

A circular logo with a dark background and a white border. The number '3' is prominently displayed in the center in a large, white, serif font. Below the '3', the words 'YEAR GUARANTEE' are written in a smaller, white, sans-serif font, following the curve of the bottom of the circle.

- 

**FA I A / B P - O A**

www.imopc.com

# M18 DC Photoelectric Switches FA



continued

## Specification common to all models

|                                |                                                                         |
|--------------------------------|-------------------------------------------------------------------------|
| Operating voltage              | 10-30VDC                                                                |
| Ripple                         | ≤10%                                                                    |
| Repeat accuracy                | 5%                                                                      |
| Load current                   | 100mA (not emitters)                                                    |
| Leakage current                | ≤10μA at Vmax (not emitters)                                            |
| Supply electrical protection   | Polarity reversal and transient                                         |
| Output electrical protection   | Short circuit (auto-reset) and over-voltage                             |
| EMC immunity                   | In accordance to EN50082-2;1995/EN60947-5-2;1999                        |
| Radiation                      | In accordance to EN50081-1;1993                                         |
| Housing material               | PBT (Plastic body) or Nickel plated brass (Metal body), PC (cable exit) |
| Tightening torque              | 40Nm                                                                    |
| Time delay before availability | 200ms (not with receiver/Laser emitter combination)                     |
| Storage temperature            | -55° to 90°C                                                            |
| Protection                     | IP67 (EN60529)                                                          |
| Cable material                 | PVC                                                                     |

## Infrared LED Emission

|                             | Infrared Emitter                                  |            | Receiver                                                                 |            |
|-----------------------------|---------------------------------------------------|------------|--------------------------------------------------------------------------|------------|
| Model                       | FAIH/XO-**                                        | FAIH/OO-** | FAIZ/**-**                                                               | FAID/**-** |
| Nominal sensing distance    | 20m with axial optics, 15m with 90 degree optics  |            |                                                                          |            |
| Emission                    | Infrared (880nm)                                  |            | -                                                                        |            |
| No load supply current      | 25mA                                              |            |                                                                          |            |
| Output voltage drop         | -                                                 |            | 1.2Vmax. I <sub>L</sub> =100mA                                           |            |
| Output type                 | -                                                 |            | NPN or PNP, Q/Q <sub>not</sub> or (LOn/DOn selectable on special models) |            |
| Switching frequency         | -                                                 |            | 250Hz                                                                    |            |
| Sensitivity adjustment      | No                                                |            |                                                                          | Yes        |
| Check input                 | BK/2 to 0V test enable                            | -          |                                                                          |            |
| Interference external light | 5000 lux (incandescent lamp) 10000 lux (sunlight) |            |                                                                          |            |
| LED indicators              | Green (Power ON)                                  |            | Yellow (light state)                                                     |            |
| Optics material             | PC                                                |            |                                                                          |            |
| Weight (approximate)        | 200g (plastic body type)                          |            | 240g (metal body type)                                                   |            |

## Visible Red LASER Emission

| Model                       | Red LASER Emitter                                     | Receiver                       |
|-----------------------------|-------------------------------------------------------|--------------------------------|
|                             | FALH/XO-**-**                                         | FAID/**-**-**                  |
| Nominal sensing distance    | 50m                                                   |                                |
| Emission                    | Red LASER 650nm (Class 1 in accordance to IEC60825-1) |                                |
| No load supply current      | 25mA                                                  |                                |
| Output voltage drop         | -                                                     | 1.8Vmax. I <sub>L</sub> =100mA |
| Spot dimension              | 40mm at 60m                                           |                                |
| Output type                 | -                                                     | NPN or PNP, Q/Q <sub>not</sub> |
| Switching frequency         | 1kHz                                                  | -                              |
| Sensitivity adjustment      | Yes                                                   | -                              |
| Check input                 | BK/2 to 0V test enable                                |                                |
| Operating temperature       | -15° to 55°C                                          |                                |
| Interference external light | 3000 lux (incandescent lamp) 10000 lux (sunlight)     |                                |
| LED indicators              | Green (Power ON)                                      | Yellow (light state)           |
| Optics material             | PC/Glass                                              |                                |
| Weight (approximate)        | 200g (plastic body type) 240g (metal body type)       |                                |

