

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.

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FA I A / B P - O A

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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 _L = 100mA	
Output type	-		NPN or PNP, Q/Q _{not} 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 _L = 100mA
Spot dimension	40mm at 60m	
Output type	-	NPN or PNP, Q/Q _{not}
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 ⁽¹⁾
Emission	Red LASER 650nm (Class 1 in accordance to IEC60825-1)
No load supply current	30mA
Output voltage drop	1.2Vmax. I _L = 100mA
Minimum object	0.1mm
Output type	NPN or PNP, Q/Q _{not} 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 _{not} 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 (100mm²) 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 _L = 100mA
Minimum object	0.7mm at 1m, 24mm at 25m
Spot dimension	25mm at 25m
Output type	NPN or PNP, Q/Q _{not} 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 _{not} 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	FAR*/A*_**	FAR*/B*_**	FAR*/2*_**	FAR*/3*_**	FAR*/4*_**	FAR*/5*_**	FAR*/6*_**	FAR*/7*_**	FAR*/8*_**	FAR*/9*_**
Nominal sensing distance	50mm ⁽¹⁾		100mm ⁽¹⁾		200mm ⁽²⁾		400mm ⁽²⁾		1m ⁽³⁾	
Emission	Red (660nm)				Infrared (880nm)					
No load supply current	30mA									
Output voltage drop	1.2Vmax. I _L =100mA									
Output type	NPN or PNP, Q/Q _{not} or (LOn/DOn selectable on special models)									
Switching frequency	250Hz									
Sensitivity adjustment	No	Yes	No	Yes	No		Yes		No	
Operating temperature	-25 to 70°C									
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 (100mm²) 90% reflection

(2) White target Kodak paper (200mm²) 90% reflection

(3) White target Kodak paper (400mm²) 90% reflection

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

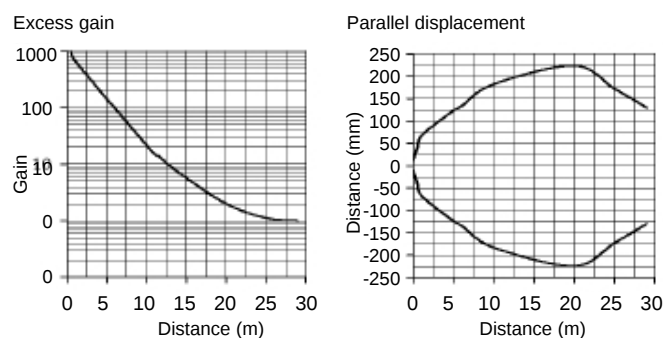
	Infrared	Red	Red		(for transparent objects)
Model	FAIC/**_**	FAIM/**_**	FARP/**_**	FARN/**_**	FARL/**_**
Nominal sensing distance	4m ⁽⁴⁾		3m ⁽⁴⁾ axial optics 2m ⁽⁴⁾ 90 degree optics		1m ⁽⁴⁾
Emission	Infrared (880nm)		Red (660nm)		
No load supply current	30mA				
Output voltage drop	1.2Vmax. I _L = 100mA				
Output type	NPN or PNP, Q/Q _{not} or (LOn/DOn selectable on special models)				
Switching frequency	250Hz				
Sensitivity adjustment	No	Yes	No	Yes	
Operating temperature	-25 to 70°C				
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.

