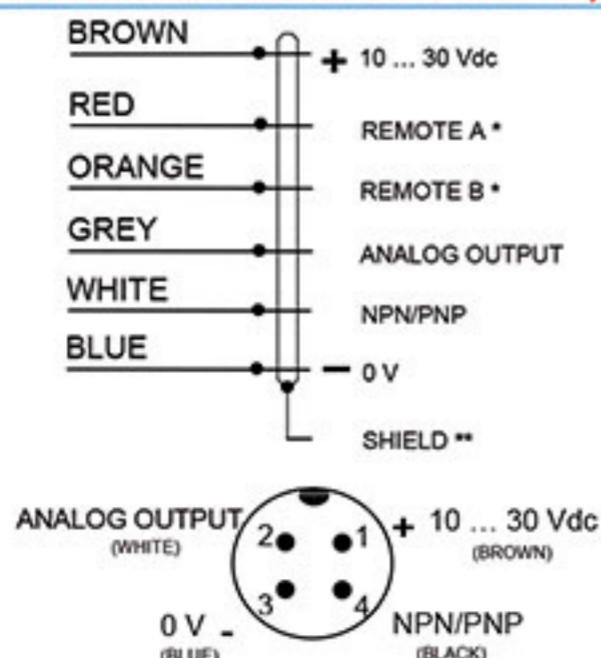
### OUTPUT:

| NPN & PNP (Programmable) |           |            |            | TL46-W-815 | TL46-W-815L |
|--------------------------|-----------|------------|------------|------------|-------------|
| NPN Cable                | TLU-011** | TLU-011**L | TL46-A-425 | -          | -           |
| PNP Cable                | TLU-111** | TLU-111**L | TL46-A-415 | -          | -           |
| NPN-NO RS485             | -         | -          | -          | -          | -           |
| PNP-NO RS485             | -         | -          | -          | -          | -           |

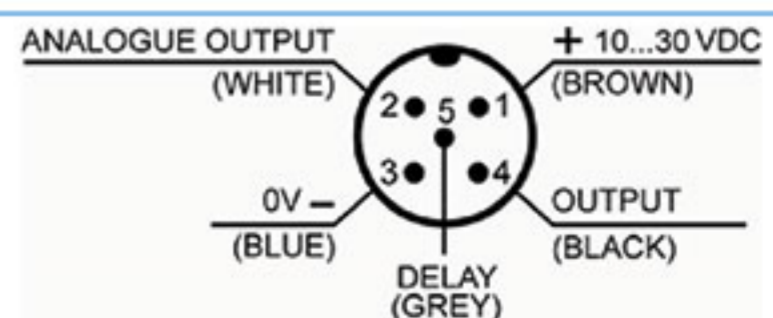
\*\*For plug type replace 1 with 5 e.g. TLU-115

For sensor cable and accessories see pages 68-71

### Wiring Diagrams

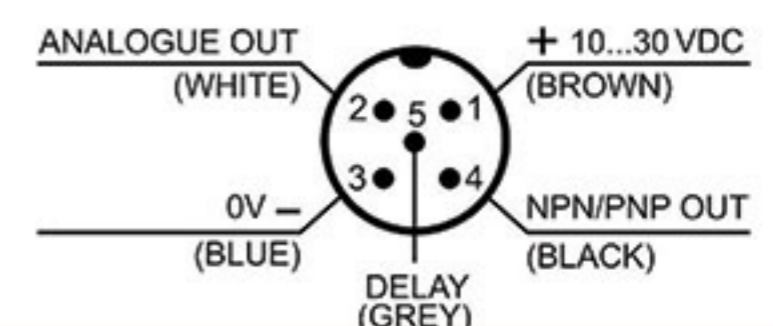


### Trimmer Verion








### Basic Standard and Enhanced Versions

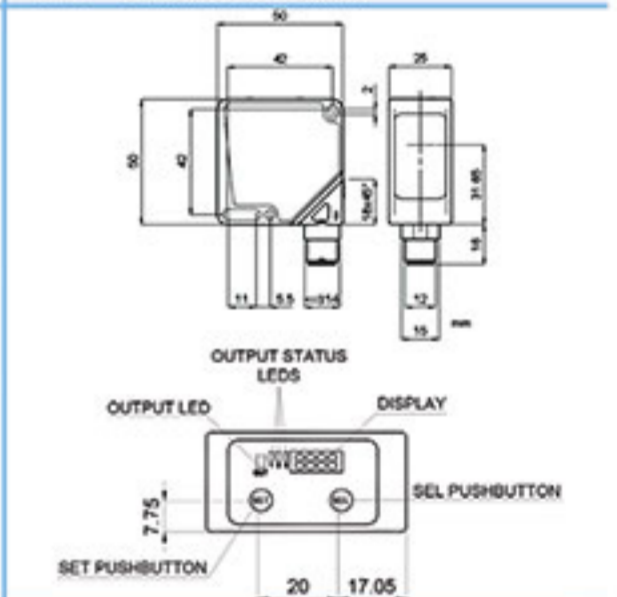
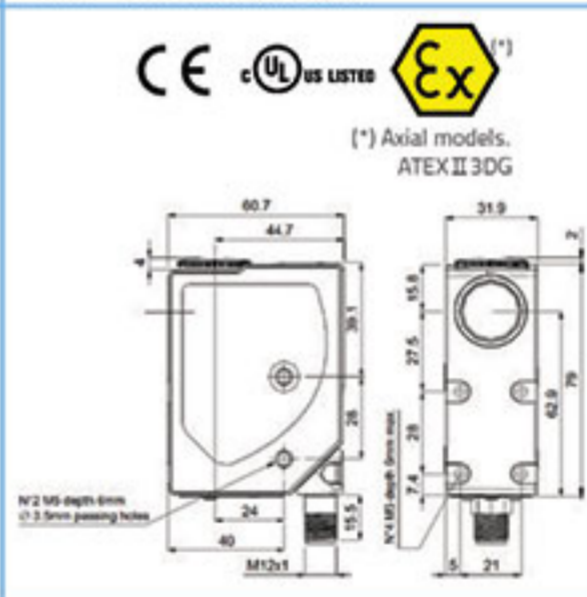
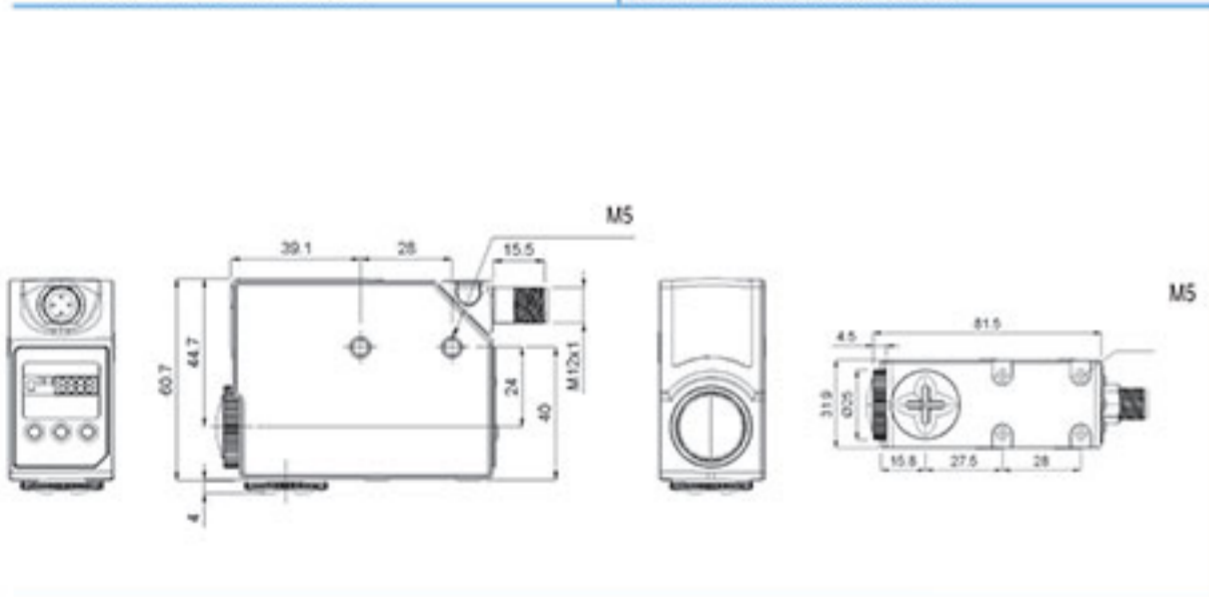
\*\* For plug and cable use part number CS-A1-03-G-03



LIMIT & PRESSURE SWITCHES & SENSORS

# » COLOUR AND LUMINESCENCE SENSORS IP67

| TL46 Series   |   | Luminescence LD46 Series  |   | Colour S65-V Series   |
|---|---|---|---|---|
| Standard  | Enhanced  |   |   |   |
|  |  |  |  |  |
| 6-12mm  | 6-12mm  | 10-20mm   |   | 5-45mm  |
| 10-30VDC  | 10-30VDC  | 15-30VDC  |   | 10-30VDC  |
| Automatic / Manual / Remote   | Automatic / Manual / Remote / Dynamic   | Manual using +, - and SET push buttons  |   | SET & SEL push buttons  |
| Yellow Output / Green Ready / Orange Delay / Orange Keylock / 5 Segment Bargraph  | Yellow Output / Green Ready / Orange Delay / Orange Keylock / 4 Digit Display     | Yellow Output / Green Ready / Orange Delay / Orange Keylock / 5 Segment Bargraph    |   | 4 Digit Display Green active Outputs, yellow or function output                     |
| RGB LED   | RGB LED   | LED UV, 375nm   |   | White LED 400-700nm   |
| <b>Vertical</b>   | <b>Horizontal</b>   | <b>Vertical</b>   | <b>Horizontal</b>   |   |
| 1.5 X 5mm   | 1.5 X 5mm   | 2 x 8mm at 10mm   |   | 4mm at 20mm   |
| NPN or PNP Programmable   | NPN or PNP Programmable   | 1 x NPN 1 x PNP   |   | 3 x PNP or NPN  |
| Yes 0-5VDC  | Yes 0-5VDC  |   |   |   |
| <100mA Max  | <100mA Max  | <100mA Max  |   | <100mA Max  |
| < 2V  | < 2V  | < 2V  |   | < 2V  |
| 25us  | 17us  | 250us   |   | 335us   |
| 20KHz   | 30KHz   | 2KHz  |   | 1.5KHz  |
| Dark/Light Selectable   | Dark/Light Selectable   | Light   |   | C or C+I Independent for each channel   |
| IP67  | IP67  | IP67  |   | IP67  |
| Aluminium   | Aluminium   | Aluminium   |   | ABS   |
| -10° to 55°C  | -10° to 55°C  | -10° to 55°C  |   | -10° to 55°C  |
| *M12 5-Pole Connector   | *M12 5-Pole Connector   | *M12 - 5 Pole Connector   |   | *M12 - 8 Pole Connector   |

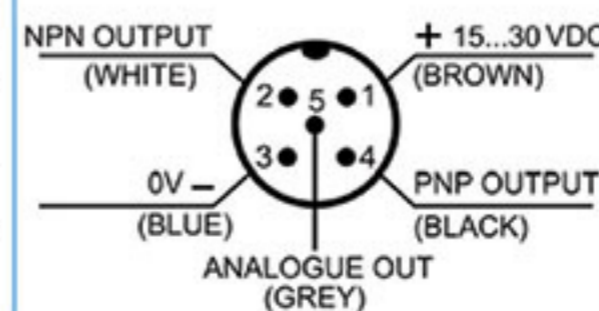


| TL46-WL-815 | TL46-WL-815L | TL46-WLF-815 | TL46-WLF-815L | LD46-UL-715 | S65-PA-5-V09-NNNZ | S65-PA-5-V09-PPPZ |
|-------------|--------------|--------------|---------------|-------------|-------------------|-------------------|
| -           | -            | -            | -             | -           | -                 | -                 |
| -           | -            | -            | -             | -           | -                 | -                 |
| -           | -            | -            | -             | -           | -                 | -                 |
| -           | -            | -            | -             | -           | -                 | -                 |

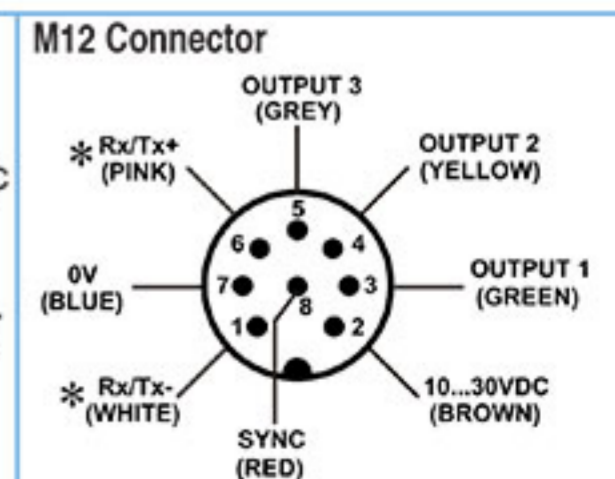
For sensor cable and accessories see pages 68-71

| Version        | pin 1       | pin 2               | pin 3  | pin 4             | pin 5 *     |
|----------------|-------------|---------------------|--------|-------------------|-------------|
|                | (brown)     | (white)             | (blue) | (black)           | (gray)      |
| TL46-A Trimmer | +10...30Vdc | 0,5...5,5Vdc output | 0Vdc   | PNP or NPN output | Delay       |
| TL46-W Base    | +10...30Vdc | 1...5,5Vdc output   | 0Vdc   | NPN/PNP output    | Delay       |
| TL46-WL Std.   | +10...30Vdc | 1...5,5Vdc output   | 0Vdc   | NPN/PNP output    | Remote      |
| TL46-WLF Enh.  | +10...30Vdc | Dark/Light Dyn.     | 0Vdc   | NPN/PNP output    | Remote/Dyn. |

\* A M12 4-pole connector can be used if the PIN5 function is not necessary.






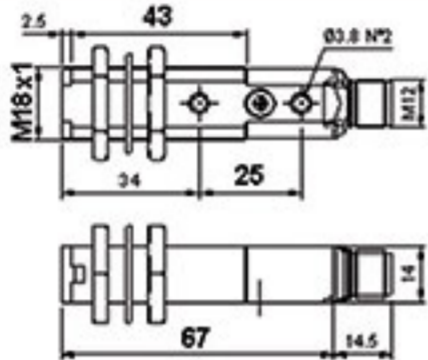
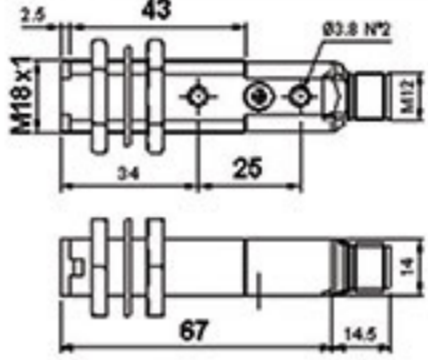
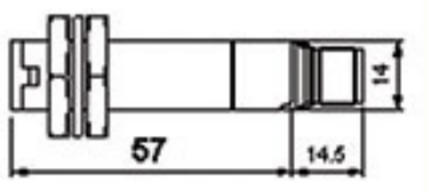
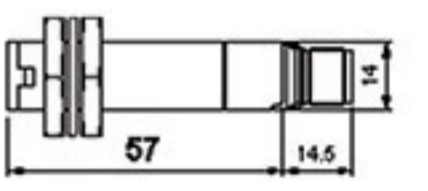




\*\* For plug and cable use part number CS-A1-03-G-03






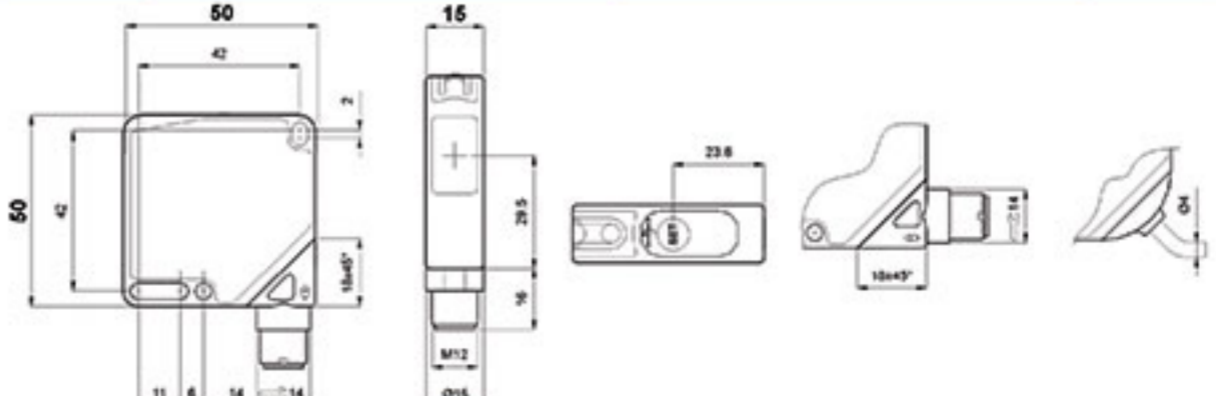
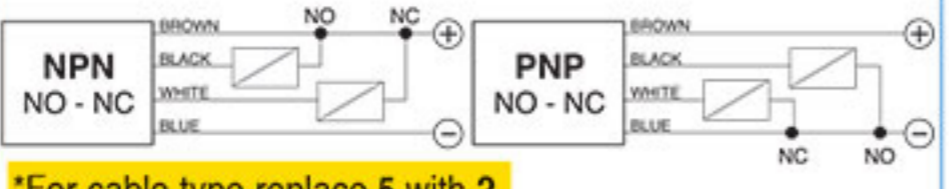



\* Available only for version with RS485 serial connection (S65-PA-5-V09-xxxZ)  
\*\* For plug and cable use part number CS-A1-06-B-03









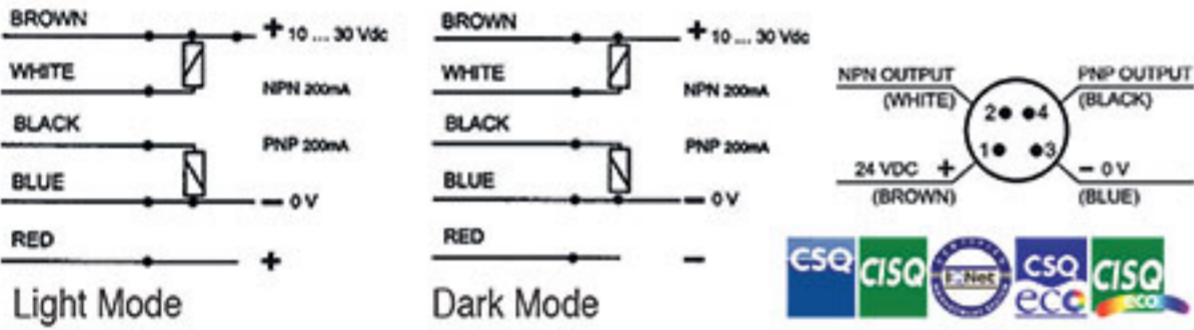
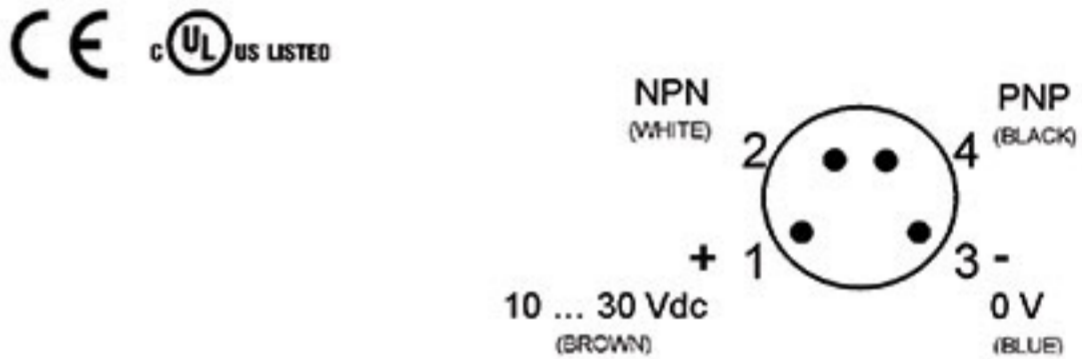
**DC LASER PNP/NPN NO-NC IP67**






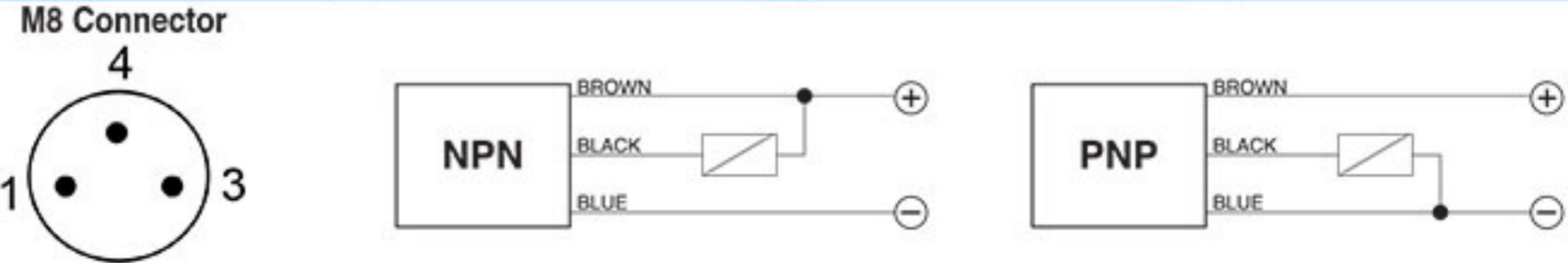

| Type DC M18<br>S50 SERIES   | Laser Diffuse Proximity  | Laser Retro-Reflective  | Laser Receiver  | Laser Emitter  |
|---|--|---|---|--|
| <ul style="list-style-type: none"> <li>Output: NPN or PNP NO-NC</li> <li>Output Current: <math>\leq 100\text{mA}</math> max.</li> <li>Response Time 333<math>\mu\text{s}</math></li> <li>Housing Material: PBT</li> <li>Temperature Range: -10 to 50°C</li> </ul>  |     |   |    |   |
| Sensing Distance  | 0-350mm  | 0-16m   | 0-60m   | 0-60m  |
| Supply Voltage  | 10-30VDC   | 10-30VDC  | 10-30VDC  | 10-30VDC   |
| Emission  | Red Laser 650nm <sup>2</sup>   | Red Laser 650nm <sup>2</sup>  | Red Laser 650nm <sup>2</sup>  | Red Laser 650nm <sup>2</sup>   |
| Setting   | Sensitivity trimmer  | Sensitivity trimmer   | Sensitivity trimmer   | Sensitivity trimmer  |
| Output LED  | Green/Yellow   | Green/Yellow  | Green/Yellow  | Green/Yellow   |
| Switching Frequency   | 1.5kHz   | 1.5kHz  | 1.5kHz  | 1.5kHz   |
| <b>Dimensions</b>   |    |  |   |  |
| <b>OUTPUT:</b>  |  |   |   |  |
| PNP NO-NC M12   | S50-PL-5-C01-PP  | S50-PL-5-B01-PP   | S50-PL-5-F01-PP   | -  |
| NPN NO-NC M12   | S50-PL-5-C01-NN  | S50-PL-5-B01-NN   | S50-PL-5-F01-NN   | -  |
| Emitter   | -  | -   | -   | S50-PL-5-G00-XG  |
| <b>Wiring Diagrams</b>  |  |   |  |  |
| <p><i>For sensor cable and accessories see pages 68-71</i></p>  |  |   |   |  |

**DC LASER PNP/NPN NO-NC IP67**

| Type DC<br>S60 SERIES   | Laser diffuse proximity  | Laser Retro-Reflective   | Laser Receiver  | Laser Emitter   |
|---|--|--|---|---|
| <ul style="list-style-type: none"> <li>Output: NPN or PNP NO-NC</li> <li>Output Current: <math>\leq 100\text{mA}</math> max.</li> <li>Response Time 250<math>\mu\text{s}</math></li> <li>Housing Material: ABS</li> <li>Temperature Range: -10 to 50°C</li> </ul>  |   |  |  |  |
| Sensing Distance  | 0-600mm  | 0.1-20m  | 0-60m   | 0-60m   |
| Supply Voltage  | 10-30VDC   | 10-30VDC   | 10-30VDC  | 10-30VDC  |
| Emission  | Red Laser 650nm <sup>2</sup>   | Red Laser 650nm <sup>2</sup>   | Red Laser 650nm <sup>2</sup>  | Red Laser 650nm <sup>2</sup>  |
| Setting   | Sensitivity trimmer  | Sensitivity trimmer  | Sensitivity trimmer   | Sensitivity trimmer   |
| Output LED  | Green/Yellow   | Green/Yellow   | Green/Yellow  | Green/Yellow  |
| Switching Frequency   | 2kHz   | 2kHz   | 1.5kHz  | 1.5kHz  |
| <b>Dimensions</b>   |  |  |   |   |
| <b>OUTPUT:</b>  |  |  |   |   |
| PNP NO-NC M12   | S60-PL-5-C01-PP  | S60-PL-5*-B01-PP   | S60-PL-5-F01-PP   | -   |
| NPN NO-NC M12   | S60-PL-5-C01-NN  | S60-PL-5-B01-NN  | S60-PL-5-F01-NN   | -   |
| Emitter   | -  | -  | -   | S60-PL-5-G00-XG   |
| <b>Wiring Diagrams</b>  |  |  |  |   |
| <p><i>For sensor cable and accessories see pages 68-71</i></p> <p>*For cable type replace 5 with 2</p>  |  |  |   |   |

LIMIT & PRESSURE SWITCHES & SENSORS



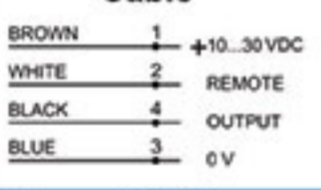
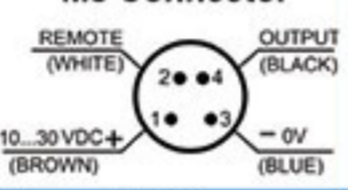
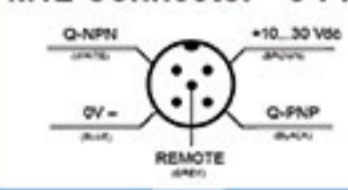
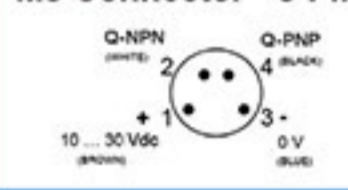
| ECONOMY U-SHAPE SENSORS   |   |  | 2mm SLOT SENSORS IP65  |   |   |
|---|---|--|--|---|---|
|   | SR31 Series 30mm  | SR22 Series 1mm  | Slot Width<br>SR21 Series  | 2mm   | 2mm   |
| <ul style="list-style-type: none"> <li>• Output Current: 200mA max.</li> <li>• Switching Frequency 10kHz</li> </ul> | Fork<br> | Slot<br> | <ul style="list-style-type: none"> <li>• High 25kHz switching frequency</li> <li>• Detection of semi-transparent labels</li> <li>• Detection of register marks on transparencies</li> <li>• NPN and PNP output</li> <li>• Output: NPN &amp; PNP</li> <li>• Output Current: 100mA Sci Protection</li> <li>• Housing Material: ZAMA</li> <li>• Temperature Range: -20 to 60°C</li> </ul> |  |  |
|   |          |           |  |   |  |
| DC Supply Voltage   | 10-30VDC  | 24VDC  | DC Supply Voltage  | 10-30VDC  | 10-30VDC  |
| Setting   | Multi-turn Sensitivity Trimmer  | Trimmer  | Emission   | Infrared LED 880nm  | Green LED 535nm   |
| Output LED  | Red Output  | Red Output   | Setting  | Auto Set push-button  | Auto Set push-button  |
| Output  | NPN or PNP  | NPN & PNP  | Resolution   | 0.5mm   | 0.5mm   |
| Operation Mode  | Dark/Light Configurable   | Dark and Light   | Output LED   | Yellow  | Yellow  |
| Housing Material  | ZAMA  | Aluminium  | Operating Mode   | Light/Dark  | Light/Dark  |
| <b>Wiring Diagrams</b>  |   |  | <b>Wiring Diagrams</b>   |   |   |
|                                 |   |  |   |   |   |
| <b>OUTPUT:</b>  |   |  | <b>OUTPUT:</b>   |   |   |
| NPN & PNP (programmable)  | SR31  | -  | PNP & NPN M8   | SR21-IR   | SR21-RG   |
| Dark Mode   | -   | SR22-5-IR-OD   | <p>For plug and cable use part number <b>CS-B1-02-G-05/03</b><br/>(03 = 3m Cable, 05 = 5m Cable)<br/>For sensor cable and accessories see pages 68-71</p>  |   |   |
| Light Mode  | -   | SR22-5-IR-OL   |  |   |   |

| ULTIMATE PRECISION FORK TYPE PHOTOELECTRIC SENSOR  |  |  |   |   |
|--|--|--|---|---|
| Fork Width   | 30mm   | 50mm   | 80mm  | 120mm   |
| <b>SRF SERIES</b><br><br><b>IP65</b><br><ul style="list-style-type: none"> <li>• Nominal Voltage 10-30VDC</li> <li>• Output: NPN or PNP</li> <li>• Output Current: 200mA Sci Protection</li> <li>• Switching Frequency: 1.5kHz</li> <li>• Housing Material: Anodised Aluminium</li> <li>• Temperature Range: -10 to 60°C</li> <li>• High resolution with visible red LED emission</li> <li>• Sensitivity adjustment trimmer</li> <li>• Sturdy industrial metal housing with glass lenses</li> </ul> |   |  |  |  |
| DC Supply Voltage  | 10-30VDC   | 10-30VDC   | 10-30VDC  | 10-30VDC  |
| Emission   | Red LED 640nm <sup>2</sup>   | Red LED 640nm <sup>2</sup>   | Red LED 640nm <sup>2</sup>  | Red LED 640nm <sup>2</sup>  |
| Setting  | Sensitivity trimmer  | Sensitivity trimmer  | Sensitivity trimmer   | Sensitivity trimmer   |
| Resolution   | 0.3mm  | 0.5mm  | 0.5mm   | 0.8mm   |
| Output LED   | Red LED  | Red LED  | Red LED   | Red LED   |
| Response Time  | 333µs  | 333µs  | 333µs   | 333µs   |
| Operation Mode   | Light/Dark   | Light/Dark   | Light/Dark  | Light/Dark  |
| <b>Wiring Diagrams</b>   |  |  |   |   |
| <b>OUTPUT:</b>   |  |  |   |   |
| PNP NO-NC Selectable M8  | SRF-30-5-P   | SRF-50-5-P   | SRF-80-5-P  | SRF-120-5-P   |
| NPN NO-NC Selectable M8  | SRF-30-5-N   | SRF-50-5-N   | SRF-80-5-N  | SRF-120-5-N   |
| <p>For plug and cable use part no. <b>CS-B1-01-G-05 (axial)</b> For sensor cable and accessories see pages 68-71</p> <p>Lazer models available on request</p>  |  |  |   |   |
|   |  |  |   |   |



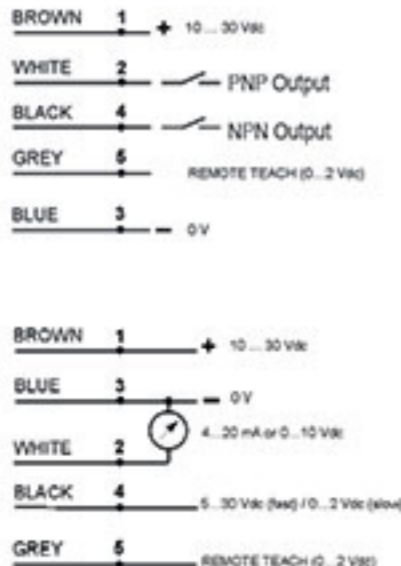
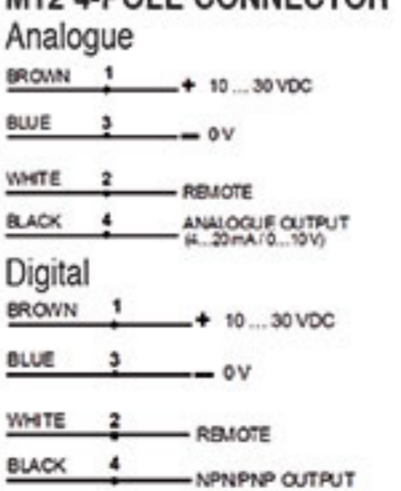

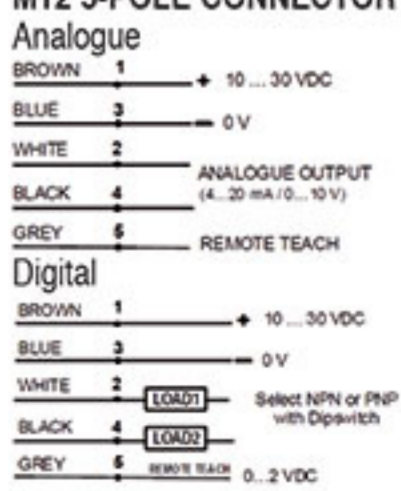

**NEW**

**SLOT SENSORS IP65**

**ULTRASONIC FORK SENSOR IP54**

| Slot Sensor<br><b>SR23 SERIES</b>   | <b>SR23 Series 5mm</b>  |                       | Slot Sensor<br><b>SRX3 SERIES</b> | <b>SRX3 Series 3mm</b><br>For Transparent Label Detection   |  |
|---|---|-----------------------|-----------------------------------|---|--|
| <ul style="list-style-type: none"> <li>Setting: Auto Set Push-Button</li> <li>Output: NPN &amp; PNP</li> </ul> <p><i>For sensor cable and accessories see pages 68-71</i></p> |    |                       |                                   |                                        |  |
| Switching Speed   | 12 kHz  | 12 kHz                | Switching Speed                   | 500Hz   |  |
| DC Supply voltage   | 10-30VDC  | 10-30VDC              | DC Supply Voltage                 | 10-30VDC  |  |
| Emission  | Infrared LED 850nm  | Infrared LED 850nm    | Emission                          | Ultrasonic  |  |
| Resolution  | 0.5mm   | 0.5mm                 | Max tape Speed                    | 300m/min  |  |
| Output LED  | Yellow, Green (Ready)   | Yellow, Green (Ready) | Settings                          | Dynamic/Static Teach-in   |  |
| Output current  | 100mA   | 100mA                 | Output LED                        | Yellow  |  |
| Saturation voltage  | 2v  | 2v                    | Output Current                    | 250mA   |  |
| Response Time   | 40us  | 40us                  | Output                            | PNP/NPN   |  |
| Electrical Protection   | class 2   | class 2               | Response Time                     | 1ms   |  |
| Housing Material  | Zinc Alloy  | Zinc Alloy            | Housing Material                  | Aluminium   |  |
| Operating temperature   | -25° to 55°C  | -25° to 55°C          | Ingress Protection                | <b>IP54</b>   |  |
| Connection  | 2m Cable  | M8 4-pole             | Connections                       | M12 5-Pole Connector  | M8 4-Pole Connector  |
| <b>Wiring Diagrams</b>  | <p><b>Cable</b></p>  <p><b>M8 Connector</b></p>  |                       | <b>Wiring Diagrams</b>            | <p><b>M12 Connector - 5 Pin</b></p>  | <p><b>M8 Connector - 8 Pin</b></p>  |
| <b>OUTPUT:</b>  |   |                       | <b>OUTPUT:</b>                    |   |  |
| NPN   | SR23-2-IR-NH  | SR23-5-IR-NH          | PNP/NPN Dynamic                   | SRX3-5-US-M12-PNH   | SRX3-6-US-M8-PH  |
| PNP   | SR23-2-IR-PH  | SR23-5-IR-PH          | PNP/NPN Static                    | SRX3-5-US-3-M12-PNH   | SRX3-6-US-3-M8-PH  |

