FA series

M18 photoelectric sensors DC

features

Complete range of M18 sensors with 10...30 Vdc power supply

Axial and radial optic with flat surface

Retro-reflective models for transparent objects detection, with red emission

IP67 protection degree

Metallic or plastic housing

Sensitivity adjustment available for all models

Total protection against any type of electric damages

Approvals: CE and cULus listed

web contents

- **Application notes**
- **Photos**
- **Catalogue / Manuals**

code description (*)

FA I C / B P - 0 A

series	FA	M18 sensor with 4 DC wires
emission	I	Infrared invisible led emission
	R	Red visible led emission
type	2	100 mm Direct reflection without adjustment
	3	100 mm Direct reflection with adjustment
	4	200 mm Direct reflection with adjustment
	5	200 mm Direct reflection without adjustment
	6	400 mm Direct reflection without adjustment
	7	400 mm Direct reflection with adjustment
	8	Direct reflection: 1000 mm axial, 800 mm radial with adjustment
	C	Reflex without adjustment
	P	Reflex polarized without adjustment
	N	Reflex polarized with adjustment
	M	Reflex with adjustment
	L	Reflex with adj. for transparent objects detection
	H	Emitter
	D	Receiver with sensitivity adjustment
	Z	Receiver without sensitivity adjustment
emitter	0	Emitter
	X	Emitter with check
	B	4 wires output complementary NO and NC
output	0	Emitter
	P	PNP output
	N	NPN output
housing	0	Plastic housing, axial optic
	1	Metal housing, axial optic
	2	Plastic housing, radial optic
	3	Metal housing, radial optic
plug / cable output	A	Axial cable output
	E	Axial M12 plastic connector output

(*) ATEX models available, contact our Sales Dept. for further information.

available models

cable exit photoeletric sensors

model	distance	housing	adjustment	4 wires (axial optic)		4 wires (right angle optic)	
				NPN NO + NC	PNP NO + NC	NPN NO + NC	PNP NO + NC
diffuse reflection	100 mm	plastic	-	FAR2/BN-0A	FAR2/BP-0A	FAR2/BN-2A	FAR2/BP-2A
			●	FAR3/BN-0A	FAR3/BP-0A	FAR3/BN-2A	FAR3/BP-2A
		metallic	-	FAR2/BN-1A	FAR2/BP-1A	FAR2/BN-3A	FAR2/BP-3A
			●	FAR3/BN-1A	FAR3/BP-1A	FAR3/BN-3A	FAR3/BP-3A
	200 mm	plastic	-	FAI4/BN-0A	FAI4/BP-0A	FAI4/BN-2A	FAI4/BP-2A
			●	FAI5/BN-0A	FAI5/BP-0A	FAI5/BN-2A	FAI5/BP-2A
		metallic	-	FAI4/BN-1A	FAI4/BP-1A	FAI4/BN-3A	FAI4/BP-3A
			●	FAI5/BN-1A	FAI5/BP-1A	FAI5/BN-3A	FAI5/BP-3A
	400 mm	plastic	-	FAI6/BN-0A	FAI6/BP-0A	FAI6/BN-2A	FAI6/BP-2A
			●	FAI7/BN-0A	FAI7/BP-0A	FAI7/BN-2A	FAI7/BP-2A
		metallic	-	FAI6/BN-1A	FAI6/BP-1A	FAI6/BN-3A	FAI6/BP-3A
			●	FAI7/BN-1A	FAI7/BP-1A	FAI7/BN-3A	FAI7/BP-3A
	1,000 mm (axial) 800 mm (90°)	plastic	●	FAI8/BN-0A	FAI8/BP-0A	FAI8/BN-2A	FAI8/BP-2A
		metallic		FAI8/BN-1A	FAI8/BP-1A	FAI8/BN-3A	FAI8/BP-3A
retroreflective	5 m (axial) 4 m (90°)	plastic	-	FAIC/BN-0A	FAIC/BP-0A	FAIC/BN-2A	FAIC/BP-2A
			●	FAIM/BN-0A	FAIM/BP-0A	FAIM/BN-2A	FAIM/BP-2A
		metallic	-	FAIC/BN-1A	FAIC/BP-1A	FAIC/BN-3A	FAIC/BP-3A
			●	FAIM/BN-1A	FAIM/BP-1A	FAIM/BN-3A	FAIM/BP-3A
polarized	4 m (axial) 2.5 m (90°)	plastic	-	FARP/BN-0A	FARP/BP-0A	FARP/BN-2A	FARP/BP-2A
			●	FARN/BN-0A	FARN/BP-0A	FARN/BN-2A	FARN/BP-2A
		metallic	-	FARP/BN-1A	FARP/BP-1A	FARP/BN-3A	FARP/BP-3A
			●	FARN/BN-1A	FARN/BP-1A	FARN/BN-3A	FARN/BP-3A
trasparents	0.1...1.5 m	plastic		FARL/BN-0A	FARL/BP-0A	FARL/BN-2A	FARL/BP-2A
		metallic		FARL/BN-1A	FARL/BP-1A	FARL/BN-3A	FARL/BP-3A
through-beam	20 m (axial) 15 m (90°)	plastic	emitter	FAIH/00-0A		FAIH/00-2A	
			emitt. + check	FAIH/X0-0A		FAIH/X0-2A	
			receiver	FAIZ/BN-0A	FAIZ/BP-0A	FAIZ/BN-2A	FAIZ/BP-2A
			adj. receiver	FAID/BN-0A	FAID/BP-0A	FAID/BN-2A	FAID/BP-2A
		metallic	emitter	FAIH/00-1A		FAIH/00-3A	
			emitt. + check	FAIH/X0-1A		FAIH/X0-3A	
			receiver	FAIZ/BN-0A	FAIZ/BP-0A	FAIZ/BN-2A	FAIZ/BP-2A
			adj. receiver	FAID/BN-1A	FAID/BP-1A	FAID/BN-3A	FAID/BP-3A