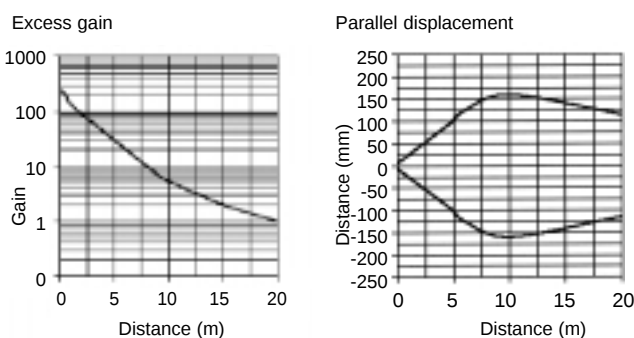
Characteristic curves

Through beam

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



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



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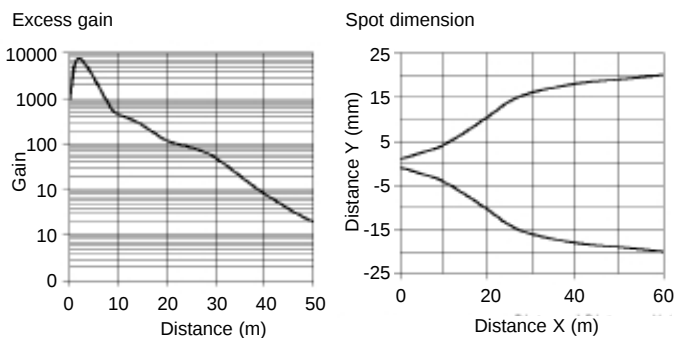