## Diffuse Red LASER Emission

| Model                       | Red LASER Emitter                                                                                                                         |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|                             | FAL4/**-**-**                                                                                                                             |
| Nominal sensing distance    | 300mm <sup>(1)</sup>                                                                                                                      |
| Emission                    | Red LASER 650nm (Class 1 in accordance to IEC60825-1)                                                                                     |
| No load supply current      | 30mA                                                                                                                                      |
| Output voltage drop         | 1.2Vmax. I <sub>L</sub> =100mA                                                                                                            |
| Minimum object              | 0.1mm                                                                                                                                     |
| Output type                 | NPN or PNP, Q/Q <sub>not</sub> or (LOn/DOn selectable on special models)                                                                  |
| Switching frequency         | 800Hz                                                                                                                                     |
| Sensitivity adjustment      | Yes, Teach function                                                                                                                       |
| Operating temperature       | -15° to 55°C                                                                                                                              |
| Interference external light | 3000 lux (incandescent lamp) 10000 lux (sunlight)                                                                                         |
| LED indicators              | Yellow (Q/Q <sub>not</sub> models indicates light status, when blinking, detection level is over threshold but under twice the threshold) |
| Optics material             | PC/Glass                                                                                                                                  |
| Weight (approximate)        | 200g                                                                                                                                      |

(1) White target Kodak paper (100mm<sup>2</sup>) 90% reflection

## Polarized retro-reflective Red LASER Emission

| Model                       | Red LASER Emitter                                                                                                                         |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|                             | FALN/**-**-**                                                                                                                             |
| Nominal sensing distance    | 25m with RL110                                                                                                                            |
| Emission                    | Red LASER 650nm (Class 1 in accordance to IEC60825-1)                                                                                     |
| No load supply current      | ≤ 20mA                                                                                                                                    |
| Output voltage drop         | 1.2Vmax. I <sub>L</sub> =100mA                                                                                                            |
| Minimum object              | 0.7mm at 1m, 24mm at 25m                                                                                                                  |
| Spot dimension              | 25mm at 25m                                                                                                                               |
| Output type                 | NPN or PNP, Q/Q <sub>not</sub> or (LOn/DOn selectable on special models)                                                                  |
| Switching frequency         | 800Hz                                                                                                                                     |
| Sensitivity adjustment      | Yes, Teach function                                                                                                                       |
| Operating temperature       | -15° to 55°C                                                                                                                              |
| Interference external light | 3000 lux (incandescent lamp) 10000 lux (sunlight)                                                                                         |
| LED indicators              | Yellow (Q/Q <sub>not</sub> models indicates light status, when blinking, detection level is over threshold but under twice the threshold) |
| Optics material             | PC/Glass                                                                                                                                  |
| Weight (approximate)        | 200g                                                                                                                                      |

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continued

## Diffuse visible red and infrared LED Emission

|                             | Red LED Emitter                                                          |            |                      |            | Infrared Emitter     |            |                      |            |                   |            |
|-----------------------------|--------------------------------------------------------------------------|------------|----------------------|------------|----------------------|------------|----------------------|------------|-------------------|------------|
| Model                       | FARA/**_**                                                               | FARB/**_** | FAR2/**_**           | FAR3/**_** | FAI4/**_**           | FAI5/**_** | FAI6/**_**           | FAI7/**_** | FAI8/**_**        | FAI9/**_** |
| Nominal sensing distance    | 50mm <sup>(1)</sup>                                                      |            | 100mm <sup>(1)</sup> |            | 200mm <sup>(2)</sup> |            | 400mm <sup>(2)</sup> |            | 1m <sup>(3)</sup> |            |
| Emission                    | Red (660nm)                                                              |            |                      |            | Infrared (880nm)     |            |                      |            |                   |            |
| No load supply current      | 30mA                                                                     |            |                      |            |                      |            |                      |            |                   |            |
| Output voltage drop         | 1.2Vmax. I <sub>L</sub> = 100mA                                          |            |                      |            |                      |            |                      |            |                   |            |
| Output type                 | NPN or PNP, Q/Q <sub>not</sub> or (LOn/DOn selectable on special models) |            |                      |            |                      |            |                      |            |                   |            |
| Switching frequency         | 250Hz                                                                    |            |                      |            |                      |            |                      |            |                   |            |
| Sensitivity adjustment      | No                                                                       | Yes        | No                   | Yes        | No                   |            | Yes                  |            | No                |            |
| Operating temperature       | -25 to 70iC                                                              |            |                      |            |                      |            |                      |            |                   |            |
| Interference external light | 5000 lux (incandescent lamp) 10000 lux (sunlight)                        |            |                      |            |                      |            |                      |            |                   |            |
| LED indicators              | Yellow (light state)                                                     |            |                      |            |                      |            |                      |            |                   |            |
| Optics material             | PC                                                                       |            |                      |            |                      |            |                      |            |                   |            |
| Weight (approximate)        | 100g (plastic body type) 120g (metal body type)                          |            |                      |            |                      |            |                      |            |                   |            |

