# Photoelectrics
# Through-beam System, Relay Output
# Type MPF.RS



- Industrial doors and gates
- Range: 15 m
- Modulated infrared light
- Option with individually adjustable channel sensitivity
- Amplifier with “Snap-ON” photoelectric switches
- Supply voltage: 12-24 VAC/DC, 115 VAC or 230 VAC
- Output: SPST relay
- LED indications for light ON and supply ON
- Ø12 mm “Snap-ON”, Ø18 or M14 photoelectric housing
- 1, 2 or 3 multiplexed channels
- With make or break test input
- CE, UL325 and UL508 approved

## Product Description

The MPFRS.. is a family of inexpensive general purpose photoelectric sensors in 3 different types of housings with separate amplifier. They are designed to meet the requirements for industrial doors and gates. The “Snap-ON” photo switch can be mounted in material with a thickness from 0.6 mm and up to 2.25 mm. The sensor set is easy to use and no adjustments are necessary. The amplifier has a test input designed to disable the emitters and therefore evaluate the sensor function. Multiplexed channels prevent cross-talk between each set of photosensors. The amplifiers are available with the following voltages: 12-24 VAC/DC, 115 VAC and 230 VAC. The output is made as positive security e.g. power lost, short-circuit or broken sensor cable makes the relay go to off state.

## Ordering Key

**Amplifier** **MPF 3 230 RS AI**

- Type
- Number of channels
- Voltage supply
- Output relay
- Safety
- Adjustable sensitivity
- Inverted test input (break)

**Sensor** **MPF T 15 M14 4C**

- Type
- Emitter
- Range
- Housing diameter
- Optical angle
- Connectors on cable

## Type Selection, Amplifier

| Housing W x H x D | Ordering no. Supply: 12-24 VAC/DC | Ordering no. Supply: 115 VAC | Ordering no. Supply: 230 VAC |
|---|---|---|---|
| 70 x 57 x 86 mm | MPF1-912 RS | MPF1-115 RS | MPF1-230 RS |
| | MPF2-912 RS | MPF2-115 RS | MPF2-230 RS |
| | MPF3-912 RS | MPF3-115 RS | MPF3-230 RS |
| | MPF1-912 RSI *) | MPF1-115 RSI *) | MPF1-230 RSI *) |
| | MPF2-912 RSI *) | MPF2-115 RSI *) | MPF2-230 RSI *) |
| | MPF3-912 RSI *) | MPF3-115 RSI *) | MPF3-230 RSI *) |
| | MPF1-912 RSA *) | MPF1-115 RSA *) | MPF1-230 RSA *) |
| | MPF2-912 RSA *) | MPF2-115 RSA *) | MPF2-230 RSA *) |
| | MPF3-912 RSA *) | MPF3-115 RSA *) | MPF3-230 RSA *) |
| | MPF1-912 RSAI *) | MPF1-115 RSAI *) | MPF1-230 RSAI *) |
| | MPF2-912 RSAI *) | MPF2-115 RSAI *) | MPF2-230 RSAI *) |
| | MPF3-912 RSAI *) | MPF3-115 RSAI *) | MPF3-230 RSAI *) |

*) Products available on request

## Type Selection, Photoelectric Switch

| Housing diameter | Rated operational distance ($S_n$) | Optical angle | Ordering no. Emitter | Ordering no. Receiver | Ordering no. Fitting |
|---|---|---|---|---|---|
| Ø12 mm | 15 m | 4° | MPFT 15-4 | MPFR-4 | |
| M14 | 15 m | 4° | MPFT 15-M14-4 | MPFR-M14-4 | |
| D11 | 15 m | 4° | MPF 15-D11-4 | MPFR-D11-4 | |
| D18 | 15 m | 4° | MPFT 15-D18-4 | MPFR-D18-4 | |
| Ø12 mm | 15 m | 4° | MPFT 15-4C | MPFR-4C | |
| M14 | 15 m | 4° | MPFT 15-M14-4C | MPFR-M14-4C | |
| D11 | 15 m | 4° | MPF 15-D11-4C | MPFR-D11-4C | |
| D18 | 15 m | 4° | MPFT 15-D18-4C | MPFR-D18-4C | |
| Fitting for Ø12 | | | | | AMPF-MB1 |