continued

Characteristic curves continued

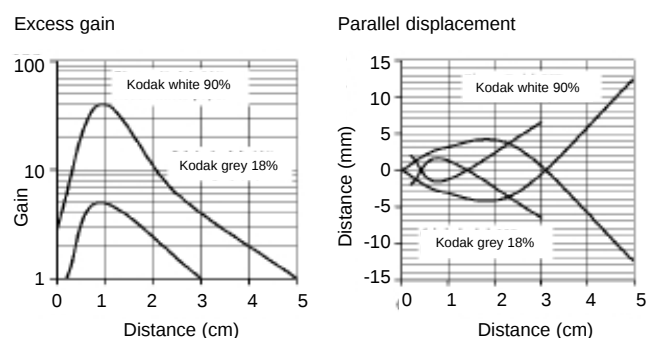
Through beam continued

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

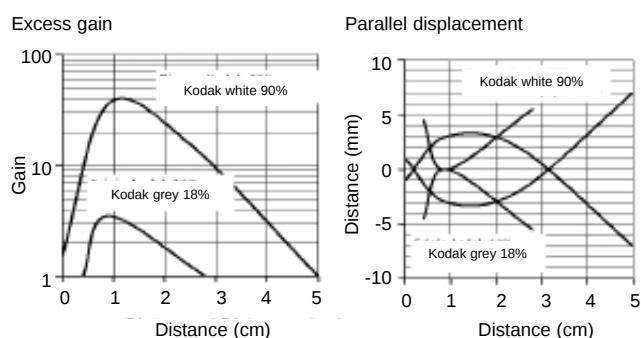


Diffuse reflection

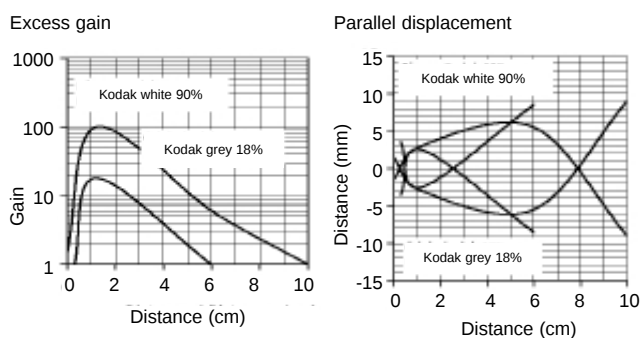
FARA/**-** FARB/**-** axial optic



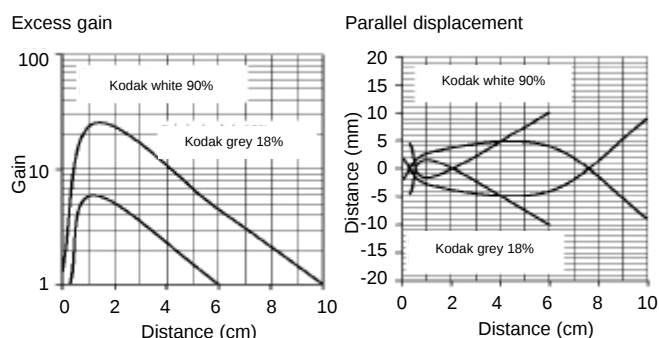
FARA/**-** FARB/**-** 90 degree optics



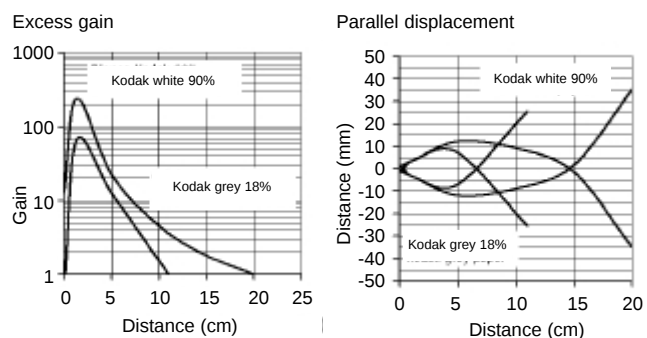
FAR2/**-** FAR3/**-** axial optic



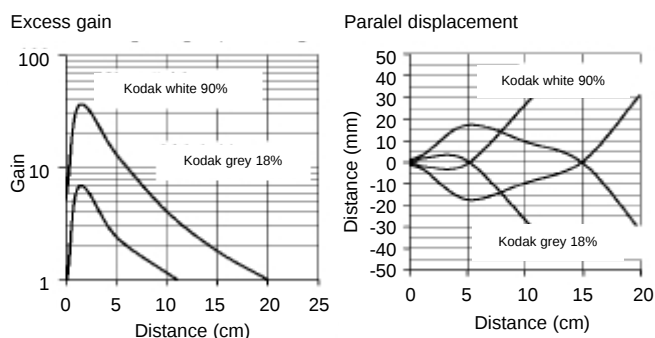
FAR2/**-** FAR3/**-** 90 degree optics



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



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



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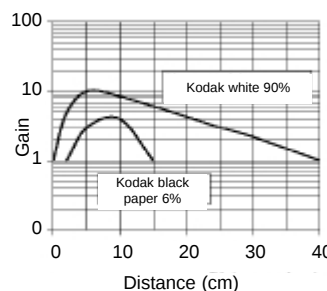
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Characteristic curves continued