available models

plug cable exit photoeletric sensors

model	distance	housing	adjustment	4 wires (axial optic)		4 wires (right angle optic)	
				NPN NO + NC	PNP NO + NC	NPN NO + NC	PNP NO + NC
diffuse reflection	100 mm	plastic	-	FAR2/BN-0E	FAR2/BP-0E	FAR2/BN-2E	FAR2/BP-2E
			●	FAR3/BN-0E	FAR3/BP-0E	FAR3/BN-2E	FAR3/BP-2E
		metallic	-	FAR2/BN-1E	FAR2/BP-1E	FAR2/BN-3E	FAR2/BP-3E
			●	FAR3/BN-1E	FAR3/BP-1E	FAR3/BN-3E	FAR3/BP-3E
	200 mm	plastic	-	FAI4/BN-0E	FAI4/BP-0E	FAI4/BN-2E	FAI4/BP-2E
			●	FAI5/BN-0E	FAI5/BP-0E	FAI5/BN-2E	FAI5/BP-2E
		metallic	-	FAI4/BN-1E	FAI4/BP-1E	FAI4/BN-3E	FAI4/BP-3E
			●	FAI5/BN-0E	FAI5/BP-0E	FAI5/BN-2E	FAI5/BP-2E
	400 mm	plastic	-	FAI6/BN-0E	FAI6/BP-0E	FAI6/BN-2E	FAI6/BP-2E
			●	FAI7/BN-0E	FAI7/BP-0E	FAI7/BN-2E	FAI7/BP-2E
		metallic	-	FAI6/BN-1E	FAI6/BP-1E	FAI6/BN-3E	FAI6/BP-3E
			●	FAI7/BN-1E	FAI7/BP-1E	FAI7/BN-3E	FAI7/BP-3E
	1.000 mm (axial) 800 mm (90°)	plastic	●	FAI8/BN-0E	FAI8/BP-0E	FAI8/BN-2E	FAI8/BP-2E
		metallic		FAI8/BN-1E	FAI8/BP-1E	FAI8/BN-3E	FAI8/BP-3E
retroreflective	5 m (axial) 4 m (90°)	plastic	-	FAIC/BN-0E	FAIC/BP-0E	FAIC/BN-2E	FAIC/BP-2E
			●	FAIM/BN-0E	FAIM/BP-0E	FAIM/BN-2E	FAIM/BP-2E
		metallic	-	FAIC/BN-1E	FAIC/BP-1E	FAIC/BN-3E	FAIC/BP-3E
			●	FAIM/BN-1E	FAIM/BP-1E	FAIM/BN-3E	FAIM/BP-3E
polarized	4 m (axial) 2.5 m (90°)	plastic	-	FARP/BN-0E	FARP/BP-0E	FARP/BN-2E	FARP/BP-2E
			●	FARN/BN-0E	FARN/BP-0E	FARN/BN-2E	FARN/BP-2E
		metallic	-	FARP/BN-1E	FARP/BP-1E	FARP/BN-3E	FARP/BP-3E
				FARN/BN-1E	FARN/BP-1E	FARN/BN-3E	FARN/BP-3E
trasparents	0,1...1.5 m	plastic	●	FARL/BN-0E	FARL/BP-0E	FARL/BN-2E	FARL/BP-2E
		metallic		FARL/BN-1E	FARL/BP-1E	FARL/BN-3E	FARL/BP-3E
through-beam	20 m (axial) 15 m (90°)	plastic	emitter	FAIH/00-0E		FAIH/00-2E	
			emitt. + check	FAIH/X0-0E		FAIH/X0-2E	
			receiver	FAIZ/BN-0E	FAIZ/BP-0E	FAIZ/BN-2E	FAIZ/BP-2E
			adj. receiver	FAID/BN-0E	FAID/BP-0E	FAID/BN-2E	FAID/BP-2E
		metallic	emitter	FAIH/00-1E		FAIH/00-3E	
			emitt. + check	FAIH/X0-1E		FAIH/X0-3E	
			receiver	FAIZ/BN-0E	FAIZ/BP-0E	FAIZ/BN-2E	FAIZ/BP-2E
			adj. receiver	FAID/BN-1E	FAID/BP-1E	FAID/BN-3E	FAID/BP-3E

technical specification

direct reflection models

	red LED emission	
	FAR2/B*-**	FAR3/B*-**
		
nominal sensing distance	100 mm (1)	
emission	red (660 nm)	
hysteresis	≤ 10 %	
repeatability	5 %	
operating voltage	10...30 Vcc	
ripple	≤ 10 %	
no-load supply current	30 mA	
load current	100 mA	
leakage current	10 µA	
output voltage drop	2 V max. IL = 100 mA	
output type	NPN or PNP NO + NC	
switching frequency	250 Hz	
power on delay	200 ms	
power supply protections	polarity reversal, impulsive overvoltage	
output protection	Short circuit (autoreset) Overvoltage	
sensitivity adjustment	-	●
operating temperature range	- 25°C...+ 70°C (without freeze)	
temperature drift	10 % Sr	
protection degree	IP67 (EN60529) (4)	
EMC	in conformity with the EMC Directive according to EN 60947-5-2	
external light interference	3,000 lux (incandescence lamp), 10,000 lux (sunlight)	
LEDs	Yellow (Light status) or (output status in the LO/DO special versions)	
housing material	PBT (plastic) / nicked plated brass (metallic) / PC (cable exit)	
optic material	PC	
tightening torque	1 Nm (plastic), 25 Nm (metallic)	
weight (approximate)	plastic version: 30 g connector / 50 g cable metallic version: 100 g connector / 130 g cable	

(1) White target kodak 90% reflection 100 x 100 mm
(2) Protection guaranteed only with plug cable well mounted

technical specification

direct reflection models

	infrared LED emission				
	FAI4/B*-**	FAI5/B*-**	FAI6/B*-**	FAI7/B*-**	FAI8/B*-**
					
nominal sensing distance	200 mm (1)		400 mm (2)		1,000 mm (3) (axial) 800 mm (3) (90°)
emission	infrared (880 nm)				
hysteresis	≤ 10 %				
repeatability	5 %				
operating voltage	10...30 Vcc				
ripple	≤ 10 %				
no-load supply current	30 mA				
load current	100 mA				
leakage current	10 µA				
output voltage drop	2 V max. IL = 100 mA				
output type	NPN or PNP NO + NC				
switching frequency	250 Hz				
power on delay	200 ms				
power supply protections	polarity reversal, impulsive overvoltage				
output protection	Short circuit (autoreset) Overvoltage				
sensitivity adjustment	●	-		●	
operating temperature range	- 25°C...+ 70°C (without freeze)				
temperature drift	10 % Sr				
protection degree	IP67 (EN60529) (4)				
EMC	in conformity with the EMC Directive according to EN 60947-5-2				
external light interference	3,000 lux (incandescence lamp), 10,000 lux (sunlight)				
LEDs	Yellow (Light status) or (output status in the LO/DO special versions)				
housing material	PBT (plastic) / nicked plated brass (metallic) / PC (cable exit)				
optic material	PC				
tightening torque	1 Nm (plastic), 25 Nm (metallic)				
weight (approximate)	plastic version: 30 g plug / 50 g cable metallic version: 100 g plug / 130 g cable				

(1) White target kodak 90% reflection 100 x 100 mm (2) White target kodak 90% reflection 200 x 200 mm (3) White target kodak 90% reflection 400 x 400 mm
(4) Protection guaranteed only with plug cable well mounted

technical specification

reflex and polarized models

	retroreflective		polarized		transparent objects detection
	FAIC/B*-** [1]	FAIM/B*-** [1]	FARP/B*-** [1]	FARN/B*-** [1]	FARL/B*-** [2]
					
nominal sensing distance	5 m (axial), 4 m (radial)		4 m (axial), 2.5 m (radial)		1.5 m
emission	infrared (880 nm)		red (660 nm)		
hysteresis	≤ 10 %				
repeatability	5 %				
operating voltage	10...30 Vdc				
ripple	≤ 10 %				
no-load supply current	30 mA				
load current	100 mA				
leakage current	≤ 10 µA				
output voltage drop	2 V max. IL = 100 mA				
output type	NPN or PNP NO + NC				
switching frequency	250 Hz				
power on delay	200 ms				
power supply protections	polarity reversal, impulsive overvoltage				
output protection	Short circuit (autoreset) Overvoltage				
sensitivity adjustment	-	●	-	●	
operating temperature range	- 25°C...+ 70°C (without freeze)				
temperature drift	10 % Sr				
protection degree	IP67 (EN60529) [3]				
EMC	in conformity with the EMC Directive according to EN 60947-5-2				
external light interference	5000 lux (incandescence lamp), 10.000 lux (sunlight)				
LEDs	Yellow (Light status) or (output status in the LO/DO special versions)				
housing material	PBT (plastic) / nicked plated brass (metallic) / PC (cable exit)				
optic material	PC		plastic		PC
tightening torque	1 Nm (plastic), 25 Nm (metallic)				
weight (approximate)	plastic version: 30 g plug / 50 g cable metallic version: 100 g plug / 130 g cable				

[1] With RL 110 reflector [2] With RL 113G or RL 116 reflector [3] Protection guaranteed only with plug cable well mounted