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## Specifications, Amplifier

| | |
|---|---|
| **Rated operational volt.** | |
| **AC types** ($U_B$) | |
| Terminals 1 & 3 | |
| MPF.- 230 RS. | 230 VAC ± 15%, 50 to 60 Hz |
| MPF.- 115 RS. | 115 VAC ± 15%, 50 to 60 Hz |
| MPF.- 912 RS. | 12-24 VAC/DC ± 15%, 50 to 60 Hz |
| **Dielectric voltage** | |
| MPF.- 230 RS. | 4 kVAC (rms) |
| **Rated impulse withstand volt.** | 4 kV (1.2/50 μs) |
| **Rated operational power** | |
| **MPF.- 912 RS** | |
| AC supply | 3 VA |
| DC supply | 2 W |
| **MPF.- 115/230 RS** | |
| AC supply | max. 4.5 VA |
| DC supply | max. 4.5 VA |
| **Output Specifications** | |
| Resistive load | |
| MPF.-xxx RS, RSA, RSI, RSAI | |
| 600.000 switchings | 1 A@250 VAC/30 VDC |
| 300.000 switchings | 2 A@250 VAC/30 VDC |
| 100.000 switchings | 2 A@250 VAC/30 VDC (UL) |
| AC15 | 0.75 A@240 VAC |
| AC14 | 0.60 A@120 VAC |
| DC13 | 0.22 A@125 VDC |
| **Rated insulation volt.** ($U_i$) | |
| MPF.- 230 RS. | 250 VAC (rms) |
| MPF.- 115 RS. | 120 VAC (rms) |
| MPF.- 912 RS. | 50 VAC (rms), 50 VDC |
| **Operating frequency** (f) | |
| Light/dark ratio 1:1 | |
| Contact output | 10 Hz |
| **Response time** | |
| OFF-ON ($t_{ON}$) | ≤ 50 ms |
| ON-OFF ($t_{OFF}$) | ≤ 40 ms |
| **Power ON delay** ($t_v$) | ≤ 300 ms |

| | |
|---|---|
| **Output function** | |
| MPF1+2 | Relay 2 x SPST |
| MPF3 | Relay 2 x SPST + 2 x SPST |
| **Indication function** | |
| Supply ON | LED, green |
| Beam ON (no object present) | LED, yellow |
| **Environment** | |
| Overvoltage category | III (IEC 66064) |
| Degree of protection | IP 40 (IEC 60529/60947-5-2) |
| Pollution degree | 3 (IEC 60664/60664A, 60947-1) |
| **Temperature** | |
| Operating | -20° to +60°C (-4° to +140°F) |
| Storage | -30° to +80°C (-22° to +176°F) |
| **Connection** | Screw terminals (max. 2.5 mm²) |
| **Protection output** | Reverse output, transients, short-circuit |
| **Test input** | |
| MPF.- 230 RS. | Potential-free contact |
| MPF.- 115 RS. | Potential-free contact |
| MPF.- 912 RS. | Max. 28 V@15 mA AC/DC |
| Testfunction activated | ≥ 3.5 V AC/DC |
| Testfunction deactivated | ≤ 1.0 V AC/DC |
| MPF.- 912 RSI. | Max. 28 V@15 mA AC/DC |
| Testfunction deactivated | ≥ 3.5 V AC/DC |
| Testfunction activated | ≤ 1.0 V AC/DC |
| **Housing material** | PC |
| **Weight** | |
| MPF.- 115/230 RS | 280 g |
| MPF.- 912 RS | 126 g |
| **CE-marking** | Yes |
| **UL-Approval** c UL us | UL325, CSA-C22.2 No.247 |
| UL | UL508 |
| **TÛV-Approval** | Yes (EN 12453) |