(1) White target Kodak paper (100mm<sup>2</sup>) 90% reflection

(2) White target Kodak paper (200mm<sup>2</sup>) 90% reflection

(3) White target Kodak paper (400mm<sup>2</sup>) 90% reflection

## Polarized retro-reflective, retro-reflective models with visible red, LASER and infrared LED Emission

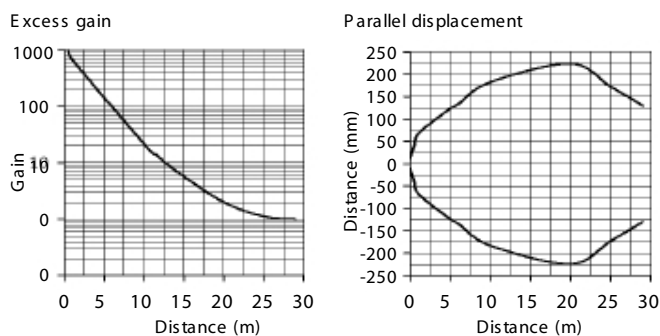
|                             | Infrared                                                                 | Red        | Red                                                               |            | (for transparent objects) |
|-----------------------------|--------------------------------------------------------------------------|------------|-------------------------------------------------------------------|------------|---------------------------|
| Model                       | FAIC/**_**                                                               | FAIM/**_** | FAIP/**_**                                                        | FAIN/**_** | FAIL/**_**                |
| Nominal sensing distance    | 4m <sup>(4)</sup>                                                        |            | 3m <sup>(4)</sup> axial optics 2m <sup>(4)</sup> 90 degree optics |            | 1m <sup>(4)</sup>         |
| Emission                    | Infrared (880nm)                                                         |            | Red (660nm)                                                       |            |                           |
| No load supply current      | 30mA                                                                     |            |                                                                   |            |                           |
| Output voltage drop         | 1.2Vmax. I <sub>L</sub> = 100mA                                          |            |                                                                   |            |                           |
| Output type                 | NPN or PNP, Q/Q <sub>not</sub> or (LOn/DOn selectable on special models) |            |                                                                   |            |                           |
| Switching frequency         | 250Hz                                                                    |            |                                                                   |            |                           |
| Sensitivity adjustment      | No                                                                       | Yes        | No                                                                | Yes        |                           |
| Operating temperature       | -25 to 70iC                                                              |            |                                                                   |            |                           |
| Interference external light | 5000 lux (incandescent lamp) 10000 lux (sunlight)                        |            |                                                                   |            |                           |
| LED indicators              | Yellow (light state)                                                     |            |                                                                   |            |                           |
| Optics material             | PC                                                                       |            |                                                                   |            |                           |
| Weight (approximate)        | 100g (plastic body type) 120g (metal body type)                          |            |                                                                   |            |                           |

(4) With RL110 reflector. Please refer to IMO data sheet for reflectors.

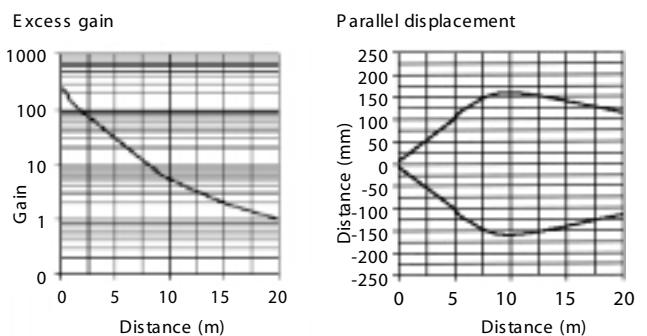
## Characteristic curves

### Through beam

FAIH/\*\*\_\*\* FAID/\*\*\_\*\* FAIZ/\*\*\_\*\* axial optic



FAIH/\*\*\_\*\* FAID/\*\*\_\*\* FAIZ/\*\*\_\*\* 90 degree optics



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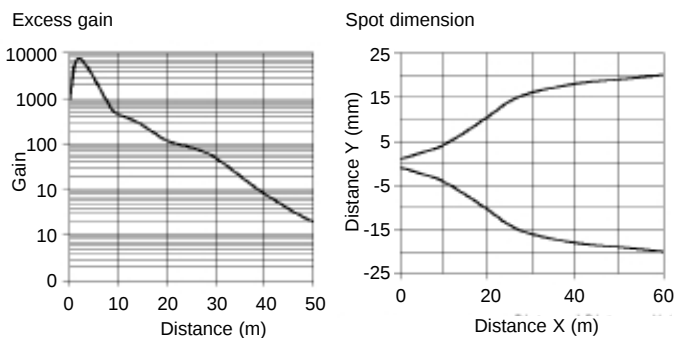