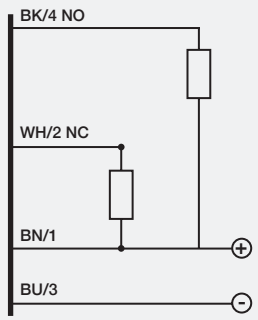
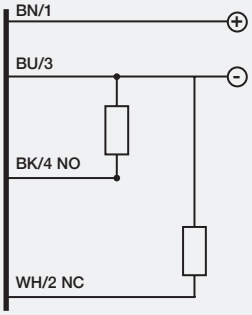
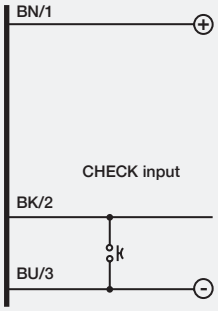
technical specification

throug beam models

	emitter		receiver	
	FAIH/X0-**	FAIH/00-**	FAIZ/B*-**	FAID/B*-**
				
nominal sensing distance	20 m axial model / 15 m right angle model			
emission	infrared (880 nm)			
hysteresis	≤ 10 %			
repeatability	5 %			
operating voltage	10...30 Vdc			
ripple	≤ 10 %			
no-load supply current	25 mA			
load current	-		100 mA	
leakage current	-		10 µA	
output voltage drop	-		2 V max. IL = 100 mA	
output type	-		NPN or PNP NO + NC	
switching frequency	-		250 Hz	
power on delay	-		200 ms	
power supply protections	impulsive overvoltage polarity reversal			
output protection	-		Short circuit (autoreset) - Overvoltage	
sensitivity adjustment	-		-	●
operating temperature range	- 25°C...+ 70°C (without freeze)			
temperature drift	10 % Sr			
check input	BK/2 connected to 0 V switches off the emission	-		
EMC	in conformity with the EMC Directive according to EN 60947-5-2			
protection degree	IP67 (EN60529) (1)			
external light interference	5,000 lux (incandescence lamp), 10,000 lux (sunlight)			
LEDs	green (power ON)		Yellow (light state or output status in the special LO/DO versions)	
housing material	PBT (plastic) / nicked plated brass (metallic) / PC (cable exit)			
optic material	PC			
tightening torque	1 Nm (plastic), 25 Nm (metallic)			
weight (approximate)	plastic version: 30 g connector / 50 g cable metallic version: 100 g connector / 130 g cable			

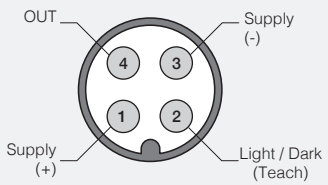
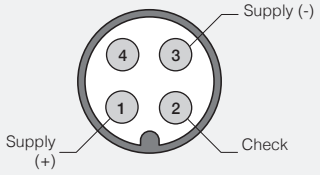
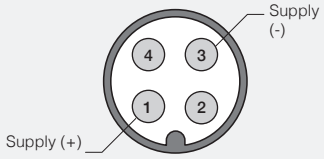
(1) Protection guaranteed only with plug cable well mounted

electrical diagrams of the connections

emitter	receiver NPN	receiver PNP
		

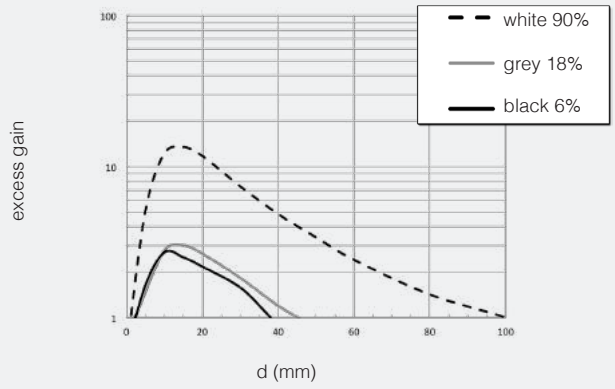
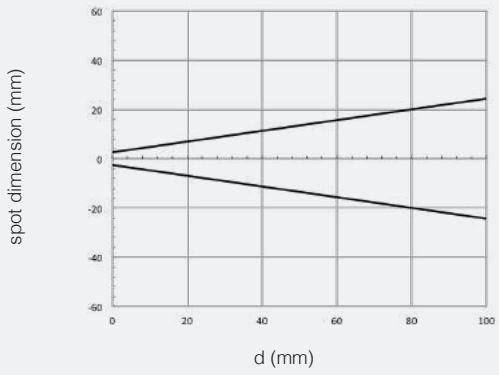
BN	brown
BU	blue
BK	black
WH	white
PK	pink
GY	gray

plug

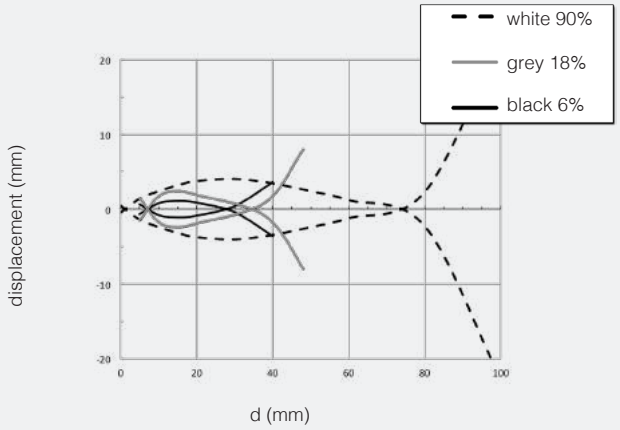
M12 diffuse reflection polarized receiver	M12 emitter with check	M12 emitter without check
		

response diagram

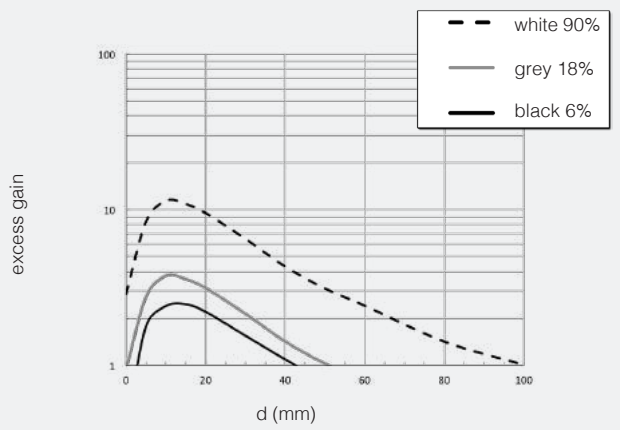
direct diffuse models

FAR2,FAR3/**-(0,1)* excess gain	FAR2,FAR3/**-(0,1)* spot dimension
	

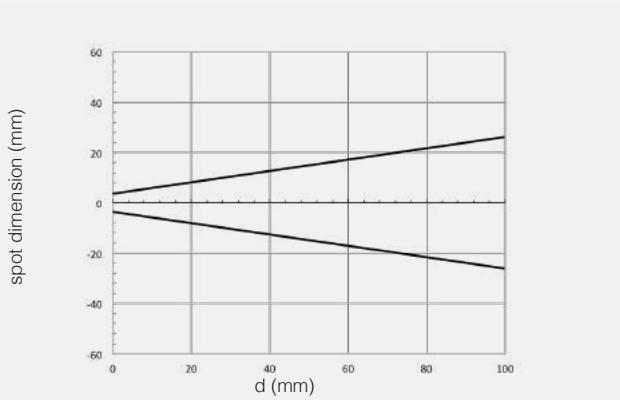
FAR2,FAR3/**-(0,1)* parallel displacement