**ULTRASONIC SENSORS FOR MEASUREMENT AND INSPECTION IP67**

| Type DC<br><b>US SERIES</b>   | <b>M18</b>   | <b>M30</b>  | <b>M50</b>  |
|---|--|---|---|
| <ul style="list-style-type: none"> <li>Nominal Voltage: 10-30VDC</li> <li>Output: NPN &amp; PNP / 0-10VDC / 4-20mA</li> <li>Output Current: 100mA max.</li> <li>Complete Range</li> </ul> |  |   |    |
| Sensing Distance  | 30-300mm   | 100-1000mm  | 200-2000mm  |
| Setting   | Teach-in Or Remote Input   |   | Teach-in Push button / Remotely / Analogue Push Button  |
| Output LED  | Yellow-Green Output / Red Power  |   | Green Power On / Red Signal / Yellow, Red Output  |
| Housing Material  | Polyester  | PBT   | ABS Polycarbonate   |
| Operating Temperature   | -25° to 55°C   | -40° to 70°C  | -20° to 70°C  |
| Connections   | M12 5-pole Connector   | M12 4-pole Connector  | M12 5-pole Connector  |
| <b>Wiring Diagrams</b>  |   | <p><b>M12 4-POLE CONNECTOR</b></p> <p><b>Analogue</b></p>  <p><b>Digital</b></p>  | <p><b>M12 5-POLE CONNECTOR</b></p> <p><b>Analogue</b></p>  <p><b>Digital</b></p>  |
| <b>OUTPUT:</b>  |  |   |   |
| NPN & PNP   | US18-PA*-5-N03-OH  | US30-PR-5-N13-OH  | US50-PR-5-N43-OH  |
| Analogue Output 0 - 10 VDC  | US18-PA*-5-N03-VH  | US30-PR-5-N13-VH  | US50-PR-5-N43-IVH   |
| Analogue Output 4 - 20 mA   | US18-PA*-5-N03-IH  | US30-PR-5-N13-IH  | US50-PR-5-N43-IVH (0-10V / 4-20mA Configurable Output)  |

\* For radial type replace A with R e.g. US18-PR-5-N03-OH For sensor cable and accessories see pages 68-71

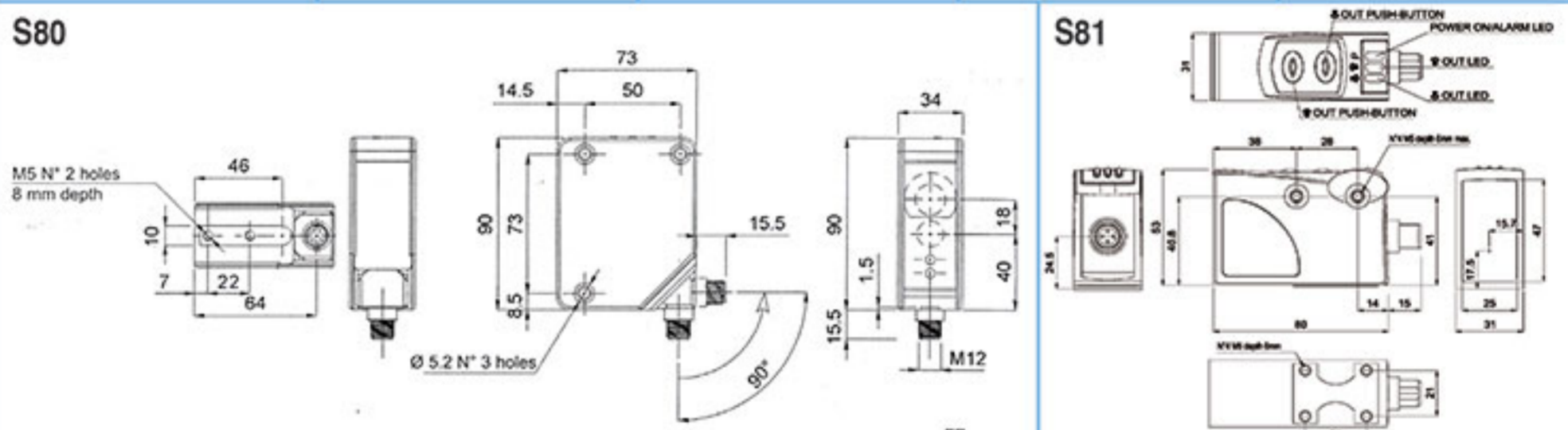
LIMIT & PRESSURE SWITCHES & SENSORS



# TIME OF FLIGHT LASER MEASUREMENT DISTANCE SENSORS

| Type DC S80 SERIES    | Analogue Distance S80 Series | Analogue Distance S80 Series | Analogue Distance S80 Series | Analogue Distance S80 Series  | Analogue Distance S81 Series <i>Cost Effective</i>  |
|-----------------------|------------------------------|------------------------------|------------------------------|-------------------------------|---|
|                       |                              |                              |                              |                               |   |
|                       |                              |                              |                              |                               |   |
| Distance              | 0.3-4m                       | 0.3-7m                       | 0.3-20.3m (on R80 reflector) | 0.3-100.3m (on R80 reflector) | 0.3-4m  |
| DC Supply Voltage     | 15-30VDC                     | 15-30VDC                     | 15-30VDC                     | 15-30VDC                      | 24VDC +/-20%  |
| Digital Resolution    | 0.9mm                        | 0.4mm                        | 0.6mm                        | 6mm                           |   |
| Linearity             | 0.3%                         | 0.3%                         | 0.25%                        | 0.15%                         | <1%   |
| Switching Frequency   | 100Hz(normal)/500Hz(fast)    | 100Hz                        | 100Hz(normal)/500Hz(fast)    | 100Hz(normal)/500Hz(fast)     | 80Hz  |
| Light Emission        | Red Laser cl.2               | Red Laser cl.2               | Red Laser cl.2               | Red Laser cl.2                | Red Laser 665nm, cl.2   |
| Response Time         | 5ms(normal)/1ms(fast)        | 5ms                          | 5ms(normal)/1ms(fast)        | 5ms(normal)/1ms(fast)         | 5ms   |
| Serial Interface      | RS485                        | RS485                        | RS485                        | RS485                         | -   |
| Settings              | Teach-in push-button         | Teach-in push-button         | Teach-in push-button         | Teach-in push-button          | Teach-in push-button  |
| Output                | 2 x PNP 4-20mA analogue      | 2 x PNP 4-20mA analogue      | 2 x PNP 4-20mA analogue      | 2 x PNP 4-20mA analogue       | 2PNP or NPN outputs<br>1PNP or NPN alarm output<br>(only S81...M) 1analogue<br>0-10V output (S81...Y) |
| Contact               | NO                           | NO                           | NO                           | NO                            | -   |
| Connection            | M12 8-pole connector         | M12 8-pole connector         | M12 8-pole connector         | M12 8-pole connector          | M12 5-pole connector  |
| Electrical Protection | Class 2                      | Class 2                      | Class 2                      | Class 2                       | Class 2   |
| Housing Material      | Aluminium                    | Aluminium                    | Aluminium                    | Aluminium                     | ABS   |
| Ingress Protection    | IP67                         | IP67                         | IP67                         | IP67                          | IP67  |
| Operating Temperature | -10° to 50°C                 | -10° to 50°C                 | -10° to 50°C                 | -10° to 50°C                  | -10° to 50°C  |

**Dimensions**



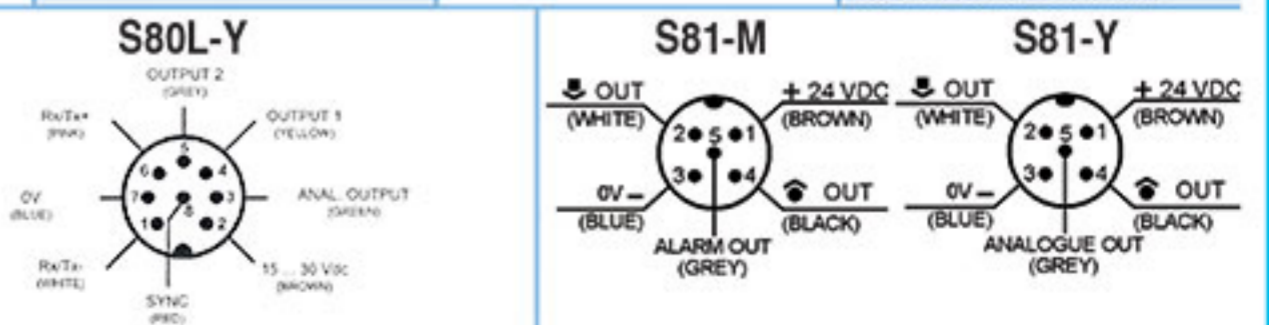
**OUTPUT:**

|                                 |                        |                     |                    |                    |                   |
|---------------------------------|------------------------|---------------------|--------------------|--------------------|-------------------|
| 2 x PNP 4 - 20mA                | S80-MH-5-Y09-PP*IZ     | S80-MH-5-YL09-PP*IZ | S80-MH-5-Y19-PP*IZ | S80-MH-5-Y29-PP*IZ | -                 |
| 2 x PNP 1 x PNP Alarm           | Background suppression |                     |                    |                    | S81-PL-5-M03-PP*C |
| 2 x PNP 0-10V Analogue          | -                      | -                   | -                  | -                  | S81-PL-5-Y03-PP*V |
| 2 x PNP Scalable 0-10V Analogue | -                      | -                   | -                  | -                  | S81-PL-5-Y03-PPVK |

**Wiring Diagrams**

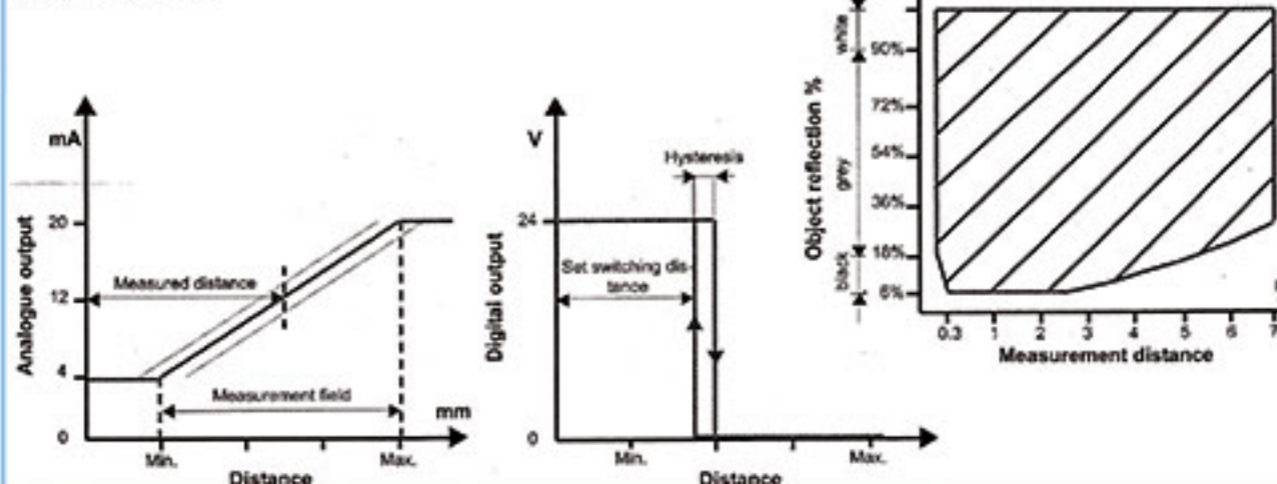
\*For NPN replace PP with NN  
E.g. S80-NG-5-Y09-NN

For plug and cable use part no.  
**CS-A1-06-B-03/10.** Use only R80 reflector  
(03 = 3m Cable. 10 = 10m Cable)

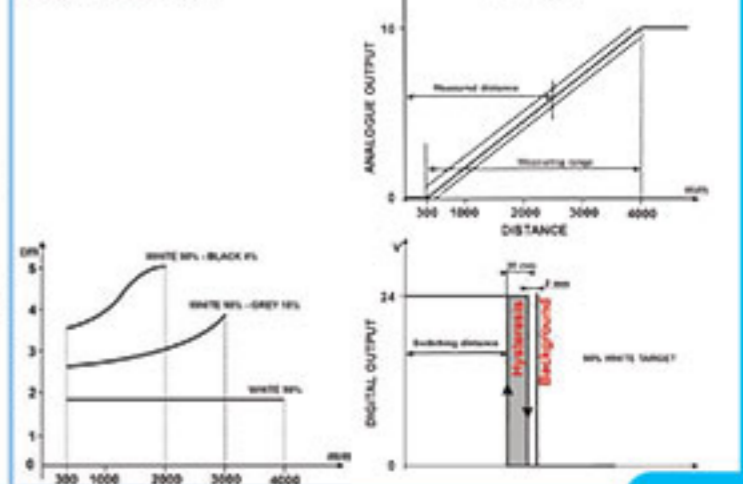


**Detection Diagrams**

**S80 Series**

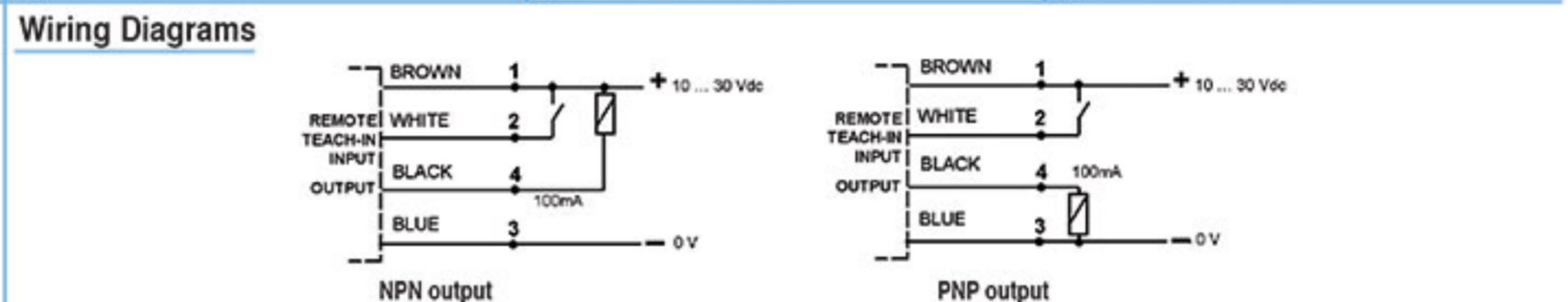


**S81 Series**



# DC FIBRE OPTIC AMPLIFIER IP67 DIN RAIL

| Type DC   | Through Beam + Proximity       | Through Beam + Proximity      | Through Beam + Proximity     |
|---|--------------------------------|-------------------------------|------------------------------|
| <b>S7 SERIES</b><br><ul style="list-style-type: none"> <li>• 10 bit resolution models with 500µs response for high operating distances</li> <li>• 12 bit resolution models with 50µs response and 4 digit display for high speed</li> <li>• Cost-effective models with multiturn trimmer adjustment</li> <li>• EASYtouch™ push-button setting with remote control, keylock and output delay</li> <li>• Ultra-thin housing with CLEARLOCK™ patented fibre fixing system</li> </ul> |                                |                               |                              |
| Switching Frequency   | 1KHz                           | 5KHz                          | 10KHz                        |
| Sensing Distance  | 100mm Prox. 300mm Through Beam | 50mm Prox. 300mm Through Beam | 25mm Prox. 75mm Through Beam |
| DC Supply Voltage   | 12-24VDC ±10%                  | 12-24VDC ±10%                 | 12-24VDC ±10%                |
| Emission  | Red LED 670nm                  | Red LED 670nm                 | White LED 460-630nm          |
| Setting   | Teach-in push-button           | Teach-in push-button          | Teach-in push-button         |
| Output LED  | Yellow/Green/Red error         | Yellow/Green/Red error        | Yellow/Green/Red error       |
| Output  | PNP or NPN                     | PNP or NPN                    | PNP or NPN                   |
| Contact   | NO                             | NO                            | NO                           |
| Output current  | ≤100ma                         | ≤100ma                        | ≤100ma                       |
| Saturation Voltage  | ≤2V                            | ≤2V                           | ≤2V                          |
| Response Time   | 500µs                          | 100µs                         | 500µs                        |
| Timing Function   | 20ms minimum out ON            | 20ms minimum out ON           | 20ms minimum out ON          |
| Operation Mode  | light with EASYtouch™          | light with EASYtouch™         | light with EASYtouch™        |



### OUTPUT:

|                        |          |          |          |
|------------------------|----------|----------|----------|
| PNP NO M8 Plug         | S7-6-E-P | -        | -        |
| NPN NO M8 Plug         | S7-6-E-N | -        | -        |
| PNP NO M8 Plug Display | -        | S7-5-E-P | -        |
| NPN NO M8 Plug Display | -        | S7-5-E-N | -        |
| PNP NO Cable Display   | -        | S7-2-E-P | S7-1-E-P |
| NPN NO Cable Display   | -        | S7-2-E-N | S7-1-E-N |

**For plug and cable use part number CS-B1-02-G-05/03 (03 = 3m Cable. 05 = 5m Cable)**

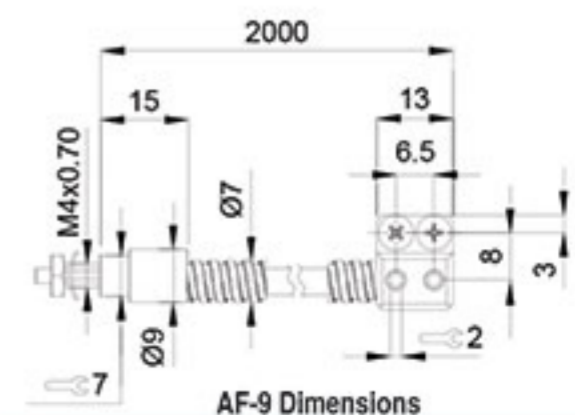
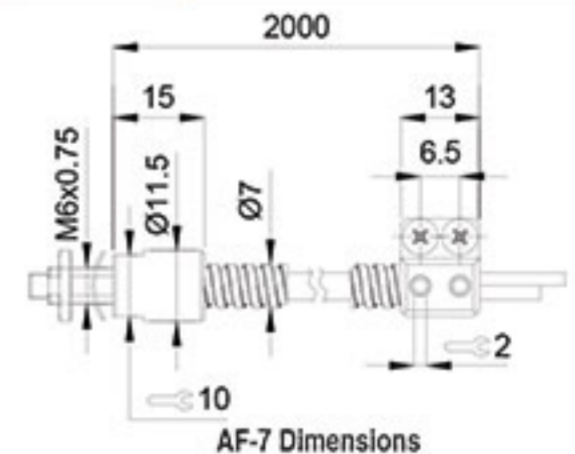
### Fibre Optic Cables

| Optic Function    | Terminal/Tips | Fibre Type            | Length | Part Number |
|-------------------|---------------|-----------------------|--------|-------------|
| Coaxial Proximity | M6 x 1mm      | Standard 1mm          | 2m     | OF-36-ST-20 |
| Proximity         | M6 x 1mm      | Standard 1mm          | 1m     | OF-18-ST-10 |
| Proximity         | M6 x 1mm*     | Standard 1mm          | 2m     | OF-22-ST-20 |
| Proximity         | M3 x 0.5mm    | Thin 0.5mm            | 1m     | OF-26-TN-10 |
| Proximity         | M6 x 0.75mm   | Standard 1mm          | 1m     | OF-42-ST-20 |
| Proximity         | M6 x 0.75mm   | High Efficiency 1.5mm | 2m     | OF-42-HP-20 |
| Through Beam      | M4 x 0.7mm    | Standard 1mm          | 1m     | OF-19-ST-10 |
| Through Beam      | M4 x 0.7mm*   | Standard 1mm          | 2m     | OF-23-ST-20 |
| Through Beam      | M2 x 0.4mm    | Thin 0.5mm            | 1m     | OF-25-TN-10 |
| Through Beam      | M4 x 0.7mm    | Standard 1mm          | 1m     | OF-43-ST-20 |
| Through Beam      | M4 x 0.7mm    | High Efficiency 1.5mm | 2m     | OF-43-HP-20 |



### Stainless Steel Protective Metal Sheath 2m

| Part Number | Suitable Fibres              |
|-------------|------------------------------|
| AF-7        | M6 x 0.75mm fibres OF-42-xx  |
| AF-9        | M4 x 0.7mm fibres OF-43-xx** |



### Application Fibre Optics

| Optic Function | Terminal/Emission     | Fibre Length | Part Number |
|----------------|-----------------------|--------------|-------------|
| Through Beam   | Axial, 16 Beam Array  | 2m           | OFA-1-AE-20 |
| Through Beam   | Radial, 16 Beam Array | 2m           | OFA-1-AS-20 |
| Proximity      | Axial, 32 Beam Array  | 2m           | OFA-2-AE-20 |
| Proximity      | Radial, 32 Beam Array | 2m           | OFA-2-AS-20 |



**\* A bendable stainless steel extension 90mm long protrudes from the threaded optic head** **\*\* 2 Sheaths have to be ordered for both the emitter-receiver fibres**

Standard fibre-optics

LIMIT & PRESSURE SWITCHES & SENSORS



## LONG RANGE PHOTOELECTRIC SENSORS IP54

| Type  | Through Beam Kits  |            |  | Accessories for P40 |
|---|--|------------|--|---------------------|
| <p>• Included: Receiver &amp; Emitter<br/>• Emission: Infrared (875nm)<br/>• Ambient: -20° to 60°C<br/>• Light Immunity: &gt;5000 Lux</p> <p><b>CE</b> <b>DAT</b></p> | <p>Receiver      Emitter</p> <p><b>P40 – flush mount</b></p> |            | <p>Receiver      Emitter</p> <p>Battery operated 9V emitter -<br/>150 days min. Solar cell power<br/>supply on request</p> | <p><b>C340</b></p>  |
|   |  |            |  | <p><b>S340</b></p>  |
| Switching Distance  | 55M  | 15M        |  | <p><b>SCP44</b></p> |
| Output  | Relay: 1A @ 24VDC  | 2 Relay    |  |                     |
| Consumption   | 40mA   | 70mA       |  |                     |
| 12-24VAC/DC   | <b>P40</b>   | <b>P44</b> |  |                     |
| 9V Alkaline Battery   | <b>P44</b>   |            |  |                     |

NEW

## ROTARY ENCODERS

|  | 40mm Hollow Shaft Encoder<br>(Incremental Type) | 250mm Wheel Type Encoder<br>250 Pulses/Revolution<br>(Incremental Type) | 250mm Wheel Type Encoder<br>25 Pulses/Revolution<br>(Incremental Type) | 250mm Wheel Type Encoder<br>1 Pulse / 4 Revolutions<br>(Incremental Type) |              |                     |              |                     |
|--|---|---|--|---|--------------|---------------------|--------------|---------------------|
| <p><b>Autonics</b><br/>Sensors &amp; Controllers</p> |   |   |  |   |              |                     |              |                     |
| <b>Type</b>  | <b>Code</b>                                     | <b>Supply Volts</b>   | <b>Code</b>  | <b>Supply Volts</b>   | <b>Code</b>  | <b>Supply Volts</b> | <b>Code</b>  | <b>Supply Volts</b> |
| Totem Pole Output                                    | E40H*-**3-T-24                                  | 12-24VDC  | ENC-1-1-T-24   | 12-24VDC  | ENC-1-2-T-24 | 12-24VDC            | ENC-1-3-T-24 | 12-24VDC            |
| NPN NO Output  | E40H*-**3-N-24                                  | 12-24VDC  | ENC-1-1-N-24   | 12-24VDC  | ENC-1-2-N-24 | 12-24VDC            | ENC-1-3-N-24 | 12-24VDC            |
| Line Driver Output                                   | E40H*-**6-L-5                                   | 5VDC  |  |   |              |                     |              |                     |
| Gear Ratio   | -   |   | 1:1  |   | 4:1          |                     | 4:1          |                     |
| Shaft Size (mm)                                      | 6 / 8 / 10 / 12mm                               |   | 1mm  |   | 1cm          |                     | 1m           |                     |
| Max. Response Freq.                                  | 300kHz  |   | 180kHz   |   | 180kHz       |                     | 180kHz       |                     |

\* Add shaft size to code: 6, 8, 10, 12

\*\* Add pulses/revolution to code: 20, 50, 75, 100, 125, 150, 200, 250, 360, 500, 1000, 1024, 1800, 2048, 2500, 3600, 5000

|                          | 20mm Ø, Shaft Type Encoder<br>(Incremental Type) | 40mm Ø, Shaft Type Encoder<br>(Incremental Type) | 50mm Ø, Shaft Type Encoder<br>(Incremental Type) |                     |   |                     |
|--------------------------|--|--|--|---------------------|---|---------------------|
| <p>Coupling</p>          |  |  |  |                     |   |                     |
| <b>Code</b>              | <p>E4DC-6/6<br/>E5DC-8/8<br/>E5DC-10/10</p>      |  |  |                     |   |                     |
| <b>Type</b>              | <b>Code</b>                                      | <b>Supply Volts</b>                              | <b>Code</b>                                      | <b>Supply Volts</b> | <b>Code</b>   | <b>Supply Volts</b> |
| Totem Pole Output (HTL)  | E20S2*-3-V-R                                     | 12-24VDC   | E40S6*-3-1                                       | 12-24VDC            | E50S8*-3-1  | 12-24VDC            |
| NPN N/O Output (TTL)     | E20S2*-3-N-R                                     | 12-24VDC   | E40S6*-3-2                                       | 12-24VDC            | E50S8*-3-2  | 12-24VDC            |
| Line Driver Output (TTL) | E20S2*-3-L-R                                     | 5VDC   | E40S6*-6-L                                       | 5VDC                | E50S8*-6-L  | 5VDC                |
| Pulses/Revolution        | *Add to code: *100, 200, 320, 360                |  | *Add to code: *100, 360, 500, 1000, 1024         |                     | *Add to code: *50, 100, 200, 250, 360, 1000, 1024, 1800, 2500, 3600 |                     |

### Specifications

| Shaft               | 2mm  | 6mm | 8mm    |
|---------------------|--|-----|--------|
| Totem Pole Output   | Low $\mathcal{G}$ Load current: Max. 30mA, Residual voltage: Max. 0.4V<br>High $\mathcal{G}$ Load current: Max. 10mA, Output Voltage: Min. 1.5V  |     |        |
| NPN Open Output     | Load Voltage: Max. 30V, Load current: Max. 30mA, Residual Voltage: Max. 0.4V   |     |        |
| Line Driver Output  | Low $\mathcal{G}$ Load current: Max. 20mA, Residual Voltage: Max. 0.5V<br>High $\mathcal{G}$ Load current: Max. -20mA, Output Voltage: Min. 2.5V |     |        |
| Max. Response Freq. | 100kHz   |     | 180kHz |

# INCREMENTAL AND ABSOLUTE OPTICAL ROTARY ENCODERS

|                      | Basic Line Incremental<br>41mmØ | Extended Line Incremental<br>58mmØ    | SSI Single-turn Absolute<br>58mmØ              |
|----------------------|---------------------------------|---------------------------------------|--|
|                      |                                 |                                       |  |
|                      |                                 |                                       |  |
|                      |                                 |                                       |  |
| Power Supply         | 5–30VDC                         | 5–30VDC                               | 7.5–34VDC                                      |
| Resolution           | Up to 4096 PPR                  | Up to 10000 PPR and programmable      | 13 bit = up to 8192 count per revolution (CPR) |
| Output Signals/ Code | A/B0 and /A/B/0                 | A/B0 and /A/B/0                       | Gray   |
| Output Circuit       | Smart Push-Pull & Line Driver   | Smart Push-Pull & Line Driver         | SSI® (RS422) tree format                       |
| Consumption          | 50mA max.                       | 70mA max.                             | 0.9W   |
| Output Current       | 40 mA max (per channel)         | 40 mA max (per channel)               | -  |
| Connection           | Cable 1.5m                      | Cable 1.5m or connector M12 or M23    | Cable 1.5m or connector M12 or M23             |
| Shaft Dimension      | Hollow or Solid Shaft Ø6mm      | Hollow Ø14 or 15mm, solid Ø6 or Ø10mm | Hollow Ø15mm, solid Ø6 or Ø10mm                |
| Case Dimension       | Ø40.5mm, depth 34mm             | Ø58mm, depth 54mm                     | Ø58mm, depth 48mm                              |

| Part Numbers            |                  |                     |                           |
|-------------------------|------------------|---------------------|---------------------------|
| Hollow Shaft Ø6/14/15mm | ENC41-H06-**-C15 | ENC58-H14*--C15-*** | AST58-H15-13X01-C15-***   |
| Solid Shaft Ø6/10mm     | ENC41-S06-**-C15 | ENC58-S06^--C15-*** | AST58-S06^--13X01-C15-*** |

\*For Ø15mm shaft use 15 e.g. ENC58-H15. ^ For Ø10mm shaft use 10 e.g. ENC58-S10 or AST58-S10 or AMT58-S10  
 \*\*Add pulses/revolution: 0100, 0360, 0500, 1000, 1024, 2048, 4096.  
 \*\*\*Add pulses/revolution: 0500, 1000, 1024, 2000, 2048, 5000, 10000, **PROG.**(only available M23 Connector)  
 \*\*\*Add connector type to code: M12 or M23

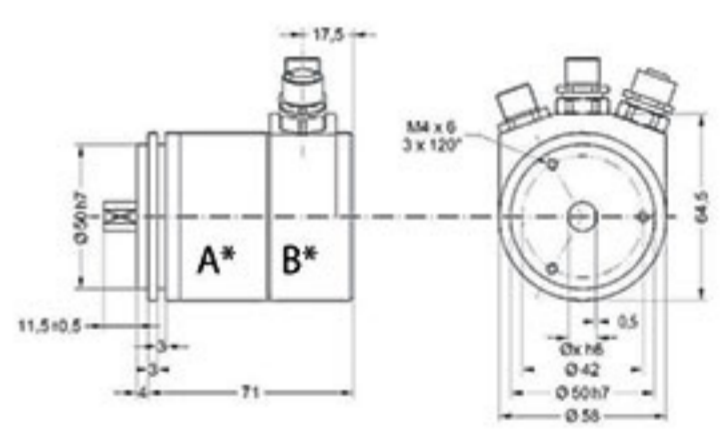
## Wiring Diagrams

| Electrical Connections: ENC41-S/H |       |        |      |      |      |     |       |       |        |
|-----------------------------------|-------|--------|------|------|------|-----|-------|-------|--------|
| Signals                           | A     | /A     | B    | /B   | 0    | /0  | +VDC  | 0VDC  | Shield |
| A/B0/A/B0 outputs (8-wire cable)  | Green | Yellow | Grey | Pink | Blue | Red | Brown | White | Shield |

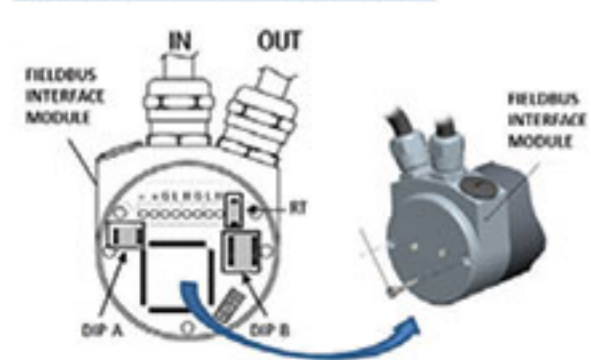
  

| Electrical Connections: ENC58-S/H |       |        |      |      |      |     |       |       |        |
|-----------------------------------|-------|--------|------|------|------|-----|-------|-------|--------|
| Signals                           | A     | /A     | B    | /B   | 0    | /0  | +VDC  | 0VDC  | Shield |
| M12 8-pin                         | 3     | 4      | 5    | 6    | 7    | 8   | 2     | 1     | Case   |
| M23 12-pin                        | 3     | 4      | 5    | 6    | 7    | 8   | 2     | 1     | Case   |
| A/B0/A/B0 outputs (8-wire cable)  | Green | Yellow | Grey | Pink | Blue | Red | Brown | White | Shield |

| SSI Serial Connections: AMT/AST58-H/S |            |           |        |
|---------------------------------------|------------|-----------|--------|
| Signals                               | M23 12-pin | M12 8-pin | Cable  |
| 0V                                    | 1          | 1         | White  |
| +VDC                                  | 2          | 2         | Brown  |
| Clock In+                             | 3          | 3         | Green  |
| Clock In-                             | 4          | 4         | Yellow |
| Data Out+                             | 5          | 5         | Grey   |
| Data Out-                             | 6          | 6         | Pink   |
| Preset                                | 7          | 7         | Blue   |
| Count dir.                            | 8          | 8         | Red    |
| Shield                                | Case       | Case      | Shield |



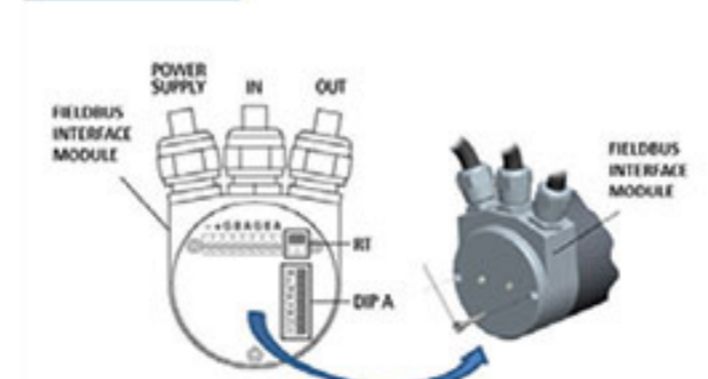
## CANopen or Devicenet



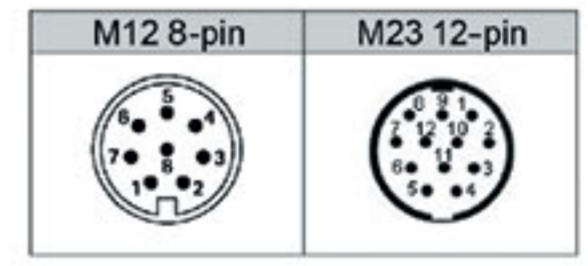
| M12 5-pin I/O |        |
|---------------|--------|
| CAN Shield    | Case 1 |
| +10...30Vdc   | + 2    |
| 0Vdc          | - 3    |
| CAN High      | H 4    |
| CAN Low       | L 5    |

| M12 4-pin PS |   | M12 4-pin I/O |   |
|--------------|---|---------------|---|
| +10...30Vdc  | 1 | TX Data +     | 1 |
| n.c.         | 2 | RX Data +     | 2 |
| 0Vdc         | 3 | TX Data -     | 3 |
| n.c.         | 4 | RX Data -     | 4 |