continued

## Characteristic curves continued

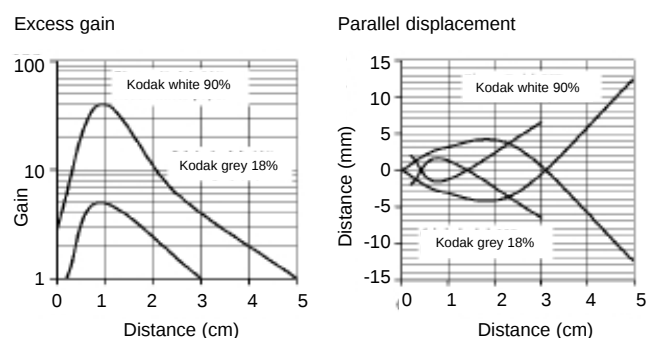
### Through beam continued

FALH/XO-\*\* FALD/\*\*-\*\*

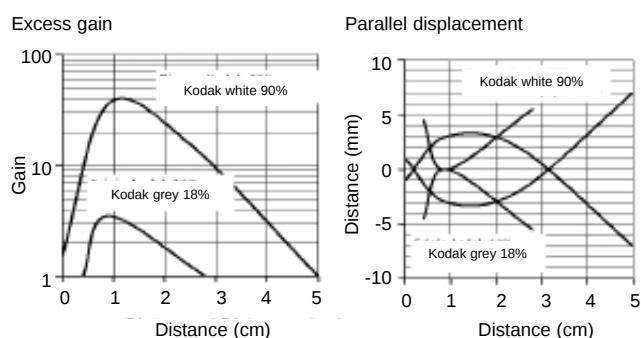


### Diffuse reflection

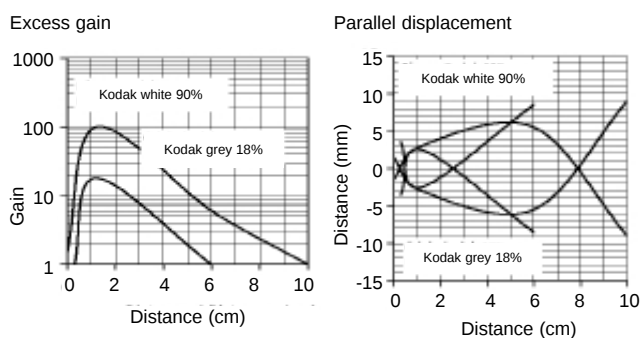
FARA/\*\*-\*\* FARB/\*\*-\*\* axial optic



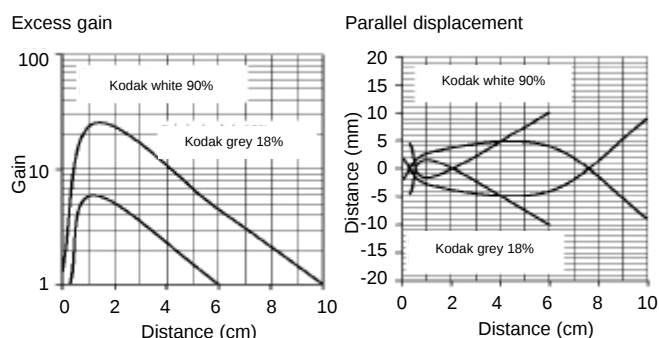
FARA/\*\*-\*\* FARB/\*\*-\*\* 90 degree optics



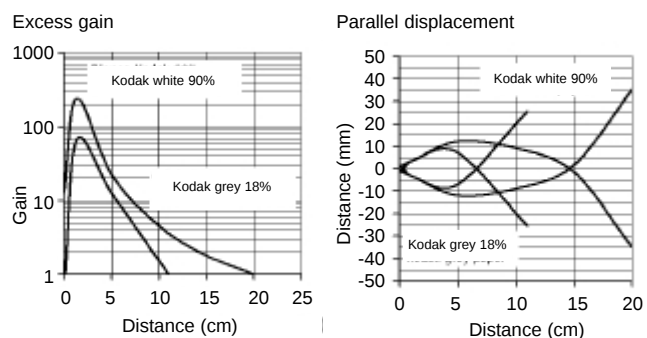
FAR2/\*\*-\*\* FAR3/\*\*-\*\* axial optic



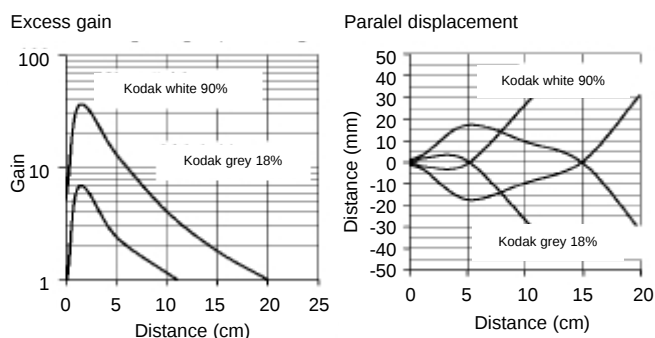
FAR2/\*\*-\*\* FAR3/\*\*-\*\* 90 degree optics