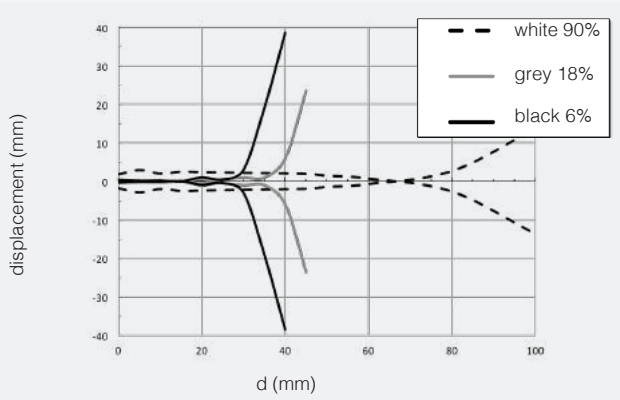
FAR2,FAR3/**-(2,3)* excess gain



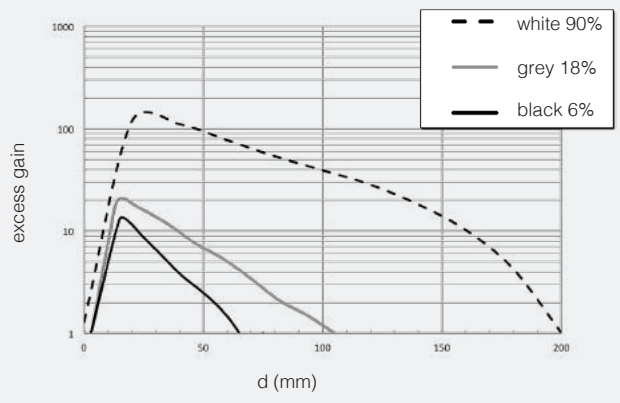
FAR2,FAR3/**-(2,3)* spot dimension



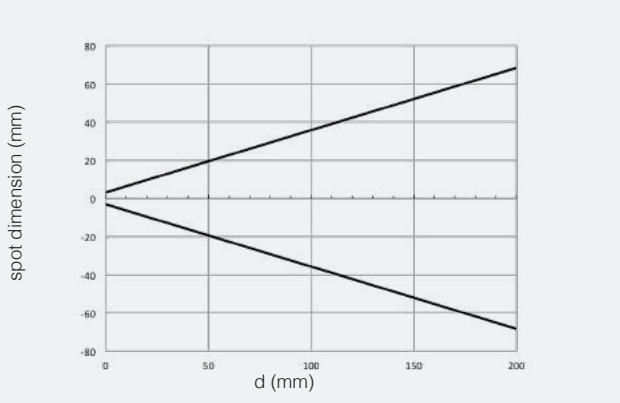
FAR2,FAR3/**-(2,3)* parallel displacement



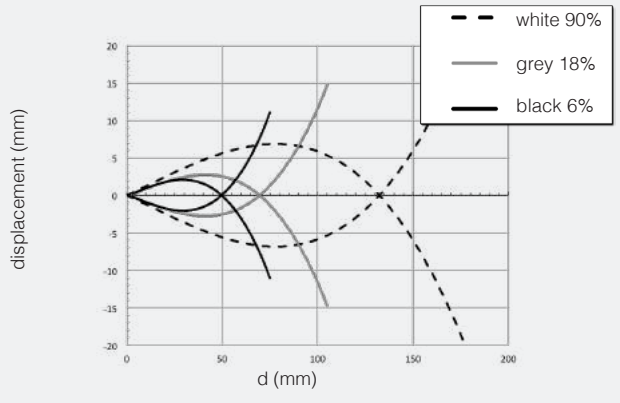
FAI4, FAI5/**-(0,1)* excess gain



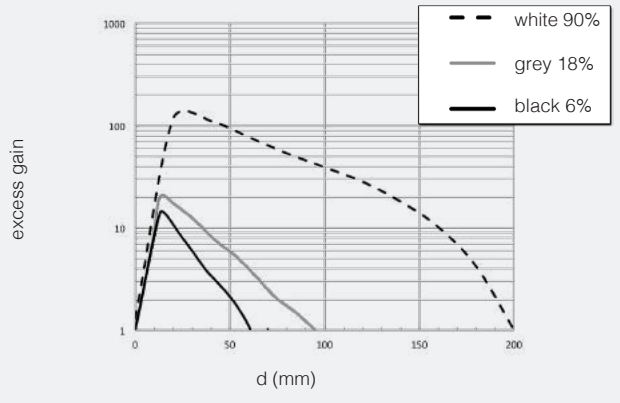
FAI4, FAI5/**-(0,1)* spot dimension



FAI4, FAI5/**-(0,1)* parallel displacement



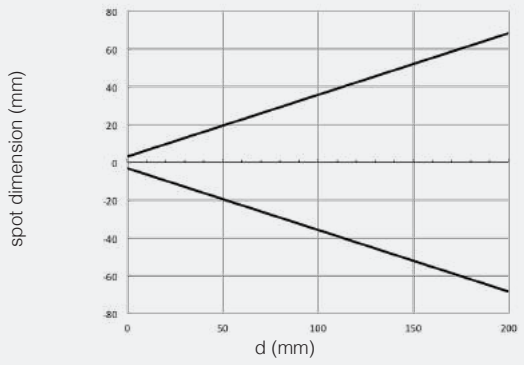
FAI4, FAI5/**-(2,3)* excess gain



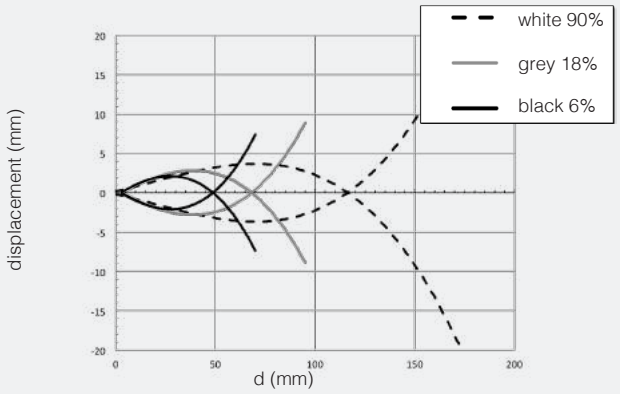
response diagrams

direct diffuse models

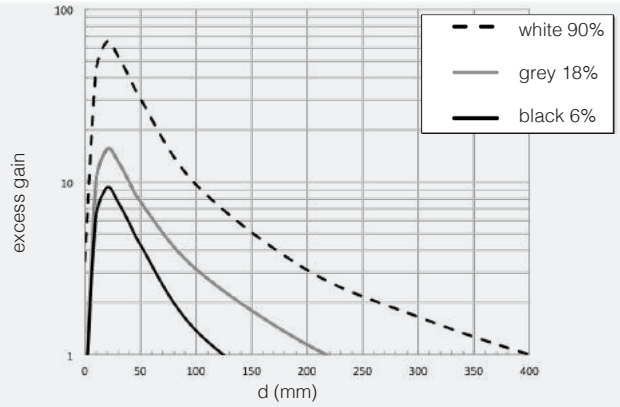
FAI4, FAI5/**-(2,3)* spot dimension



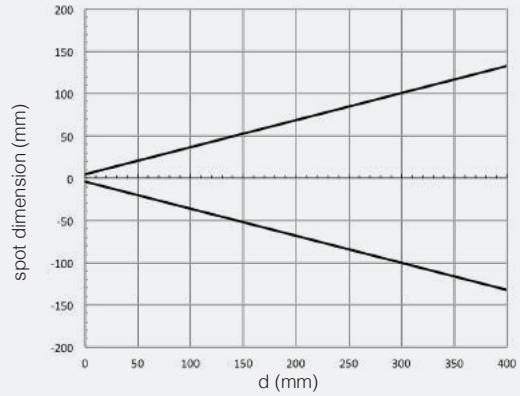
FAI4, FAI5/**-(2,3)* parallel displacement