## Profibus-DP






| M12 3-pin   |   | M12 5-pin I/O |         |
|-------------|---|---------------|---------|
| +10...30Vdc | 1 | n.c.          | 1       |
| 0Vdc        | 3 | Profibus A    | Green 2 |
| Shield      | 4 | n.c.          | 3       |
|             |   | Profibus B    | Red 4   |
|             |   | n.c.          | 5       |



| M12 4-pin P1 |   | M12 4-pin PS |   | M12 4-pin P2 |   |
|--------------|---|--------------|---|--------------|---|
| TX Data +    | 1 | +10...30Vdc  | 1 | TX Data +    | 1 |
| RX Data +    | 2 | n.c.         | 2 | RX Data +    | 2 |
| TX Data -    | 3 | 0Vdc         | 3 | TX Data -    | 3 |
| RX Data -    | 4 | n.c.         | 4 | RX Data -    | 4 |

LIMIT & PRESSURE SWITCHES & SENSORS

# SSI AND FIELDBUS ABSOLUTE OPTICAL ROTARY ENCODERS

| SSI Multi-turn Absolute<br>58mmØ   | Multi-turn with Integrated Fieldbus<br>Absolute 58mmØ  | Multi-turn with Modular Fieldbus<br>Interface Absolute 58mmØ  |
|--|--|---|
|           |            |                  |
| 7.5-34VDC<br>13 x 12 bit = up to 8192 CPR x 4096 turns                                     | 7.5 - 34VDC<br>13 x 12 bit = 8192 CPR x 4096 turns /<br>13 x 14 bit = 8192 CPR x 16384       | 7.5-34VDC<br>16 x 14 bit = up to 65536 CPR x 16384 turns  |
| Gray<br>SSI® (RS422) tree format<br>1W   | -<br>Canopen, Devicenet, Ethercat, Profibus, Profinet<br>2.2W                                | -<br>Fieldbus interface module<br>2.2W  |
| -  | -  | -   |
| Cable 1.5m or connector M12 or M23<br>Hollow Ø15mm, solid Ø6 or Ø10mm<br>Ø58mm, depth 48mm | M12 Connector<br>Hollow Ø15mm, solid Ø10mm<br>Ø58mm, dept 71mm, (encoder + interface module) | M12 connectors<br>Hollow Ø15mm, solid Ø6 or Ø10mm<br>Ø58mm, depth 71mm (encoder + interface module) |

**Part Numbers**

|                          |                     |                     |                       |
|--------------------------|---------------------|---------------------|-----------------------|
| AMT58-H15-13X12-C15***   | AMT58-H15-13X12-PB◇ | AMT58-H15-13X14-PN# | AMT58-H15-16X4-FBUS   |
| AMT58-S06^A-13X12-C15*** | AMT58-S10-13X12-PB◇ | AMT58-S15-13X14-PN# | AMT58-S06^A-16X4-FBUS |

**ACCESSORIES FOR FIELDBUS ENCODERS**

| Code                  | Description                             |
|-----------------------|---|
| CN-M12-CB/DN-KIT      | Canopen/ Devicenet 2 connectors kit     |
| CN-M12-5P-5M-CB/DN-O  | Canopen/ Devicenet output cable 5m      |
| CN-M12-5P-5M-CB/DN-I  | Canopen/ Devicenet input cable 5m       |
| CN-M12-PBUS-KIT       | Profibus 3 connectors kit               |
| CN-M12-4P-5M-BUS-PS   | Pbus/Ecat/Pnet power supply cable 5m    |
| CN-M12-5P-5M-PBUS-I   | Profibus input cable 5m                 |
| CN-M12-5P-5M-PBUS-O   | Profibus output cable 5m                |
| CN-M12-4P-5M-EC/PN-RJ | Ethercat/Profinet programming cable 5m  |
| CN-M12-4P-5M-EC/PN-IO | Ethercat/Profinet input-output cable 5m |
| CN-M12-4P-00-EC/PN-IO | Ethercat/Profinet input-output plug     |

**FIELDBUS INTERFACE MODULES**

|                               |               |
|-------------------------------|---------------|
| CANopen interface module*     | AMT58-FBUS-CB |
| Devicenet interface module*   | AMT58-FBUS-DN |
| Profibus DP interface module* | AMT58-FBUS-PB |

\*The encoder base unit must be ordered with the **FIELDBUS** interface module. The encoder base unit must be connected to the required **FIELDBUS** interface module

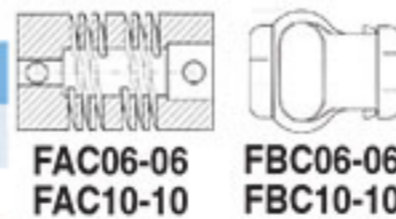
◇ For Canopen type replace **PB** with **CB**.  
For Devicenet type replace **PB** with **DN**

# For Ethercat replace **PN** with **EC**  
Fieldbus Encoders only available ex-indent

## ACCESSORIES FOR ENCODERS

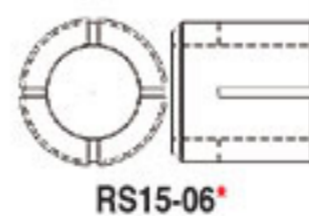
**Aluminium and Plastic Couplings Ø6mm & Ø10mm**

| Code     | FAC06-06 | FBC06-06 | FAC10-10 | FBC10-10 |
|----------|----------|----------|----------|----------|
| Diameter | Ø6mm     | Ø6mm     | Ø10mm    | Ø10mm    |



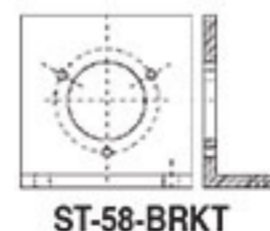
**Encoder Reducing Sleeve**

|      |   |
|------|---|
| Code | RS15-06*                                    |
|      | * For 8 / 10 / 11 / 12mm use 08, 10, 11, 12 |



**Encoder Mounting Brackets for Ø58 Encoders**

| Code | ST-58-KIT     | ST-58-BELL    | ST-58-BRKT | ST-58-FLNG |
|------|---------------|---------------|------------|------------|
| Type | Fixing Clamps | Mounting Bell | L-Bracket  | Flange     |



**Cables & Connectors**

| Code             | Description                   |
|------------------|-------------------------------|
| CS-A1-06-U-05*   | M12 8 Pin 5m cable            |
| CN-M23^A-12P-05* | M23 12 Pin 5m cable           |
| CS-A1-06-B-NC    | M12 8 Pin connector no cable  |
| CN-M23-12P-00    | M23 12 Pin connector no cable |














| Code              | Description                                       |
|-------------------|---|
| OEK-4             | Encoder Kit PNP 250PPR. Bracket, Spring and Wheel |
| IEP58-PROG-TOOL   | Programming tool for ENC58                        |
| CN-M12-PROG-CABLE | M12 Cable for Programming Tool                    |
| CN-M23-PROG-CABLE | M12 Cable for Programming Tool                    |
| DWA*-5000         | Draw Wire   |

\*For integral encoder replace **A** with **I**



^For Absolute Encoder Plug and Cable Add A / \*For 10m Cable replace 05 with 10

# FINGER, HAND AND BODY PROTECTION SAFETY LIGHT CURTAINS IP65

| Type 2 or 4   | SG4 BASE  | SG2 BASE   | SG2 Extended   |
|---|---|--|--|
| <p>• According to IEC61496-1 and EIC61496-2</p> <p><b>Note: For Safety Light Curtain selection guide see Datalogic Short Form Catalogue</b></p>   | <ul style="list-style-type: none"> <li>• High reliability</li> <li>• Easy installation and alignment</li> <li>• Cost effective solution</li> </ul>    | <ul style="list-style-type: none"> <li>• High reliability</li> <li>• Easy installation and alignment</li> <li>• Cost effective solution</li> </ul>    |  <ul style="list-style-type: none"> <li>• High reliability</li> <li>• Easy installation and alignment</li> <li>• Cost effective solution</li> </ul>   |
| Sensing Distance  | 6m      19m   | 19m  | Selectable 9m or 19m   |
| Power Supply  | 24VDC   | 24VDC  | 24VDC  |
| Resolution (mm)   | 14mm      30mm  | 30mm   | 30mm   |
| Controlled Height   | 150-1800mm  | 150-1800mm   | 150-1800mm   |
| Response Time   | 10-51ms      9-28ms   | 8-24ms   | 8-24ms   |
| Output  | 2 x PNP transistors   | 2 x PNP transistors  | 2 x PNP transistors  |
| Connection  | Rx: M12 8-Pole,<br>Tx M12 4-Pole  | Rx: M12 5-Pole<br>Tx: M12 4-Pole   | Rx: M12 8-Pole<br>Tx: M12 4-Pole   |
| Profile (mm)  | 32 x 37   | 32 x 37  | 32 x 37  |
| Device Settings   |   |  |  |
| Device Function   | Reset Test, Manual/Auto Restart selection, EDM selection  |  | Test, Manual/Automatic Restart Selection   |
| Plus Functions  |   | Test, Automatic Restart  | EDM Selectable. Selectable max distance 9m or 19m  |

### Controlled Height/Beams <sup>A</sup>

|        |                 |                 |                 |                   |
|--------|-----------------|-----------------|-----------------|-------------------|
| 150mm  | SG4-14-015-00-E | SG4-30-015-00-E | SG2-30-015-00-X | SG2-30-015-00-E-C |
| 300mm  | SG4-14-030-00-E | SG4-30-030-00-E | SG2-30-030-00-X | SG2-30-030-00-E-C |
| 450mm  | SG4-14-045-00-E | SG4-30-045-00-E | SG2-30-045-00-X | SG2-30-045-00-E-C |
| 600mm  | SG4-14-060-00-E | SG4-30-060-00-E | SG2-30-060-00-X | SG2-30-060-00-E-C |
| 750mm  | SG4-14-075-00-E | SG4-30-075-00-E | SG2-30-075-00-X | SG2-30-075-00-E-C |
| 900mm  | SG4-14-090-00-E | SG4-30-090-00-E | SG2-30-090-00-X | SG2-30-090-00-E-C |
| 1050mm | SG4-14-105-00-E | SG4-30-105-00-E | SG2-30-105-00-X | SG2-30-105-00-E-C |
| 1200mm | SG4-14-120-00-E | SG4-30-120-00-E | SG2-30-120-00-X | SG2-30-120-00-E-C |

<sup>A</sup>Units with even longer controlled heights available on request. For safety accessories see pages 50-51

## CABLES FOR ALL SAFETY LIGHT CURTAINS

### Cables - for SG4 BASE, SG2 BASE & SG2 EXTENDED

| Light Curtain Series  | Transmitter Cable Code | Description     |
|---|------------------------|-----------------|
| SG4 BASE<br>(SG4-xx-xxx-00-X)   | CS-A1-02-U-03          | 4 Pole 3m Cable |
| SG2 BASE<br>(SG2-xx-xxx-00-X)   |                        |                 |
| SG2 EXTENDED<br>(SG2-xx-xxx-00-E-C)                                   | CS-A1-02-U-05          | 4 Pole 5m Cable |
| <b>The above cables are also used with single beam safety sensors</b> |                        |                 |
| Light Curtain Series  | Receiver Cable Code    | Description     |
| SG2 BASE<br>(SG2-xx-xxx-00-X)   | CS-A1-06-U-03          | 8 Pole 3m Cable |
| SG2 EXTENDED<br>(SG2-xx-xxx-00-E-C)                                   | CS-A1-06-U-05          | 8 Pole 5m Cable |
| SG4 BASE<br>(SG4-xx-xxx-00-E)   | CS-A1-03-U-03          | 5 Pole 3m Cable |
|   | CS-A1-03-U-05          | 5 Pole 5m Cable |

Note: All cables have axial connectors

Note: The Cable Chart is also to be used with SG2-B/E-50/90 on page 319







### Cables - for SG2 MUTING & SG4 EXTENDED

| Light Curtain Series              | Transmitter/Receiver Main Connector | Pigtail Cable/Interface Code | Length |
|-----------------------------------|-------------------------------------|------------------------------|--------|
| SG2 MUTING<br>(SG2-30-xxx-00-W)   | Transmitter                         | CS-G1-50-B-002               | 0.2m   |
|                                   | Receiver                            | CS-G1-70-B-002               | 0.2m   |
| SG4 EXTENDED<br>(SG4-xx-xxx-00-P) | Transmitter                         | CS-G1-50-B-002               | 0.2m   |
|                                   | <b>Blanking Configuration</b>       |                              |        |
|                                   | Receiver                            | CS-G1-70-B-002               | 0.2m   |
|                                   | <b>Muting Configuration</b>         |                              |        |
|                                   | Receiver                            | CS-R1-75-B-002               | 0.2m   |
| <b>Dongle</b>                     |                                     |                              |        |
|                                   | Receiver                            | SG4-DONGLE                   | -      |

Note: 1) The light curtain is sold without pigtail cables: they must be ordered separately for Transmitter and Receiver. 2) For SG4 EXTENDED, the pigtail cable used determines if the light curtain will work in Muting configuration or in Blanking configuration. If, in place of the pigtail cable, the Dongle is used for receiver, the light curtain can work in both configurations. When muting and blanking are not needed, Dongle or pigtail cable CS-G1-70-B-002 are suggested. 3) If SG4 EXTENDED receiver is connected to the programming and monitoring interface (DONGLE), the pigtail cable for Receiver isn't needed.

## PROGRAMMABLE, MUTING AND BLANKING TYPES IP65

| SG4 Extended Programmable***  |  | SG2-M-30 Muting   | Type 2 or 4 SERIES | SG Body Compact Base  | SG Body Compact Muting |
|---|--|---|--------------------|---|------------------------|
|  <p><b>SG EXTENDED</b></p> <ul style="list-style-type: none"> <li>State of the art technology</li> <li>Complete diagnostics and online monitoring</li> </ul>   |  |    |                    |     |                        |
| <p>7m (14mm) 20m</p> <p>24VDC</p> <p>14mm 30m</p> <p>300-1800mm</p> <p>No coding 15-33ms, coding 20-65ms</p> <p>2 x PNP/NPN configurable</p> <p>Rx: M12 12-Pole+M12 5-Pole for muting; M12 12-Poles for blanking, Tx: M12 5-Pole</p> <p>35 x 41 <b>(ZERO DEAD ZONE)</b></p> <p>Basic Configuration Mode (BCM)*</p> <p>Advanced Configuration Mode (ACM)**</p> <p>Reset, Restart selection, Alignment, EDM, Test, Muting, Partial Muting, Override, Coding, Range reduction, Fixed Blanking, Floating Blanking, Cascade, PNP/NPN output, GUI programming</p> |  | <p>20m</p> <p>24VDC</p> <p>30mm</p> <p>300-1800mm</p> <p>13-22ms</p> <p>2 x PNP transistors</p> <p>Rx: M12 12-Pole+M12 5-Pole</p> <p>Tx: M12 5-Pole</p> <p>35 x 41 <b>(ZERO DEAD ZONE)</b></p> <p>Basic Configuration Mode (BCM)*</p> <p>Test, Manual/Auto Restart Selection, EDM selection, Configurable Muting, Range Reduction</p> <p>Reduction Range, Alignment Aid</p> |                    | <p>• According to IEC61496-1 &amp; IEC61496-2</p> <p>Note: For Safety Light Curtain selection guide see Datalogic Short Form Catalogue</p> <p>CE NEW</p>  |                        |
|   |  |   |                    | <p>• Intergrated muting lamp</p> <p>• L and T muting models provided with retroreflective muting arms</p>   |                        |
|   |  |   |                    | <p>Sensing Distance 50m</p> <p>Power Supply 24VDC</p> <p>No. of beams 2-3-4</p> <p>Resolution (mm) 500-800-900-1200mm</p> <p>Controlled Height</p> <p>Response Time 14-16ms</p> <p>Output 2 x PNP transistors</p> <p>Connection Rx: M12 8-Pole Tx: M12 4-Pole</p> <p>Profile (mm) 35 x 40</p> <p>Device Settings Dip-switches, present on the Receiver Guarantee rapid and safe device settings</p> <p>Device Function Test, Manual/Auto Restart selection. EDM</p> <p>Plus Functions</p>                 |                        |
|   |  |   |                    | <p>50m (SG-S) 3m (SG-T/L)</p> <p>24VDC</p> <p>2-3-4</p> <p>500-800-900-1200mm</p> <p>500-800mm (L or T models)</p> <p>14-16ms</p> <p>2 x PNP transistors</p> <p>Rx: M12 8-Pole+M12 5-Pole</p> <p>Tx: M12 4-Pole+M12 5-Pole</p> <p>35 x 40</p> <p>Dip-switches, present on the Receiver Guarantee rapid and safe device settings</p> <p>One-way/Two-way Muting. Test Manual/Auto Restart selection. Muting time-out selection, EDM selection override</p>  |                        |
|   |  |   |                    | <p><b>Controlled Height/Beams</b> <sup>A</sup> For safety accessories see pages 50-51</p>   |                        |
|   |  |   |                    | <p>500mm 2Beam SG2**-S2-050-PP-E SG2**-S2-050-PP-W</p> <p>800mm 3Beam SG2**-S3-080-PP-E SG2**-S3-080-PP-W</p> <p>900mm 4Beam SG2**-S4-090-PP-E SG2**-S4-090-PP-W</p> <p>1200mm 4Beam SG2**-S4-120-PP-E SG2**-S4-120-PP-W</p> <p>L Muting 515mm 2Beam SG2**-L2-050-PP-W</p> <p>L Muting 815mm 3Beam SG2**-L3-080-PP-W</p> <p>T Muting 915mm 2Beam SG2-T2-050-PP-W</p> <p>T Muting 1215mm 3Beam SG2-T3-080-PP-W</p> <p>T Muting 515mm 2Beam SG4-T2-050-PP-W</p> <p>T Muting 815mm 3Beam SG4-T3-080-PP-W</p> |                        |
|   |  |   |                    | <p>** For type 4 units replace 2 with 4 e.g SG4-S3-050-PP-E or SG4-L2-050-PP-W</p> <p><sup>A</sup>Units with even longer controlled heights available on request.</p>   |                        |
|   |  |   |                    | <p>For safety accessories see pages 50-51</p>   |                        |

## CABLES FOR ALL SAFETY LIGHT CURTAINS

### Cables - for SG2 MUTING & SG4 EXTENDED (Continued)

| Light Curtain Series  | Transmitter/Receiver Secondary Connector | Receiver Main Connector | Length |
|---|--|-------------------------|--------|
| SG2 MUTING<br>(SG2-30-xxx-OO-W)<br>&<br>SG4 EXTENDED<br>(SG4-xx-xxx-OO-P) | CS-A1-03-U-03                            | CS-A1-10-U-03           | 3m     |
|   | CS-A1-03-U-05                            | CS-A1-10-U-05           | 5m     |
|   | CS-A1-03-U-10                            | CS-A1-10-U-10           | 10m    |
|   | CS-A1-03-U-15                            | CS-A1-10-U-15           | 15m    |
|   | CS-A1-03-U-25                            | CS-A1-10-U-25           | 25m    |
|   | CS-A1-03-U-50                            | CS-A1-10-U-50           | 50m    |

\*Push buttons located on both TX and RX allow the user to configure the device in a very easy and quick way

\*\*A GUI interface on PC communicate to the barrier through Ethernet and lead the customer through the configuration process step by step

\*\*\*(1) The light curtain is sold without pigtail cables: they must be ordered separately for Transmitter and Receiver. 2) In the case of the SG4 EXTENDED, the choice of the Receiver pigtail determines if it will work in **Muting configuration** or in **Blanking configuration**. 3) In case the SG4 EXTENDED will be installed together with the programming and monitoring interface (DONGLE), the pigtail cable for Receiver isn't needed. See accessories table for more info on DONGLE

**Pigtail cable for receiver:** Muting CS-R1-75-B-002, Blanking CS-G1-70-B-002

**Pigtail cable for emitter:** Muting & Blanking CS-G1-50-B-002

### Cables for SG BODY COMPACT BASE/MUTING - Main Connectors

| Light Curtain Series              | Transmitter Cable | Description                |
|-----------------------------------|-------------------|----------------------------|
| BASE<br>(SG2/4-Sx-xxx-PP-E)       | CV-A1-22-B-03     | M12 Axial 4 Pole 3m Cable  |
|                                   | CV-A1-22-B-05     | M12 Axial 4 Pole 5m Cable  |
| MUTING<br>(SG2/4-S/L/Tx-xxx-PP-W) | CV-A2-22-B-03     | M12 Radial 4 Pole 3m Cable |
|                                   | CV-A2-22-B-05     | M12 Radial 4 Pole 5m Cable |






| Light Curtain Series              | Receiver Cable | Description                |
|-----------------------------------|----------------|----------------------------|
| BASE<br>(SG2/4-Sx-xxx-PP-E)       | CV-A1-26-B-03  | M12 Axial 8 Pole 3m Cable  |
|                                   | CV-A1-26-B-05  | M12 Axial 8 Pole 5m Cable  |
| MUTING<br>(SG2/4-S/L/Tx-xxx-PP-W) | CV-A2-26-B-03  | M12 Radial 8 Pole 3m Cable |
|                                   | CV-A2-26-B-05  | M12 Radial 8 Pole 5m Cable |

### - Secondary Connectors

| Light Curtain Series                       | Receiver Cable | Description               |
|--|----------------|---------------------------|
| MUTING<br>(Linear) (SG2/4-S/L/Tx-xxx-PP-W) | CV-A1-03-U-03  | M12 Axial 5 Pole 3m Cable |
|  | CV-A1-03-U-05  | M12 Axial 5 Pole 5m Cable |

Note: The cables for the secondary connector of SG BODY COMPACT MUTING T and L are provided within the package

## PRESENCE CONTROL & REFLECTOR TYPE SAFETY LIGHT CURTAINS IP65

| SERIES   | SG2-B-50/SG2-B-90<br>Type 2   | SG2-E-50/SG2-E-90<br>Type 2   | SG4 Body Big Reflector Base<br>Type 4   | SG4 Body Big Reflector Muting<br>Type 4  |
|--|---|---|---|--|
| <p>• According to IEC61496-1 and IEC61496-2</p> <p>Note: For Safety Light Curtain selection guide see Datalogic Short Form Catalogue</p>  |  |  | <p>Passive/Reflector → Active ←</p>  | <p>Passive/Reflector → Active ←</p> <p>• Reflective muting arms included in L and T muting version</p> <p>• Integrated muting lamp</p>  |
| Sensing Distance   | 19m   | Selectable 9m or 19m  | Up to 8m  | Up to 8m   |
| Power Supply   | 24VDC   | 24VDC   | 24VDC   | 24VDC  |
| Resolution/No. of beams  | 50/90mm   | 50/90mm   | 2-3-4   | 2-3-4 (linear)   |
| Controlled Height  | 300-1800mm  | 300-1800mm  | 500-800-900-1200mm  | 2-3 (L or T) 500-800-900-1200mm<br>500-800 (Lor T)   |
| Response Time  | 20-80ms (50 vers),<br>8-19ms (90 vers)  | 20-80ms(50 vers),<br>8-19ms (90 vers)   | 12ms  | 12ms   |
| Output   | 2 x PNP   | 2 x PNP   | 2 x PNP transistors   | 2 x PNP transistors  |
| Connection   | Rx: M12 5-Pole<br>Tx: M12 4-Pole  | Rx: M12 8-Pole<br>Tx: M12 4-Pole  | Active units: M12 8-Pole<br>Passive units: non connected  | Active units: M12 5-Pole+M12<br>12-Pole, Passive units: non connected  |
| Profile (mm)   | 32 x 37   | 32 x 37   | 52 x 57   | 52 x 57  |
| Device Settings  |   | **  |   | Dip Switches   |
| Device Function  | Reset/Test/Auto Restart   |   | Test, Manual/Auto Restart selection.<br>EDM selection   | Test, Manual/Auto Restart selection. EDM selection   |
| Plus Functions   |   |   |   | One-way or two-way Muting. Muting time-out selection. Muting enable. Muting filter. Edged/Triggered Override selection. Auto restart after override selection.   |

### Controlled Height/Beams \*

|                |                  |                    | Active           | Passive/Reflector | Active            | Passive/Reflector |
|----------------|------------------|--------------------|------------------|-------------------|-------------------|-------------------|
| 300mm 9 Beam   | SG2-50*-030-00-X | SG2-50*-030-00-E-C |                  |                   |                   |                   |
| 450mm 13 Beam  | SG2-50*-045-00-X | SG2-50*-045-00-E-C |                  |                   |                   |                   |
| 600mm 17 Beam  | SG2-50*-060-00-X | SG2-50*-060-00-E-C |                  |                   |                   |                   |
| 750mm 21 Beam  | SG2-50*-075-00-X | SG2-50*-075-00-E-C |                  |                   |                   |                   |
| 900mm 25 Beam  | SG2-50*-090-00-X | SG2-50*-090-00-E-C |                  |                   |                   |                   |
| 1050mm 29 Beam | SG2-50*-105-00-X | SG2-50*-105-00-E-C |                  |                   |                   |                   |
| 1200mm 33 Beam | SG2-50*-120-00-X | SG2-50*-120-00-E-C |                  |                   |                   |                   |
| 500mm 2 Beam   |                  |                    | SG4-RB2-050-00-E | SG4-RDB2          | SG4-RB2-050-00-W  | SG4-RDB2          |
| 800mm 3 Beam   |                  |                    | SG4-RB3-080-00-E | SG4-RDB3          | SG4-RB3-080-00-W  | SG4-RDB3          |
| 900mm 4 Beam   |                  |                    | SG4-RB4-090-00-E | SG4-RDB4-090      | SG4-RB4-090-00-W  | SG4-RDB4-090      |
| 1200mm 4 Beam  |                  |                    | SG4-RB4-120-00-E | SG4-RDB4-120      | SG4-RB4-120-00-W  | SG4-RDB4-120      |
| 500mm L 2 Beam |                  |                    |                  |                   | SG4-RB2L-050-00-W | SG4-RDB2L         |
| 500mm T 2 Beam |                  |                    |                  |                   | SG4-RB2T-050-00-W | SG4-RDB2T         |
| 800mm L 3 Beam |                  |                    |                  |                   | SG4-RB3L-080-00-W | SG4-RDB3L         |
| 800mm T 3 Beam |                  |                    |                  |                   | SG4-RB3T-080-00-W | SG4-RDB3T         |

\* For units with 90mm resolution replace 50 with 90 e.g. SG2-90-030-00-X ^Units with even longer controlled heights available on request.

Note: Active and Passive/Reflector units must be ordered separately to make up a set.

## CABLES FOR ALL SAFETY LIGHT CURTAINS

### Safety Muting Lamps



For Signal Towers please see AC/DC Main Catalogue pages 346-347



Axial Cable Connector

### Cables for SG BODY REFLECTOR BASE/MUTING - Main Connectors


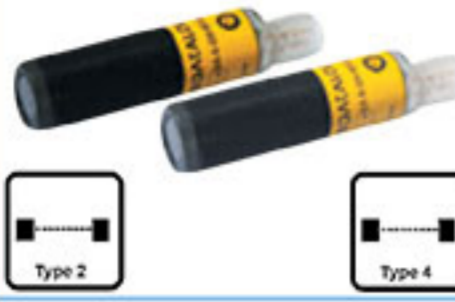


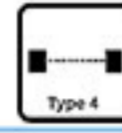


| Light Curtain Series                         | Active Unit Code | Description           |
|--|------------------|-----------------------|
| SG BODY REFLECTOR BASE<br>(SG4-RBx-xxx-00-E) | CS-A1-06-U-03    | M12 8 Pole 3m Cable   |
|  | CS-A1-06-U-05    | M12 8 Pole 5m Cable   |
|  | CS-A1-06-U-10    | M12 8 Pole 10m Cable  |
| SG BODY REFLECTOR MUTING (SG4-RBx-xxx-00-W)  | CS-A1-10-U-03    | M12 12 Pole 3m Cable  |
|  | CS-A1-10-U-05    | M12 12 Pole 5m Cable  |
|  | CS-A1-10-U-10    | M12 12 Pole 10m Cable |

### - Secondary Connectors

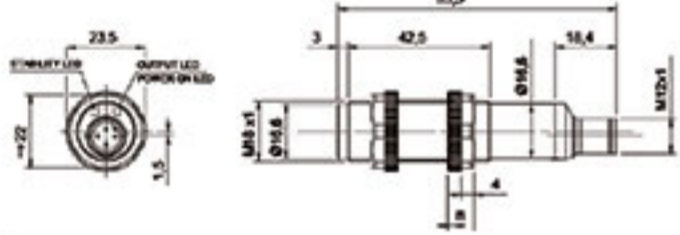
| Light Curtain Series                        | Active Unit Code | Description          |
|---|------------------|----------------------|
| SG BODY REFLECTOR MUTING (SG4-RBx-xxx-00-W) | CS-A1-03-U-03    | M12 5 Pole 3m Cable  |
|   | CS-A1-03-U-05    | M12 5 Pole 5m Cable  |
|   | CS-A1-03-U-10    | M12 5 Pole 10m Cable |



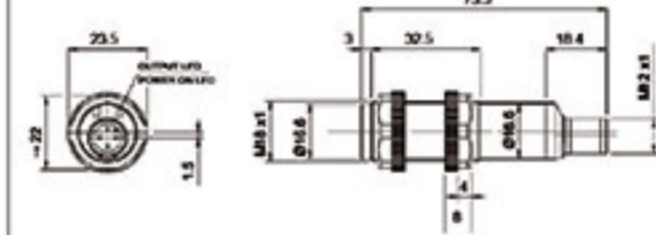
# SINGLE BEAM SAFETY PHOTOCELLS VDC PNP IP67

| Safety Photocells  |   |   |   |   |
|--|---|---|---|---|
| SERIES   | S5 Photo  | SL5 Laser   | S300 Photo  | S300 Photo  |
|  | Type 2 or Type 4  | Type 4  | Type 2  | Type 4  |
| <ul style="list-style-type: none"> <li>• Emitter-receiver photocells with test input</li> <li>• Type 2 and Type 4 models</li> <li>• Plastic tubular and MAXI</li> <li>• Photocells with standard M12 connectors</li> <li>• IR emission models for distances reaching 8m, 40m, 50m</li> <li>• Class 1 laser emission models for distances reaching 40m</li> </ul>  |  |   |   |   |
|  |  |  |  |  |
| Sensing Distance   | 0-8m  | 0-40m   | 0-50m   | 0-40m   |
| Power Supply   | 10-30VDC  | 10-30VDC  | 10-30VDC  | 10-30VDC  |
| Emission   | LED Infrared 880nm  | Red Laser (650nm)*  | LED Infrared 880nm  | LED Infrared 880nm  |
| Output   | PNP (short circuit protection)  |   | PNP NC open collector   |   |
| Output Current   | 100mA max   |   | 100mA resistive load  |   |
| Consumption (Excluding output)   | 30mA max  | 35mA max  | F = < 25mA<br>G = < 20mA  | F = < 25mA<br>G = < 20mA  |
| Saturation Voltage   | 2V max  | 2V max  | 2.4V max  | 2.4V max  |
| Response Time  | 1ms   | 1ms   | 1ms   | 1ms   |
| Switching Frequency  | 500hz   | 500hz   | 500hz   | 500hz   |
| Housing Material   | ABS UL 94V-O  |   | PBT 30% glass fibre-reinforced  |   |
| Mechanical Protection  | IP67  | IP67  | IP67  | IP67  |
| Connections  | M12 4-Pole Connector**  | M12 4-Pole Connector**  | Terminal Block  | Terminal Block  |
| Diagnostic functions   | Test Input  | Test Input  | Test Input  | Test Input  |
| Weight   | 30g Max   | 30g Max   | 140g Max  | 140g Max  |

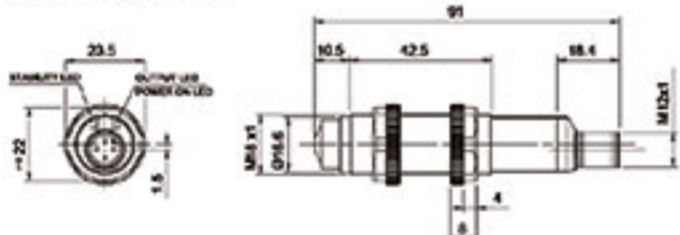
S5-5-F8-92-SG-ST2



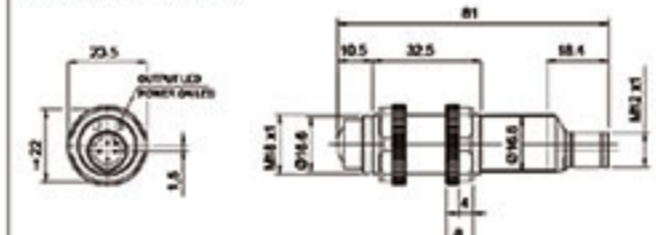
S5-5-G8-62-SG-ST2



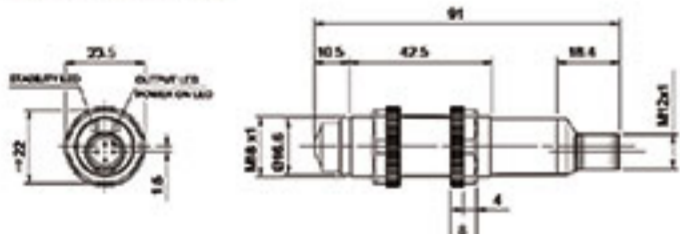
S5-5-F8-92-SG-ST4



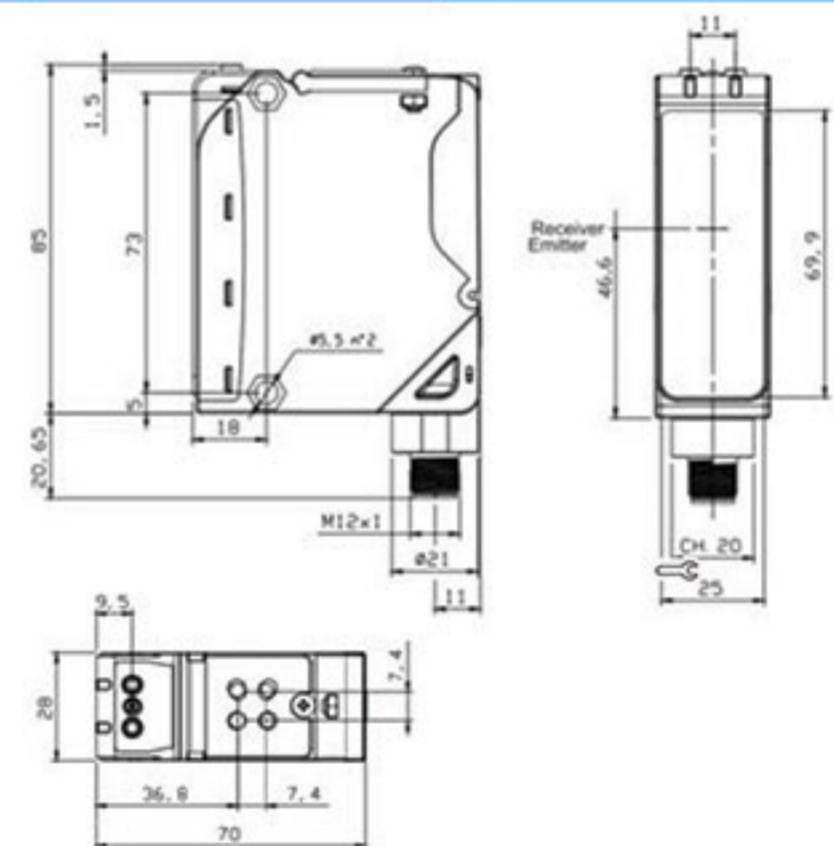
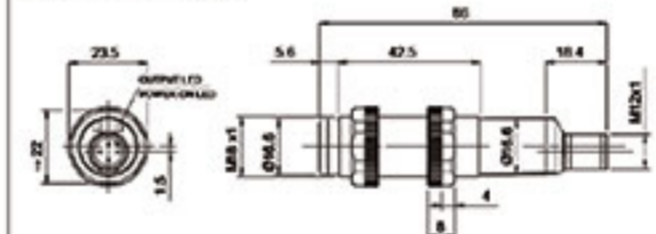
S5-5-G8-62-SG-ST4