FAI4/\*\*-\*\* FAI5/\*\*-\*\* axial



FAI4/\*\*-\*\* FAI5/\*\*-\*\* 90 degree optics



# M18 DC Photoelectric Switches FA



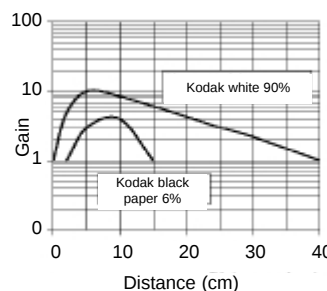
continued

## Characteristic curves continued

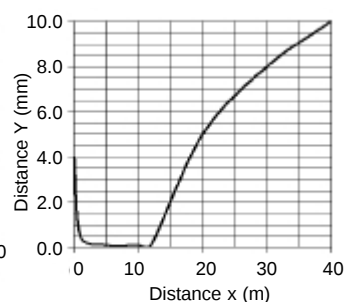
### Diffuse reflective continued

#### FA14/\*\*\_\*\*

Excess gain

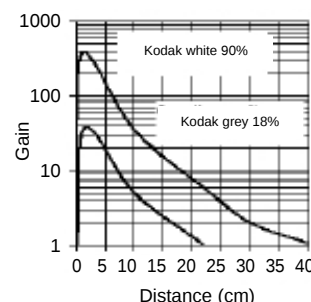


Minimum object

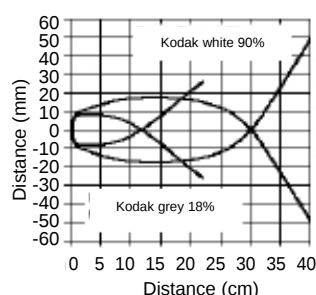


#### FA16/\*\*\_\*\* FA16/\*\*\_\*\* axial optics

Excess gain

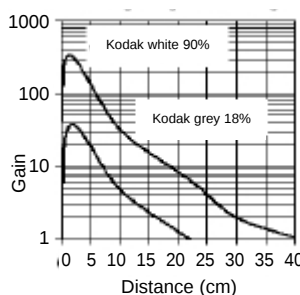


Parallel displacement

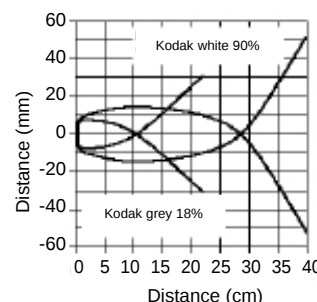


#### FA16/\*\*\_\*\* FA16/\*\*\_\*\* 90 degree optics

Excess gain

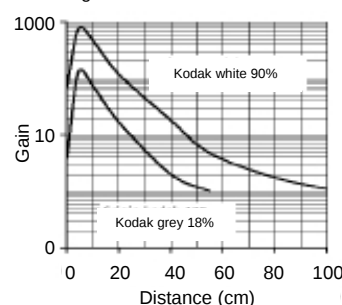


Parallel displacement

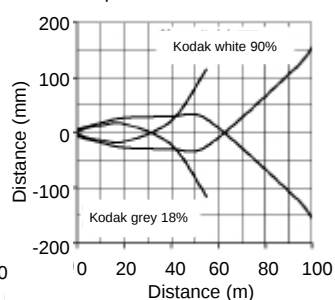


#### FA18/\*\*\_\*\* FA19/\*\*\_\*\* axial optics

Excess gain

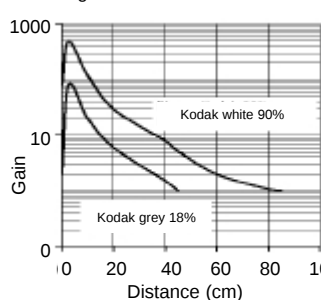


Parallel displacement

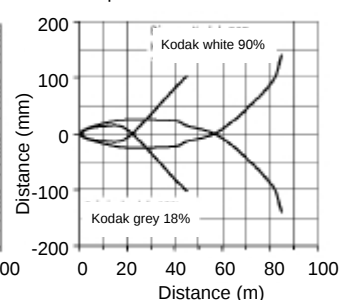


#### FA18/\*\*\_\*\* FA19/\*\*\_\*\* 90 degree optics

Excess gain



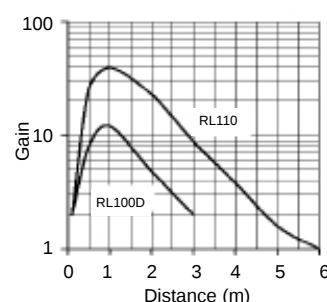
Parallel displacement



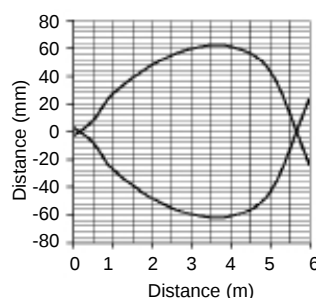
## Retro-reflective

#### FA1C/\*\*\_\*\* FA1M/\*\*\_\*\* axial optics

Excess gain

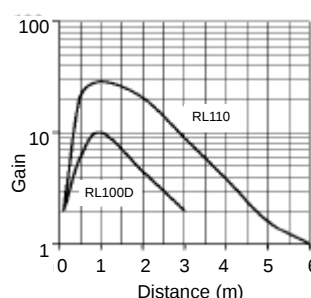


Parallel displacement

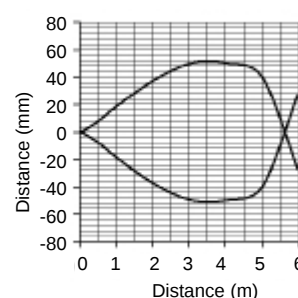


#### FA1C/\*\*\_\*\* FA1M/\*\*\_\*\* 90 degree optics

Excess gain



Parallel displacement



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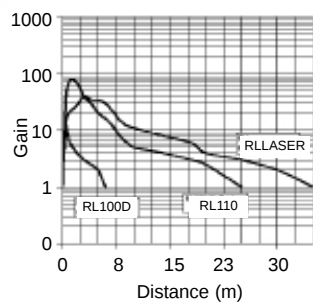
continued