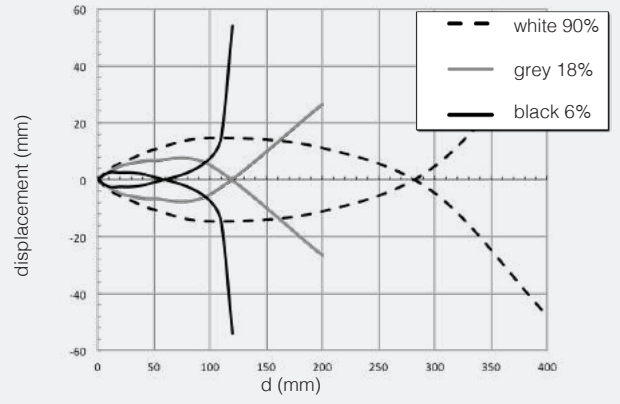
FAI6,FAI7/**-(0,1)* excess gain



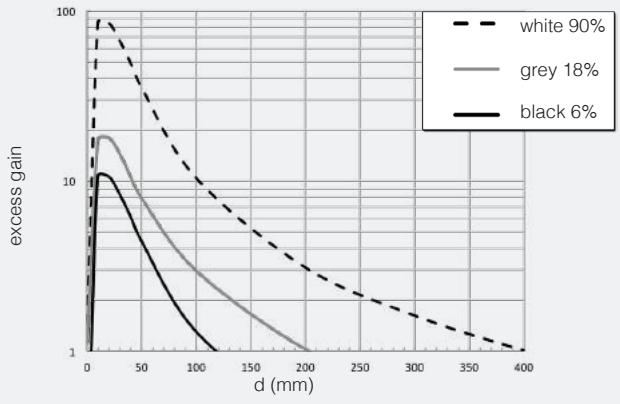
FAI6,FAI7/**-(0,1)* spot dimension



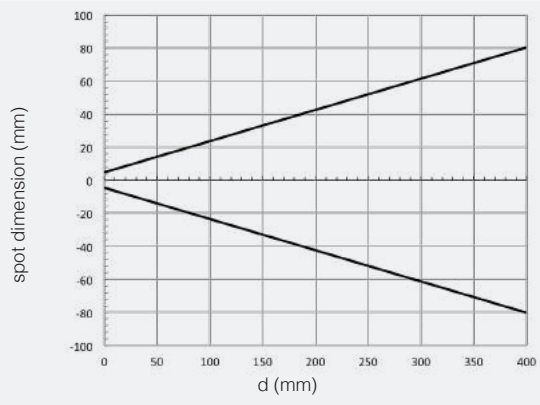
FAI6,FAI7/**-(0,1)*parallel displacement



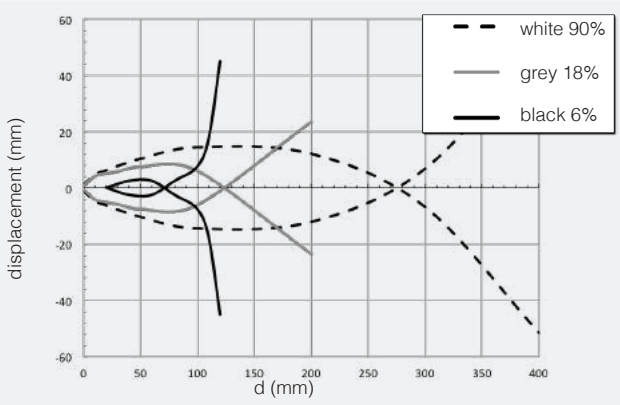
FAI6,FAI7/**-(2,3)* excess gain



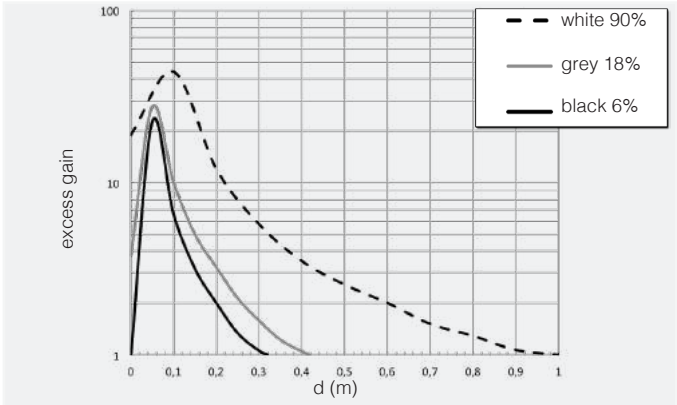
FAI6,FAI7/**-(2,3)* spot dimension



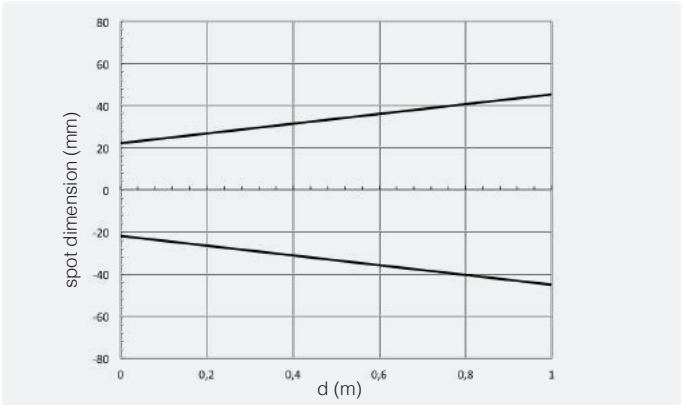
FAI6,FAI7/**-(2,3)* parallel displacement