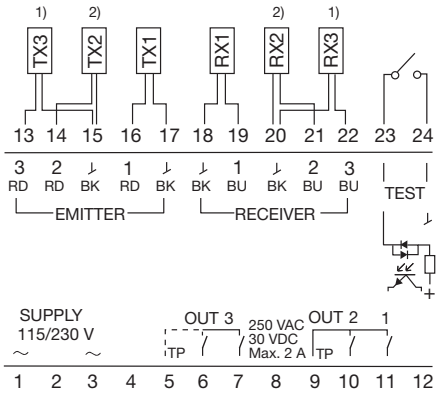
## Specifications, Photoelectric Switches

| | |
|---|---|
| **Rated operation dist. ($S_n$)** | 15 m - 8 m (UL 325) |
| **Light source** | LED 880 nm |
| **Light type** | Infrared modulated |
| **Ambient light** | > 20.000 lux |
| **Housing material** | |
| MPFT15-4/C | |
| MPFT15-D18-4/C | |
| MPFR-4/C | |
| MPFR-D11-4/C | PA6 Glass filled |
| MPFR-D18-4/C | |
| Housing | PC |
| Backpart | ABS |
| MPFT15-M14-4/C | |
| MPFR15-M14-4/C | |
| Housing | Stainless steel/PC |
| Backpart | PTE |
| **Connection** | |
| MPFT15-XXX-4 | |
| MPFR15-XXX-4 | |
| Cable | PVC, grey, 10 m, Ø 2.9 mm² |
| MPFT15-XXX-4C | Red connector pair |
| MPFR15-XXX-4C | White connector pair |
| *Connector is placed 15 cm from sensorhead* | |
| Cable | PVC, grey, 10 m, Ø 2.9 mm² |
| **Degree of protection** | IP 67 (IEC 60529/60947-5-2) |
| **Mounting** | |
| "Snap-ON" | Ø12 mm or fitting |
| MPFT15-4/C | |
| MPFR-4/C | |
| Rubber profile | D11 |
| MPFT15-D11-4/C | |
| MPFR-D11-4/C | |
| Rubber profile | D18 |
| MPFT15-D18-4/C | |
| MPFR-D18-4/C | |
| Threaded barrel | M14 |
| MPFT15-M14-4/C | |
| MPFR-M14-4/C | |
| **CE-marking** | Yes |
| **UL-Approval** c UL us | UL325, CSA-C22.2 No.247 |
| UL | UL508 |
| **TÛV-Approval** | Yes (EN 12453) |



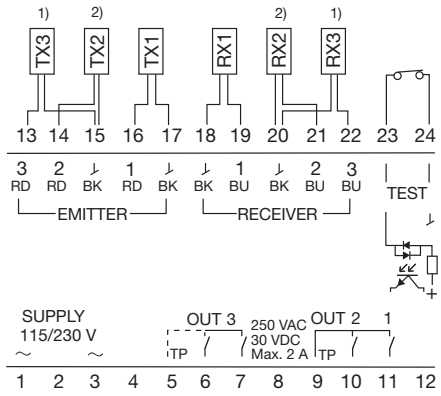
Specifications are subject to change without notice (12.02.2010)