SL5-5-F-92-SG-ST4



SL5-5-G-92-SG-ST4



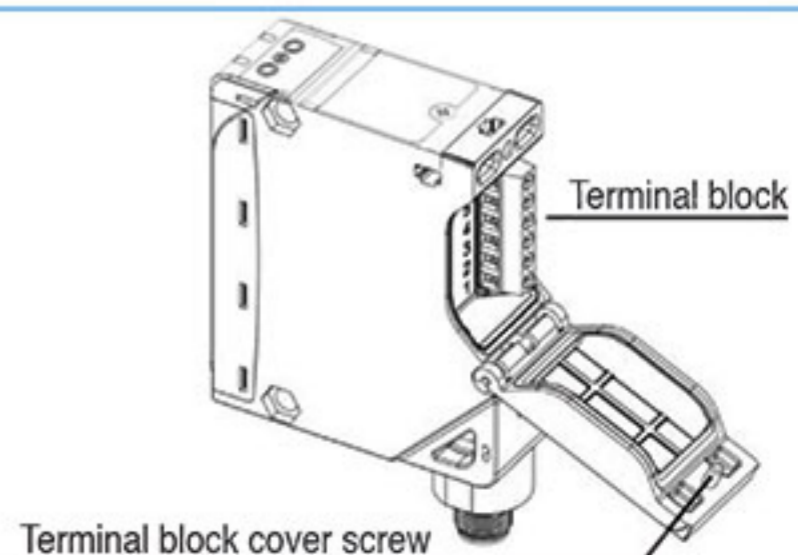
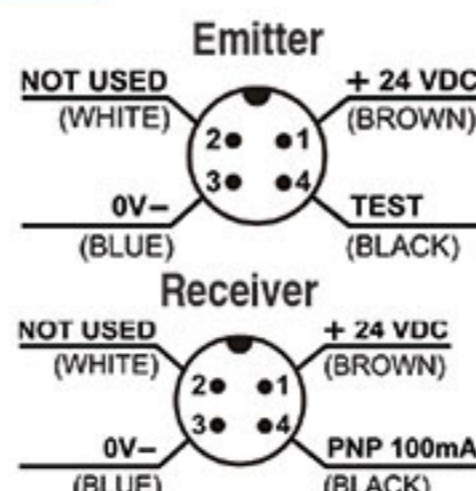
**OUTPUT:**

|                       |                   |                         |                         |
|-----------------------|-------------------|-------------------------|-------------------------|
| Emitter Type 2        | S5-5-G8-62-SG-ST2 | S300-PR-5-G00-EX-SG-ST2 |                         |
| Receiver Type 2       | S5-5-F8-92-SG-ST2 | S300-PR-5-F00-OC-SG-ST2 |                         |
| Emitter Type 4        | S5-5-G8-62-SG-ST4 |                         | S300-PR-5-G00-EX-SG-ST4 |
| Receiver Type 4       | S5-5-F8-92-SG-ST4 |                         | S300-PR-5-F00-OC-SG-ST4 |
| Laser Emitter Type 4  |                   | SL5-5-G-92-SG-ST4       |                         |
| Laser Receiver Type 4 |                   | SL5-5-F-92-SG-ST4       |                         |

*For sensor cable and accessories see pages 53-56*

**\*CLASS 1 EN60825-1 (1994) LASER PRODUCT**  
NOTE: THE SAFETY PHOTOCELLS LISTED ABOVE ARE CERTIFIED AND MUST BE USED ONLY WITH SAFETY CONTROL UNITS SG-BWS-T4 AND SG-BWS-T4-MT SERIES. NEITHER TECHNICAL AND FUNCTIONING COMPATIBILITY NOR CERTIFICATIONS ARE GUARANTEED IF USING THEM WITH OTHER BRAND CONTROL UNITS OR OLD/OBSOLETE DATALOGIC AUTOMATION CONTROL UNITS

**Wiring Diagrams**



**NEW**

# ACCESSORIES FOR SAFETY LIGHT CURTAINS

## Brackets - Metal angled brackets

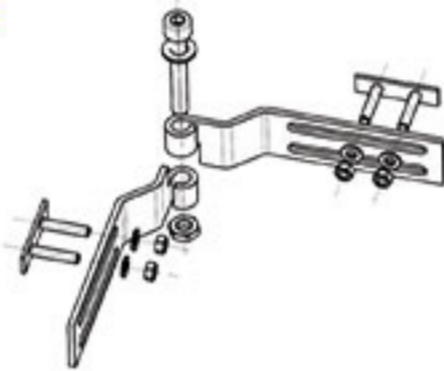
| Code    | Description                        |
|---------|------------------------------------|
| ST-KSTD | Fixing brackets (4pcs kit)         |
| ST-K4OR | Orientable supports (4pcs kit)     |
| ST-K6OR | Orientable supports (6pcs kit)     |
| ST-K4AV | Anti-vibration supports (4pcs kit) |
| ST-K6AV | Anti-vibration supports (6pcs kit) |

Compatible with **SG2/4 BASE, SG2/4 EXTENDED, SG2/4 COMPACT BODY, SG2 MUTING, SG2/4 BODY BIG, SG4 BODY REFLECTOR & SG4 LONG RANGE BASE**

## Brackets - Cascade brackets

| Code                    | Description                                 |
|-------------------------|---|
| ST-KCASCADE-SG EXTENDED | Connection Bracket for SG4 EXTENDED Cascade |

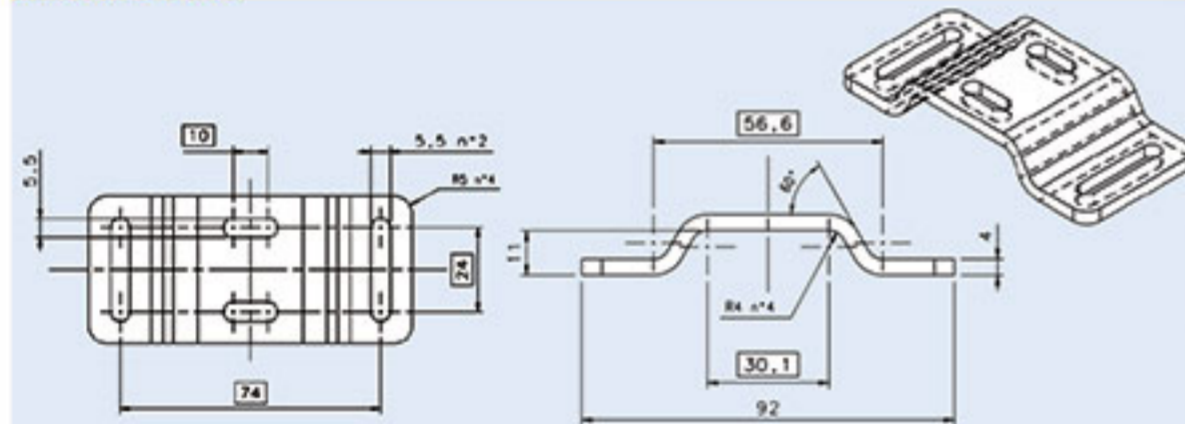
Compatible with **SG4 EXTENDED**



## Brackets - Rear brackets

| Code                  | Description                                  |
|-----------------------|--|
| ST-K4REAR-SG BODY BIG | Metal rear bracket mounting kit (4 brackets) |

Compatible with **SG BODY BIG, SG BODY REFLECTOR & SG4 LONG RANGE BASE**



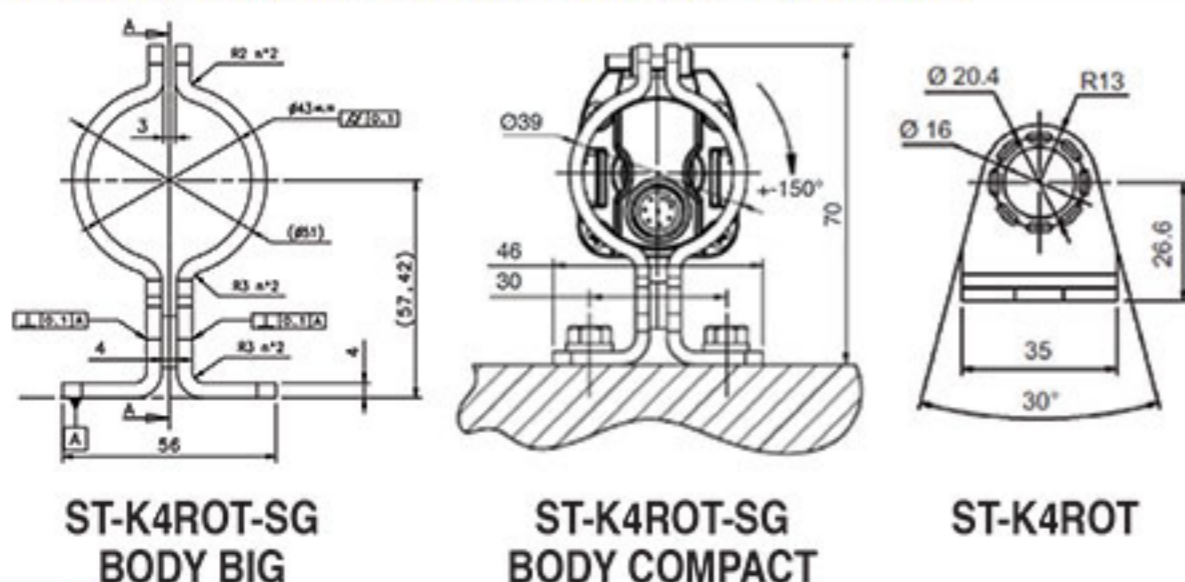
## Brackets - Rotating brackets

| Code                     | Description  |
|--------------------------|--|
| ST-K4ROT-SG BODY BIG     | Metal top-bottom rotating fixing bracket mounting kit (4 brackets) |
| ST-K4ROT-SG BODY COMPACT | Metal top-bottom rotating bracket mounting kit (4 brackets)        |
| ST-K4ROT                 | Metal top-bottom rotating brackets kit (4 brackets)                |

ST-K4ROT-SG-BODY BIG compatible with: **SG BODY BIG, SG BODY REFLECTOR & SG4 LONG RANGE BASE**

ST-K4ROT-SG-BODY COMPACT compatible with: **SG BODY COMPACT**

ST-K4ROT compatible with: **SG2/4 BASE & SG2 EXTENDED**



## SG-IP69K - Protective Tubes

| Code          | Description            |
|---------------|------------------------|
| SG-IP69K150   | Tubular IP69K H=150mm  |
| SG-IP69K300   | Tubular IP69K H=300mm  |
| SG-IP69K450   | Tubular IP69K H=450mm  |
| SG-IP69K600   | Tubular IP69K H=600mm  |
| SG-IP69K750   | Tubular IP69K H=750mm  |
| SG-IP69K900   | Tubular IP69K H=900mm  |
| SG-IP69K1050  | Tubular IP69K H=1050mm |
| SG-IP69K1200* | Tubular IP69K H=1200mm |

Compatible with **SG2/4 BASE & SG2 EXTENDED**

|                |                        |
|----------------|------------------------|
| SG-IP69K-2-050 | Tubular IP69K H=500mm  |
| SG-IP69K-3-080 | Tubular IP69K H=800mm  |
| SG-IP69K-4-090 | Tubular IP69K H=900mm  |
| SG-IP69K-4-120 | Tubular IP69K H=1200mm |

Compatible with **SG BODY COMPACT**

**Note:** 1) Each package contains the necessary to protect a single unit (emitter or receiver). To protect both elements of a couple, order two pieces  
2) Tubular PMMA POLICRIL material chemical resistance table is available on product's datasheet. \*Units with longer heights available on request.

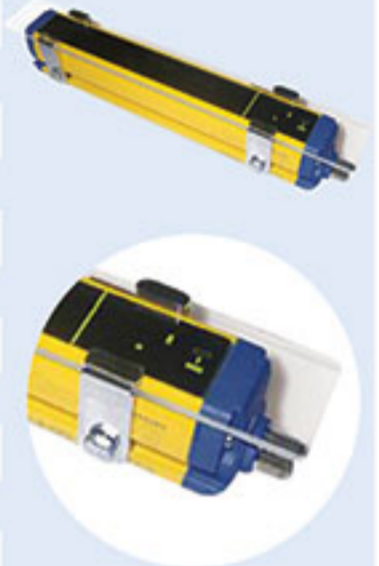


## Lens Shield

| Code         | Description                                  |
|--------------|--|
| SG-LS 150    | Lens shield 150 mm                           |
| SG-LS 300    | Lens shield 300 mm                           |
| SG-LS 450    | Lens shield 450 mm                           |
| SG-LS 600    | Lens shield 600 mm                           |
| SG-LS 750    | Lens shield 750 mm                           |
| SG-LS 900    | Lens shield 900 mm                           |
| SG-LS 1050   | Lens shield 1050 mm                          |
| SG-LS 1200*  | Lens shield 1200 mm                          |
| SG-LS 2      | Lens shield 2 beams 500 mm                   |
| SG-LS 3      | Lens shield 3 beams 800 mm                   |
| SG-LS 4-900  | Lens shield 4 beams 900 mm                   |
| SG-LS 4-1200 | Lens shield 4 beams 1200 mm                  |
| SG-LS-MC4    | Elastic fastener for lens shield (kit 4pcs.) |

SG-LSxxxx compatible with **SG2/4 BASE & SG2 EXTENDED**

SG-LS 2/3, SG-LS 4-900/120 compatible with **SG BODY COMPACT**



## Laser Pointer

| Code  | Description         |
|-------|---------------------|
| SG-LP | SG-LP Laser pointer |

Compatible with all **SG Series Safety Light Curtains**



## Communication Interface for Programmable Safety Light Curtains Dongle

| Code       | Description      |
|------------|------------------|
| SG4-DONGLE | Ethernet adaptor |

Compatible with **SG4 EXTENDED**

### Functions

- Ethernet connection (TCP/IP) to Monitoring and Configuration Software SG4-E GUI.
- Configuration cloning
- Error logging
- Configuration logging

**Note:** To connect **SG-DONGLE** directly to a PC, order Ethernet cable **CAB-ETH-M01**

### Dongle - PC Ethernet Cable

| Code        | Description               |
|-------------|---------------------------|
| CAB-ETH-M01 | M12-IP67 Ethernet` CAB 1M |







# ACCESSORIES FOR SAFETY LIGHT CURTAINS

## Stands

**Stands - Stands with adjustable mirrors (SG-PSM)**

| Code          | Description                               |
|---------------|---|
| SG-PSM-2-500  | Protective stand with 2 mirrors H=500 mm  |
| SG-PSM-3-800  | Protective stand with 3 mirrors H=800 mm  |
| SG-PSM-4-900  | Protective stand with 4 mirrors H=900 mm  |
| SG-PSM-4-1200 | Protective stand with 4 mirrors H=1200 mm |



**Protective Stands - (SG-PSB) and accessories**

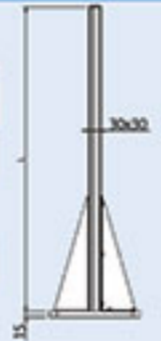
| Code         | Description                |
|--------------|----------------------------|
| SG-PSB 600   | Protective Stand H=600 mm  |
| SG-PSB 1000  | Protective Stand H=1000 mm |
| SG-PSB 1200* | Protective Stand H=1200 mm |



Compatible with all SG Series Light Curtains SG-DM-Mirrors

**Protective Stands - (SE-S) and accessories**

| Code       | Description                        |
|------------|------------------------------------|
| SE-S 800   | Column and floor stand H = 800 mm  |
| SE-S 1000  | Column and floor stand H = 1000 mm |
| SE-S 1200* | Column and floor stand H = 1200 mm |



Compatible with all SG Series Light Curtains SG-DM-Mirrors

\*Units with longer heights available on request

**Stand Plate Kits**

| Code | Description                     |
|------|---------------------------------|
| SG-P | Plate kit for protective stands |

Compatible with protection stands SG-PSB mirror stands SG-PSM

Note: The kit includes two plates and three springs, to compensate the effect of collisions, vibrations and uneven floor surfaces.



**Mirrors - Mirrors for finger and hand protection safety light curtains (SG-DM)**

| Code        | Description                      |
|-------------|----------------------------------|
| SG-DM 600   | Deviating mirror version 600 mm  |
| SG-DM 900   | Deviating mirror version 900 mm  |
| SG-DM 1200* | Deviating mirror version 1200 mm |



Note: 1) To mount these mirrors into the stands SG-PSB, order ST-PS-DM mounting kit. 2) To mount these mirrors to columns SE-S, order two ST-DM mounting kits

\*Units with longer heights available on request

**Single Beam Mirrors**

| Code      | Description                     |
|-----------|---------------------------------|
| SG-DM 150 | Deviating mirror version 150 mm |

Note: 1) To mount this mirror into the stands SG-PSB order ST-PS-DM mounting kit. 2) To mount this mirrors to columns SE-S, order ST-DM mounting kit

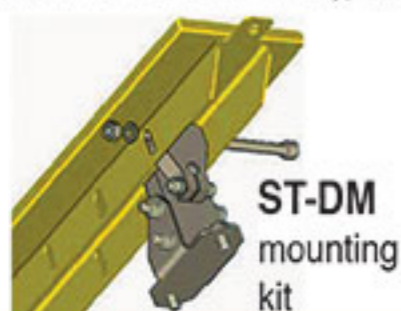
**Mounting Kits for Mirrors**

**Mounting Kits - for SG-DM mirrors on SE-S floor columns**

| Code  | Description     |
|-------|-----------------|
| ST-DM | Kit stand alone |

Compatible with SG-DM mirrors on SE-S floor columns

Note: For SG-DM 150 stand-alone mirror, order one kit. For longer mirrors (SG-DM 600 to SG-DM 1900), order two kits.



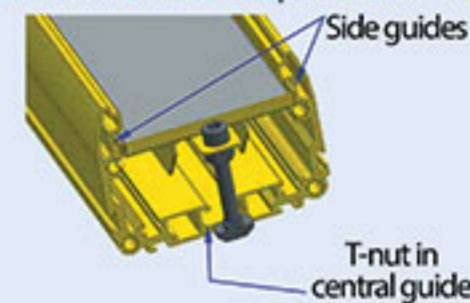
For standalone mirror (SG-DM 150) order one kit. For longer mirrors (SG-DM 600 to SG-DM 1900), order two kits. The kit can be used to mount mirrors on SE-S column.

**Mounting Kits - for SG-DM Mirrors, SG-PSB protective stands and safety light curtains**

| Code     | Description                                       |
|----------|---|
| ST-PS-DM | Deviating mirror mounting kit (contains 2 T-nuts) |

Compatible with SG-DM Mirrors in SG-PSB protective stands.

Note: For each mirror (SG-DM xxx) order 1 kit.



**Mounting Kits for Safety Light Curtains**

| Code           | Description  |
|----------------|--|
| ST-PS4-SG BODY | Protective stand mounting kit for SG BODY BIG (4 brackets) |
| ST-PS6-SG BODY | Protective stand mounting kit for SG BODY BIG (6 brackets) |
| ST-PS4-SG      | Protective stands mounting kit for SG (4 brackets)         |
| ST-PS6-SG      | Protective stands mounting kit for SG (6 brackets)         |

ST-PSx-SG compatible with SG2/4 BASE, SG2/4 EXTENDED, SG2 MUTING, SG BODY COMPACT

ST-PSx-SG BODY compatible with SG BODY BIG, SG BODY REFLECTOR

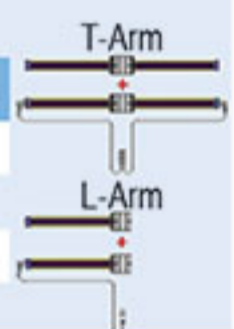
Note: 1) Each kit allows to install an element (emitter or receiver, active part or passive part) of a light curtain. To install both elements of the light curtain, order 2 kits of the same type. 2) For light curtains with height  $\geq 1200$  mm, order the 6 brackets kits (ST-PS6-SG xxxx).

**Accessories for Muting**

**Muting Arms**

**Active/Passive Arms**

| Code      | Description                             |
|-----------|---|
| SG-L-ARMS | Active/Passive arms Couple for L muting |
| SG-T-ARMS | Active/Passive arms Couple for T muting |
| SG-AS-ARM | Active sensor single arm                |
| SG-PR-ARM | Passive reflector single arm            |



**Emitter/Receiver Arms**

|               |  |
|---------------|--|
| SG-F1-G1-ARMS | Emitter/Receiver arms couple (first couple)  |
| SG-F2-G2-ARMS | Emitter/Receiver arms couple (second couple) |

**Brackets and Cables**

| Code           | Description   |
|----------------|---|
| SG-CB-B        | Muting arms mounting bracket kit for BIG series     |
| SG-CB-C        | Muting arms mounting bracket kit for COMPACT series |
| CV-Y1-02-B-007 | M12 4-Pole T muting cable                           |
| CV-L1-02-B-007 | M12 4-Pole L muting cable                           |

**Compatibility and Operating Distances**

| Muting Arm Code                | Light Curtain Code  | Operating Distance |
|--------------------------------|---|--------------------|
| SG-L-ARMS<br>SG-T-ARMS         | SG BODY COMPACT MUTING  | 0.5-3m             |
| SG-AS-ARM<br>SG-PR-ARM         | SG2 BODY BIG MUTING<br>SG4 BODY BIG MUTING SHORT RANGE*<br>SG BODY COMPACT MUTING<br>SG BODY REFLECTOR MUTING | 0.5-3m             |
| SG-F1-G1-ARMS<br>SG-F2-G2-ARMS | SG2 BODY BIG MUTING<br>SG4 BODY BIG MUTING SHORT RANGE*<br>SG BODY COMPACT MUTING                             | 0.5-7m             |

\* SG4 BODY MUTING LONG RANGE (whose operating range is 6-60m) can not be used in combination with muting arms.

Note: SG-T-ARMS (T muting cable CV-Y1-02-B-007 is included)

SG-L-ARMS (L muting cable CV-L1-02-B-007 is included)

**NEW**

# CONTROL UNITS, SAFETY RELAYS & CONNECTOR BOXES

- Integrated control of 4 single beams and 2 light curtains
- Simple DIP Switch configuration
- Muting functions can be assigned to light curtains or single beams



| Code   | SG-BWS-T4  | SG-BWS-T4-MT   |
|--|--|--|
|  | <b>Inputs</b>                                      |  |
| Power Supply   | 24VDC - 15/+10%                                    | 24VDC - 15/+10%  |
| PNP Outputs from S5/SL5/S300                                 | 4  | 4  |
| OSSDs Couples from SLC                                       | -  | 2  |
| Muting Inputs  | -  | 4  |
| Test, Reset, Override, EDM, Muting enable, Auto/Man Selector | 3  | 9  |
| Safety Outputs   | 2PNP   | 2NO  |
| Muting Lamps   | -  | 2  |
|  | <b>Outputs</b>                                     |  |
| Test Outputs   | 4  | 4  |
| Response Time  | 29ms   | 39ms   |
|  | <b>Mechanical Data</b>                             |  |
| Operating Temp.  | 0 to 55°C  | 0 to 55°C  |
| Mechanical Protection  | IP20   | IP20   |
|  | <b>Functions</b>                                   |  |
| Functions*   | Automatic/Manual Reset, External Device Monitoring | Automatic/Manual Reset, External Device Monitoring<br>L/T Muting, Double Muting, Muting Enable, Muting Timeout, Override |
| Compatibility Single Beam Photocells                         | S5/SL5/S300  | S5/SL5/S300  |
| Compatibility Safety Light Curtains                          | -  | All Datalogic Safety Light Curtains  |

Function settings are done through DIP switches in the SG-BWS-T4-MT and through wiring in the SG-BWS-T4

SE-SR2 is a safety unit that can be used in combination with every DATALOGIC Safety Light Curtains. It provides dual-channel operation without detection of shorts across contacts. Short circuits and earth faults in the pushbutton circuit are detected. CS-ME is an interface with two forcibly guided relays, providing 3 NO contacts. The diagnostic function must be performed by the Safety Light Curtains through External Device Monitoring function.



| Code                                    | SE-SR2                              | CS-ME   |
|---|-------------------------------------|---|
| Power Supply                            | 24VDC-15/+10%                       | 24VDC-/+20%   |
| Safe Outputs (Cat.4)                    | 3NO                                 | 3NO   |
| Auxiliary Outputs                       | 1NC                                 | 1NC   |
| Response Time Following Input going Off | typ. 10ms, max. 20ms                | 15ms  |
| Response Time With Power Failure        | typ. 70ms, max. 120ms               | 15ms  |
| Recovery Time Following Inputs going On | 50ms                                | 40ms  |
| Recovery Time After Power On            | 150ms                               | 40ms  |
| Operating Temperature                   | -10 to 55°C                         | -25 to 55°C   |
| Mechanical Protection                   | IP20                                | IP20  |
|   | <b>Functions</b>                    |   |
| Reset Modes                             | Automatic/Manual/Monitred           | Automatic   |
| External Device Monitoring              | Available on SE-SR2                 | Must be activated on Safety Light Curtain (ESPE)      |
| Comptability                            | All Datalogic Safety Light Curtains | All Datalogic Safety Light Curtains with EDM function |

SG-SRT1 and SG-SRT2 are interfaces provided with redundant forcibly guided relays, supplying a ready operator interface to restart or override the Safety Light Curtain, and have muting indication. SG-SRT1 and SG-SRT2 provide internal or external EDM signal to the Safety Light Curtain: to operate safely, EDM monitoring function must be activated on the Safety Light Curtain and correct wiring must be followed.



| Code                    | SG-SRT1  | SG-SRT2   |
|-------------------------|--|---|
| Power Supply            | 24VDC +/-20%   | 24VDC +/-20%  |
| Safe Outputs            | 2NO  | 2NO   |
| Max. Switchable Voltage | 250VAC   | 250VAC  |
| Max. Switchable Current | 2A   | 2A  |
|                         | <b>Functions</b>   |   |
| Reset Mode              | Automatic/Manual, Test, Reset, Restart, Override                         | Automatic/Manual, Test, Reset, Restart, Override<br>Muting State Indication |
| Comptability            | SG BODY COMPACT MUTING<br>SG BODY BIG MUTING<br>SG BODY REFLECTOR MUTING | SG BODY BIG MUTING<br>SG BODY REFLECTOR MUTING                              |

LIMIT & PRESSURE SWITCHES & SENSORS

**NEW**

# MOBILE SCANNERS & VEHICLE MOUNT COMPUTERS

*For more information on a solution using these products, please contact our Automation Specialists*



| Range       | DL-AXIST  | FALCON-X4   | SKORPIO X4   |
|-------------|---|---|--|
| Description | Rugged full touch Enterprise Class PDA with Android technology and a brilliant 5" screen. It is equipped with an advanced 2D imager allowing quick and easy data capture from high density codes. | Rugged ergonomics combine in a fully featured mobile computer to provide the ultimate performance in Warehousing and T&L. 1D laser and 2D imaging technologies available. | A high performance multicore 1 Ghz architecture that offers blazing speed when running WEC7 or Android |

| Applications          |   |   |   |
|-----------------------|---|---|---|
| Retail                | ✓ | ✓ | ✓ |
| Manufacturing         | ✓ | ✓ | ✓ |
| Transport & Logistics | ✓ | ✓ | ✓ |

| Features                            |                             |  |                        |
|-------------------------------------|-----------------------------|--|------------------------|
| Operating Systems                   | Android v4.4.4              | Windows Embedded Compact 7 / Android v4.4    |                        |
| CPU Processor                       | OMAP 4430 @ 1 GHz Dual Core | XScale PXA310 @ 806 MHz;<br>Cortex-M3 32 bit | TI OMAP4 @ 1 GHz       |
| Memory RAM / ROM                    | RAM: 1 GB; eMMC Flash: 8 GB | RAM: 256 MB; Flash: 1 GB                     | RAM: 1 GB; Flash: 8 GB |
| 1D/Linear Codes/2D Codes/ 2D Imager | ✓                           | ✓  | ✓                      |

| Communications                          |   |   |   |
|---|---|---|---|
| Local Wireless Radio (Wi-Fi, Bluetooth) | T1802.11 a/b/g/n Cisco CCX v4; MIMO; Bluetooth v4.0 | Laird/Summit IEE 802.11 b/g/n Cisco CCX v4; Bluetooth v2.1 with EDR | TI Wi-Link 8 IEEE 802.11 a/b/g/n; Bluetooth v4 / BLE (Android Models) Bluetooth v2.1 + EDR (WEC7 Models) MIMO |
| WWAN                                    | ✓   | X   | X   |
| Wired Comms                             | USB 2.0 Client                                      | USB; RS232; Ethernet  | USB; RS232; Ethernet  |

*For more information on a solution using these products, please contact our Automation Specialists*



| Range       | RHINO II   | BLACKLINE SH15  | BLACKLINE SH21   |
|-------------|--|---|--|
| Description | Vehicle mount computers available in 10" and 12" display sizes; sets the standard for ruggedness in the warehouse. Choices of WEC, WES7, Windows 10 IoT Enterprise or Android 7.1 operating systems. | A 15" Vehicle mount computer as well as a fixed mount unit for use in any industrial application. It increases productivity through reduced errors during all scanning activities | A 21" Industrial computer designed for wall or fixed mount industrial applications. It increases productivity by allowing a high level of interaction between operators and machines |

| Applications          |   |   |   |
|-----------------------|---|---|---|
| Retail                | ✓ | X | X |
| Manufacturing         | ✓ | ✓ | ✓ |
| Transport & Logistics | ✓ | ✓ | ✓ |

| Features          |   |  |  |
|-------------------|---|--|--|
| Operating Systems | WEC, Windows Embedded Standard 7, Windows 10 IoT Enterprise 64 bit, Android 7.1 | Windows Embedded Standard 7 or Windows IoT Enterprise                    | Windows Embedded Standard 7 or Windows IoT Enterprise                    |
| CPU Processor     | Proc. ARM 4 x 1.0 Ghz;<br>Proc. Intel E3826 2 x 1.46 Ghz                        | Intel Atom E3845 Quad Core 1.91 Ghz;<br>Intel i5-5350U Dual Core 1.8 Ghz | Intel Atom E3845 Quad Core 1.91 Ghz;<br>Intel i5-5350U Dual Core 1.8 Ghz |
| Memory RAM / ROM  | RAM: 1/2 Gb (Arm), 4 GB (Intel) Storage: 32GB CFAST/SD Card                     | RAM: 4 Gb (Quad Core), 16 GB (i 5) Storage: 32GB CFAST/SD Card           | RAM: 4 Gb (Quad Core), 16 GB (i 5) Storage: 32GB CFAST/SD Card           |

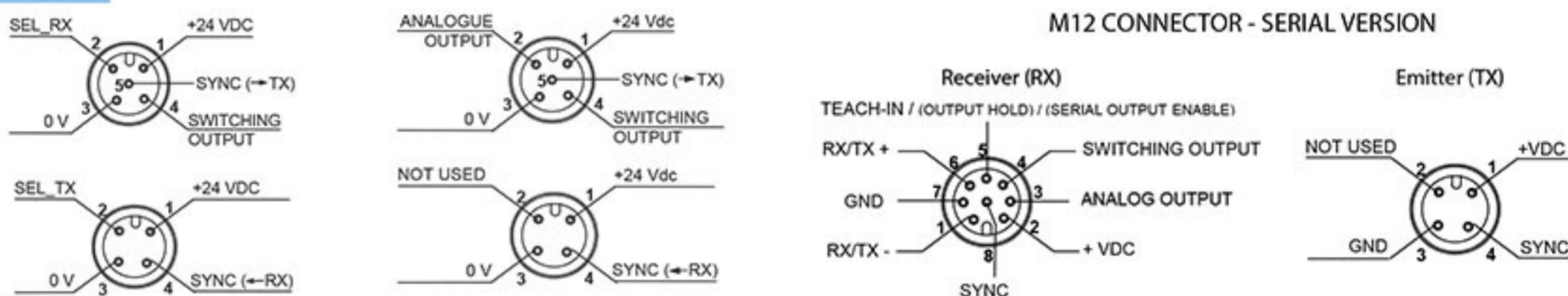
| Communications                          |  |  |  |
|---|--|--|--|
| Local Wireless Radio (Wi-Fi, Bluetooth) | Wi-Fi 802.11 a/b/g/n (2.4 & 5 GHz); Cisco CCX v4; Bluetooth v4.0 | Wi-Fi 802.11 a/b/g/n (2.4 & 5 GHz); Cisco CCX v4; Bluetooth v4.0 | Wi-Fi 802.11 a/b/g/n (2.4 & 5 GHz); Cisco CCX v4; Bluetooth v4.0 |
| WWAN                                    | Optional   | X  | X  |
| Wired Comms                             | Ethernet; USB, RS232 (5 and 12V)                                 | Ethernet; USB, RS232 (5 and 12V)                                 | Ethernet; USB, RS232 (5 and 12V)                                 |

# AREA SENSORS / LIGHT GRIDS

NEW

| Type DC<br>Areascan TM Series  | AS1                                 |    | DS1                              |    | DS2                              |                       |
|--|-------------------------------------|----|----------------------------------|----|----------------------------------|-----------------------|
|  |                                     |    |                                  |    | Serial RS485                     | Ethernet              |
| <ul style="list-style-type: none"> <li>Nominal Voltage 24VDC</li> <li>Output PNP</li> <li>Output Current 100mA max</li> <li>Current Consumption TX 100mA Max</li> <li>Current Consumption RX 40mA Max</li> <li>Housing Material Black electro-painted aluminium</li> </ul> |                                     |    |                                  |    |                                  |                       |
| Sensing Area (Controlled Height)   | 100mm                               |    | 100mm-300mm                      |    | 150-1650mm                       | 600-1650mm            |
| Sensing Distance   | 2.1m                                | 3m | 2m                               | 4m | 0.3 - 10m                        | 0.3 - 5mm             |
| DC Supply Voltage  | 24VDC                               |    | 24VDC                            |    | 24VDC                            |                       |
| Output   | PNP                                 |    | PNP and Analog                   |    | PNP, 0-10V & RS485               | PNP, 0-10V & Ethernet |
| Emission   | IR LED 880nm                        |    | IR LED 880nm                     |    | IR LED 880nm                     |                       |
| Response Time  | 1,75ms, 2,75 - 8ms.                 |    | 1-2, 75ms                        |    | 5-90ms                           |                       |
| Resolution   | Flat: 0,2 x 75mm. Cylindrical: @6mm |    | 4mm-7mm                          |    | 6mm(5m)/25mm(10m)                | 6mm                   |
| Output LED   | Yellow Output - Green Power         |    | Yellow Output - Green Power      |    | Yellow Output - Green Power      |                       |
| Connection   | Rx: M12 5-Pole<br>Tx: M12 4-Pole    |    | Rx: M12 5-Pole<br>Tx: M12 4-Pole |    | Rx: M12 8-Pole<br>Tx: M12 4-Pole |                       |
| Dimensions (mm)  | 22 x 43 x 150                       |    | 22 x 43 x (150-300)              |    | 35 x 40 x (256-1726)             |                       |