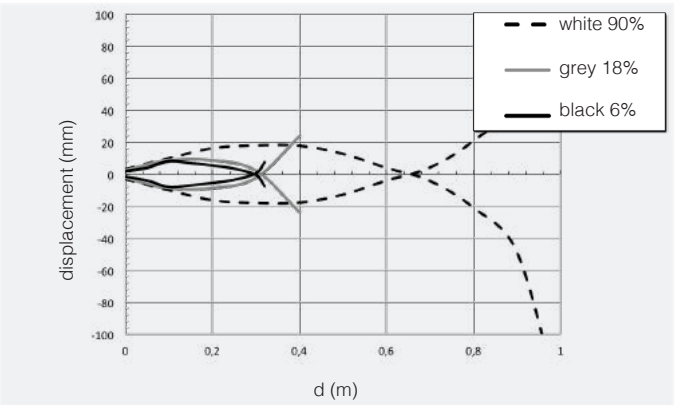
FAI8/**-(0,1)* excess gain



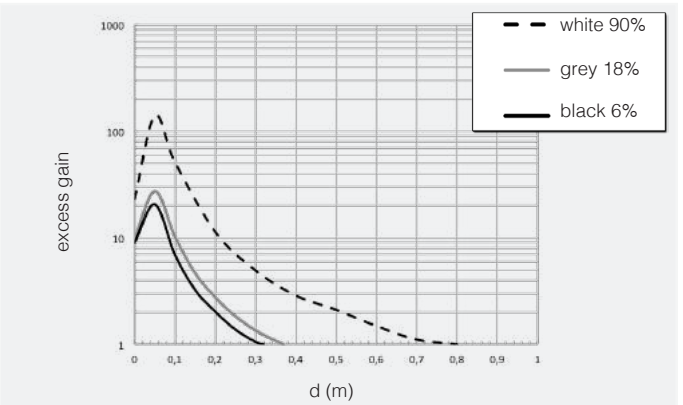
FAI8/**-(0,1)* spot dimension



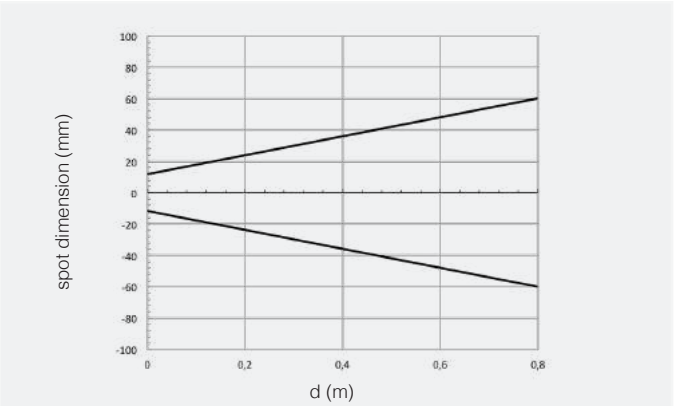
FAI8/**-(0,1)* parallel displacement



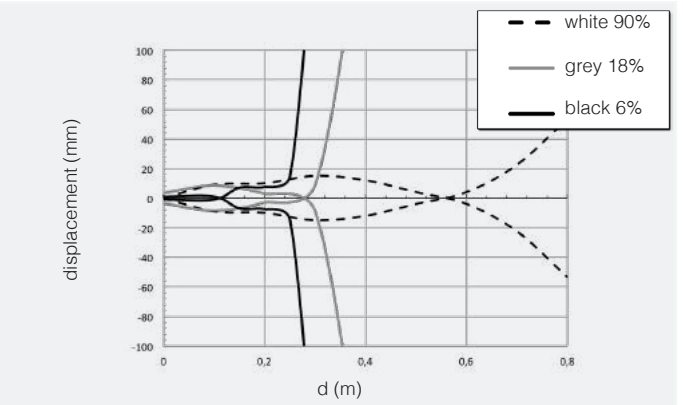
FAI8/**-(2,3)* excess gain



FAI8/**-(2,3)* spot dimension



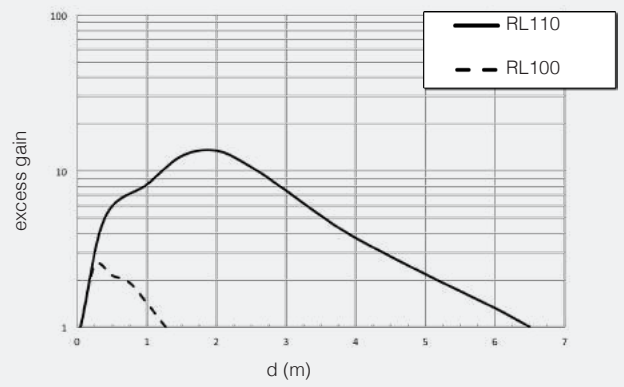
FAI8/**-(2,3)* parallel displacement



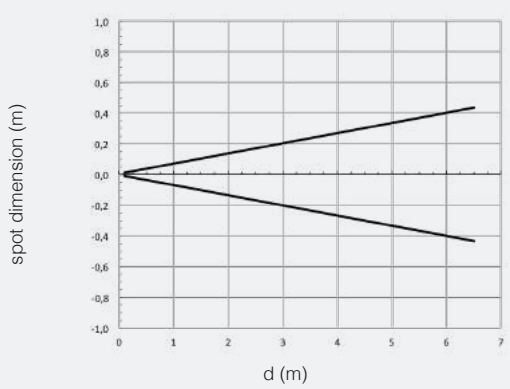
response diagrams

retro-reflective models

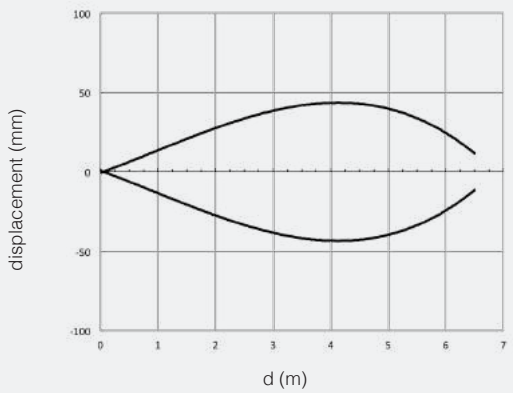
FAIC,FAIM/**-(0,1)* excess gain



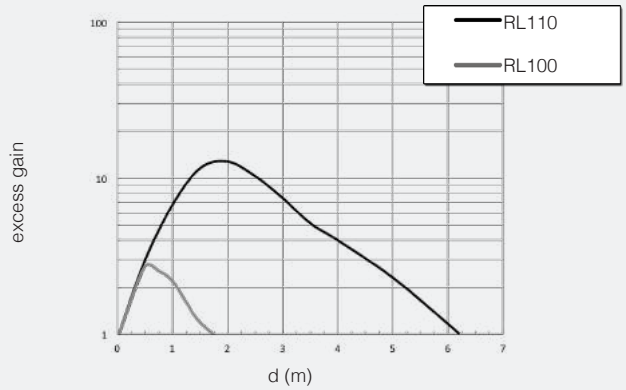
FAIC,FAIM/**-(0,1)* spot dimension



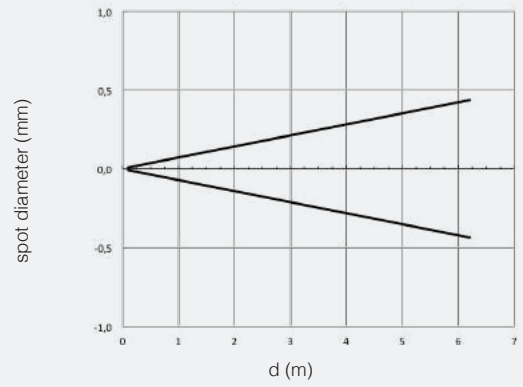
FAIC,FAIM/**-(0,1)* parallel displacement



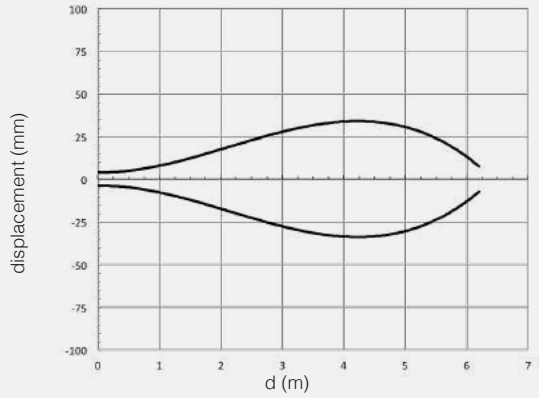
FAIC,FAIM/**-(2,3)* excess gain



FAIC,FAIM/**-(2,3)* dispot diameter



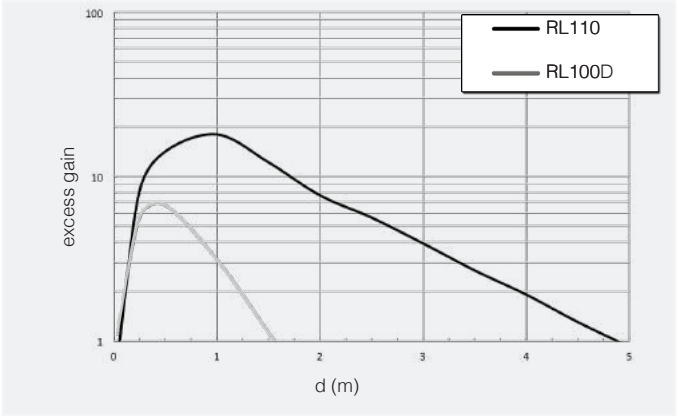
FAIC,FAIM/**-(2,3)* parallel displacement