## Wiring Diagrams



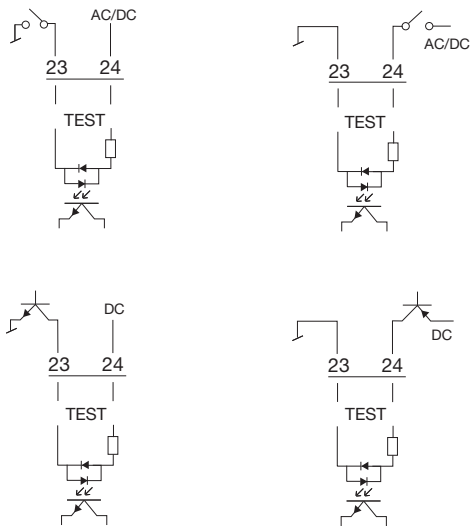

1) Not MPF1 and MPF2
2) Not MPF1

**Test input make, shown for 115/230 version**

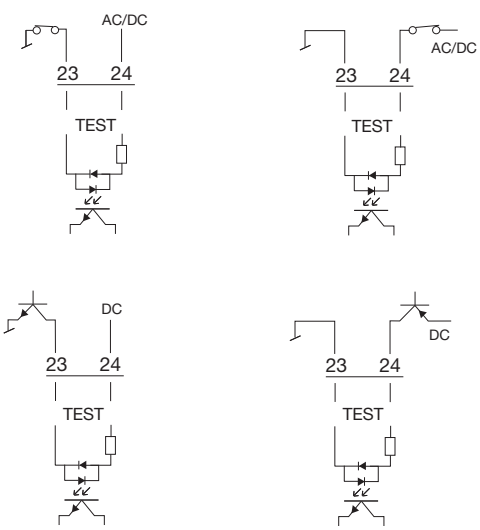



1) Not MPF1 and MPF2
2) Not MPF1

**Test input break, shown for 115/230 version**

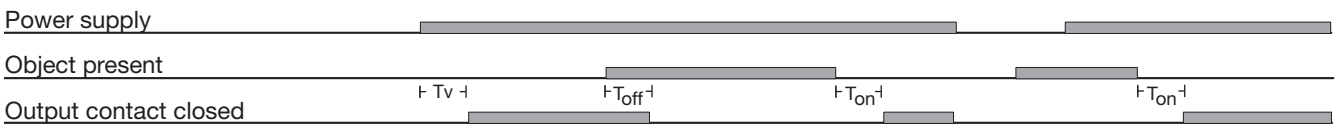