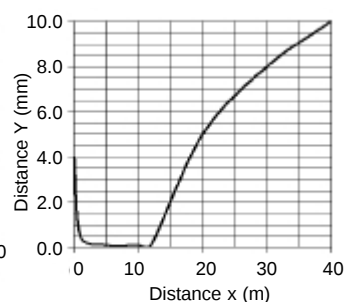
Diffuse reflective continued

FA14/**_**

Excess gain

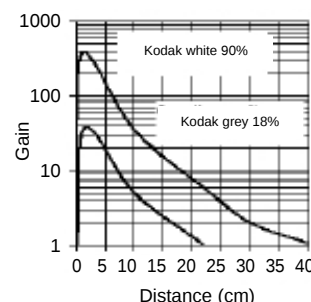


Minimum object

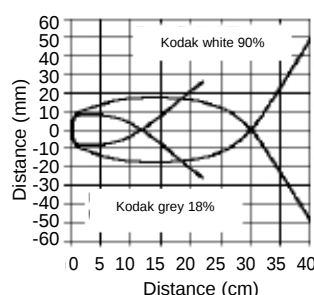


FA16/**_** FA16/**_** axial optics

Excess gain

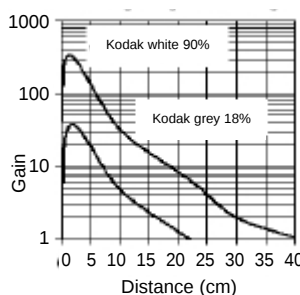


Parallel displacement

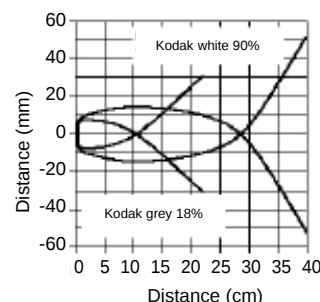


FA16/**_** FA16/**_** 90 degree optics

Excess gain

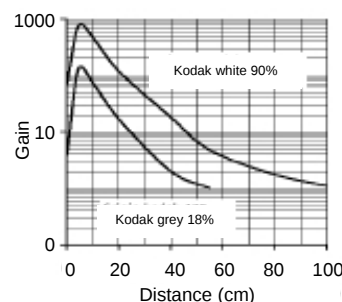


Parallel displacement

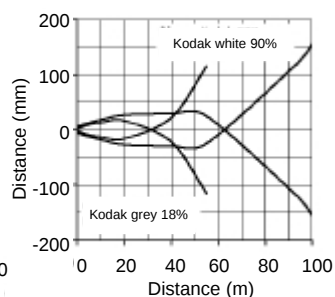


FA18/**_** FA19/**_** axial optics

Excess gain

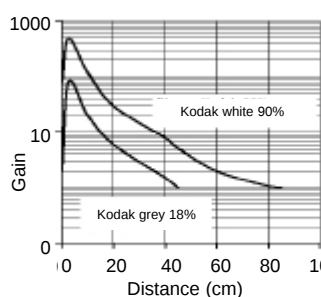


Parallel displacement

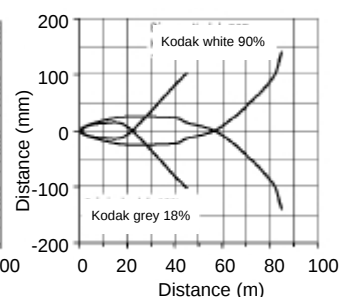


FA18/**_** FA19/**_** 90 degree optics

Excess gain



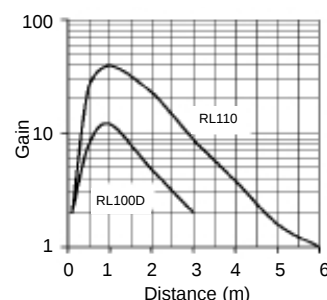
Parallel displacement



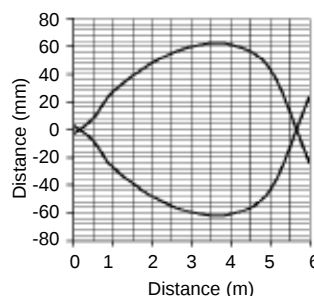
Retro-reflective

FA1C/**_** FA1M/**_** axial optics

Excess gain

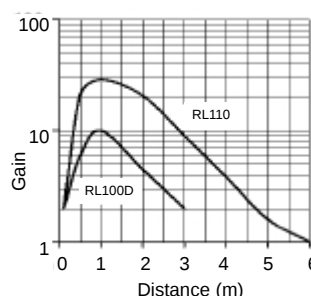


Parallel displacement

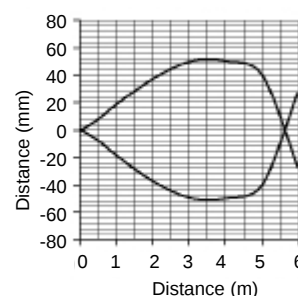


FA1C/**_** FA1M/**_** 90 degree optics

Excess gain



Parallel displacement



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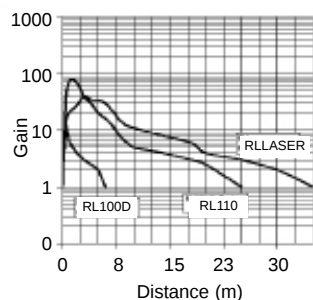
continued