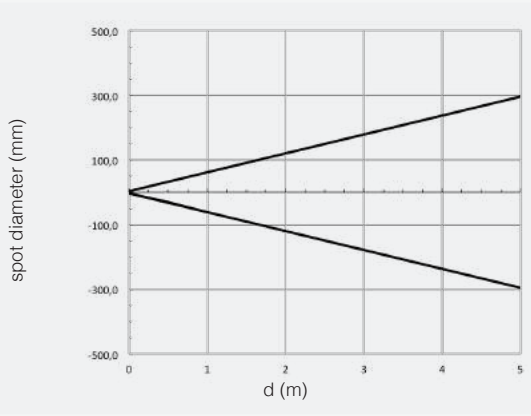
response diagrams

polarized models

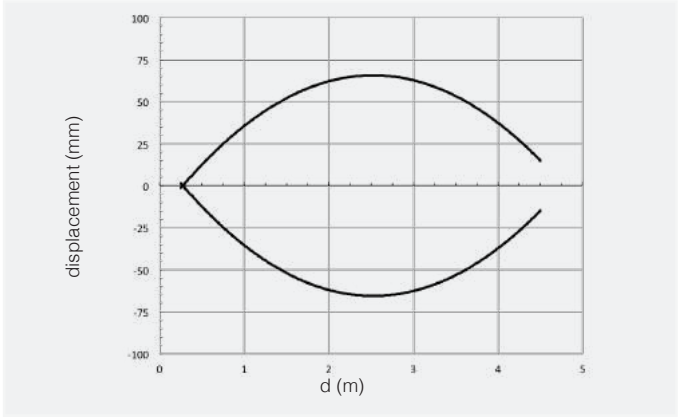
FARP,FARN/**-(0,1)* excess gain



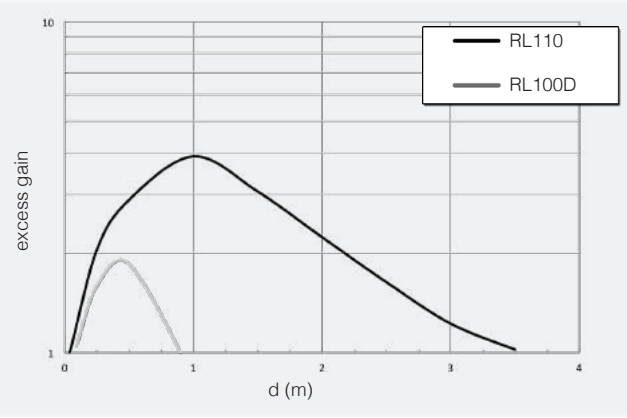
FARP,FARN/**-(0,1)* spot diameter



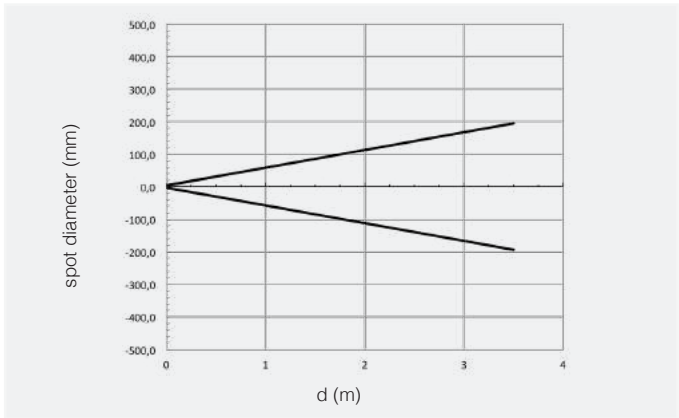
FARP,FARN/**-(0,1)* parallel displacement



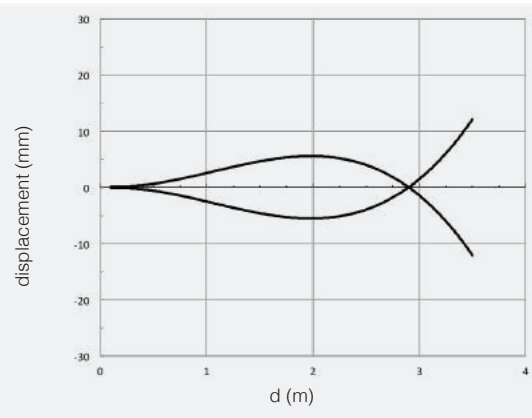
FARP,FARN/**-(2,3)* excess gain



FARP,FARN/**-(2,3)* spot diameter



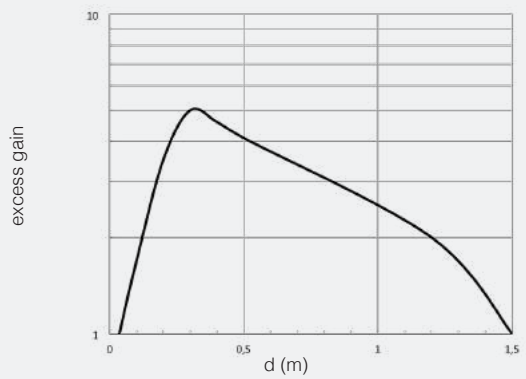
FARP,FARN/**-(2,3)* parallel displacement



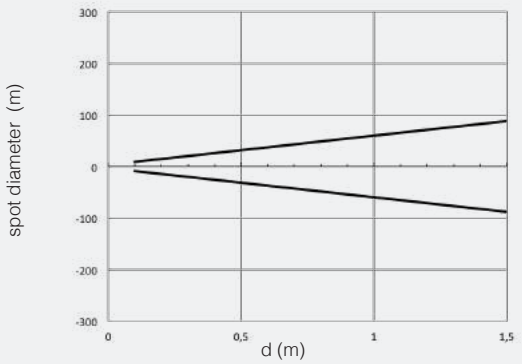
response diagrams

polarized models for transparent objects (diagrams calculated with RL110)

FARL/-* excess gain**



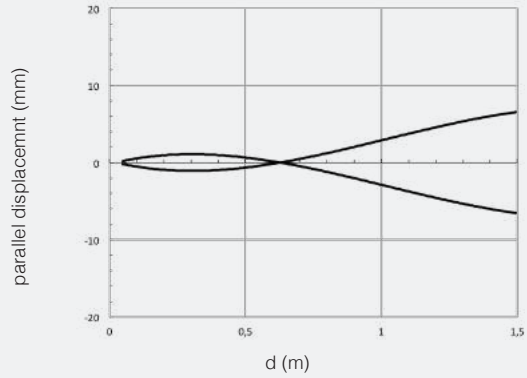
FARL/-* spot diameter**



response diagrams

polarized models for transparent objects

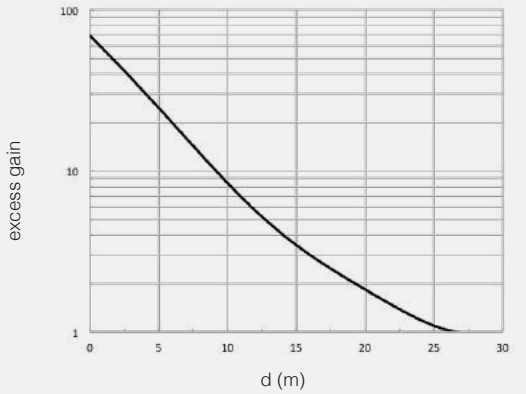
FARL/-* parallel displacement**



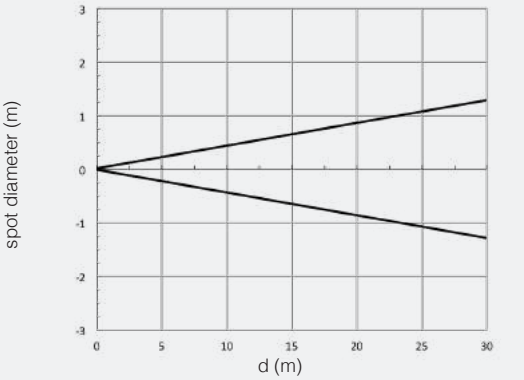
response diagrams

through beam models

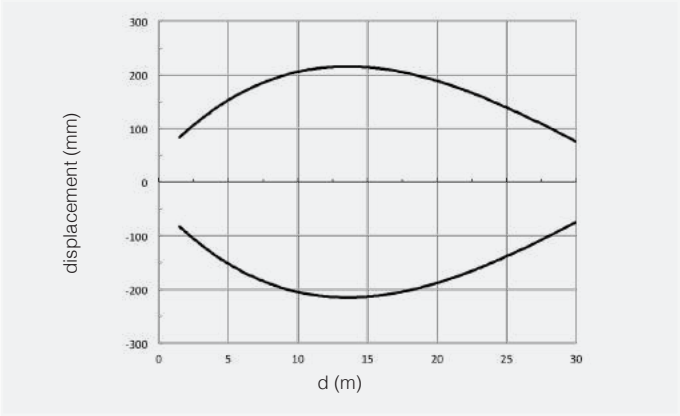
FAIH/-(0,1)* FAID/**-(0,1)*, excess gain**