**Test input make, shown for 912 version**

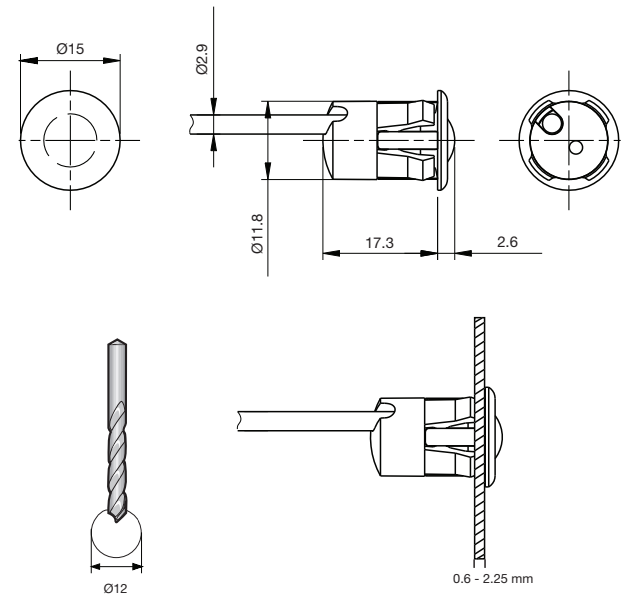



**Test input break, shown for 912 version**

## Operation Diagram

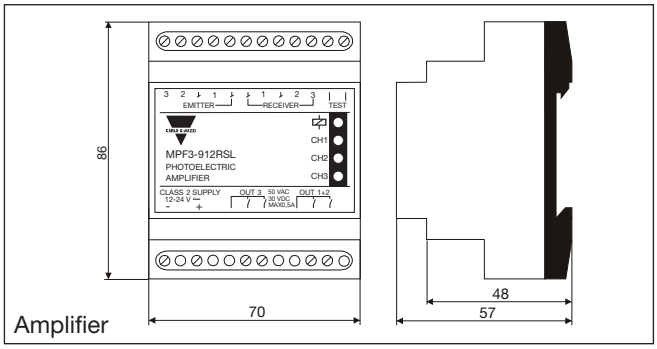


## Dimensions

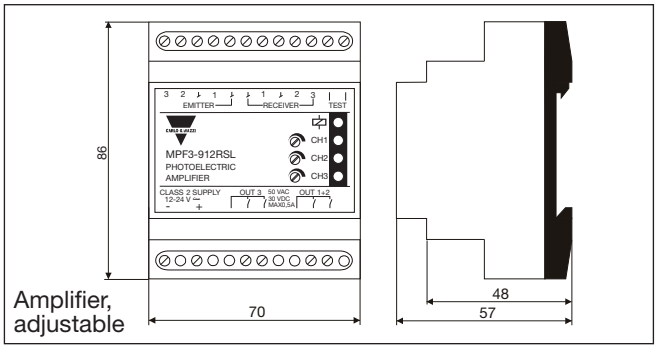



Ø12

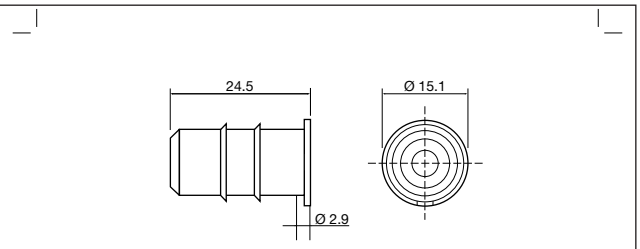
To be mounted in material with a thickness of 0.6-2.25 mm