## Characteristic curves continued

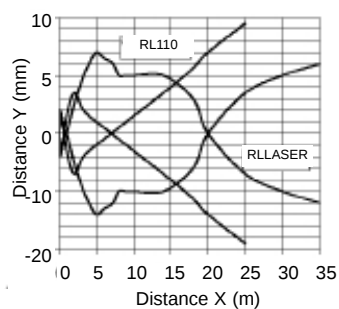
### Retro-reflective continued

#### FALM/\*\*-\*\*

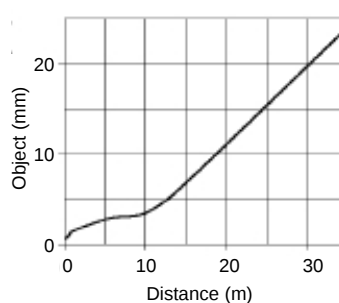
Excess gain



Parallel displacement

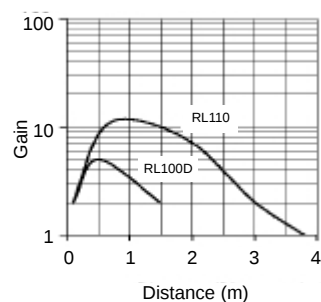


Minimum object

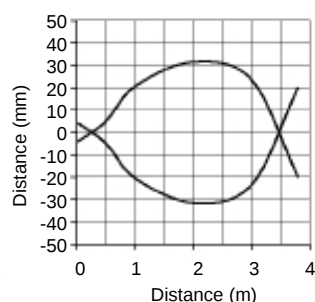


#### FARP/\*\*-\*\* FARN/\*\*-\*\* axial optics

Excess gain

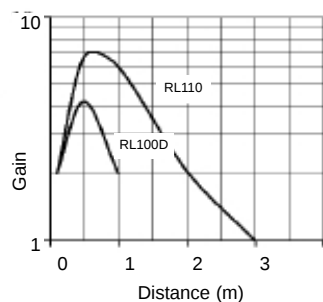


Parallel displacement

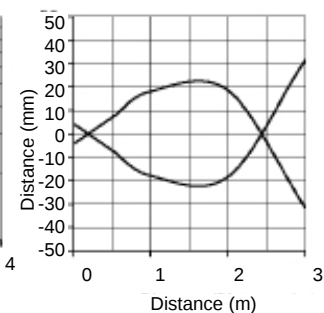