FAIH/-(0,1)* FAID/**-(0,1)*, spot diameter**



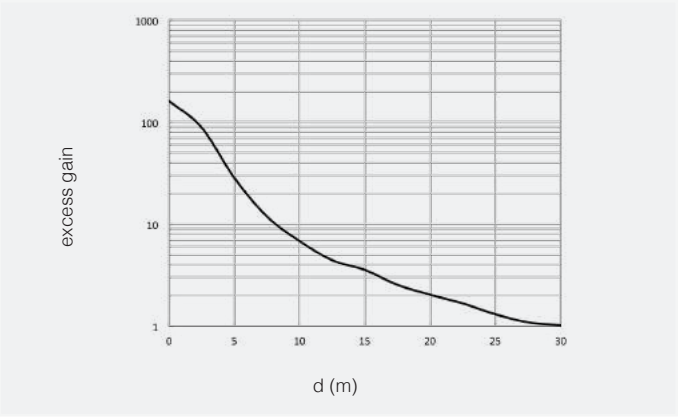
FAIH/**-(0,1)* FAID/**-(0,1)*, parallel displacement



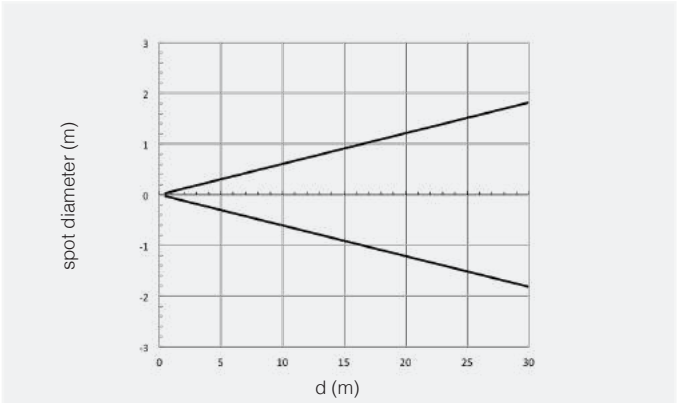
response diagrams

through beam models

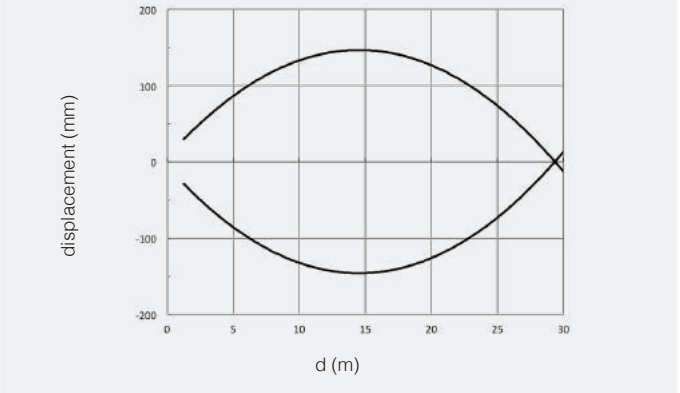
FAIH/**-(2,3)* FAID/**-(2,3)*, excess gain



FAIH/**-(2,3)* FAID/**-(2,3)*, spot diameter

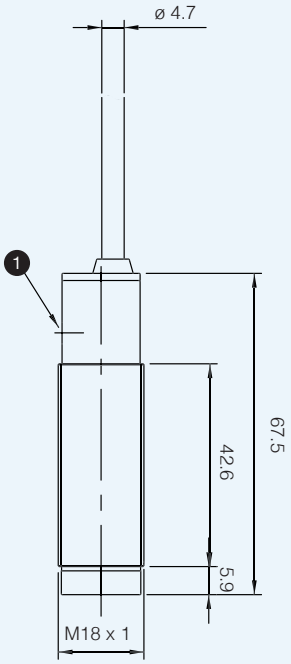


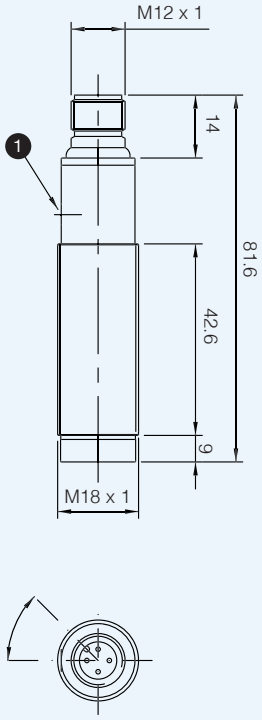
FAIH/**-(2,3)* FAID/**-(2,3)*, parallel displacement

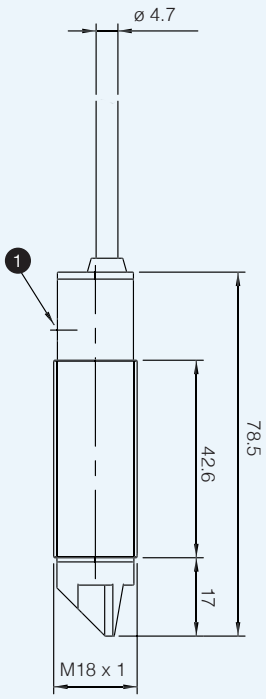


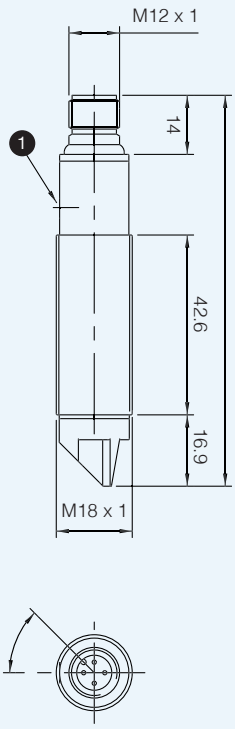
dimensions (mm)

FA**/**-0A; FA**-**1A	FA**/**-0E; FA**-**1E	FA**/**-2A; FA**-**3A	FA**/**-2E; FA**-**3E





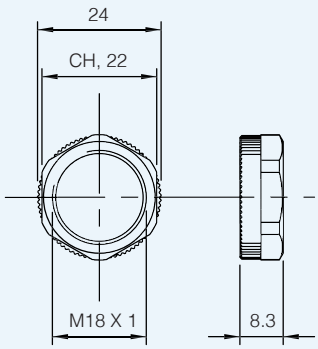




1 Trimmer for sensibility regulation

dimensions (mm)

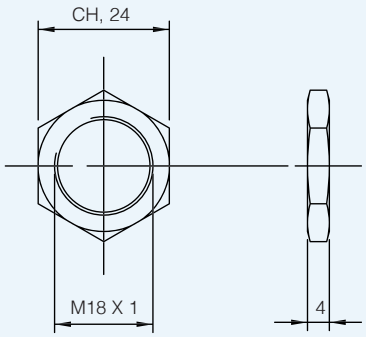
accessories included in all plastic models



plastic
nut (2 x)

dimensions (mm)

accessories included in all metallic models



metallic
nut (2 x)