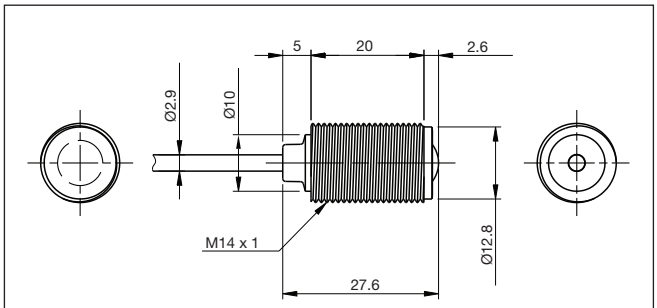

Amplifier



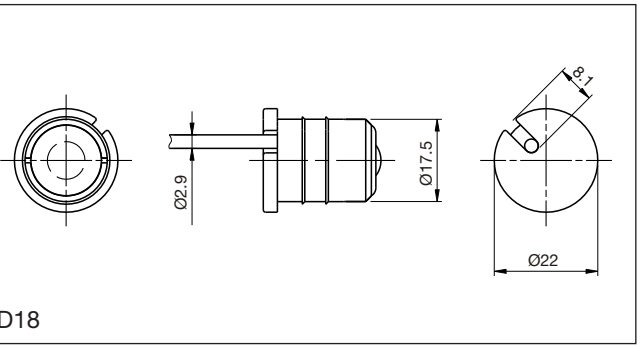

Amplifier, adjustable



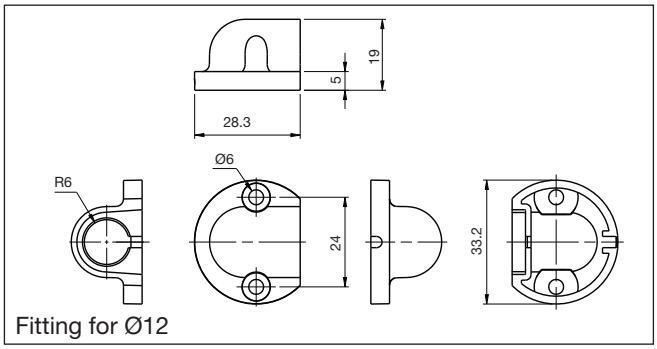

D11




M14

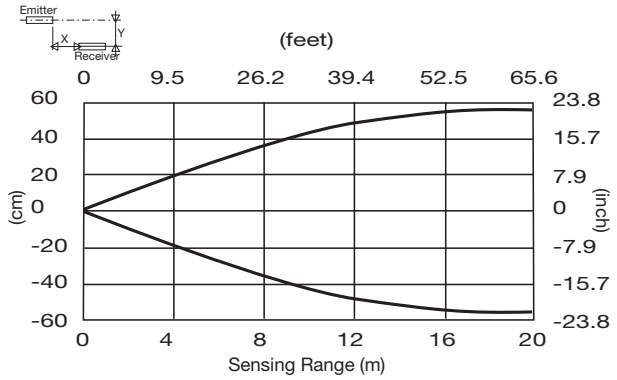



D18

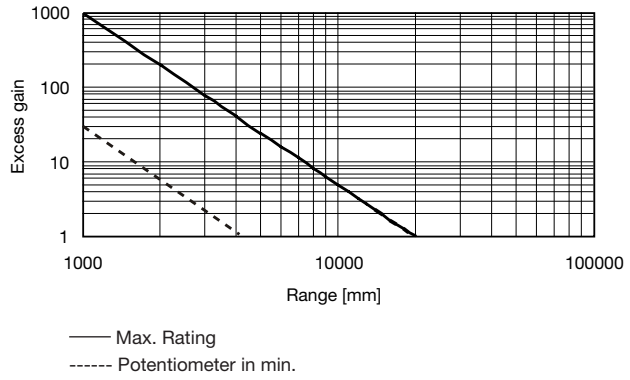



Fitting for Ø12

## Detection Diagram

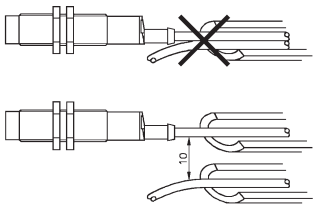



## Excess Gain

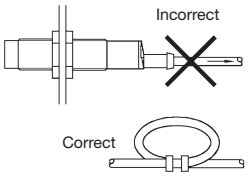



## Installation Hints

*To avoid interference from inductive voltage/ current peaks, separate the prox. switch power cables from any other power cables, e.g. motor, contactor or solenoid cables*

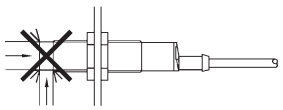



*Relief of cable strain*



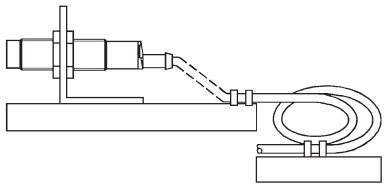

The cable should not be pulled

*Protection of the sensing face*



A proximity switch should not serve as mechanical stop

*Switch mounted on mobile carrier*



Any repetitive flexing of the cable should be avoided

## Delivery Contents

- Amplifier, MPF..
- Installation instruction
- **Packaging:** cardboard box

# Unikeyic Electronics

Global Electronic Components Distributor

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## Carlo Gavazzi:

NRGC-PN DLA71DB232P ER 1830 NPAS-1 RCP1100324VDC RSE4012-B DAC01CM40 GMS-63H 40A PA18CAT20M1 RKD2A60D75C RSBS2332A2V23C24HP WM20AV63H GMB633PC15 GT32S8A ICB12L50F06POM1 ICB18S30N08PO NRGC-EIP CC65/4SA120 DCB51CM24 DMB71DW24 DIB01CD4810A DUA52C724 EM24DINAV53XE1X RM1A23A50 GFX11 RGC3A60A65GGEAFM RZ3A60D40 BPH CGMS-12A-120-01 CGT-12M-1.0 FAA08DW24