#### FARP/\*\*-\*\* FARN/\*\*-\*\* 90 degree optics

Excess gain

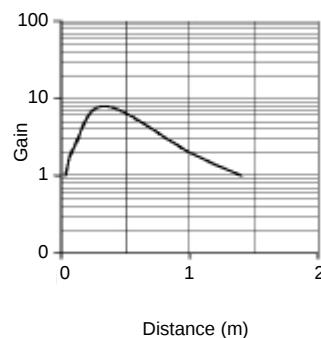


Parallel displacement

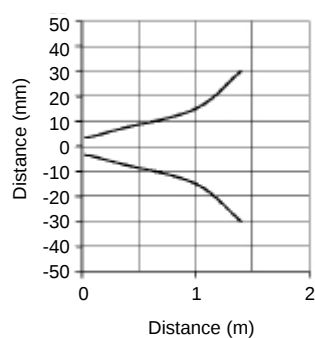


#### FARL/\*\*-\*\*

Excess gain



Parallel displacement

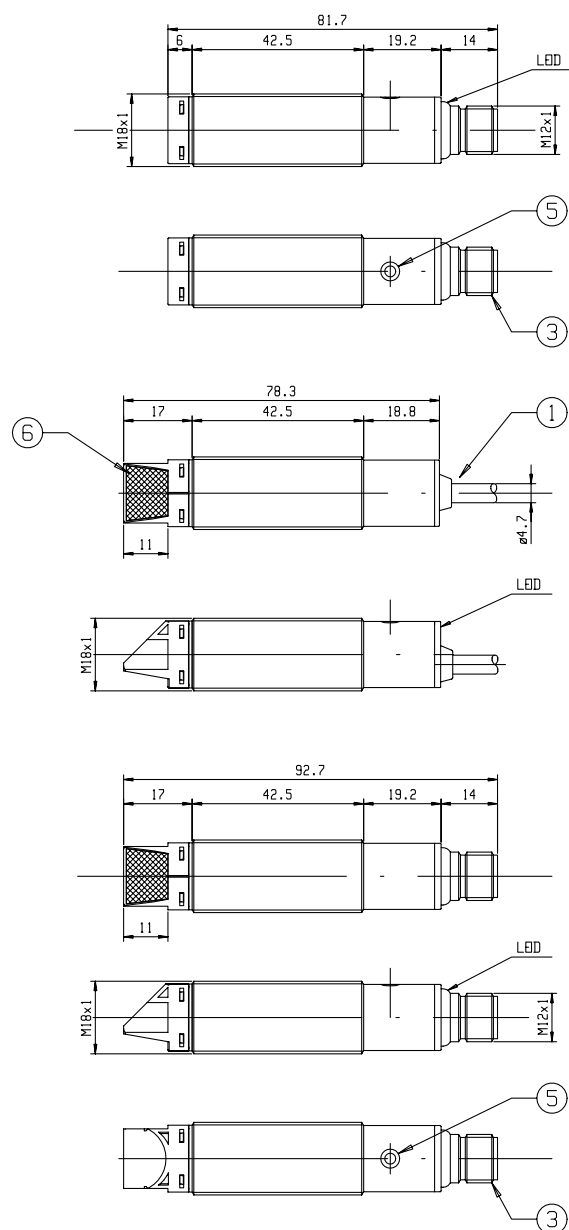


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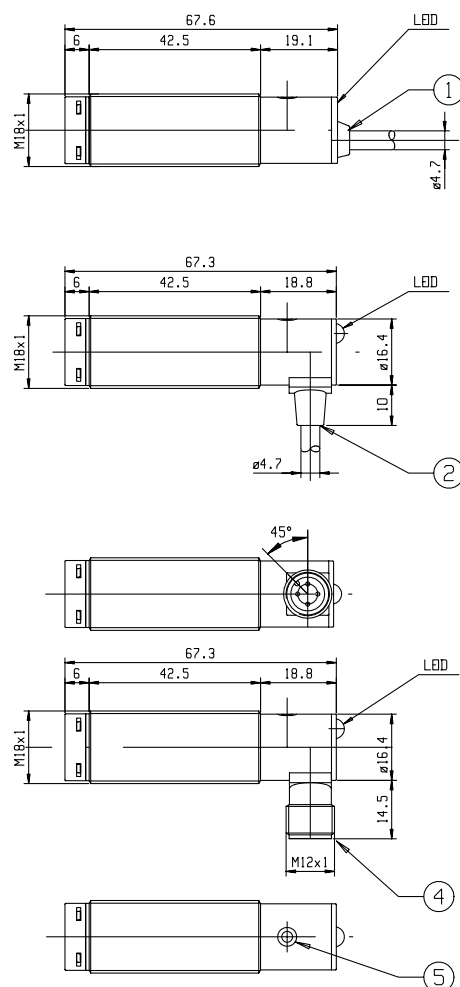
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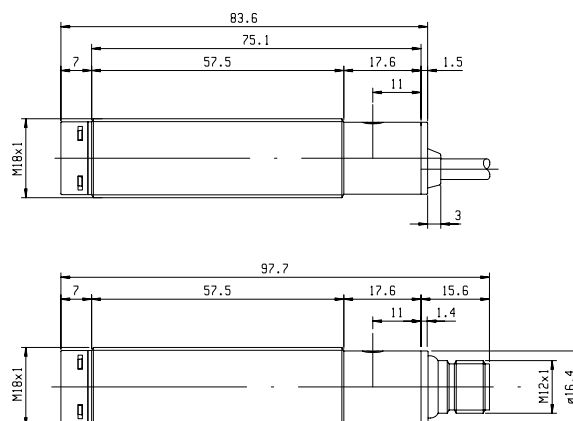
## Dimensions (mm)