### Wiring Diagrams



### OUTPUT:

|                         | AS1-LD-HR-010-J* | AS1-HD-HR-010-J | -                               | -                | -                               | -                |
|-------------------------|------------------|-----------------|---------------------------------|------------------|---------------------------------|------------------|
| PNP High Resolution     | AS1-LD-HR-010-J* | AS1-HD-HR-010-J | -                               | -                | -                               | -                |
| PNP Standard Resolution | AS1-LD-SR-010-J* | AS1-HD-SR-010-J | -                               | -                | -                               | -                |
| 100mm (7mm resolution)  | -                | -               | DS1-LD-S**R-010-J <sup>AV</sup> | DS1-HD-SR-010-JV | -                               | -                |
| 150mm (7mm resolution)  | -                | -               | DS1-LD-S**R-015-J <sup>AV</sup> | DS1-HD-SR-015-JV | DS2-05-07-015-JV                | -                |
| 300mm (7mm resolution)  | -                | -               | DS1-LD-SR-030-J <sup>AV</sup>   | DS1-HD-SR-030-JV | DS2-05-07-030-JV                | -                |
| 450mm                   | -                | -               | -                               | -                | DS2-05-07 <sup>AA</sup> -045-JV | -                |
| 600mm                   | -                | -               | -                               | -                | DS2-05-07 <sup>AA</sup> -060-JV | DS2-05-07-060-JE |
| 750mm                   | -                | -               | -                               | -                | DS2-05-07 <sup>AA</sup> -075-JV | DS2-05-07-075-JE |
| 900mm                   | -                | -               | -                               | -                | DS2-05-07 <sup>AA</sup> -090-JV | DS2-05-07-090-JE |
| 1050mm                  | -                | -               | -                               | -                | DS2-05-07-105-JV                | -                |
| 1200mm                  | -                | -               | -                               | -                | DS2-05-07-120-JV                | DS2-05-07-120-JE |

\* For units with trimmers replace J with P e.g. AS1-LD-HR-010-P \*\*For units with 4mm High resolution replace S with H e.g. DS1-HR-010-JV  
<sup>A</sup>For units with adjustment trimmer replace J with P e.g. DS1-SR-010-PV (adjustment timmer only available in 7mm resolution units)  
<sup>AA</sup>For units with 25mm resolution change 07 to 25 e.g. DS2-05-25-045-JV

# DISTRIBUTION BOXES & CABLES



### Distribution Boxes

| Code                           | Description                  |
|--------------------------------|------------------------------|
| <b>Cable Type - 54 x 127mm</b> |                              |
| DSTR8-5/4AZ-1205               | 5P 4 Wire 250VAC             |
| DSTR8-5/4PA-1205               | 5P 4 Wire PNP 10-30VDC LED's |
| DSTR8-5/4NA-1205               | 5P 4 Wire NPN 10-30VDC LED's |
| <b>Plug Type</b>               |                              |
| DLTR8-5/4NA-T12                | 5P 4 Wire NPN 10-30VDC LED's |
| DLTR8-5/4PA-T12                | 5P 4 Wire PNP 10-30VDC LED's |
| DM8C8-4/4PC-12705              | M8 4P PNP 10-30VDC LED's     |

### M23 Female Connectors for Plug Type Distribution Boxes

| Code          | Description             |
|---------------|-------------------------|
| Z-FS12KAT5005 | M23 12P Plug & 5m Cable |

### M12 Male to Female Cable Connectors

| Code                    | Description                         |
|-------------------------|-------------------------------------|
| R-MS5TZU822+R-FS5TZU822 | M12 5P Male to Female - Straight    |
| R-MS5TZU822+R-FA5TZU822 | M12 5P Male to Female - Right Angle |


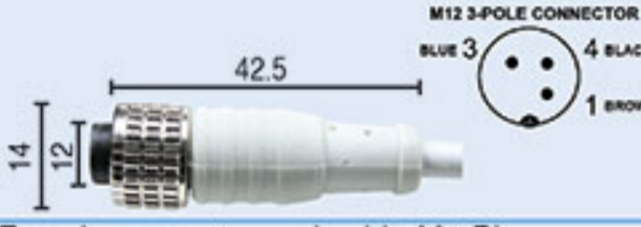
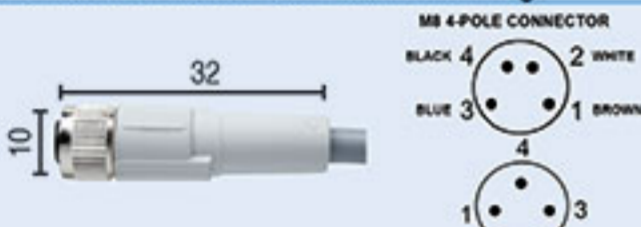
### Micro Splitters with Cable - M12 Splitter with 2 x M12 plugs

| Code             | Description                      |
|------------------|----------------------------------|
| U2-R4R-FS4KPV062 | Male to Female Straight (PNP)    |
| U2-R4R-FS4KZV062 | Male to Female Straight          |
| U2-R4R-FA4KPV062 | Male to Female Right Angle (PNP) |
| U2-R4R-FA4KZV062 | Male to Female Right Angle       |

### Micro Splitters

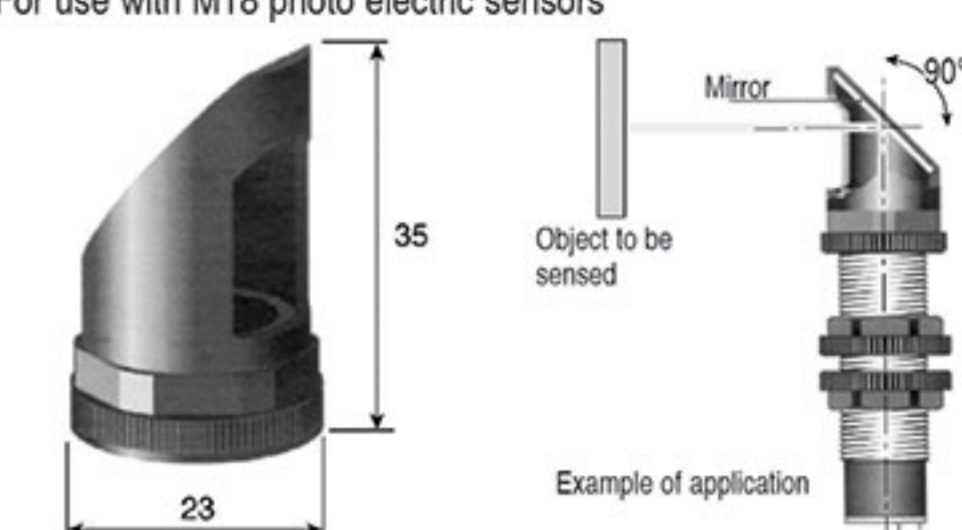
| Code        | Description                 |
|-------------|-----------------------------|
| U2-R5/4Z-R4 | M12 5P Male - M12 4P Female |
| U2-R5/5Z-R5 | M12 5P Male - M12 5P Female |

# CABLE & ACCESSORIES FOR PROXIMITY SWITCHES & SENSORS

| Dimensions   | Cable Length* | Code     |                                |
|--|---------------|----------|--------------------------------|
| <b>Female connector and cable M12 Plug</b>   |               |          |                                |
| <b>90° Version</b>   |               |          |                                |
|  <p>38.5<br/>24<br/>M12 4-POLE CONNECTOR<br/>BLUE 3 4 BLACK<br/>WHITE 2 1 BROWN</p> | 4 Pin 4 Wire  | 3m<br>5m | CS-A2-02-G-03<br>CS-A2-02-G-05 |
|  | 3 Pin 3 Wire  | 5m       | CS-A2-11-G-05                  |
| <b>Straight Version</b>  |               |          |                                |
|  <p>42.5<br/>14<br/>12<br/>M12 3-POLE CONNECTOR<br/>BLUE 3 4 BLACK<br/>1 BROWN</p>  | 4 Pin 4 Wire  | 3m<br>5m | CS-A1-02-G-03<br>CS-A1-02-G-05 |
|  | 3 Pin 3 Wire  | 5m       | CS-A1-01-G-05                  |
| <b>Connector with no cable</b>   |               |          |                                |
|  |               |          | CS-A1-02-B-NC                  |
| <b>Female connector and cable M8 Plug</b>  |               |          |                                |
|  <p>32<br/>10<br/>M8 4-POLE CONNECTOR<br/>BLACK 4 2 WHITE<br/>BLUE 3 1 BROWN</p>   | 4 Pin 4 Wire  | 3m<br>5m | CS-B1-02-G-03<br>CS-B1-02-G-05 |
|  | 3 Pin 3 Wire  | 3m<br>5m | CS-B1-01-G-03<br>CS-B1-01-G-05 |
| <b>Connector with no cable</b>   |               |          |                                |
|  |               |          | CS-A1-02-B-NC                  |

\*10m versions available on request

## Accessories for 90° Sensing

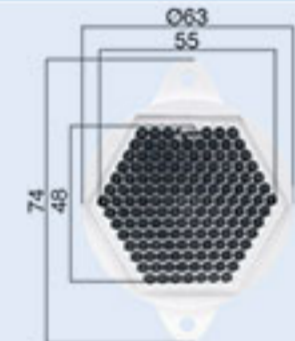
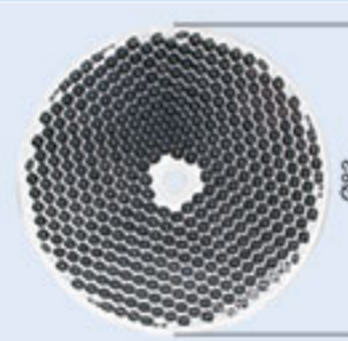

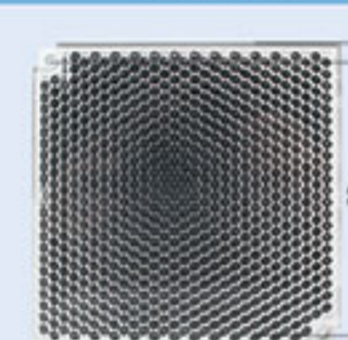
| Code   | DEV90 | 90° Adaptor |
|--|-------|-------------|
| For use with M18 photo electric sensors  |       |             |
|  <p>35<br/>23<br/>Mirror<br/>Object to be sensed<br/>90°<br/>Example of application</p> |       |             |

## Nuts



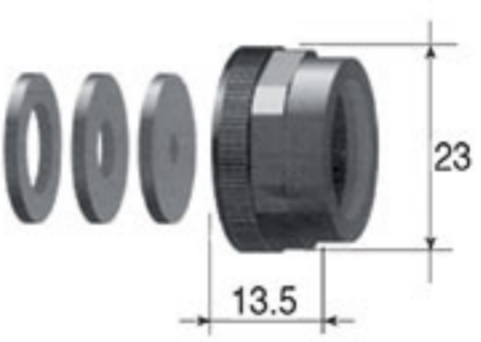
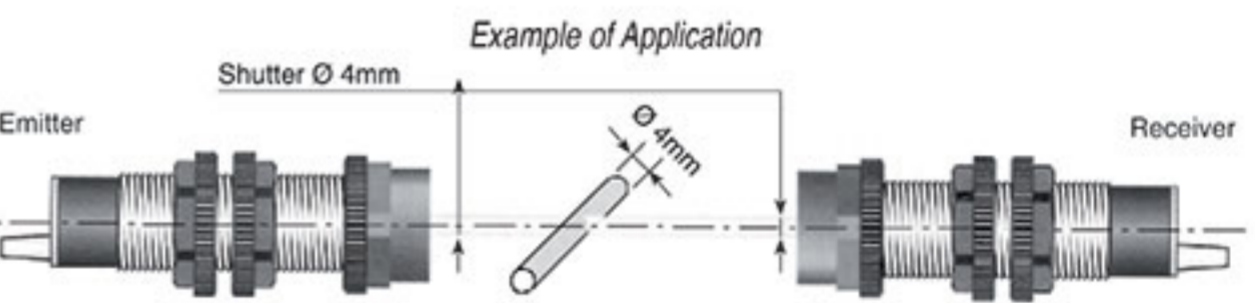
\*For Plastic Type, add P to code

## Reflectors

| Code | R2  | R5  |
|------|---|---|
|      |  <p>74 48<br/>O63 55</p>                 |  <p>O63</p>    |
| Code | R4  | DAC100  |
|      |  <p>10 20 10<br/>4.3<br/>61<br/>51.5</p> |  <p>92 100</p> |




## Shutter for Emitter-Receiver Thru Beam

Accessory to sense small size object with emitter-receiver cylindrical barriers M18.

| Code  | P180TT   | Shutter kit          |                          |                      |       |       |     |       |       |     |       |       |     |  |
|---|--|----------------------|--------------------------|----------------------|-------|-------|-----|-------|-------|-----|-------|-------|-----|--|
| <b>Note:</b> Each package contains three shutter disks.   |  |                      |                          |                      |       |       |     |       |       |     |       |       |     |  |
|  <p>23<br/>13.5</p>   |  |                      |                          |                      |       |       |     |       |       |     |       |       |     |  |
|   | <table border="1"> <thead> <tr> <th>Shutting Diam.</th> <th>Min. Object to be Sensed</th> <th>Distance Attenuation</th> </tr> </thead> <tbody> <tr> <td>⊙ 2mm</td> <td>≥ 2mm</td> <td>97%</td> </tr> <tr> <td>⊙ 4mm</td> <td>≥ 4mm</td> <td>84%</td> </tr> <tr> <td>⊙ 8mm</td> <td>≥ 8mm</td> <td>54%</td> </tr> </tbody> </table> | Shutting Diam.       | Min. Object to be Sensed | Distance Attenuation | ⊙ 2mm | ≥ 2mm | 97% | ⊙ 4mm | ≥ 4mm | 84% | ⊙ 8mm | ≥ 8mm | 54% |  |
| Shutting Diam.  | Min. Object to be Sensed   | Distance Attenuation |                          |                      |       |       |     |       |       |     |       |       |     |  |
| ⊙ 2mm   | ≥ 2mm  | 97%                  |                          |                      |       |       |     |       |       |     |       |       |     |  |
| ⊙ 4mm   | ≥ 4mm  | 84%                  |                          |                      |       |       |     |       |       |     |       |       |     |  |
| ⊙ 8mm   | ≥ 8mm  | 54%                  |                          |                      |       |       |     |       |       |     |       |       |     |  |
| <b>Note:</b> The datum "Minimum object to be sensed" refers to the condition of shutter mounted on emitter/receiver.  |  |                      |                          |                      |       |       |     |       |       |     |       |       |     |  |
| <p><b>Example of Application</b></p>  <p>Emitter Shutter Ø 4mm Receiver<br/>Ø 4mm</p> |  |                      |                          |                      |       |       |     |       |       |     |       |       |     |  |

## Mounting Brackets for Proximity Switches and Photo Sensors

(Stainless Steel)

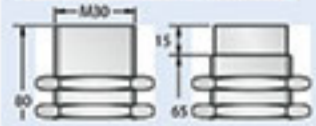
|             |  |  |   |  |  |
|-------------|---|---|---|---|---|
| Code        | ST1218  | ST1830  | JOINT-18  | ST-5039   | ST-504  |
| Description | For M12 & M18   | For M18 & M30   | Adjustable M18 Mounting Bracket   | S100 and S3Z Mounting Bracket   | S62 Mounting Bracket  |
|             |  |  |  |  |  |
| Code        | JOINT-62  | ST-505  | ST-5072   | ST-5100   | ST-S3Z-M18  |
| Description | Adjustable S62 Mounting Bracket   | S40 and S41 Mounting Bracket  | S8 Mounting Bracket   | S300-PR Mounting Bracket  | M18 Threaded Adapter Nose for S100 & S3Z  |

# SENSOR CABLES & CONNECTORS

## M8 Series



### M8 PIN Assignment



### M12 PIN Assignment

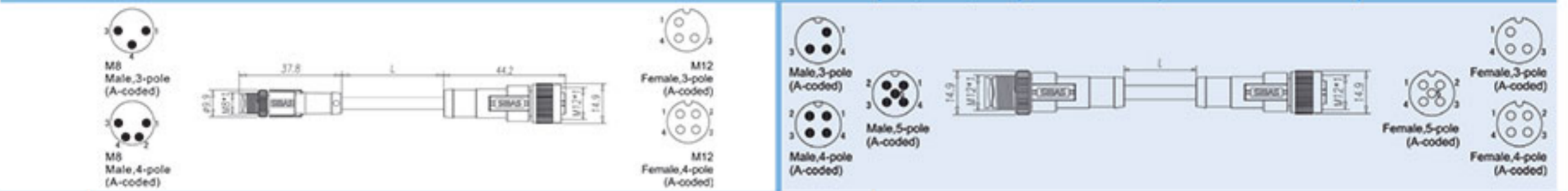


## M12 Series

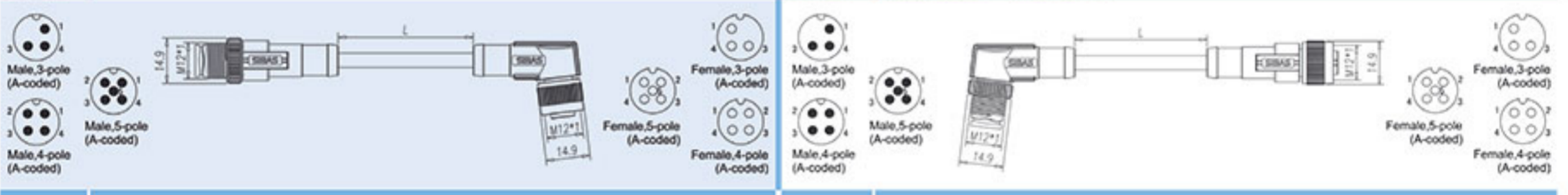


| PIN | Wire Colour |        |        |
|-----|-------------|--------|--------|
|     | 3-Pole      | 4-Pole | 5-Pole |
| 1   | Brown       | Brown  | Brown  |
| 2   |             | White  | White  |
| 3   | Blue        | Blue   | Blue   |
| 4   | Black       | Black  | Black  |
| 5   |             |        | Grey   |

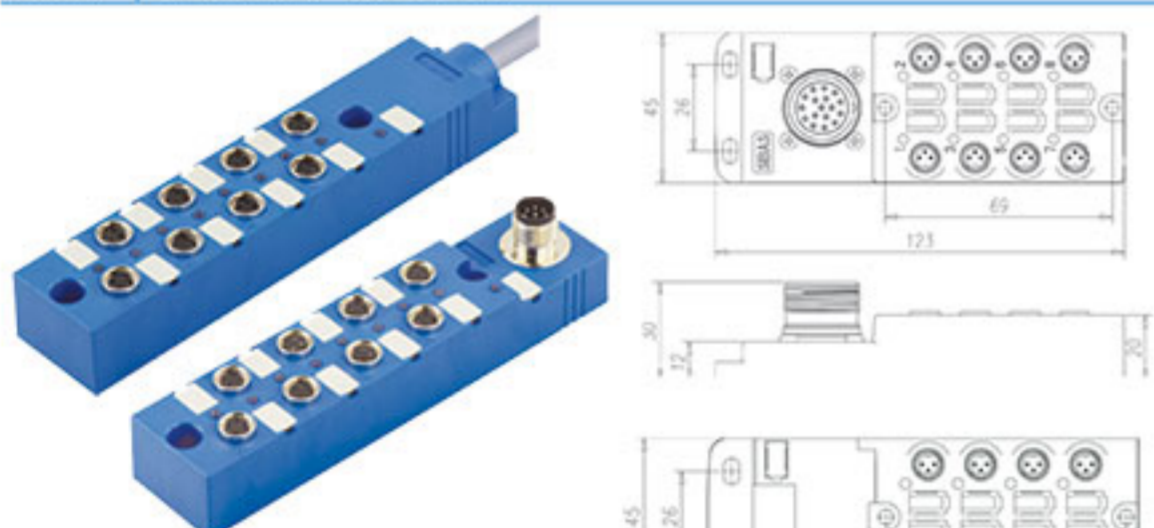
| Poles  | Angle        | Cable Type   | M8 Female Code | M12 Female Code |
|--------|--------------|--------------|----------------|-----------------|
| 3-Pole | Straight     | Non-Shielded | M8FS-3V*-3**   | M12FS-3V*-3**   |
| 4-Pole | Straight     | Non-Shielded | M8FS-4V*-3**   | M12FS-4V*-3**   |
| 5-Pole | Straight     | Non-Shielded |                | M12FS-5V*-3**   |
| 3-Pole | Straight     | Shielded     | M8FS-3V*-3**SH | M12FS-3V*-3**SH |
| 4-Pole | Straight     | Shielded     | M8FS-4V*-3**SH | M12FS-4V*-3**SH |
| 5-Pole | Straight     | Shielded     |                | M12FS-5V*-3**SH |
| 3-Pole | Right Angled | Non-Shielded | M8FR-3V*-3**   | M12FR-3V*-3**   |
| 4-Pole | Right Angled | Non-Shielded | M8FR-4V*-3**   | M12FR-4V*-3**   |
| 5-Pole | Right Angled | Non-Shielded |                | M12FR-5V*-3**   |
| 3-Pole | Right Angled | Shielded     |                | M12FR-3V*-3**SH |
| 4-Pole | Right Angled | Shielded     |                | M12FR-4V*-3**SH |
| 5-Pole | Right Angled | Shielded     |                | M12FR-5V*-3**SH |



| Poles  | M8 Male Straight to M12 Female Straight | Poles  | M12 Male Straight to M12 Female Straight |
|--------|---|--------|--|
| 3-Pole | M8-3MS-3**-M12-3FS-V*                   | 3-Pole | M12-3MS-3**-M12-3FS-V*                   |
| 4-Pole | M8-4MS-3**-M12-4FS-V*                   | 4-Pole | M12-4MS-3**-M12-4FS-V*                   |
| 5-Pole | -                                       | 5-Pole | M12-5MS-3**-M12-5FS-V*                   |



| Poles  | M12 Male Straight to M12 Female Right Angled | Poles  | M12 Female Straight to M12 Male Right Angled |
|--------|--|--------|--|
| 3-Pole | M12-3MS-3**M12-3FR-V*                        | 3-Pole | M12-3FS-3**M12-3MR-V*                        |
| 4-Pole | M12-4MS-3**M12-4FR-V*                        | 4-Pole | M12-4FS-3**M12-4MR-V*                        |
| 5-Pole | M12-5MS-3**M12-5FR-V*                        | 5-Pole | M12-5FS-3**M12-5MR-V*                        |

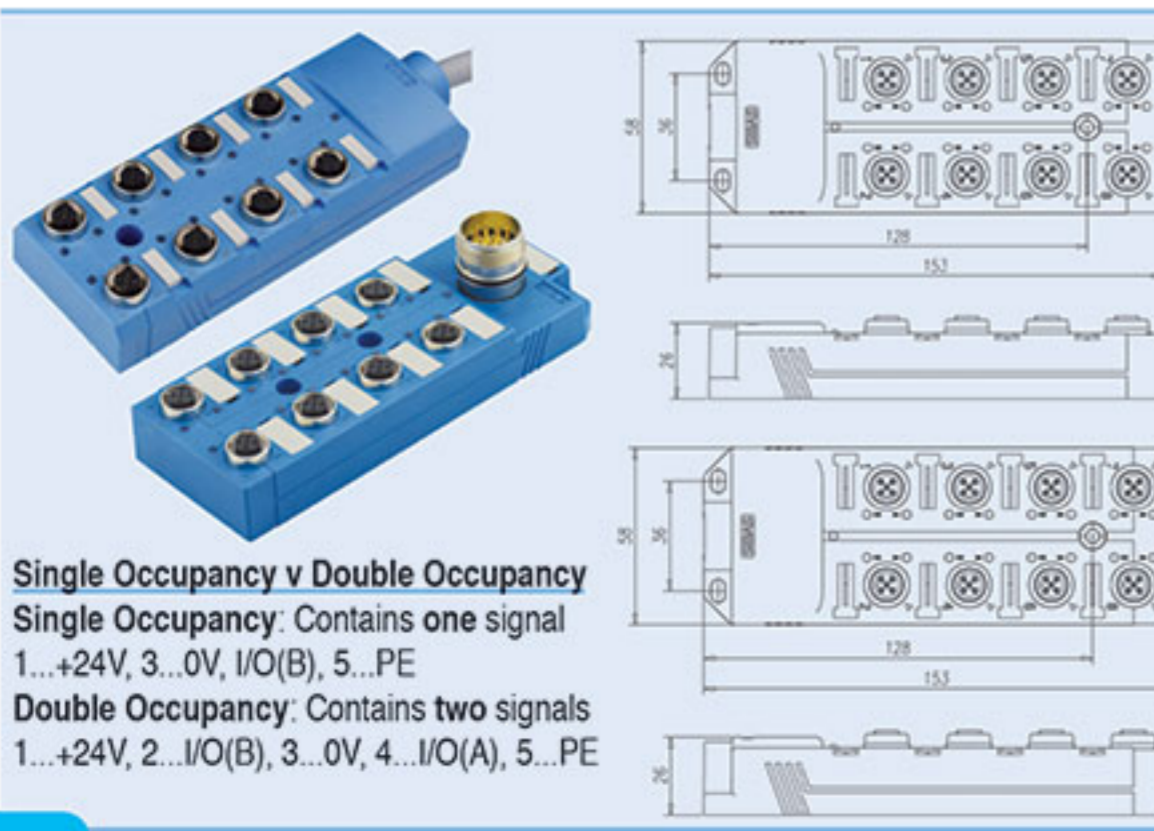


**Single Occupancy v Double Occupancy**  
**Single Occupancy:** Contains one signal 1...+24V, 3...0V, 4...I/O(A), 5...PE  
**Double Occupancy:** Contains two signals 1...+24V, 2... I/O(B), 3...0V, 4...I/O(A), 5...PE

## M8 PNP Sensor Actuator Boxes Single or Double Occupancy. Cable or M23 Plug Versions with LED's IP67

| Poles    | Cable Length | Ports | Code                                      |
|----------|--------------|-------|---|
| 3/4-Pole | 5m           | 4     | M8PSL-3 <sup>†</sup> 4P-5U <sup>^^</sup>  |
| 3/4-Pole | 10m          | 4     | M8PSL-3 <sup>†</sup> 4P-10U               |
| 3/4-Pole | 5m           | 6     | M8PSL-3 <sup>†</sup> 6P-5U <sup>^^</sup>  |
| 3/4-Pole | 10m          | 6     | M8PSL-3 <sup>†</sup> 6P-10U               |
| 3/4-Pole | 5m           | 8     | M8PSL-3 <sup>†</sup> 8P-5U <sup>^^</sup>  |
| 3/4-Pole | 10m          | 8     | M8PSL-3 <sup>†</sup> 8P-10U               |
| 3/4-Pole | 5m           | 10    | M8PSL-3 <sup>†</sup> 10P-5U <sup>^^</sup> |
| 3/4-Pole | 10m          | 10    | M8PSL-3 <sup>†</sup> 10P-10U              |

\* For PUR version cables replace V with U e.g. M8FS-3U-3  
 \*\* For 1.5m, 5m or 10m Cable lengths replace 3 with 1.5, 5 or 10 e.g. M8F3-3V-5  
 ^^ For M23 plug types replace U with M23 e.g. M8PSL-34P-M23  
 † For Double Occupancy Boxes, replace PSL-3 with PDL-4 e.g. M8PDL-44P-5U<sup>^^</sup>  
**Note: 4-Pole units are Double Occupancy Boxes**



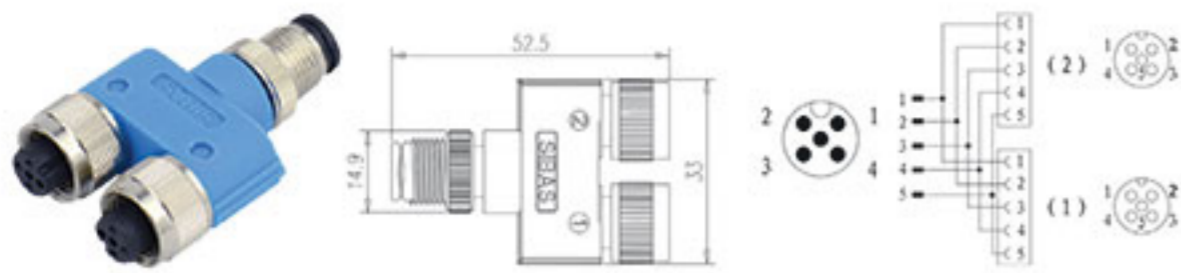
**Single Occupancy v Double Occupancy**  
**Single Occupancy:** Contains one signal 1...+24V, 3...0V, I/O(B), 5...PE  
**Double Occupancy:** Contains two signals 1...+24V, 2...I/O(B), 3...0V, 4...I/O(A), 5...PE

## M12 PNP/NPN Sensor Actuator Boxes Single or Double Occupancy. Cable or M23 Plug Versions with LED's IP67

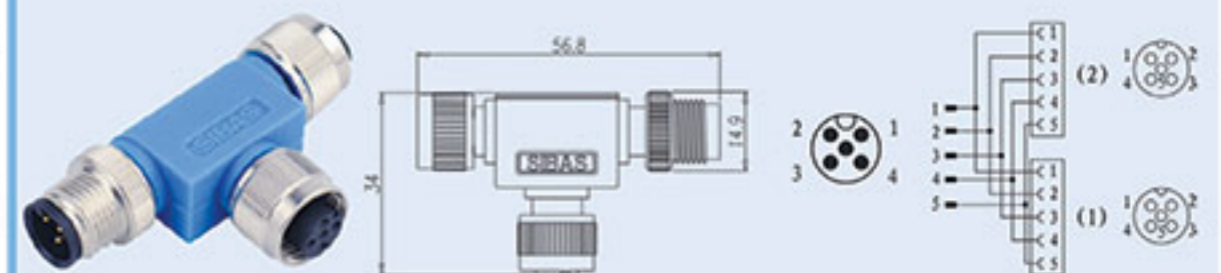
| Poles  | Cable Length | Ports | Code                                      |
|--------|--------------|-------|---|
| 5-Pole | 5m           | 4     | M12P <sup>†</sup> SL-54P-5U <sup>^^</sup> |
| 5-Pole | 10m          | 4     | M12P <sup>†</sup> SL-54P-10U              |
| 5-Pole | 5m           | 6     | M12P <sup>†</sup> SL-56P-5U <sup>^^</sup> |
| 5-Pole | 10m          | 6     | M12P <sup>†</sup> SL-56P-10U              |
| 5-Pole | 5m           | 8     | M12P <sup>†</sup> SL-58P-5U <sup>^^</sup> |
| 5-Pole | 10m          | 8     | M12P <sup>†</sup> SL-58P-10U              |

^^ For M23 plug types replace U with M23 e.g. M12PSL-54P-M23  
 For Double Occupancy Boxes, replace S with D e.g. M12PDL-54P-5U  
 † For NPN versions replace P with N e.g. M12NSL-54P-M23

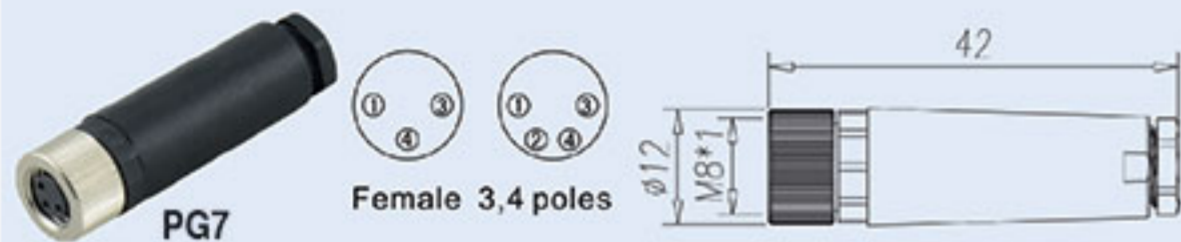
# SENSOR CABLES & CONNECTORS



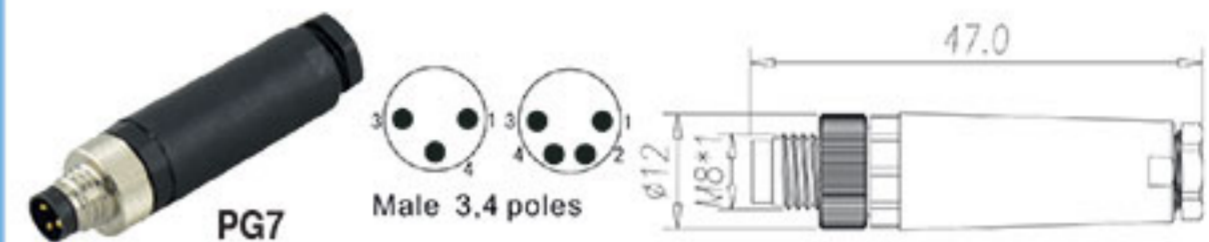
| Poles  | M12 Y Straight Distributor Connector IP67 |
|--------|---|
| 3-Pole | M12MS-3M12-Y1                             |
| 4-Pole | M12MS-4M12-Y1                             |
| 5-Pole | M12MS-5M12-Y1                             |



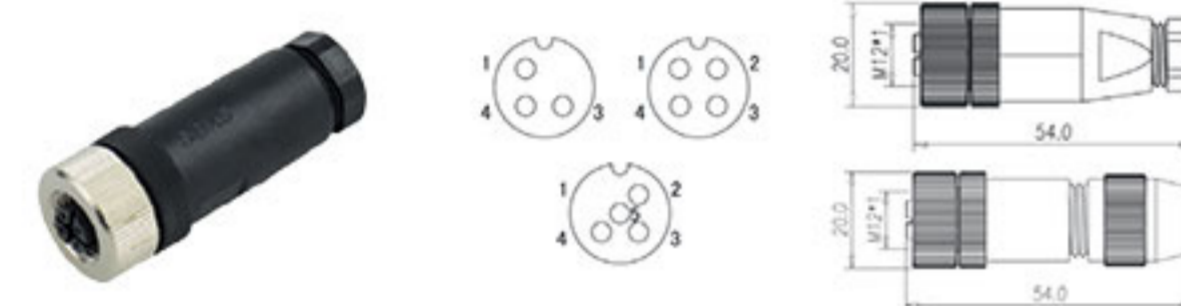
| Poles  | M12 T Straight Distributor Connector IP67 |
|--------|---|
| 3-Pole | M12MS-3M12-T1                             |
| 4-Pole | M12MS-4M12-T1                             |
| 5-Pole | M12MS-5M12-T1                             |



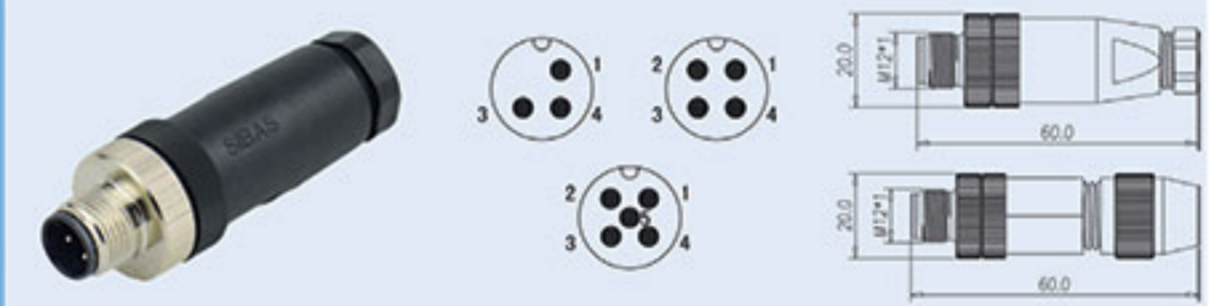
| Poles  | M8 Female Screw Connection Straight IP67 |
|--------|--|
| 3-Pole | M8FS-3PG7-M                              |
| 4-Pole | M8FS-4PG7-M                              |