Characteristic curves continued

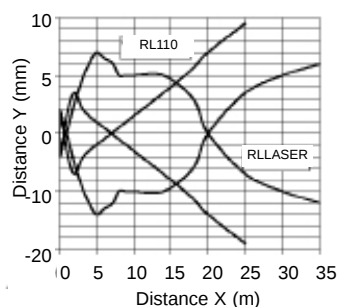
Retro-reflective continued

FALM/**_**

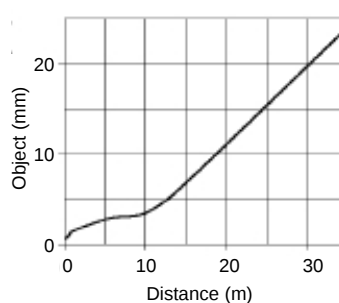
Excess gain



Parallel displacement

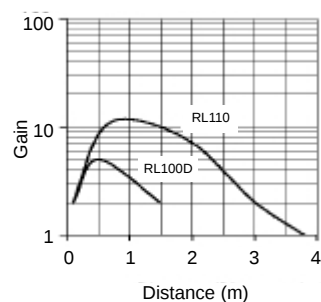


Minimum object

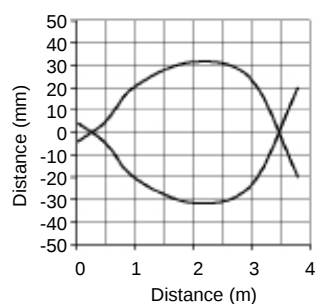


FARP/**_** FARN/**_** axial optics

Excess gain

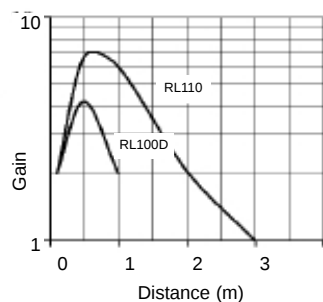


Parallel displacement

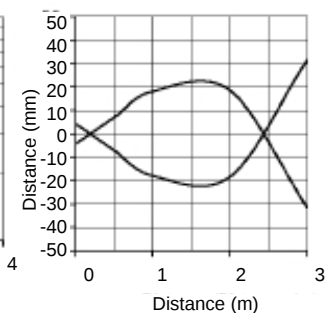


FARP/**_** FARN/**_** 90 degree optics