1. Axial cable exit with tang
2. Right angle cable exit with tang
3. M12 plug cable exit
4. Right angle M12 plug cable exit
5. Sensitivity adjustment trimmer



## FAL models (laser)



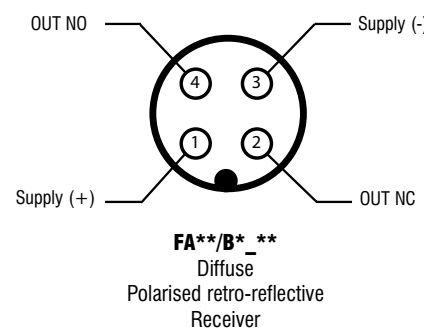
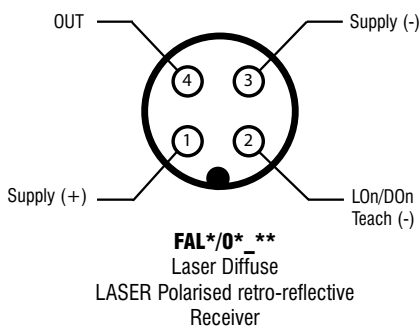
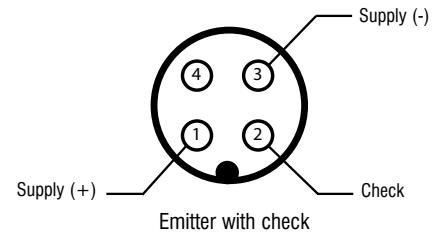
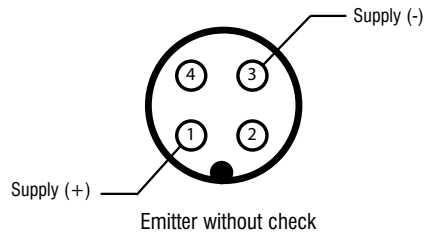
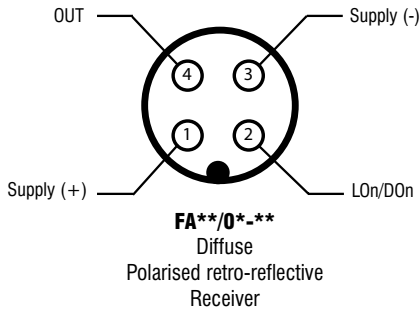
# M18 DC Photoelectric Switches FA



continued

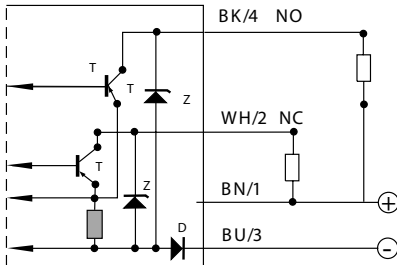
## Wiring connections and outputs

### M12 plug connector

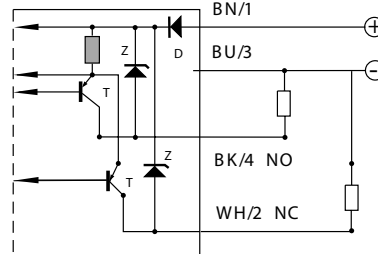


### Complementary Q/Q<sub>not</sub> output

#### NPN

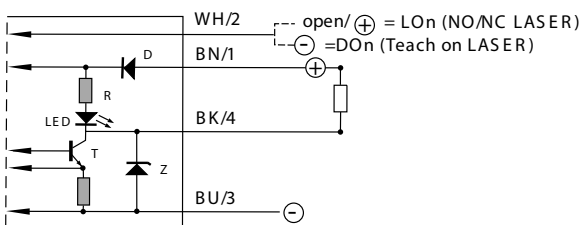


#### PNP

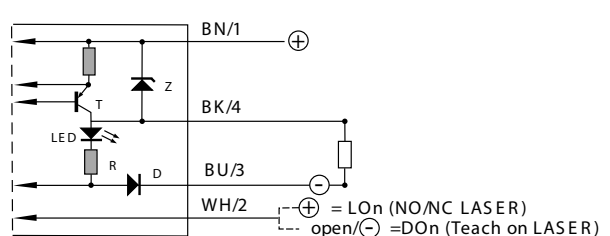


### LOn/DOn selectable output

#### NPN

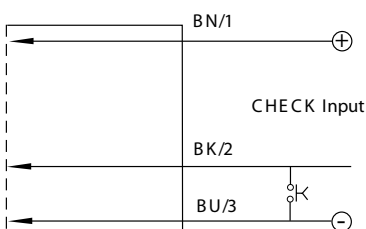


#### PNP



### Complementary Q/Q<sub>not</sub> output

#### Emitter with check



#### Emitter without check