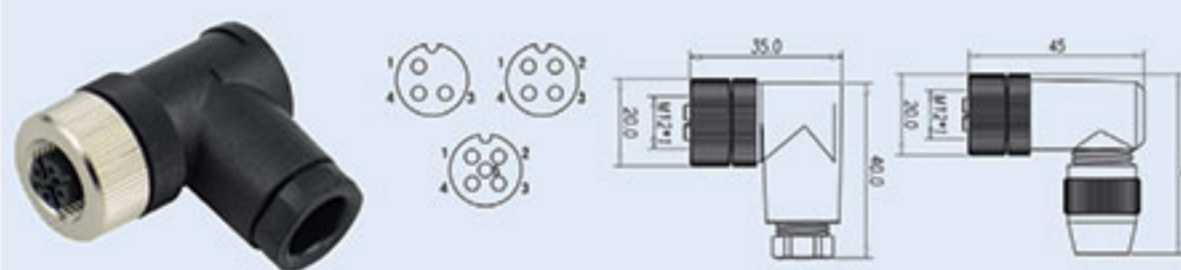
| Poles  | M8 Male Screw Connection Straight IP67 |
|--------|--|
| 3-Pole | M8MS-3PG7-M                            |
| 4-Pole | M8MS-4PG7-M                            |



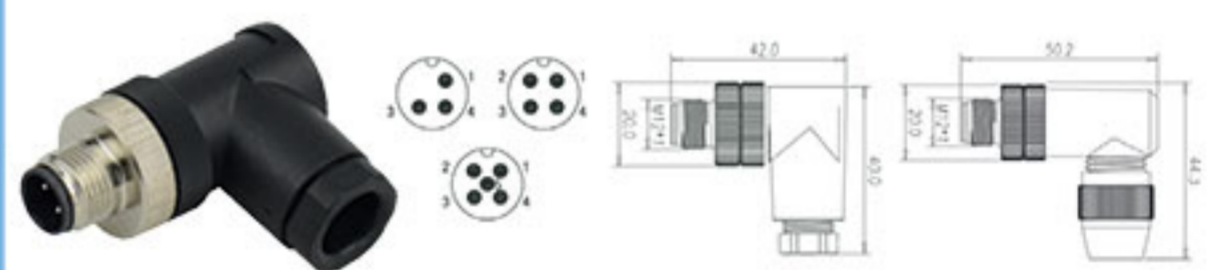
| Poles  | M12 Female Screw Connection Straight IP67 |
|--------|---|
| 3-Pole | M12FS-3PG7-M <sup>^</sup>                 |
| 4-Pole | M12FS-4PG7-M <sup>^</sup>                 |
| 5-Pole | M12FS-5PG7-M <sup>^</sup>                 |



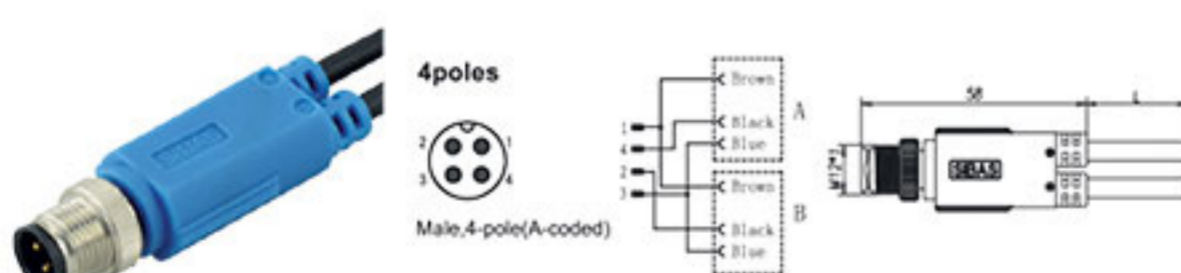
| Poles  | M12 Male Screw Connection Straight IP67 |
|--------|---|
| 3-Pole | M12MS-3PG7-M <sup>^</sup>               |
| 4-Pole | M12MS-4PG7-M <sup>^</sup>               |
| 5-Pole | M12MS-5PG7-M <sup>^</sup>               |



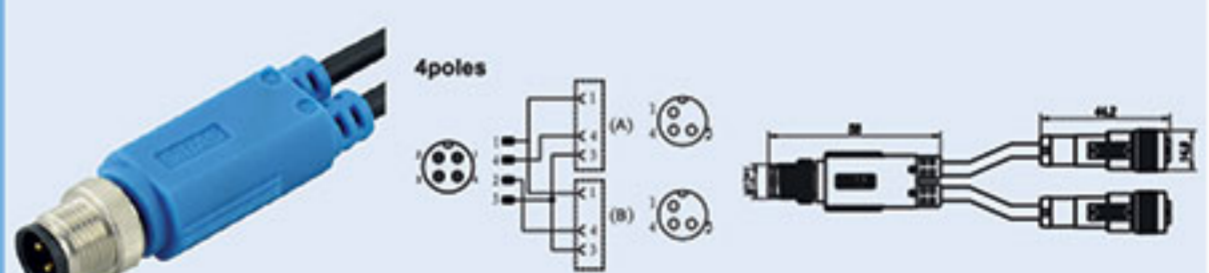
| Poles  | M12 Female Screw Connection Right Angled IP67 |
|--------|---|
| 3-Pole | M12FR-3PG7-M <sup>^</sup>                     |
| 4-Pole | M12FR-4PG7-M <sup>^</sup>                     |
| 5-Pole | M12FR-5PG7-M <sup>^</sup>                     |



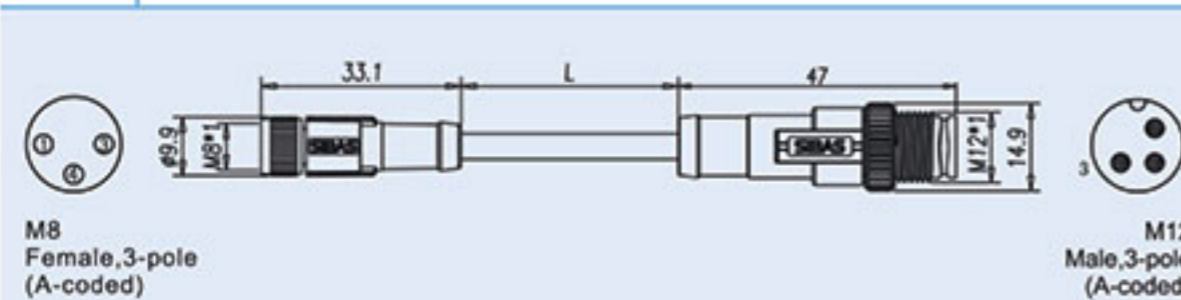
| Poles  | M12 Male Screw Connection Right Angled IP67 |
|--------|---|
| 3-Pole | M12MR-3PG7-M <sup>^</sup>                   |
| 4-Pole | M12MR-4PG7-M <sup>^</sup>                   |
| 5-Pole | M12MR-5PG7-M <sup>^</sup>                   |



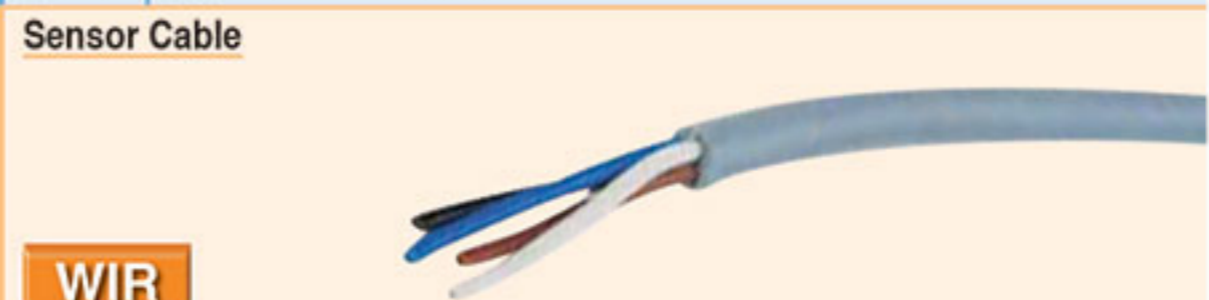
| Poles  | M12 Male Straight Y Connector IP67 |
|--------|------------------------------------|
| 3-Pole | -                                  |
| 4-Pole | M12Y-MS4-V*3**                     |



| Poles  | M12 Male Straight Y Connector IP67 |
|--------|------------------------------------|
| 3-Pole | -                                  |
| 4-Pole | M12Y-4MS3**·2M12-3FSV*             |



| Poles  | M8 Female Straight to M12 Male Straight IP67 |
|--------|--|
| 3-Pole | M83FS-1.5**·M12-3MS-V*                       |
| 4-Pole | M84FS-3**·M12-4MS-V*                         |



| Code | Description  |
|------|--|
| WS-3 | 3 core x 0.34mm <sup>2</sup> grey cable, core colour ●●●   |
| WS-4 | 4 core x 0.34mm <sup>2</sup> grey cable, core colour ●○●●  |
| WS-5 | 5 core x 0.34mm <sup>2</sup> grey cable, core colour ●○●●● |

<sup>^</sup> For Shielded versions replace M with SH e.g. M12FS-3PG7-SH

# OPTICAL ROTARY ENCODER SPECIFICATIONS

## What is an encoder

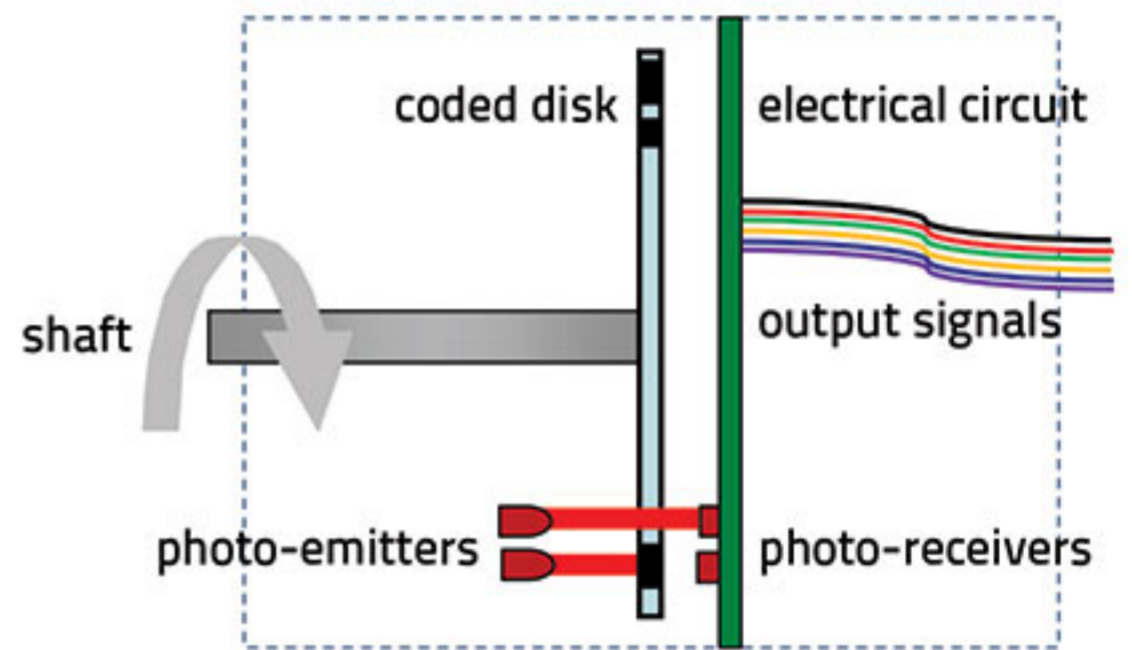
Optical rotary encoders (or shaft encoders) are made to provide output signals or digital data based on physical mechanical measures:

- Rotational speed of the encoder shaft
  - Direction of rotation
  - Angular position of the shaft
  - Linear displacement (with draw wires or measuring wheels)
- Encoders are used as sensors for motion control, length measurement and positioning applications



## How is made

The encoder shaft transmits the rotation to a coded disc made of lines which shutter the light from photo-emitters to photo-receivers, thus generating a variable electrical signal. According to the different coded disk mask and electrical circuit there are two types of encoders: incremental or absolute.

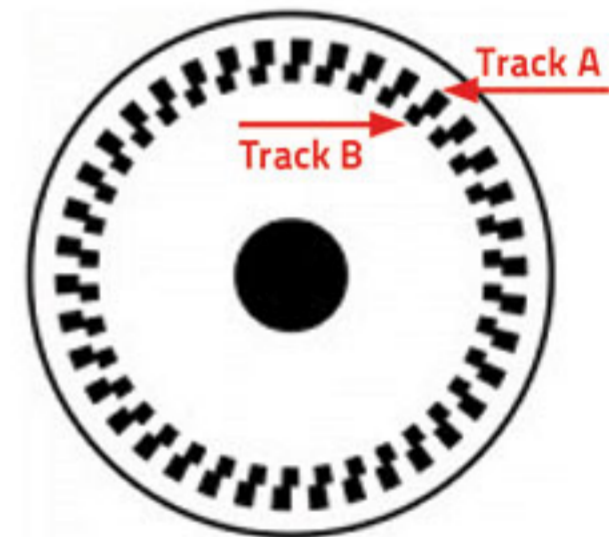


## Incremental encoders

Incremental encoders produce sinusoidal or square wave outputs, which give an incremental number of pulses per revolution of the shaft.

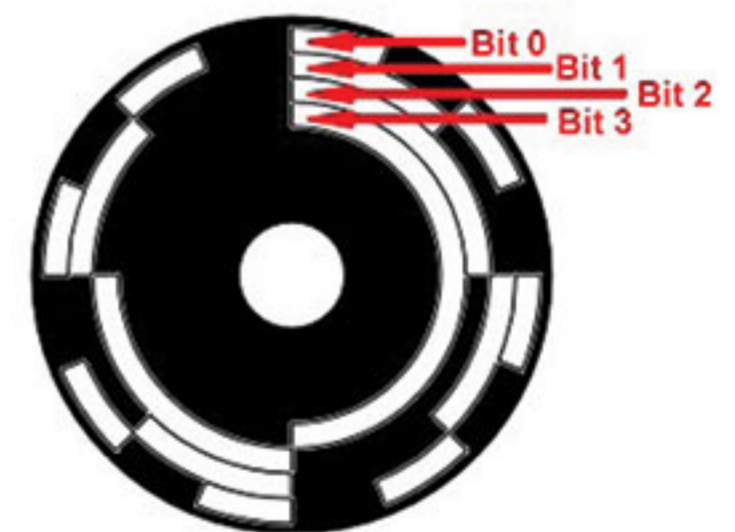
The resolution is defined as Pulse Per Revolution (PPR).

The signals start at the power up and the shaft position is not retained when encoder is switched-off, so they can be used to control rotation speed and direction, but can't provide absolute position. A-B-0 (90° phase shifted tracks and zero) and /A-/B-/0 complement outputs are used to detect rotation direction, increase resolution and avoid disturbances. The 0 index is used as reference marker for the 'home' position. Datalogic incremental encoders offer a Smart Push-Pull & Line Driver output which is suitable for both configurations.



## Absolute encoders

Absolute encoders generate a multi-bit digital data information, providing the actual angular position of the shaft. Single-turn absolute encoders repeat the code for every shaft revolution. Multi-turn absolute encoders increase the code at each shaft revolution. Shaft position is retained when the absolute encoder is switched-off, so it can provide the absolute position, as well as rotation speed or direction. Absolute encoders have a different bit mask for each angular position, resolution is defined as Code Per Revolution (CPR) and also expressed in bits. The simple example shows a 4 bit mask, that's 16 CPR. Datalogic absolute encoders are available either with SSI® serial synchronous interface, or Fieldbus interfaces as CANopen®, Devicenet, EtherCAT, Profibus, or Profinet.





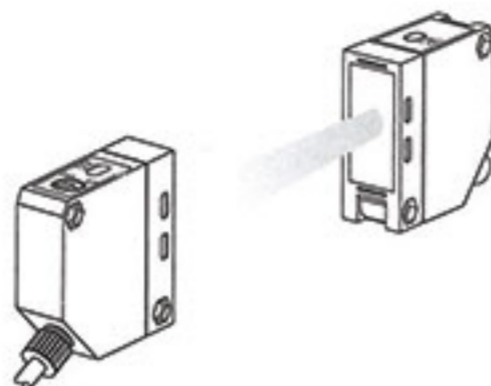
# PHOTO SENSOR SPECIFICATIONS

## WORKING PRINCIPLES

A sensor is made up of an irradiating element, a particular type of light (usually infrared, red or green) and an element photosensitive to the irradiated light. The presence or absence of light on the photosensitive element is used as a signal producing a change in the output of the sensor. Thanks to the qualities of transmission and propagation of the light, different types of sensor can be used.

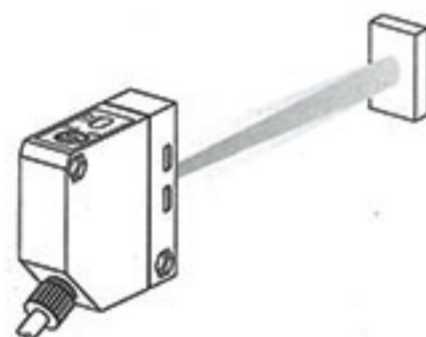
### Thru-beam

This type is made up of an emitter and a receiver on the same axis. Every time an object interrupts the light beam, which goes from the emitter to the receiver, a change in the receiver output takes place. This type allows great sensing distances and is particularly suitable for being used in dirty and dusty locations



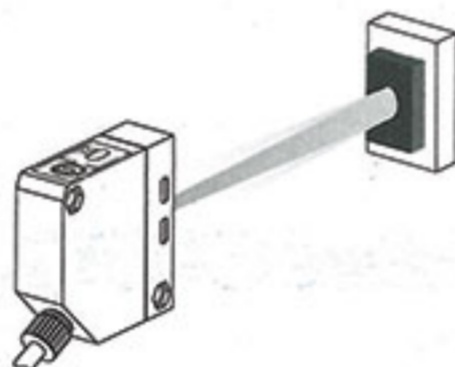
### Diffuse Reflective

In this case the light source and the photosensitive element are included in the same unit. The emitted light reaches the photosensitive element after being reflected from an object present in the irradiation field. The presence or absence of the light on the receiver causes a change in the output state signalling either the presence or absence of an object in the sensing area.



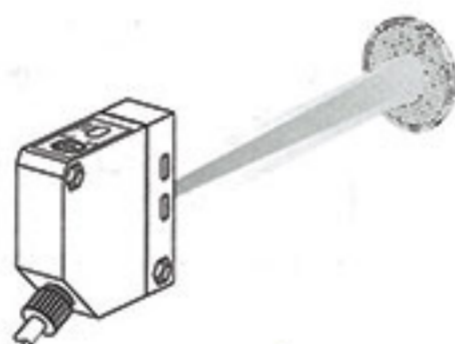
### Background suppression

Background suppression diffuse reflective sensors have, in comparison to the ones we describe above, a specific and a well defined working area. Within this area, these sensors can detect the objects almost apart from their surface and their colour. Besides this restricted and specific detection area, that is in the background zone, all the other objects are ignored apart from their surface features.



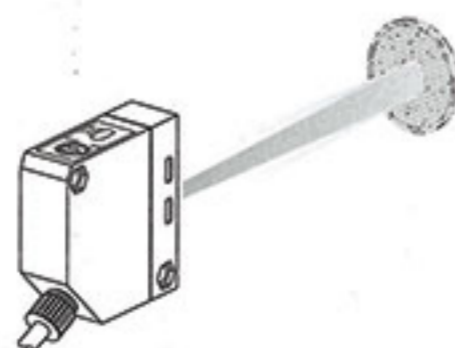
### Retro Reflective

As in Diffuse type the light source and the photosensitive element are in the same unit. Differing for the Diffuse type, the reflection of the light emitted is obtained by using a reflector. As a consequence, the detection occurs when the beam of the reflected light is interrupted, that is, when there is an object between the reflector and the sensor. This system is limited by the fact that shining or reflecting objects cannot be identified by the sensor as they reflect the emitted light, as if they were reflectors.



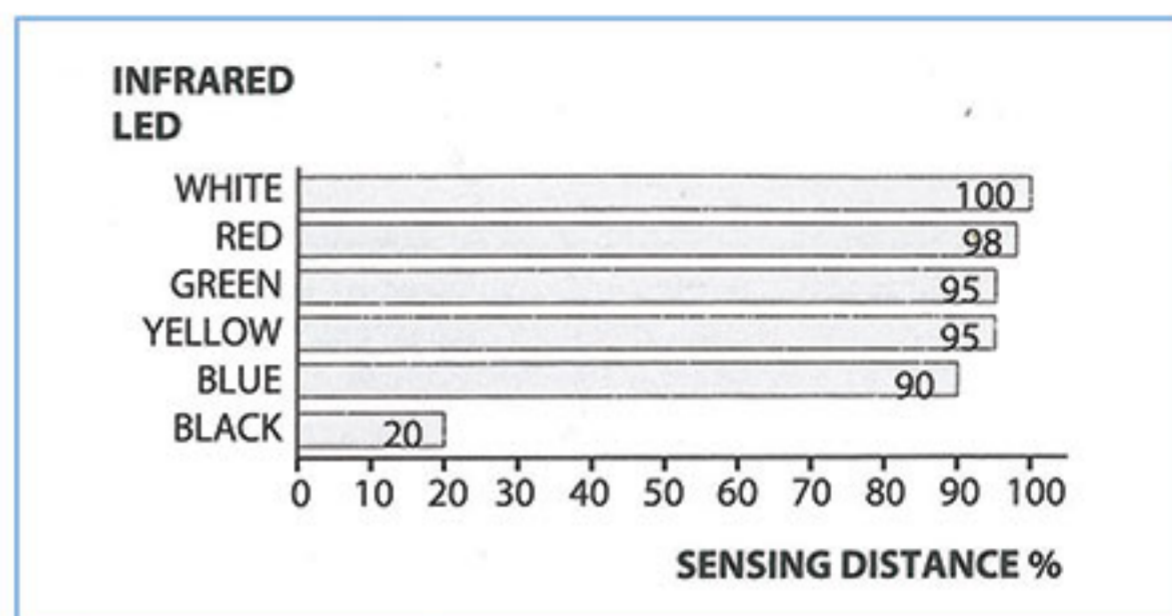
### Polarized Retro Reflective

The working principle is the same as in the retro Retro Reflective type. This sensor allows shining or reflecting objects to be sensed. This is due to the fact that reflectors deviate the light radiation of 90°. By using special polarizing filters, only the light reflected by the reflector is sensed by the photosensitive element. Therefore common reflecting objects can be sensed because they cannot the light radiation and act as the retroreflector. However if the reflecting surface is of 'active material', the light beam through this material may have the same behaviour as the reflector. This is due to the disposition of molecules of that particular material. To avoid this, is advisable to rotate the optical axis (photoelectric sensor-reflector) 45° to the surface to scan.



### Switching Distance for Diffuse Reflective Sensor

Detecting distance for optical proximity sensors varies according to the material to sense. The parameters that influence the maximum capacity of the sensor are mainly the colour and the brightness or roughness of the surface to be detected. The data below show approximate values and are the result of lab tests with mat paper targets 10x10 wide of the following colours.



### Switching Distance for Retro Reflective Sensor and Thru-beam

It is the maximum distance between photocell and reflector or between emitter and receiver.

### Nominal Switching Distance (Sn) According to EN 60947-5-2

It is the conventional value of operating distance for photoelectric switches. It does not take into account either manufacturing tolerances ( $\pm 10\%$ ) or variations due to external conditions such as voltage and temperature.

### Usable Operating Distance (Su) According to EN 60947-5-2

It is the assured operating distance within the specified voltage, functioning and temperature intervals; it is included between 81% and 12% of the nominal switching distance Sn ( $0.8S_n \leq S_u \leq 1.21S_n$ ) for photoelectric switches.

### Assured Operating Distance (Sa) According to EN 60947-5-2

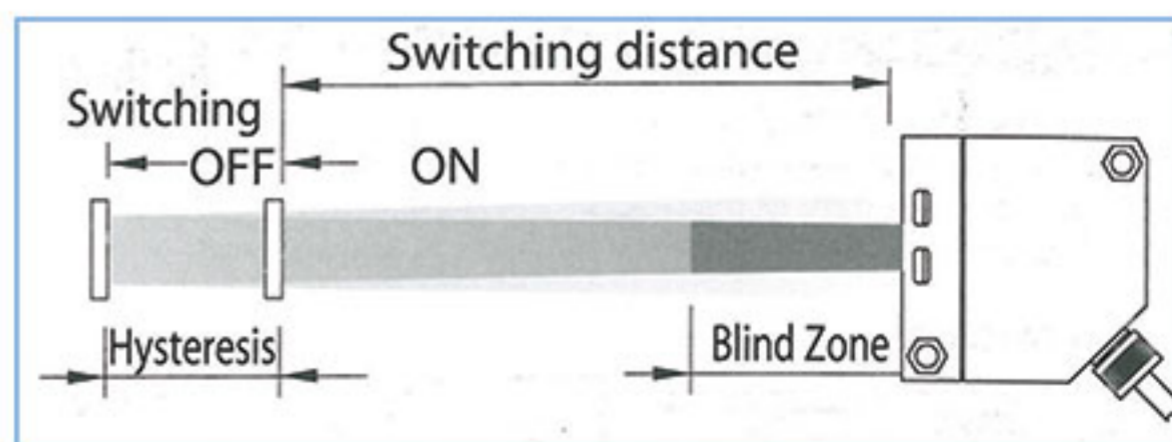
It is the distance at which the photoelectric switches works safely in all the temperature and voltage intervals as specified for the same sensor. The assured operating distance is included between 0 and 1'81% of Sn only in the case of photoelectric switches without blind zone and referring to specific targets.

### Blind Zone

It is the area between the 'photoelectric switches active surface' and the minimum switching distance, within which an object cannot be detected.

### Hysteresis

It is the maximum distance between the detected and non detected points. These points are obtained by moving the object towards or away from the photocell axis. Data are expressed in percentage to the value of the sensing distance.



### Switching Frequency

It shows the maximum number of operations per second performed by the photocell.

### Response Time

It is the time the object takes to cover the optical sensor field to perform a correct switching.

# SAFETY LIGHT CURTAIN SELECTION GUIDE

The selection of safety sensors for use in machinery is part of the overall risk reduction process, which starts with the analysis and evaluation of all possible risks the machine presents and ends with the validation and testing of the safety system. The sensors chosen should fulfill any safety requirements specific to the machine they will be mounted on. If there are no machine-specific requirements, the safety system should be designed to comply with all general safety and health standards. The overall system design dictates the parameters the safety sensors must meet. The following list of parameters and functions related to safety sensors can serve as a checklist to help in the selection process.

| Number | Definition                           | Values                 |                   |                   |           |                    |
|--------|--------------------------------------|------------------------|-------------------|-------------------|-----------|--------------------|
|        |                                      | a                      | b                 | c                 | d         | e                  |
| 1      | Performance level required           | a                      | b                 | c                 | d         | e                  |
| 2      | Type                                 | 2                      |                   | 4                 |           |                    |
| 3      | DETECTION CAPABILITY (OR RESOLUTION) |                        |                   |                   |           |                    |
|        | Finger protection                    | 14 mm                  |                   |                   |           |                    |
|        | Hand protection                      |                        | 30 mm             |                   |           |                    |
|        | Arm protection/Presence              |                        |                   | 50 mm             |           | 90 mm              |
|        | Body protection                      | 2 beams<br>500 mm      | 3 beams<br>800 mm | 4 beams<br>900 mm |           | 4 beams<br>1200 mm |
| 4      | DETECTION ZONE                       |                        |                   |                   |           |                    |
|        | Height                               | from 150 mm to 1800 mm |                   |                   |           |                    |
|        | Operating range                      | from 0.2 m to 60 m     |                   |                   |           |                    |
|        | Zero dead zone                       |                        | yes               |                   | no        |                    |
| 5      | Retroreflective light curtains       |                        | yes               |                   | no        |                    |
| 6      | Cascading                            |                        | yes               |                   | no        |                    |
| 7      | Response time                        | from 8 ms to 33 ms     |                   |                   |           |                    |
| 8      | Manual or automatic restart          |                        | Manual            |                   | Automatic |                    |
| 9      | External Device Monitoring (EDM)     |                        | yes               |                   | no        |                    |
| 10     | MUTING                               |                        |                   |                   |           |                    |
|        | Type of muting                       |                        | T                 |                   | L         |                    |
|        | Integrated muting lamp               |                        | yes               |                   | no        |                    |
|        | Partial muting                       |                        | yes               |                   | no        |                    |
| 11     | Override                             |                        | yes               |                   | no        |                    |
| 12     | BLANKING                             |                        |                   |                   |           |                    |
|        | Fixed Blanking                       |                        | yes               |                   | no        |                    |
|        | Floating Blanking                    |                        | yes               |                   | no        |                    |
|        | Reduced resolution                   |                        | yes               |                   | no        |                    |
| 13     | Software configuration               |                        | yes               |                   | no        |                    |

## 1. Performance Level (PL) and required Performance Level (PLr)

Performance level is one of five discrete levels (a, b, c, d, e) that specify the ability of the safety-related part of a control system to perform a specific safety function. The performance level depends on the system design, the reliability of components used, the diagnostic coverage of dangerous faults, and on the ability of the safety parts to avoid common cause and systematic faults. The minimum required Performance Level (PLr) to reduce a risk is determined by following the diagram in fig. 1, which takes into account three factors: the severity of injury, the frequency of exposure to hazard, and the possibility to avoid the hazard. Performance level and its calculation methods are described in EN ISO 13849-1.

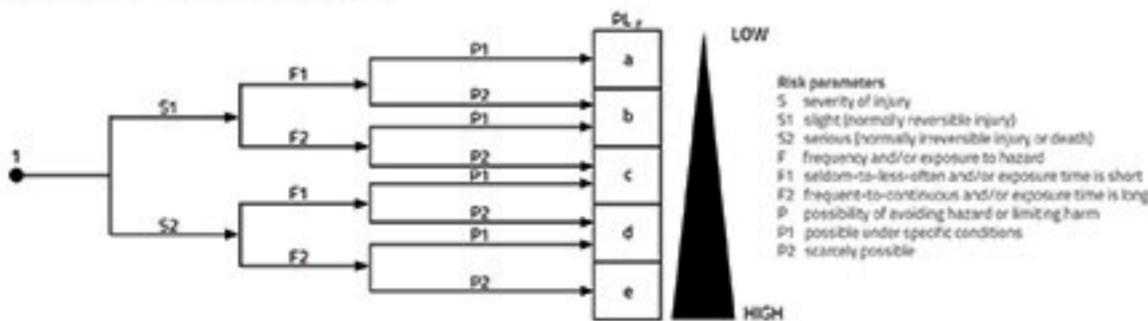


Fig. 1 Required Performance Level

## 2. Type

Safety sensors whose function is to detect the interruption of beams by an object are called Active Optoelectronic Protective Devices (AOPD). AOPDs are classified in two Types (Type 2 and Type 4) depending on their design and optical performance. The optical performance is dependent on the maximum limit of the effective aperture angle (EAA), that is  $\pm 5^\circ$  for Type 2, and  $\pm 2.5^\circ$  for Type 4. A lower EAA results in a more focused beam. Type and Performance Level are directly correlated: Type 2 Sensors must reach at least PL c, and Type 4 Sensors must reach at least PL e. Conversely, the maximum PL that can be reached for a safety function that includes the use of a Type 2 AOPD is PL c, while for a Type 4 AOPD, the maximum is PL e. Based on these considerations, to reduce the highest risks on machines, Type 4 AOPDs should be used (see Fig. 2). Active optoelectronic protective devices and corresponding Types are described in IEC 61496-1 and IEC 61496-2.

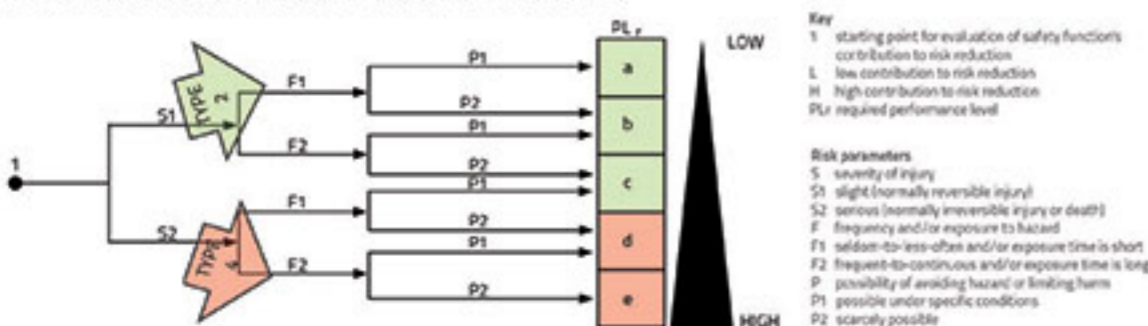


Fig. 2 AOPD Type and Performance Level

## 3. Detection Capability (or Resolution)

The detection capability of a light curtain is the diameter of the smaller object that will activate the device when it's placed in any point of the detection zone. The value of the detection capability, together with response time, is crucial to calculating the minimum safety distance required between the light curtain and the dangerous zone. For single light beam sensors and for multiple light beams sensors (2, 3 or 4 beams), in place of detection capability, it's common to use the number of light beams. In this case, their purpose is to provide "body protection", detecting the passage of the entire body of a person. For an introduction to the minimum safety distance calculation rules (described in EN 13855) see page 94 and the light curtain's technical documentation.

## 4. Detection zone

The detection zone is the area where any object whose dimensions are at least equal to the detection capability activates the light curtain. It is defined by its height and by the distance between the emitter and the receiver element ("operating range"). If the light curtain is retroreflective, the operating range is the distance between the active and the passive element. Light curtains can have a "dead zone", in which they are not able to detect the object due to the absence of beams. When it is required that the dimension of the light curtain corresponds exactly to the height of its detection zone, the light curtain is said to have zero dead zone.

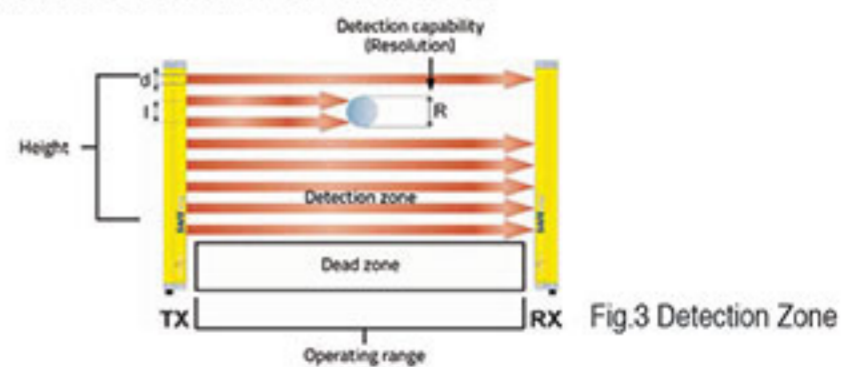


Fig. 3 Detection Zone

## 5. Retroreflective light curtains

2, 3 and 4 beams light curtains can be manufactured with all emitters and receivers on one side, and passive elements (mirrors) on the other side. The advantage of using a retroreflective light curtain is that only one side needs to be powered on.