Excess gain

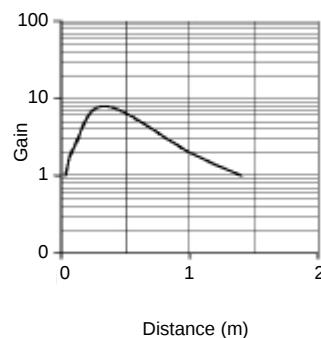


Parallel displacement

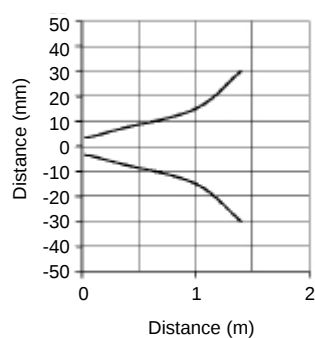


FARL/**_**

Excess gain



Parallel displacement

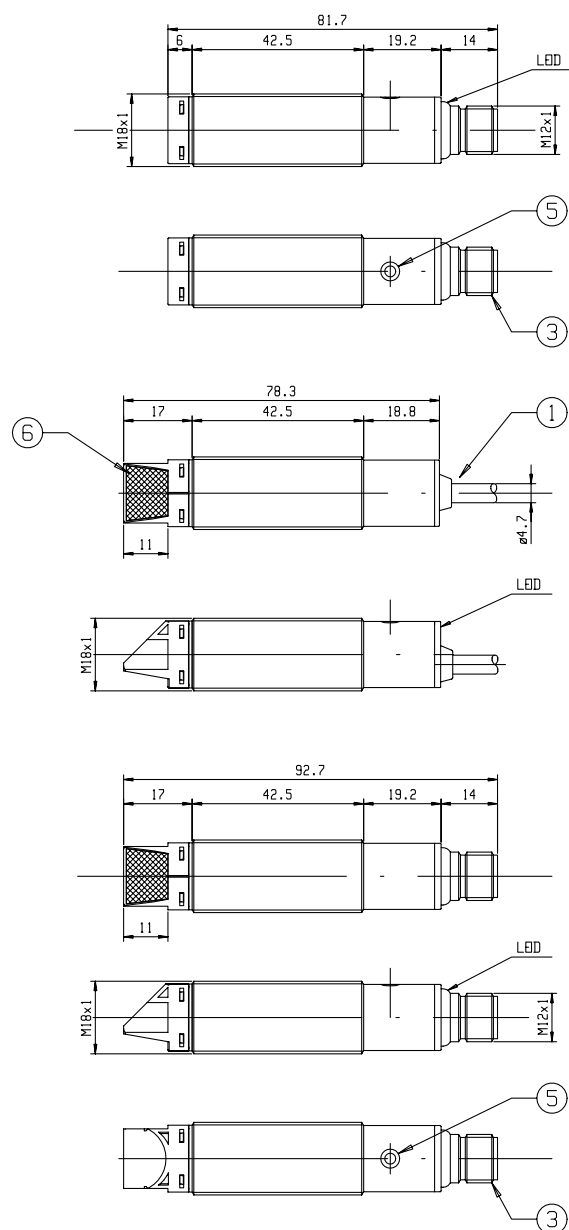


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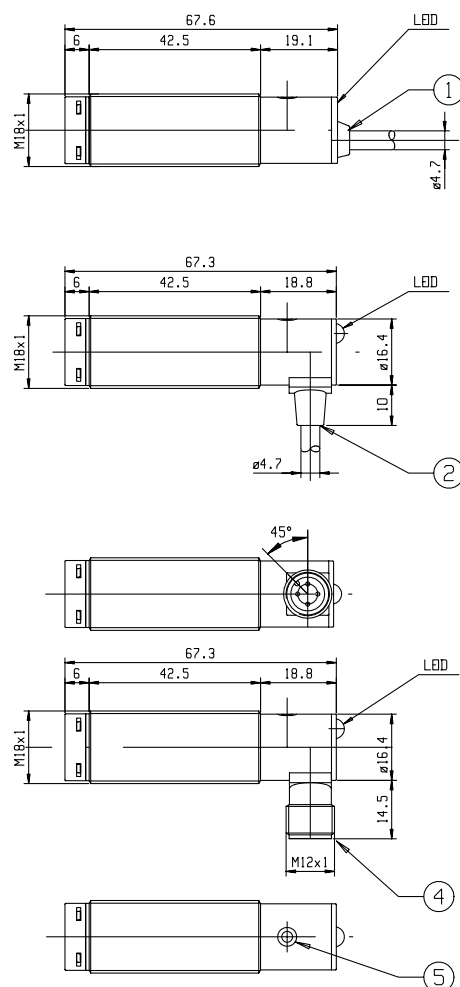
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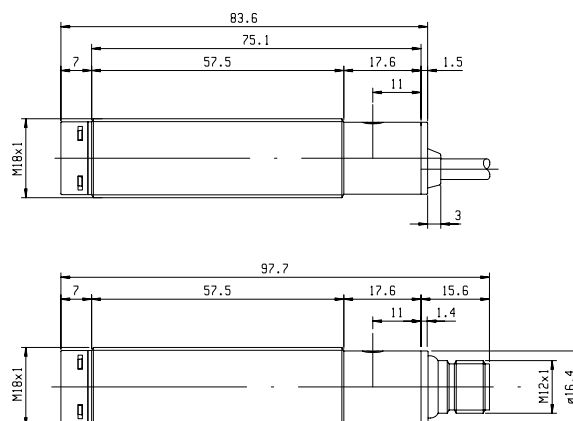
Dimensions (mm)



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)