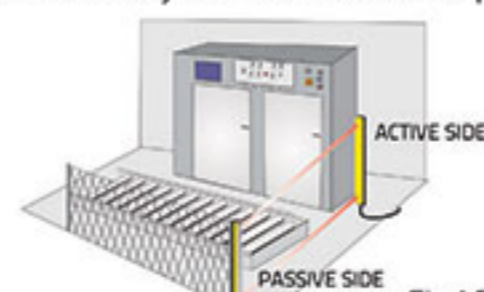


Fig. 4 Retroreflective Light Curtains

# SAFETY LIGHT CURTAIN SELECTION GUIDE

## 6. Cascading

Cascading is when two or more light curtains are connected to each other, resulting in one system that functions as a single light curtain. Advantages of cascading are: better monitoring of dangerous areas with presence detection beyond the vertical detection zone and space and cost savings by using a single safety unit.

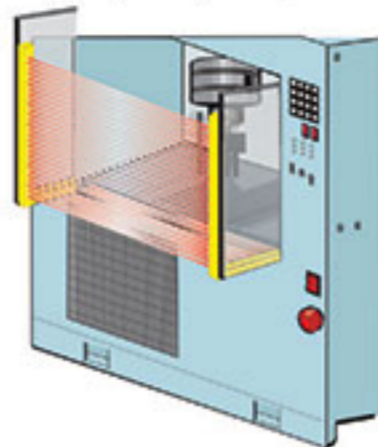


Fig.5 Cascading

## 7. Response time

The response time is the maximum time occurring between the detection of the test object in the detection zone and the activation of the light curtain's outputs. It is a safety relevant parameter, and its value must be taken in account when calculating the position in which the safety sensor will be placed in relation to the dangerous area.

## 8. Manual or automatic restart

Depending on the initial risk analysis of the machine, a start or restart interlock can be a safety requirement of the control system. It prevents an automatic restart of the machine during a dangerous part of the operating cycle after activation of the sensing device, or when the electrical supply of the sensor is switched on or restored after interruption. This interlock can be implemented by a manual restart of the safety controller or by the light curtain itself.

## 9. External Device Monitoring (EDM)

EDM is a function that allows the electro-sensitive protective equipment (ESPE) to monitor the state of control devices (i.e. contactors, actuators) that are driven by its outputs. This function can be achieved by the safety controller or directly by the light curtain.

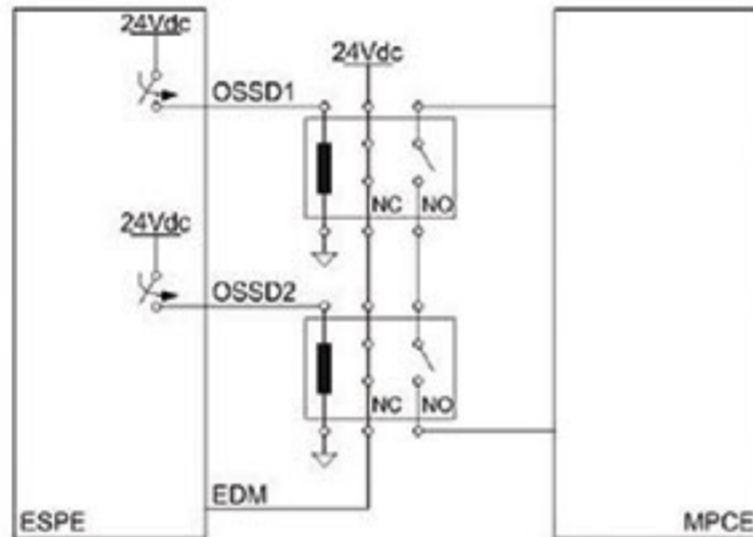


Fig.6 External Device Monitoring Wiring Diagram

## 10. Muting

Muting is the temporary automatic suspension of a safety function. When a light curtain is muted, its outputs will remain ON even if an object is detected in the detection zone. Because muting suspends a safety function, it must be implemented with all necessary precautions and in compliance with the machine-specific safety requirements. T muting is a specific kind of muting that can be used to allow the passage of material through an opening in direction of the dangerous area or in both directions. L muting can be used only if material exits the dangerous area.

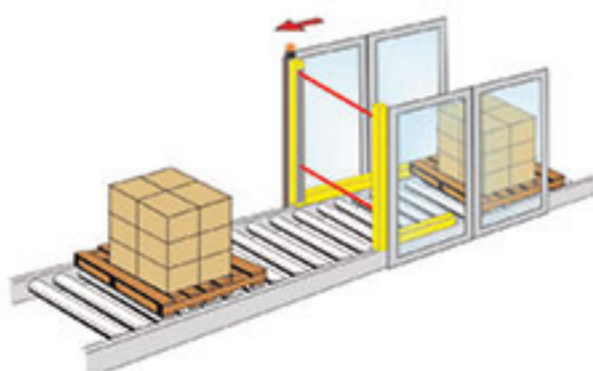


Fig. 7 Safety Light Curtain with Integrated L muting actuator



Fig. 8 Safety Light Curtain with Integrated T muting actuator

Light curtains can be provided with muting arms, with pre-wired sensors detecting the passage of material, or can be used with external muting sensors.

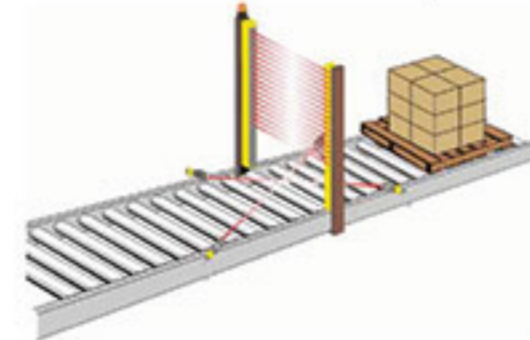


Fig. 9 Safety light curtain with external crossed beams muting sensors

Muting lamps integrated in the light curtains, or installed external to them, are designed to flash as long as the muting is active.



Fig.10 Intergrated Muting Lamps

To maintain the safety of the application, light curtains can be configured to perform the muting function only on the number of beams needed for the passage of the material (Partial Muting), keeping the others active.

## 11. Override

Override function is a mute dependent bypass of the light curtain, that can be provided for some applications (for example conveyor and packaging machinery) in order to clear a blockage in the area of the machine where sensors are located. The activation of the bypass function should be possible for a limited amount of time, only when at least one muting sensor is activated, and will require the use of a device located where operator can see the point of hazard.

## 12. Blanking

The blanking function is used when an object detected in a defined part of the detection zone must not cause an OFF-state of the light curtains outputs. Blanked beams are monitored so that the absence or a change in the size or location of the object causes the light curtain's outputs to go to the OFF-state. Fixed blanking is when the object must remain in a fixed position, with a given tolerance. Floating blanking is when the object can move along the detection zone. Depending on the configuration of the light curtain, in floating blanking the object can also leave the detection zone or not. Reduced resolution is a particular kind of floating blanking, with light curtain outputs going OFF-state only when a predefined number of beams adjacent are interrupted, in any position along the light curtain. When reduced resolution is active, more than one small object can interrupt the light curtain beams without its output going OFF. Blanking can affect the detection capability of the light curtain and can result in a recalculation of the minimum safety distance.

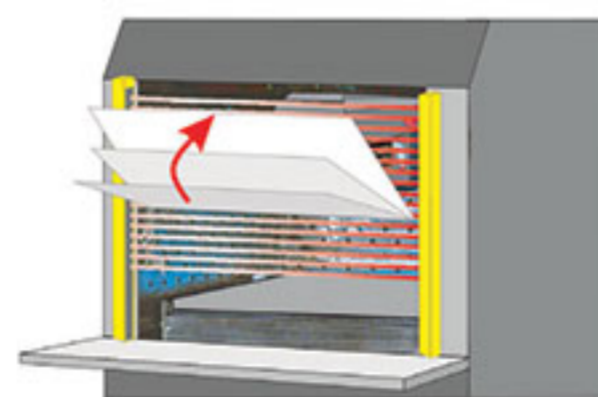


Fig.11 Floating Blanking

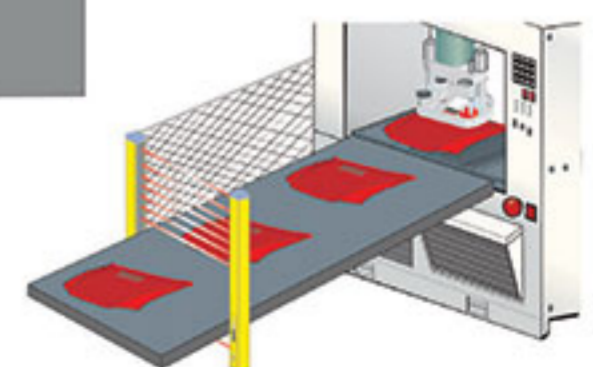
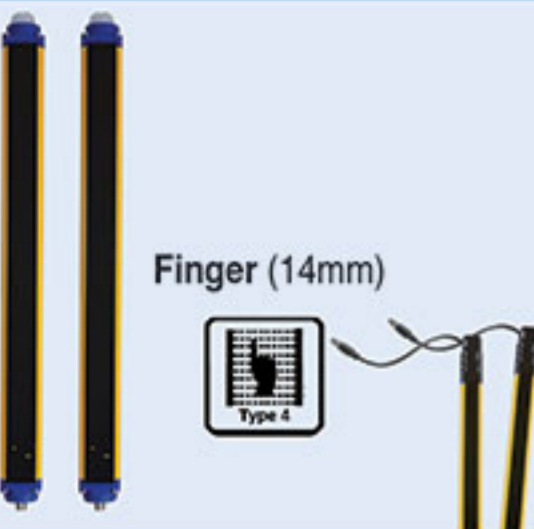
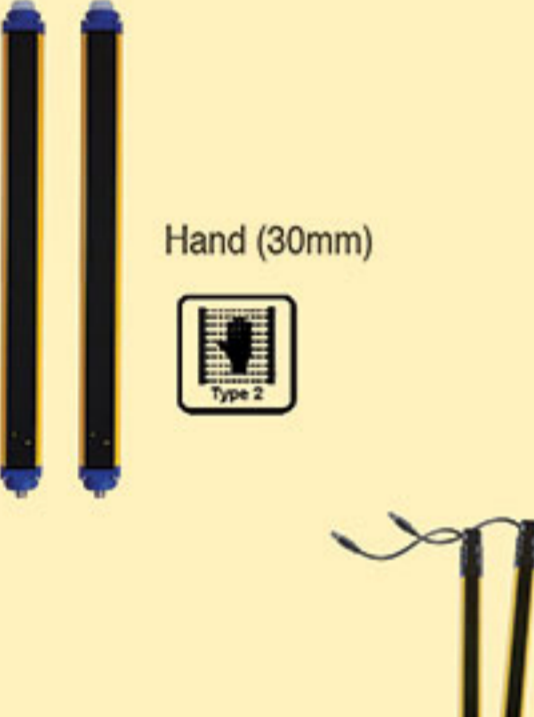

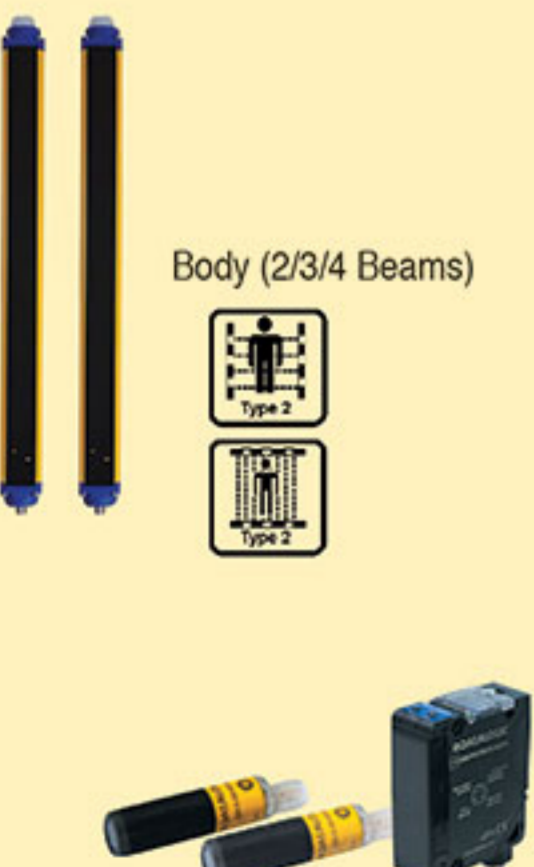


Fig.12 Fixed Blanking with Tolerance

## 13. Software configuration

Setting DIP-Switch or through wiring, it is possible to set typical parameters like manual or auto reset, EDM enable or disable, muting type selection, as well as auto-teach blanking function. A software configurator (Graphic User Interface, GUI) is required for more advanced functionality, such as setting the muting timeout with 1-second steps, or designing complex patterns for floating or fixed blanking.

# SAFETY LIGHT CURTAIN SELECTION GUIDE

| Resolution  | Type | Range/Sensing Distance (m)                               | Controlled Height (mm) |
|---|------|--|------------------------|
|  <p>Finger (14mm)</p> <p>Type 4</p>                      | 4    | 0.2...6  | 150...1800             |
|   |      | 0.2...7  | 300...1800             |
|  <p>Hand (30mm)</p> <p>Type 2</p>                       | 2    | 0.2...19   | 150...1800             |
|   |      | 0.2...19   | 150...1800             |
|   | 4    | 0.2...20   | 300...1800             |
|   |      | 0.2...19   | 150...1800             |
|  <p>Arm/Presence (50/90mm)</p> <p>Type 2</p>           | 2    | 0.2...19   | 150...1800             |
|   |      | 0.2...19   | 150...1800             |
|  <p>Body (2/3/4 Beams)</p> <p>Type 2</p> <p>Type 2</p> | 2/4  | 0.5...50   | 500/800/900/1200       |
|   |      | 0.5...50<br>0.5...3 <sup>A</sup><br>0.5...7 <sup>B</sup> | 500/800/900/1200       |
|   |      | 0.5...60   | 500/800/900/1200       |
|   |      | 0.5...60<br>0.5...3 <sup>A</sup><br>0.5...7 <sup>B</sup> | 500/800/900/1200       |
|   |      | 0.5...8  | 500/800/900/1200       |
|   |      | 0.5...8<br>0.5...3 <sup>A</sup>                          | 500/800/900/1200       |
|   |      | 0...8 <sup>C</sup><br>0...40 <sup>C</sup>                | Flexible               |

## Notes



- <sup>A</sup> With retroreflective muting arms
- <sup>B</sup> With emitter/receiver muting arms
- <sup>C</sup> Depending on models



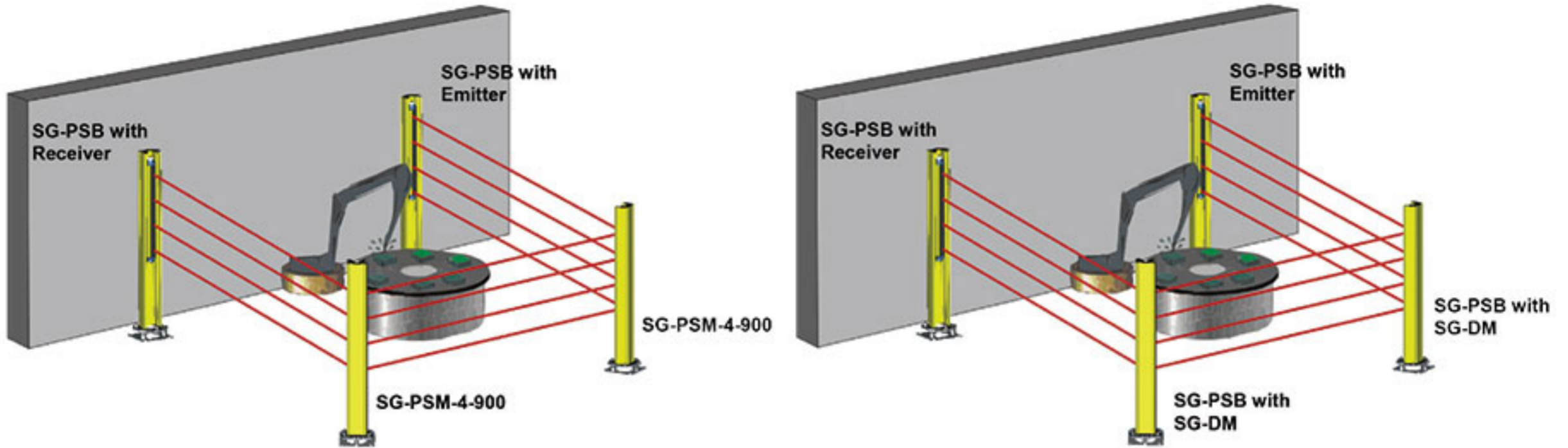
Information in this publication is provided to guide customers in the choice of products in DATALOGIC portfolio. It has to be considered indicative and concise. For the correct use of safety components described, please always refer to additional information you can find on products datasheets and manuals, as well as to the legislation in force at the moment and in the country of their use.

# SAFETY LIGHT CURTAIN SELECTION GUIDE

| Functions                        | Additional HW Features   | Family                   | Page |
|----------------------------------|--|--------------------------|------|
| Manual/Auto Restart              |  | SG4 BASE                 | 45   |
| External Device Monitoring (EDM) |  |                          |      |
| Manual/Auto Restart              | Zero dead zone<br>Cascade<br>Advanced Programmable Configuration<br>Monitoring via Erthnet/IP<br>Error logging | SG4 EXTENDED             | 46   |
| External Device Monitoring (EDM) |  |                          |      |
| T, L Muting Function             |  |                          |      |
| Partial Muting                   |  |                          |      |
| Override                         |  |                          |      |
| Fixed blanking                   |  |                          |      |
| Floating Blanking                |  |                          |      |
| Auto restart                     |  |                          |      |
| Manual/Auto Restart              |  | SG2 EXTENDED             | 45   |
| External Device Monitoring (EDM) |  |                          |      |
| Manual/Auto Restart              | Zero dead zone   | SG2 MUTING               | 46   |
| External Device Monitoring (EDM) |  |                          |      |
| T, L Muting function             |  |                          |      |
| Partial Muting                   |  |                          |      |
| Override                         |  |                          |      |
| Manual/Auto Restart              |  | SG4 BASE                 | 45   |
| External Device Monitoring (EDM) |  |                          |      |
| Manual/Auto Restart              | Zero dead zone<br>Cascade<br>Advanced Programmable Configuration<br>Monitoring via Erthnet/IP<br>Error logging | SG4 EXTENDED             | 46   |
| External Device Monitoring (EDM) |  |                          |      |
| T, L Muting function             |  |                          |      |
| Partial Muting                   |  |                          |      |
| Override                         |  |                          |      |
| Fixed blanking                   |  |                          |      |
| Floating Blanking                |  |                          |      |
| Auto restart                     |  |                          |      |
| Manual/Auto Restart              |  | SG2 EXTENDED             |      |
| External Device Monitoring (EDM) |  | SG BODY COMPACT BASE     | 46   |
| Manual/Auto Restart              |  |                          |      |
| External Device Monitoring (EDM) | Intergrated muting lamp<br>Intergrated muting arms <sup>c</sup>  | SG BODY COMPACT MUTING   | 46   |
| T, L Muting function             |  |                          |      |
| Override                         |  |                          |      |
| Manual/Auto Restart              |  | SG BODY BIG BASE         | 47   |
| External Device Monitoring (EDM) |  |                          |      |
| Manual/Auto Restart              | Intergrated muting lamp  | SG BODY BIG MUTING       | 47   |
| External Device Monitoring (EDM) |  |                          |      |
| T, L Muting function             |  |                          |      |
| Override                         |  |                          |      |
| Manual/Auto Restart              | Retroreflective  | SG BODY REFLECTOR BASE   | 47   |
| External Device Monitoring (EDM) |  |                          |      |
| Manual/Auto Restart              | Retroreflective<br>Intergrated muting lamp<br>Intergrated muting arms <sup>c</sup>                             | SG BODY REFLECTOR MUTING | 47   |
| External Device Monitoring (EDM) |  |                          |      |
| T, L Muting function             |  |                          |      |
| Override                         |  |                          |      |
| Manual/Auto Restart              | Double muting function<br>Low temperature<br>Defogging<br>Separated control unit                               | SINGLE BEAM SENSORS      | 48   |
| External Device Monitoring (EDM) |  |                          |      |
| T, L Muting function             |  |                          |      |
| Override                         |  |                          |      |

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| <b>ACCESSORIES</b>                               |   |       |
| Safety Accessories                               |    | 50-51 |
| Safety Control Units, Relays and Connector Boxes |  | 49    |

# SAFETY LIGHT CURTAIN REFERENCE GUIDE FOR SG-PSB & SG-PSM STANDS



Corresponding Table

| SG-PSM       | Corresponding Safety Light Curtian | SG-PSM        | Corresponding Safety Light Curtian |
|--------------|------------------------------------|---------------|------------------------------------|
| SG-PSM-2-500 | SG2-S2-050-PP-E                    | SG-PSM-4-900  | SG2-S4-090-PP-E                    |
|              | SG2-S2-050-PP-W                    |               | SG2-S4-090-PP-W                    |
|              | SG4-S2-050-PP-E                    |               | SG4-S4-090-PP-E                    |
|              | SG4-S2-050-PP-W                    |               | SG4-S4-090-PP-W                    |
|              | SG2-B2-050-OO-E                    |               | SG2-B4-090-OO-E                    |
|              | SG2-B2-050-OO-W-C                  |               | SG2-B4-090-OO-W-C                  |
|              | SG4-B2-050-OO-E                    |               | SG4-B4-090-OO-E                    |
|              | SG4-BLR2-050-OO-W-C                |               | SG4-BLR4-090-OO-W-C                |
| SG-PSM-3-800 | SG4-BSR2-050-OO-W-C                | SG-PSM-4-1200 | SG4-BSR4-090-OO-W-C                |
|              | SG2-S3-080-PP-E                    |               | SG2-S4-120-PP-E                    |
|              | SG2-S3-080-PP-W                    |               | SG2-S4-120-PP-W                    |
|              | SG4-S3-080-PP-E                    |               | SG4-S4-120-PP-E                    |
|              | SG4-S3-050-PP-W                    |               | SG4-S4-120-PP-W                    |
|              | SG2-B3-080-OO-E                    |               | SG2-B4-120-OO-E                    |
|              | SG2-B3-080-OO-W-C                  |               | SG2-B4-120-OO-W-C                  |
|              | SG4-B3-080-OO-E                    |               | SG4-B4-120-OO-E                    |
|              | SG4-BLR3-080-OO-W-C                |               | SG4-BLR4-120-OO-W-C                |
|              | SG4-BSR3-080-OO-W-C                |               | SG4-BSR4-120-OO-W-C                |

Mirrors - Safety Light Curtains Correspondance Table

| Mirror Models               | Corresponding Light Curtian | Mirror Models               | Corresponding Safety Light Curtian |
|-----------------------------|-----------------------------|-----------------------------|------------------------------------|
| SG -DM 600                  | SGX -XX -015                | 4X SG -DM 150 / SG -DM 1200 | SG2-S4-090                         |
| SG -DM 600                  | SGX -XX -030                | 4X SG -DM 150 / SG -DM 1200 | SG4-S4-090                         |
| SG -DM 600                  | SGX -XX -045                | 4X SG -DM 150 / SG -DM 1200 | SG2-B4-090                         |
| SG -DM 900                  | SGX -XX -060                | 4X SG -DM 150 / SG -DM 1200 | SG4-B4-090                         |
| SG -DM 900                  | SGX -XX -075                | 4X SG -DM 150 / SG -DM 1200 | SG4-BLR4-090                       |
| 2X SG -DM 150 / SG -DM 900  | SG2-S2-050                  | 4X SG -DM 150 / SG -DM 1200 | SG4-BSR4-090                       |
| 2X SG -DM 150 / SG -DM 900  | SG4-S2-050                  | SG -DM 1650                 | SGX -XX -120                       |
| 2X SG -DM 150 / SG -DM 900  | SG2-B2-050                  | SG -DM 1650                 | SGX -XX -135                       |
| 2X SG -DM 150 / SG -DM 900  | SG4-B2-050                  | SG -DM 1650                 | SGX -XX -150                       |
| 2X SG -DM 150 / SG -DM 900  | SG4-BLR2-050                | 4X SG -DM 150 / SG -DM 1650 | SG2-S4-120                         |
| 2X SG -DM 150 / SG -DM 900  | SG4-BSR2-050                | 4X SG -DM 150 / SG -DM 1650 | SG4-S4-120                         |
| SG -DM 1200                 | SGX -XX -090                | 4X SG -DM 150 / SG -DM 1650 | SG2-B4-120                         |
| SG -DM 1200                 | SGX -XX -105                | 4X SG -DM 150 / SG -DM 1650 | SG4-B4-120                         |
| 3X SG -DM 150 / SG -DM 1200 | SG2-S3-080                  | 4X SG -DM 150 / SG -DM 1200 | SG4-BLR4-120                       |
| 3X SG -DM 150 / SG -DM 1200 | SG4-S3-080                  | 4X SG -DM 150 / SG -DM 1200 | SG4-BSR4-120                       |
| 3X SG -DM 150 / SG -DM 1200 | SG2-B3-080                  | SG -DM 1650                 | SG4-40-120                         |
| 3X SG -DM 150 / SG -DM 1200 | SG4-B3-080                  | SG -DM 1900                 | SGX -XX -165                       |
| 3X SG -DM 150 / SG -DM 1200 | SG4-BLR3-080                | SG -DM 1900                 | SGX -XX -180                       |
| 3X SG -DM 150 / SG -DM 1200 | SG4-BSR3-080                |                             |                                    |

## ORDERING SUMMARY TABLE FOR MUTING ACCESSORIES

| Safety Light Curtain                              | Muting | Type | SG-L-ARM | SG-T-ARM | SG-AS-ARM | SG-PR-ARM | SG-CB-B | SG-CB-C | CV-L1-02-B-007 | CV-Y1-02-B-007 | SG-F1G1-ARMS | SG-F2G2-ARMS |
|---|--------|------|----------|----------|-----------|-----------|---------|---------|----------------|----------------|--------------|--------------|
| <b>SG BODY BIG MUTING</b>                         | L      | RRX  |          |          | 1         | 1         | 2       |         | 1              |                |              |              |
|   | T      | RRX  |          |          | 2         | 2         | 2       |         |                | 1              |              |              |
|   | L      | F/G  |          |          |           |           | 2       |         | 2              |                | 1            |              |
|   | T      | F/G  |          |          |           |           | 2       |         |                | 2              | 1            | 1            |
| <b>SG BODY REFLECTIVOR (Active &amp; Passive)</b> | L      | RRX  |          |          | 1         | 1         | 2       |         | 1              |                |              |              |
|   | T      | RRX  |          |          | 2         | 2         | 2       |         |                | 1              |              |              |
| <b>SG BODY COMPACT MUTING</b>                     | L      | RRX  | 1        |          |           |           |         |         |                |                |              |              |
|   | L      | RRX  |          |          | 1         | 1         |         | 2       | 1              |                |              |              |
|   | T      | RRX  |          | 1        |           |           |         |         |                |                |              |              |
|   | T      | RRX  |          |          | 2         | 2         |         | 2       |                | 1              |              |              |
|   | L      | F/G  |          |          |           |           |         | 2       | 2              |                | 1            |              |
|   | T      | F/G  |          |          |           |           |         | 2       |                | 2              | 1            | 1            |

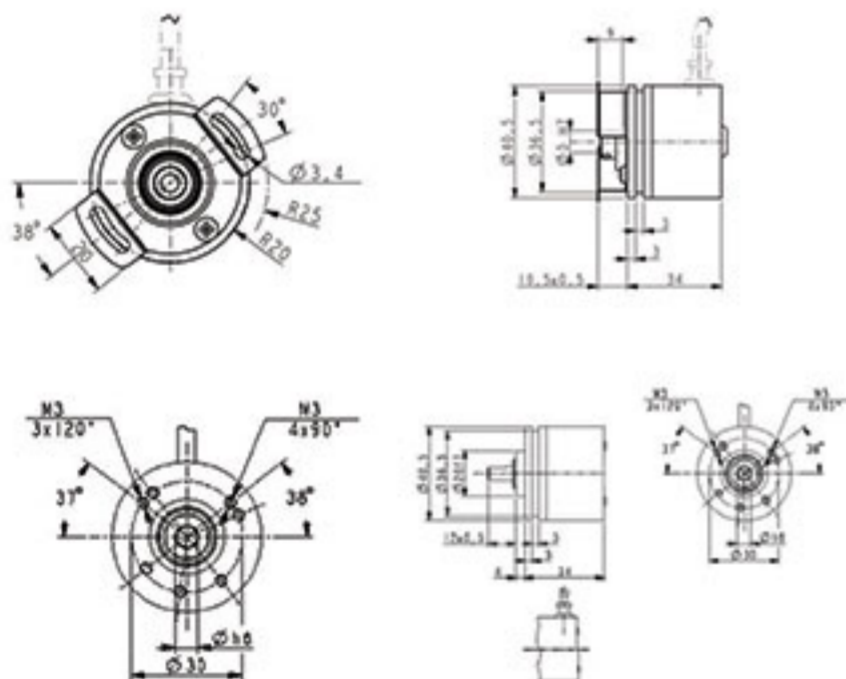
**Note:** RRX = Active/Passive retroreflective muting arms. F/G = Emitter/Receiver muting arms

1) To realize an L muting with retroreflective arms starting from a **SG BODY COMPACT MUTING**, order the complete kit **SG-L-ARMS** or, in alternative, the following: 1x **SG-AS-ARM**, 1x **SG-PR-ARM**, 2x **SG-CB-C**, 1x **CV-L1-02-B-007**.

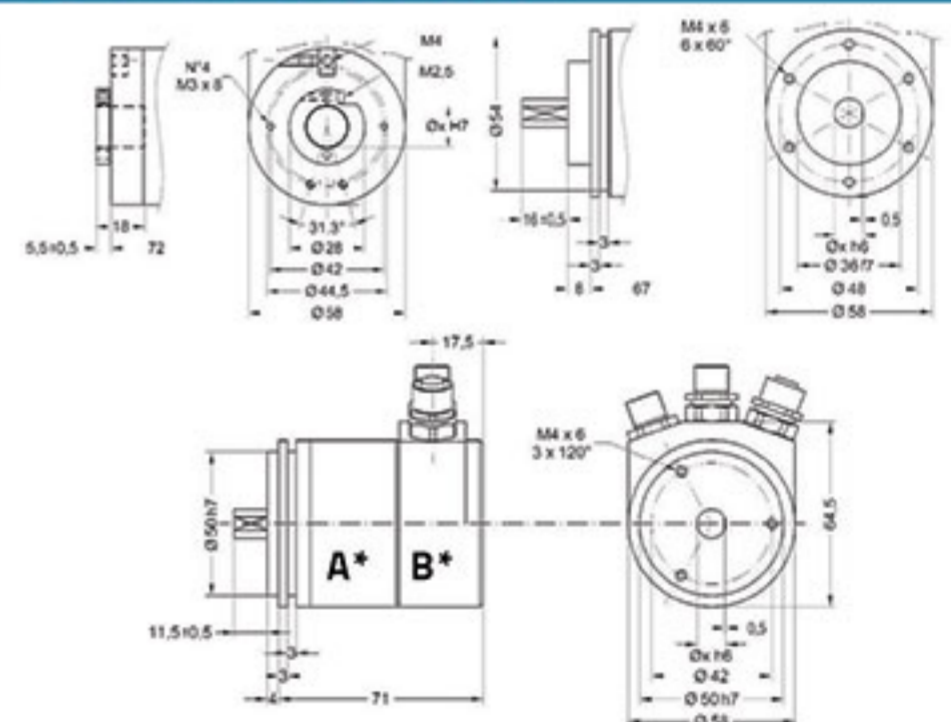
2) To realize a T muting with emitter/receiver arms, starting from a **SG BODY BIG MUTING**, order the following: 2x **SG-CB-B**, 2x **CV-Y1-02-B-007**, 1x **SG-F1G1-ARMS**, 1x **SG-F2G2-ARMS**.

## OPTICAL ROTARY ENCODERS DIMENSIONS

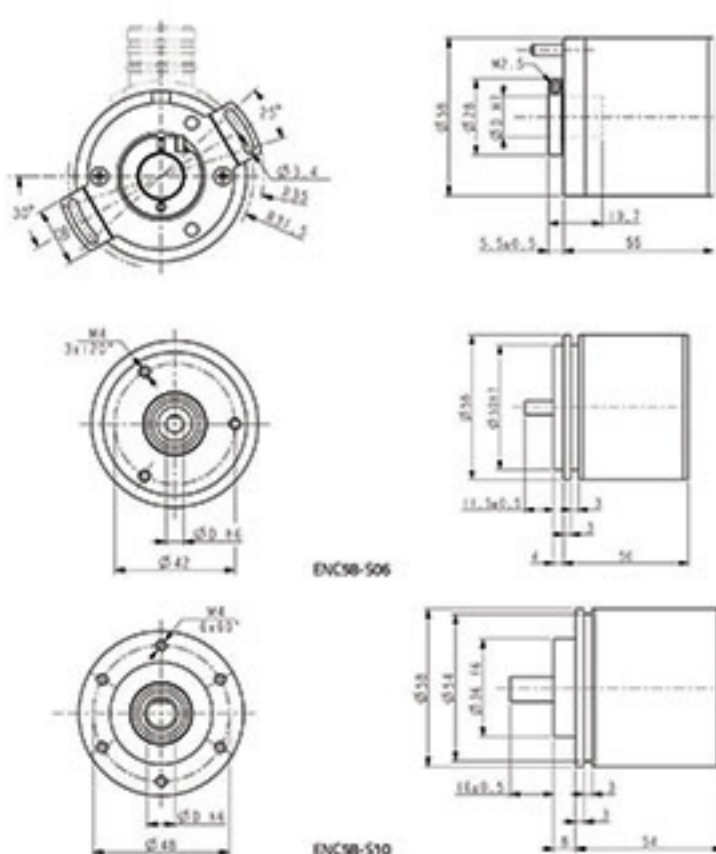
**Basic Line Incremental 41mmØ**



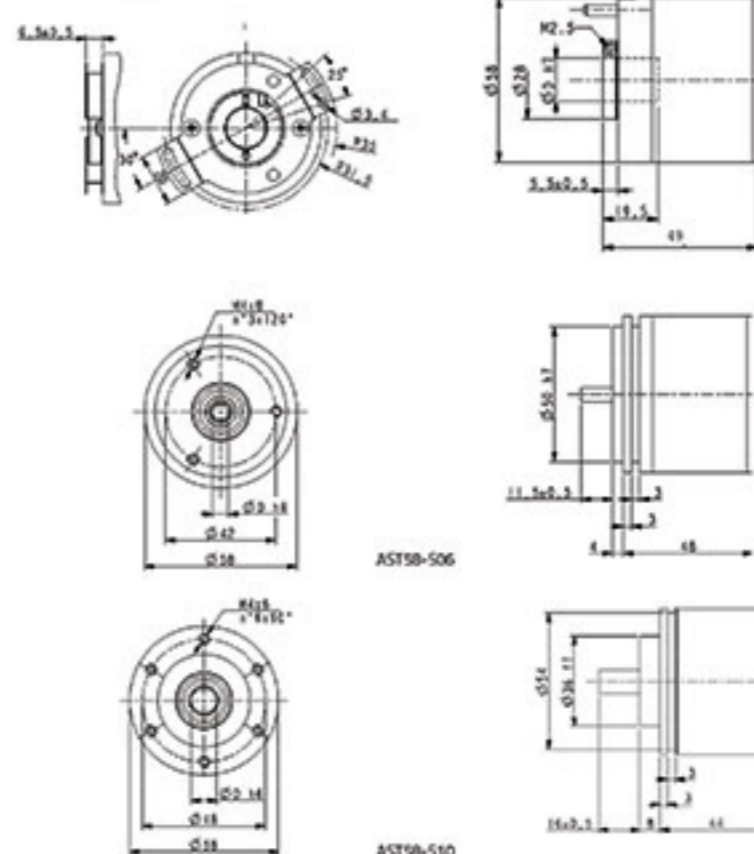
**Multi-turn with Modular Fieldbus Interface Absolute 58mmØ**



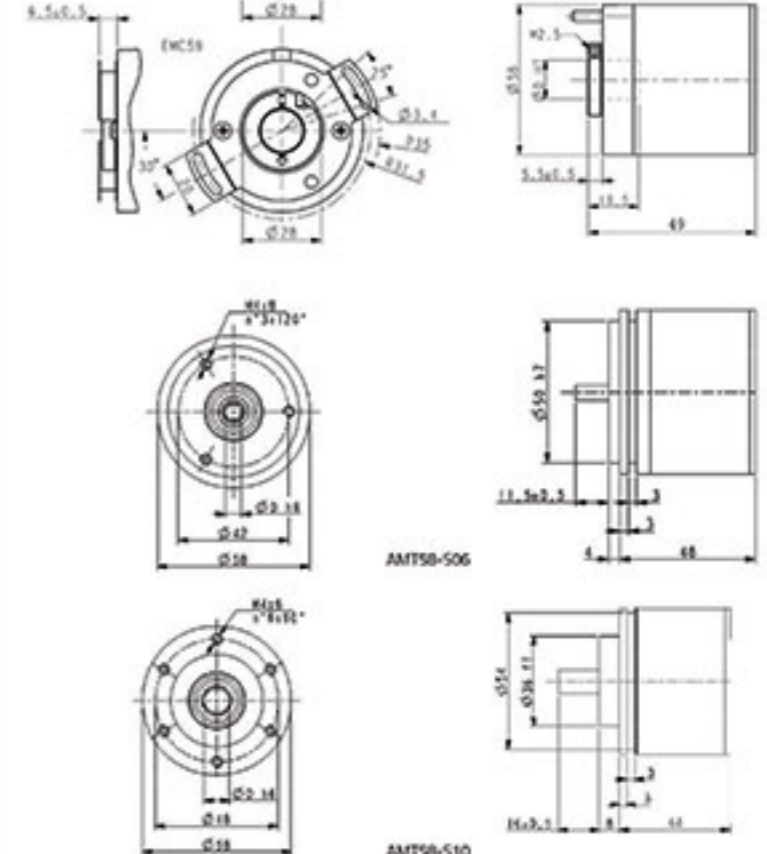
**Extended Line Incremental 58mmØ**



**SSI Single-turn Absolute 58mmØ**



**SSI Multi-turn Absolute 58mmØ**



# PROXIMITY SWITCH SPECIFICATIONS

## Inductive Sensors

Inductive proximity sensors generate a magnetic field from their detection faces. Whenever a detectable object moves into the sensor's field of detection, Eddy currents build up in the target and dampen the sensor's magnetic field. This effect triggers the sensor's output. Since a current in the target is needed for detection, inductive proximity sensors are uniquely suited for detection of all types of metals.

### ADVANTAGES

- Not affected by humidity and dust
- No moving parts, no mechanical wear
- Independent of the color of the object to detect
- No dead zone

### DISADVANTAGES

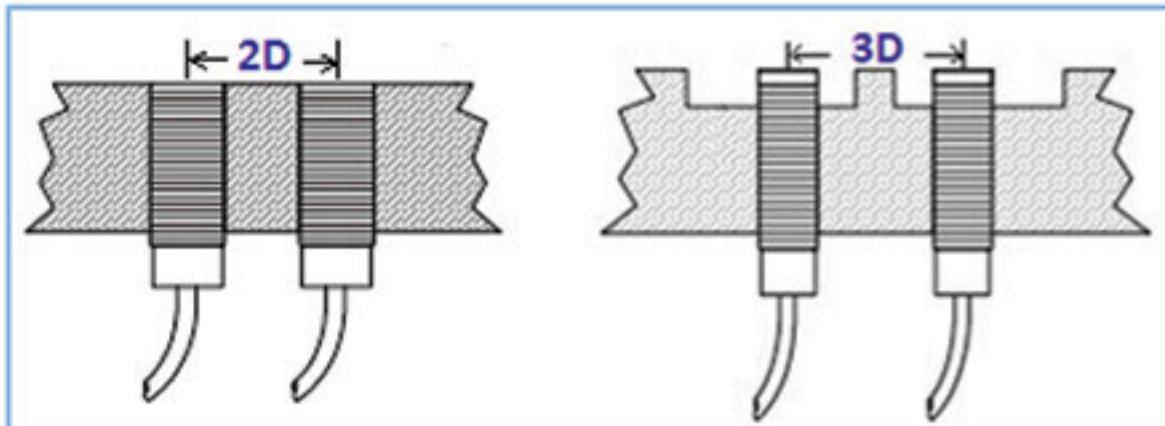
- only detect metallic objects
- low operating distance
- sensitive to electromagnetic interference (such as electric welding, induction ovens)

### Shielded models - FLUSH mounting

Shielded models can be installed with their sensing faces flush to the metal. The distance from opposing metal surfaces must be  $\geq 3s_n$  and the distance between two proximity switches (side-by-side)  $\geq 2D$ .

### Unshielded models - NON-FLUSH mounting

Unshielded models can be identified by their "caps", since they have no metal housing surrounding the area of the sensing face. The sensing face must extend  $\geq 2s_n$  from the metallic installation medium. The distance from opposing metal surfaces must be  $\geq 3s_n$  and the distance between two adjacent proximity switches  $\geq 3D$ . The metal body leaves uncovered part of the sensing area resulting in an increased sensing distance.



Main tubular models are available in both nickel plated brass and stainless steel housing, with the active sensing face in LCP plastic.

### METAL FACE version

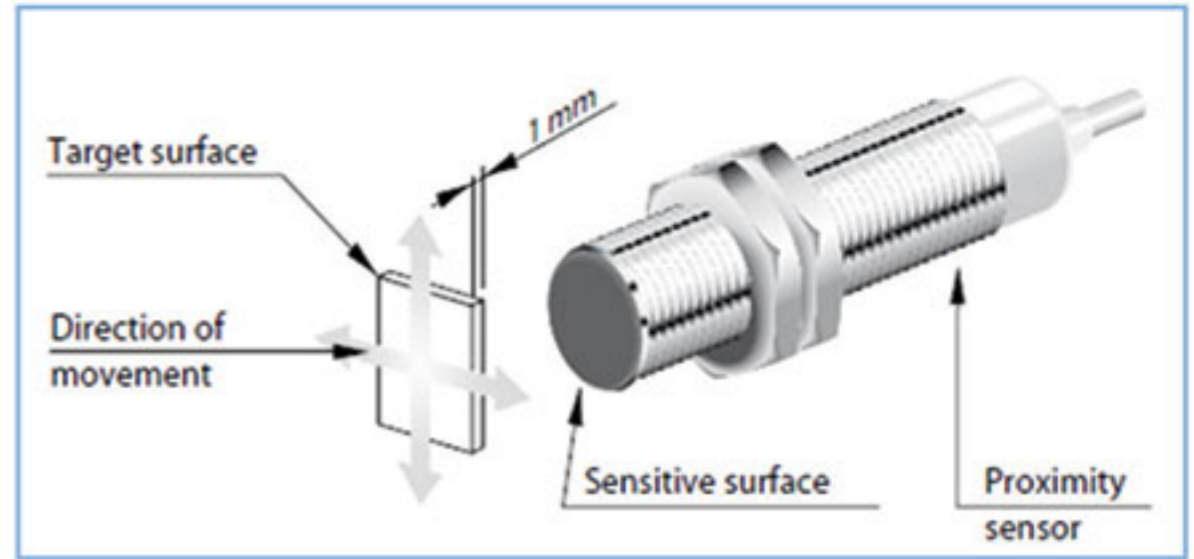
Are available stainless steel versions (M12, M18). Are used in especially harsh environments and applications which are too extreme for standard sensors. They resist to abrasive media, aggressive cleaners and solvents with their rugged sensing face. IP67 protection.

### WELD FIELD IMMUNE version

These special field immune models are ideal for welding environments and other applications where large magnetic fields are present. They are rated for reliable operation near the current line carrying 20,000 amps.

### NAMUR version

Are available 2 wires versions (M5, M6,5, M8, M12, M18, M30). They can be used in conjunction with suitable switching amplifiers, in explosive systems or Zone 1 and Zone 2 areas. The switch amplifier must be installed outside the explosive area. Almost all versions have IP67 mechanical protection. Nominal Switching distance ( $s_n$ ) According to EN 60947-5-2  
When an inductive proximity sensor is rated for sensing distance, it refers to the sensor's ability to detect the "standard detectable object" at its specified sensing distance. The "standard detectable object" is a 1mm thick square piece of ferrous iron that is in height and width the size of the proximity sensor's detection face's diameter.



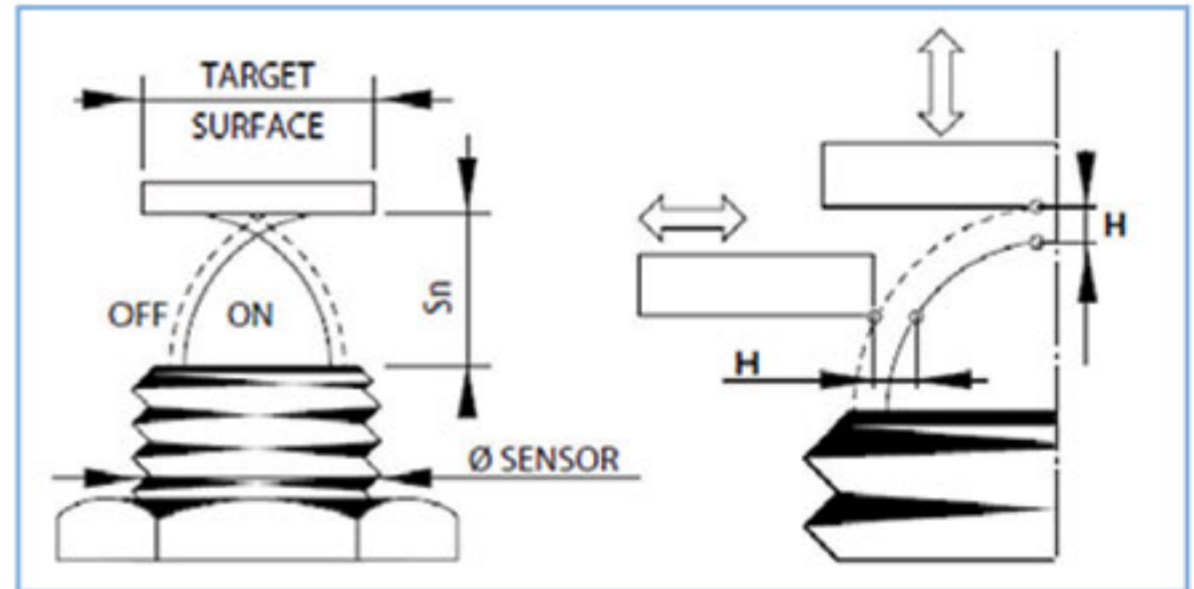
When the object to be detected is a different metal material, multiply the value of the related operating distance for a reduction factor. To the right is a table with the reduction factors of the main metals used in industry.

### REDUCING FACTOR

|                 |             |
|-----------------|-------------|
| Fe37            | 1 x $s_n^*$ |
| Stainless-Steel | 0,9 x $s_n$ |
| Brass-Bronze    | 0,5 x $s_n$ |
| Alluminium      | 0,4 x $s_n$ |
| Copper          | 0,3 x $s_n$ |

### Hysteresis (H)

distance between the point of switching on and the point of switching off of the trigger object. The value is a percentage of the nominal switching distance  $s_n$ .



### AC/DC version

Are available 2/3-wires versions (M12, M18, M30), that operate in alternating current with voltage drop of 5 V for currents of the order of 100mA.

To be able to provide a proper potential drop at the load, it is recommended to power the sensors with at least a supply voltage equal to the Voltage drop indicated (5V).

M12/18/30 FLUSH models are ATEX certified



II 3G EX nA II T6  
II 3D EX tD A22 IP67 T85°C

"M12/18/30 models are Diversey and ECOLAB tested"





# PROXIMITY SWITCH SPECIFICATIONS

## OPERATING DISTANCE

| MODEL                   | M4  | M5      | M6.5 | M8    | M12 | M18  | M30   | SQUARE     |
|-------------------------|-----|---------|------|-------|-----|------|-------|------------|
| Diameter (mm)           | 4   | 5       | 6.5  | 6.5   | 12  | 18   | 30    | 8x8, 40x40 |
| Operating Distance (mm) | 0,8 | 0,8/1,5 | 1/3  | 1.5/3 | 2/8 | 5/14 | 10/20 | 1,5/30     |

## HOUSING LENGTHS

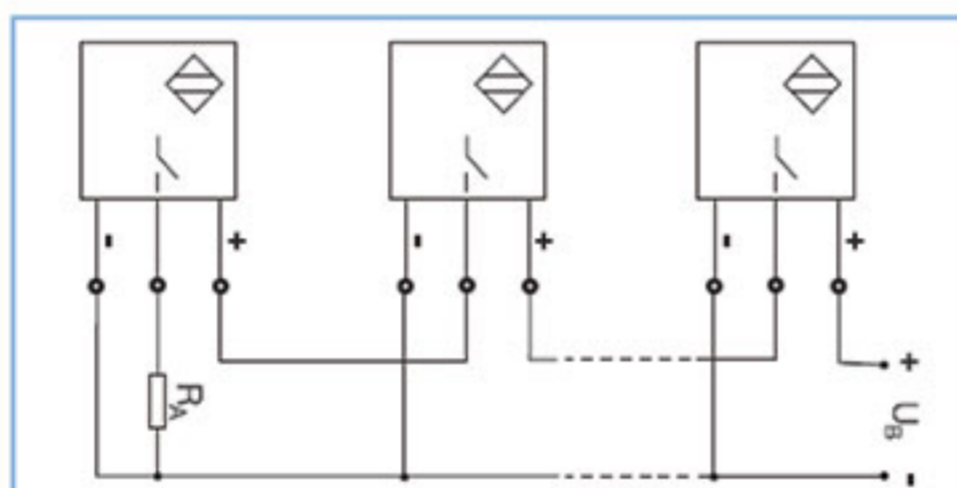
The following table shows the approximate length (mm) intervals for all categories and models of tubular inductive sensors.

| MODEL | STANDARD  |       | SHORT     |       |
|-------|-----------|-------|-----------|-------|
|       | connector | cable | connector | cable |
| M4    | ...       | 25    | ...       | ...   |
| M5    | 40        | 20/25 | ...       | ...   |
| M6.5  | 53/63     | 46/55 | 50/54     | 40/44 |
| M8    | 52/73     | 44/55 | 48/57     | 40/44 |
| M12   | 68/72     | 58/64 | 48/54     | 42/48 |
| M18   | 73/82     | 70/78 | 56/65     | 47/56 |
| M30   | 74/85     | 70/82 | 56/82     | 49/56 |

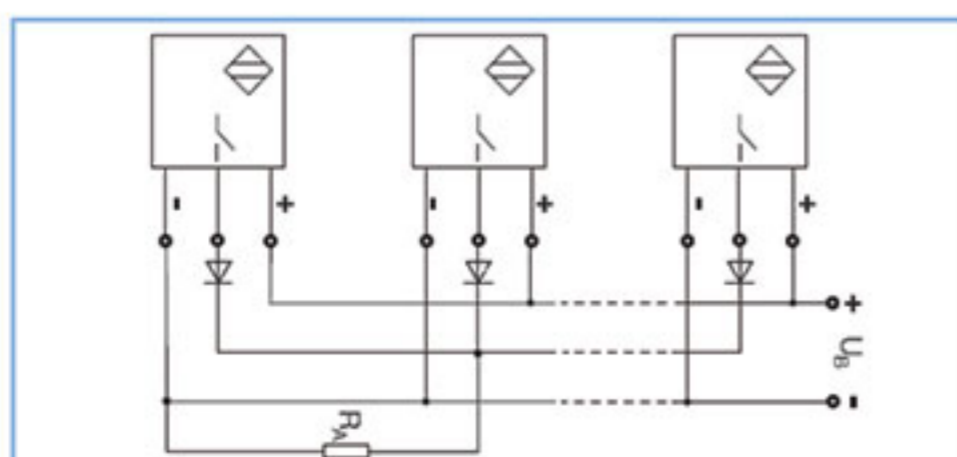
## WIRES

| TYPE      | DESCRIPTION  |
|-----------|--|
| 2-3 WIRES | Work with sinking or sourcing devices<br>Vdc, Vac and NAMUR versions<br>Higher leakage current |
| 3 WIRES   | Must select PNP or NPN, NC or NO version<br>10-30 Vdc version<br>Low leakage current           |
| 4 WIRES   | Programmable output<br>PNP/NPN and NC/NO in one device   |

The number of inductive proximity sensors that can be connected in series or parallel is limited.



Parallel connection: the leakage current of each single sensor, when added to the other, may accumulate and drive the load even in the absence of operated switches.



This problem is more relevant in versions AC 2-wire, because of the high voltages and currents supplied to the sensor. For this type of connection you should use a 3-wire sensors working in DC.

## NOMINAL VOLTAGE

Is the permissible voltage range in which certain safe operation of the switch is guaranteed.

## RESIDUAL RIPPLE

Is the maximum admissible ripple of the DC supply voltage shown as percentage to its medium value.

## MAX. OUTPUT CURRENT

It shows maximum output current a sensor can cope with when working steadily.

## MIN. OUTPUT CURRENT

Is the smallest load current required for function of the switch when ON.

## RESIDUAL CURRENT

Is the current flowing through the load when a proximity switch is not conducting (open).

## VOLTAGE DROP

Is the voltage measured across the load of a closed (conducting) sensor at load current.

## START UP DELAY

Is the time from when the supply voltage is applied, and the proximity switch assumes the ready state. This time may not be longer than 300 ms. During this time there must be no fault signal longer than 2 ms.

## SWITCHING FREQUENCY

Refers to the maximum number of switching operations per second.

## SHORT CIRCUIT PROTECTION

Is 100 A, i. e., per EN 60947-5-2 the power supply during testing in short circuit mode must be able to provide at least 100 A for a short duration. This current is prescribed in the standard in order to test.

## PROTECTION AGAINST INVERSION OF POLARITY

Available in DC supplied type, it prevents the sensor from being damage when supply cables are incorrectly connected.

## INDUCTIVE LOAD PROTECTION

It protects sensor output in presence of high inductive loads. This protection is performed by a diode or zenner diode.



# JICK SELECTION GUIDE

## INDUCTIVE PROXIMITY SWITCHES - IP67

| mm     | M12              |                  | M12              |                  | M18              |                  | M18              |                   |      | M30               |                   |                   | M30               |      |      |
|--------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|------|-------------------|-------------------|-------------------|-------------------|------|------|
|        | 2mm              | 4mm              | 4mm              | 8mm              | 5mm              | 8mm              | 8mm              | 14mm              | 16mm | 10mm              | 15mm              | 16mm              | 15mm              | 20mm | 25mm |
|        | SHIELDED         |                  | NON SHIELDED     |                  | SHIELDED         |                  | NON SHIELDED     |                   |      | SHIELDED          |                   |                   | NON SHIELDED      |      |      |
| 20-03  | IS-12-A20-03     |                  | IS-12-C20-03     |                  | IS-18-A20-03     |                  | IS-18-C20-03     |                   |      | IS-30-A20-03      |                   | IS-30-C20-03      |                   |      |      |
| 20-52  | IS-12-A20-52     |                  | IS-12-C20-52     |                  | IS-18-A20-52     |                  | IS-18-C20-52     |                   |      | IS-30-A20-52      |                   | IS-30-C20-52      |                   |      |      |
|        | IPS12-S2U060-A2P | IPS12-S4U060-A2P | IPS12-N4U060-A2P | IPS12-N8U060-A2P | IPS18-S5U055-A2P | IPS18-S8U055-A2P | IPS18-N8U055-A2P | IPS18-N16U055-A2P |      | IPS30-S10U055-A2P | IPS30-S16U055-A2P | IPS30-N15U055-A2P | IPS30-N25U055-A2P |      |      |
|        | IPS12-S2U068-A12 | IPS12-S4U068-A12 | IPS12-N4U068-A12 | IPS12-N8U068-A12 | IPS18-S5U079-A12 | IPS18-S8U079-A12 | IPS18-N8U079-A12 | IPS18-N16U079-A12 |      | IPS30-S10U079-A12 | IPS30-S16U079-A12 | IPS30-N15U079-A12 | IPS30-N25U079-A12 |      |      |
|        | IPS12-S2UC60-A2P | IPS12-S4UC60-A2P | IPS12-N4UC60-A2P | IPS12-N8UC60-A2P | IPS18-S5UC55-A2P | IPS18-S8UC55-A2P | IPS18-N8UC55-A2P | IPS18-N16UC55-A2P |      | IPS30-S10UC55-A2P | IPS30-S16UC55-A2P | IPS30-N15UC55-A2P | IPS30-N25UC55-A2P |      |      |
|        | IPS12-S2UC68-A12 | IPS12-S4UC68-A12 | IPS12-N4UC68-A12 | IPS12-N8UC68-A12 | IPS18-S5UC79-A12 | IPS18-S8UC79-A12 | IPS18-N8UC79-A12 | IPS18-N16UC79-A12 |      | IPS30-S10UC79-A12 | IPS30-S16UC79-A12 | IPS30-N15UC79-A12 | IPS30-N25UC79-A12 |      |      |
|        | IS-12-A9-03      |                  | IS-12-C9-03      |                  | IS-18-A9-03      |                  | IS-18-C9-03      |                   |      | IS-30-A9-03       |                   | IS-30-C9-03       |                   |      |      |
|        | IS-12-A9-52      |                  | IS-12-C9-52      |                  | IS-18-A9-52      |                  | IS-18-C9-52      |                   |      | IS-30-A9-52       |                   | IS-30-C9-52       |                   |      |      |
|        | IS-12-A0-03      | IS-12-E0-03      | IS-12-C0-03      | IS-12-F0-03      | IS-18-A0-03      | IS-18-E0-03      | IS-18-C0-03      | IS-18-F0-03       |      | IS-30-A0-03       | IS-30-E0-03       | IS-30-C0-03       | IS-30-F0-03       |      |      |
|        | IS-12-A0-52      | IS-12-E0-52      | IS-12-C0-52      | IS-12-F0-52      | IS-18-A0-52      | IS-18-E0-52      | IS-18-C0-52      | IS-18-F0-52       |      | IS-30-A0-52       | IS-30-E0-52       | IS-30-C0-52       | IS-30-F0-52       |      |      |
| 11-03  | IS-12-A1-03      | IS-12-G1-03      | IS-12-C1-03      | IS-12-H1-03      | IS-18-A1-03      | IS-18-G1-03      | IS-18-C1-03      | IS-18-H1-03       |      | IS-30-A1-03       | IS-30-G1-03       | IS-30-C1-03       | IS-30-H1-03       |      |      |
| 11-51* | IS-12-A1-52      | IS-12-G1-52      | IS-12-C1-52      | IS-12-H1-52      | IS-18-A1-52      | IS-18-G1-52      | IS-18-C1-52      | IS-18-H1-52       |      | IS-30-A1-52       | IS-30-G1-52       | IS-30-C1-52       | IS-30-H1-52       |      |      |
| 12-03  | IS-12-A2-03      | IS-12-G2-03      | IS-12-C2-03      | IS-12-H2-03      | IS-18-A2-03      | IS-18-G2-03      | IS-18-C2-03      | IS-18-H2-03       |      | IS-30-A2-03       | IS-30-G2-03       | IS-30-C2-03       | IS-30-H2-03       |      |      |
| 12-51* | IS-12-A2-52      | IS-12-G2-52      | IS-12-C2-52      | IS-12-H2-52      | IS-18-A2-52      | IS-18-G2-52      | IS-18-C2-52      | IS-18-H2-52       |      | IS-30-A2-52       | IS-30-G2-52       | IS-30-C2-52       | IS-30-H2-52       |      |      |
| 13-03  | IS-12-A3-03      | IS-12-G3-03      | IS-12-C3-03      | IS-12-H3-03      | IS-18-A3-03      | IS-18-G3-03      | IS-18-C3-03      | IS-18-H3-03       |      | IS-30-A3-03       | IS-30-G3-03       | IS-30-C3-03       | IS-30-H3-03       |      |      |
| 13-51* | IS-12-A3-52      | IS-12-G3-52      | IS-12-C3-52      | IS-12-H3-52      | IS-18-A3-52      | IS-18-G3-52      | IS-18-C3-52      | IS-18-H3-52       |      | IS-30-A3-52       | IS-30-G3-52       | IS-30-C3-52       | IS-30-H3-52       |      |      |
| 14-03  | IS-12-A4-03      | IS-12-G4-03      | IS-12-C4-03      | IS-12-H4-03      | IS-18-A4-03      | IS-18-G4-03      | IS-18-C4-03      | IS-18-H4-03       |      | IS-30-A4-03       | IS-30-G4-03       | IS-30-C4-03       | IS-30-H4-03       |      |      |
| 14-51* | IS-12-A4-52      | IS-12-G4-52      | IS-12-C4-52      | IS-12-H4-52      | IS-18-A4-52      | IS-18-G4-52      | IS-18-C4-52      | IS-18-H4-52       |      | IS-30-A4-52       | IS-30-G4-52       | IS-30-C4-52       | IS-30-H4-52       |      |      |

## CAPACITIVE SENSORS (Cable Units Only) - IP67

| 3A Relay<br>300mA AC<br>200mA DC | DIAMETER                               |                      | M18             |                 | M30    |        | M30             |                 |
|----------------------------------|--|----------------------|-----------------|-----------------|--------|--------|-----------------|-----------------|
|                                  | SENSING DISTANCE                       |                      | 1-5mm           | 1-10mm          | 1-20mm | 1-25mm | 1-20mm          | 1-30mm          |
|                                  | NORMALLY OPEN (NO)                     | NORMALLY CLOSED (NC) |                 |                 |        |        |                 |                 |
| DC-PNP (4-Wire)                  | NO                                     | NC                   | CS-08           | CS-14           | CS-10  | CS-16  |                 |                 |
| DC-NPN (4-Wire)                  | NO                                     | NC                   | CS-07           | CS-13           | CS-09  | CS-15  |                 |                 |
| RELAY (6-Wire)                   | RELAY: 18-230VAC/DC DELAY TIMER: 1s-5m |                      |                 |                 |        |        | CS-31 CS-31TE   | CS-32 CS-32TE   |
| VAC (3-Wire)                     | NO                                     | NC                   | CCM1-1808A-A3L2 | CCM2-1815A-A3L2 |        |        | CCM1-3020A-A3L2 | CCM2-3020A-A3L2 |
|                                  |  |                      | CCM1-1808A-B3L2 | CCM2-1815A-B3L2 |        |        | CCM1-3020A-B3L2 | CCM2-3020A-B3L2 |

## SPECIAL INDUCTIVE PROXIMITY SWITCHES - IP67

| 200mA          | DIAMETER           |                        | M12             |              | M18          |              |
|----------------|--------------------|------------------------|-----------------|--------------|--------------|--------------|
|                | SENSING DISTANCE   |                        | 2mm             | 4mm          | 5mm          | 8mm          |
|                | NORMALLY OPEN (NO) | NORMALLY CLOSED (NC)   | CONNECTOR       |              |              |              |
| PNP            | NO                 | Weld Immune Metal Face |                 | IS-F12-S1-S2 | IS-F12-T1-S2 | IS-F18-S1-S2 |
|                | NO                 |                        |                 | IS-12-I1-S2  | IS-12-L1-S2  | IS-18-I1-S2  |
| 200mA          |                    |                        | CABLE/CONNECTOR |              |              |              |
| PNP            | NO                 | NC                     |                 | IS-40-W5-03  | IS-40-Y5-03  |              |
|                | NO                 | NC                     |                 | IS-40-X5-S2  | IS-40-Y6-03  |              |
| NPN            | NO                 | NC                     |                 | IS-40-W6-03  | IS-40-Y6-03  |              |
|                | NO                 | NC                     |                 | IS-40-X6-S2  |              |              |
| AC/DC (2-Wire) | NO                 | NC                     |                 |              | IS-40-W7-03  | IS-40-Y7-03  |
|                |                    |                        |                 |              | IS-40-W8-03  | IS-40-Y8-03  |

## MAGNETIC PROXIMITY SWITCHES - IP67

| Reed Contact Magnetic Switches - Cable Length 2m |        |         |              |               |
|--|--------|---------|--------------|---------------|
| DIAMETER   | LENGTH | CODE NO | AMPS - 30VDC | AMPS - 250VAC |
| 8  | 30mm   | SM03    | 0.1A         | 0.01A         |
| 10   | 30mm   | SM05    | 0.33A        | 0.04A         |
| 12   | 40mm   | SM09    | 1.6A         | 0.02A         |
| 12   | 70mm   | SM13    | 3A           | 0.4A          |
| 18   | 70mm   | SM17    | 3A           | 0.4A          |

| DIAMETER | LENGTH | CODE NO + NC | AMPS - 30VDC | AMPS - 250VAC |
|----------|--------|--------------|--------------|---------------|
| 10       | 30mm   | SM06         | 0.33A        | 0.04A         |
| 12       | 40mm   | SM08         | 0.1A         | 0.01A         |
| 12       | 70mm   | SM14         | 3A           | 0.4A          |
| 18       | 70mm   | SM18         | 2A           | 0.25A         |

| Hall Effect Magnetic Proximity Switches: 12-30VDC IP67 |                    |       |                 |       |        |
|--|--------------------|-------|-----------------|-------|--------|
| TYPE   | BI-LATERAL SENSING |       | FRONTAL SENSING |       | PNP NO |
|  | 12mm               | 18mm  | 12mm            | 18mm  |        |
| PNP N/O  | HS03B              | HS05B | HS03F           | HS05F |        |
| PNP N/C  | HS04B              | HS06B | HS04F           | HS06F |        |

| Reed Contact Switch/Magnet Switching Distances (mm) |          |            |          |            |          |            |          |            |          |            |
|---|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|
| DIA.  | Distance | Hysteresis | Distance | Hysteresis | Distance | Hysteresis | Distance | Hysteresis | Distance | Hysteresis |
| 6   | 24       | 5          | 22       | 5          | 6        | 2.5        | 32       | 5          | 29       | 5          |
| 8   | 24       | 5          | 22       | 5          | 6        | 2.5        | 32       | 5          | 29       | 5          |
| 10  | 24       | 5          | 22       | 5          | 6        | 2.5        | 32       | 5          | 29       | 5          |
| 12  | 24       | 5          | 22       | 5          | 6        | 2.5        | 22       | 9          | 20       | 9          |
| 12  | 12       | 7          | 10       | 6          | -        | -          | 22       | 9          | 20       | 9          |
| 18  | 12       | 7          | 10       | 6          | -        | -          | 22       | 9          | 20       | 9          |

## ACCESSORIES FOR PROXIMITY SWITCHES & SENSORS

| Through Beam | Receiver        | Emitter         |
|--------------|-----------------|-----------------|
| 40-120mm     | 0-20m           | 0-20m           |
| PK           | S15-PA-2-F00-PK | S15-PA-2-G00-XG |
|              | S15-PA-5-M01-PK | S15-PA-5-G01-XG |
|              | S15-PA-2-F00-NK | S15-PA-2-G00-XG |
| NK           | S15-PA-5-M01-NK | S15-PA-5-G01-XG |

| Contrast | Through Beam    | Receiver        | Emitter         |
|----------|-----------------|-----------------|-----------------|
| 10mm     | 20m             | 20m             | 20m             |
| PP       | S50-PA-2-W03-PP | S50-PA-2-F01-PP | S50-PA-2-G00-XG |
|          | S50-PA-5-W03-PP | S50-PA-5-F01-PP | S50-PA-5-G00-XG |
| NN       | S50-PA-2-W03-NN | S50-PA-2-F01-NN | S50-PA-2-G00-XG |
|          | S50-PA-5-W03-NN | S50-PA-5-F01-NN | S50-PA-5-G00-XG |

| Connectors & Cables               |               |               |
|-----------------------------------|---------------|---------------|
| DIMENSIONS                        | CABLE LENGTH* | CODE          |
| FEMALE CONNECTOR & CABLE M12 PLUG |               |               |
| 90° VERSION                       | 3m            | CS-A2-02-G-03 |
|                                   | 5m            | CS-A2-02-G-05 |
| CONNECTOR WITH NO CABLE           |               |               |
| 4 Pin 4 Wire                      | 3m            | CS-A2-02-B-NC |
| 4 Pin 4 Wire                      | 3m            | CS-A1-02-G-03 |
|                                   | 5m            | CS-A1-02-G-05 |
| 3 Pin 3 Wire                      | 3m            | CS-A1-01-G-05 |
| CONNECTOR WITH NO CABLE           |               |               |
| 4 Pin 4 Wire                      | 3m            | CS-B1-02-G-03 |
|                                   | 5m            | CS-B1-02-G-05 |
| 3 Pin 3 Wire                      | 3m            | CS-B1-01-G-03 |
|                                   | 5m            | CS-B1-01-G-05 |

\*10M VERSIONS AVAILABLE ON REQUEST

| Accessories for 90° Sensing |               |             |
|-----------------------------|---------------|-------------|
| CODE                        | DEV90         | 90° ADAPTOR |
| ST1218                      | For M12 & M18 |             |
| ST1830                      | For M18 & M30 |             |

| Mounting Brackets |               |
|-------------------|---------------|
| CODE              | DESCRIPTION   |
| ST1218            | For M12 & M18 |
| ST1830            | For M18 & M30 |

| Reflectors |             |                 |
|------------|-------------|-----------------|
| CODE       | DESCRIPTION | Material        |
| R2         |             | Stainless Steel |
| R5         |             | Stainless Steel |
| R4         |             | Stainless Steel |
| DAC100     |             | Stainless Steel |

| Sensor Cables & Connectors IP67 |             |              |               |                  |               |
|---------------------------------|-------------|--------------|---------------|------------------|---------------|
| M8 STRAIGHT                     |             | M12 STRAIGHT |               | M12 RIGHT ANGLED |               |
| FEMALE                          | MALE        | FEMALE       | MALE          | FEMALE           | MALE          |
|                                 |             |              |               |                  |               |
| 3                               | M8FS-3PG7-M | M8MS-3PG7-M  | M12FS-3PG7-M* | M12MS-3PG7-M*    | M12FR-3PG7-M* |
| 4                               | M8FS-4PG7-M | M8MS-4PG7-M  | M12FS-4PG7-M* | M12MS-4PG7-M*    | M12FR-4PG7-M* |
| 5                               |             |              | M12FS-5PG7-M* | M12MS-5PG7-M*    | M12FR-5PG7-M* |

\*For shielded units replace M with SH e.g. M12FS-3PG7-SH

| M12 Y STRAIGHT |               | M12 T STRAIGHT |               | SENSOR CABLE / M |  |
|----------------|---------------|----------------|---------------|------------------|--|
| FEMALE         | MALE          | FEMALE         | MALE          |                  |  |
|                |               |                |               |                  |  |
| 3              | M12MS-3M12-Y1 |                | M12MS-3M12-T1 | WS-3             |  |
| 4              | M12MS-4M12-Y1 |                | M12MS-4M12-T1 | WS-4             |  |
| 5              | M12MS-5M12-Y1 |                | M12MS-5M12-T1 | WS-5             |  |

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