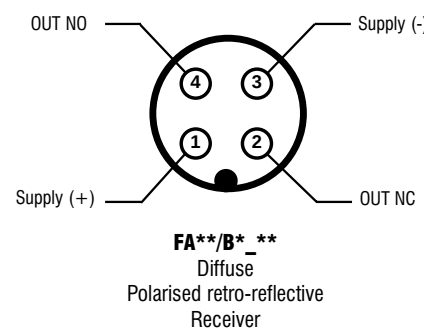
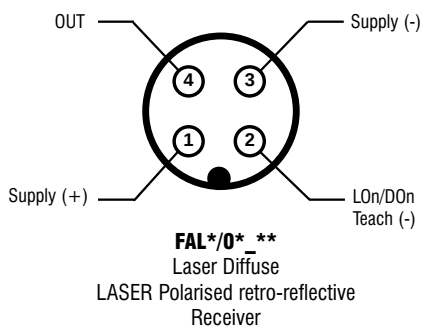
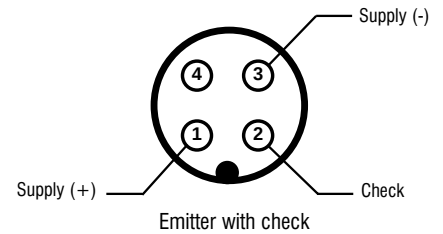
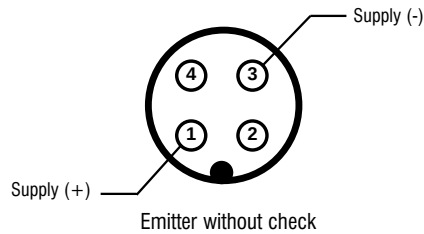
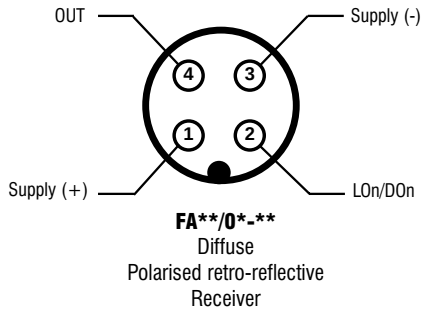
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continued

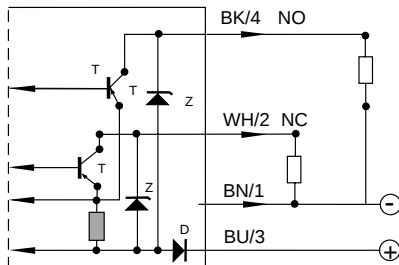
Wiring connections and outputs

M12 plug connector

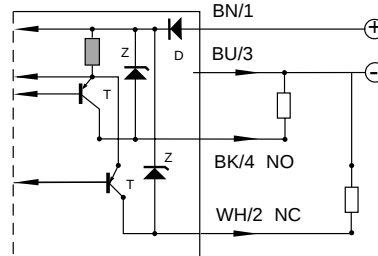


Complementary Q/Q_{not} output

NPN

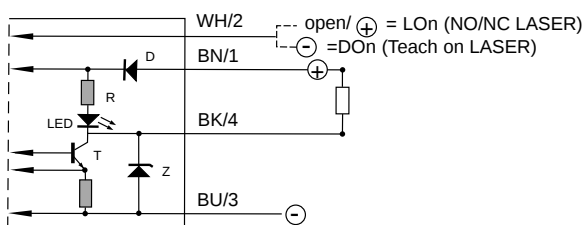


PNP

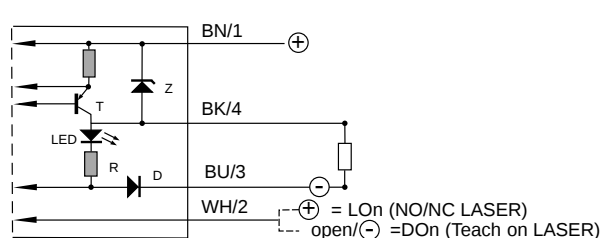


LOn/DOn selectable output

NPN

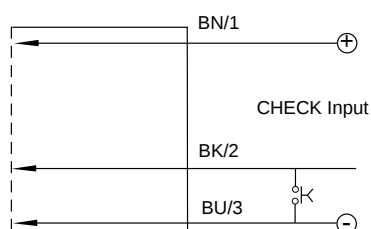


PNP



Complementary Q/Q_{not} output

Emitter with check



Emitter without check

