

### Sensori fotoelettrici M18 DC serie FA

#### M18 photoelectric sensors DC FA series



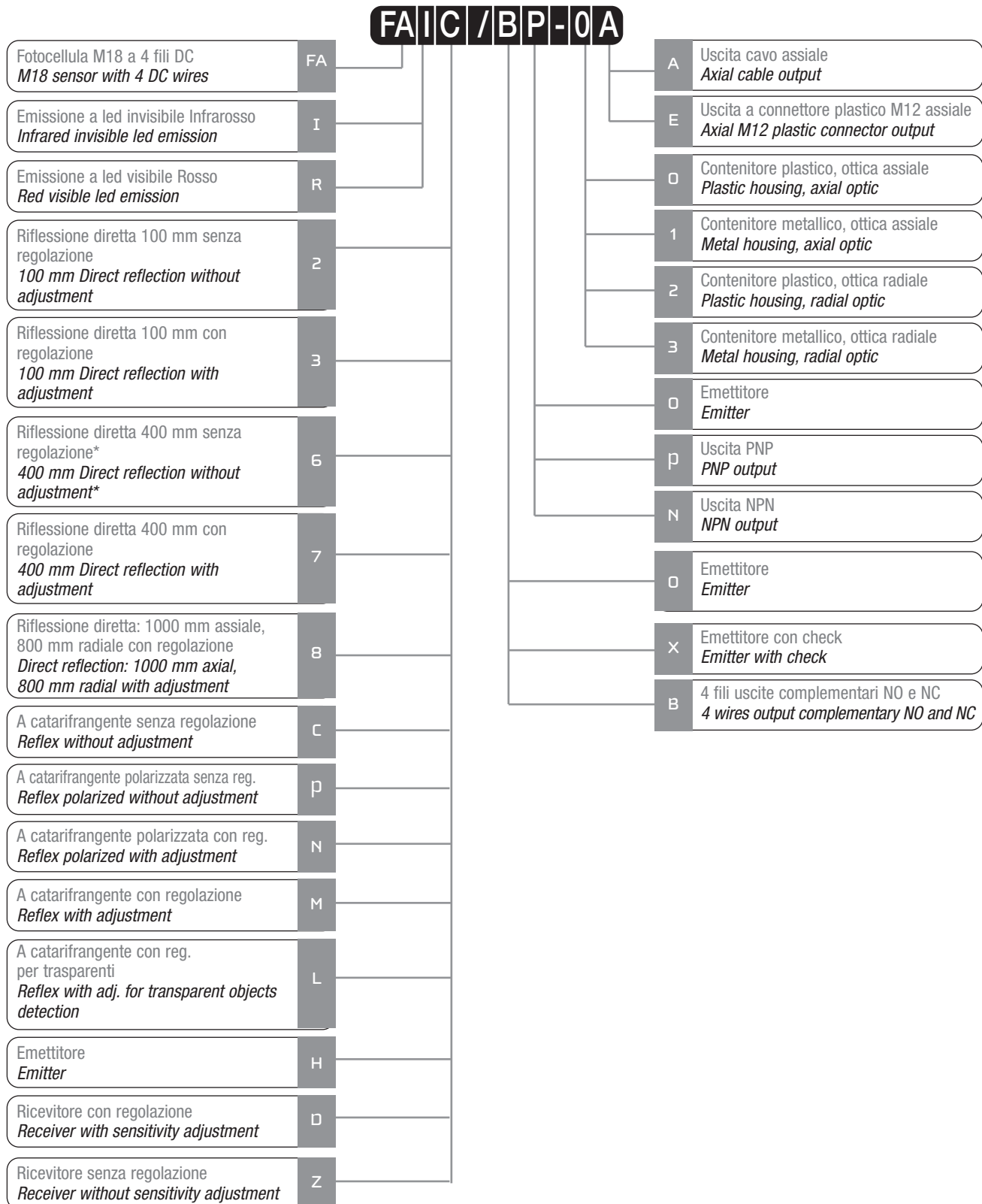
#### Caratteristiche principali Main features

- > Serie completa di sensori M18 con alimentazione 10-30 Vcc
- > *Complete range of M18 sensors with 10-30 Vdc power supply*
- > Ottica assiale e radiale con superficie piatta
- > *Axial and radial optic with flat surface*
- > Modelli a riflessione per la lettura di oggetti trasparenti, ad emissione rossa
- > *Retro-reflective models for transparent objects detection, with red emission*
- > Grado di protezione IP67
- > *IP67 protection*

 Disponibili, su richiesta, modelli ATEX, cat. 3  
*ATEX models, cat. 3, available on request*

- > Corpo metallico o plastico
- > *Metallic or plastic housing*
- > Regolazione di sensibilità disponibile per tutti i modelli
- > *Sensitivity adjustment available for all models*
- > Protezione totale contro i danneggiamenti di tipo elettrico
- > *Total protection against any type of electric damages*
- > Approvazioni: CE e cULus listed
- > *Approvals: CE and cULus listed*

### Descrizione del codice - Code structure



### Modelli disponibili - Available models

Funzione Model	Portata Distance	Corpo Housing	Regol. Adj.	Optica assiale / Axial optic		Optica radiale / Right angle optic		
				4 fili / 4 wires NPN NO+NC	4 fili / 4 wires PNP NO+NC	4 fili / 4 wires NPN NO+NC	4 fili / 4 wires PNP NO+NC	
Tasteggio diretto Diffuse reflection	100 mm	Plastico Plastic	No	FAR2/BN-0A	FAR2/BP-0A	FAR2/BN-2A	FAR2/BP-2A	
			Si / Yes	FAR3/BN-0A	FAR3/BP-0A	FAR3/BN-2A	FAR3/BP-2A	
		Metallico Metal	No	FAR2/BN-1A	FAR2/BP-1A	FAR2/BN-3A	FAR2/BP-3A	
			Si / Yes	FAR3/BN-1A	FAR3/BP-1A	FAR3/BN-3A	FAR3/BP-3A	
	400 mm	Plastico Plastic	No	FAI6/BN-0A	FAI6/BP-0A	FAI6/BN-2A	FAI6/BP-2A	
			Si / Yes	FAI7/BN-0A	FAI7/BP-0A	FAI7/BN-2A	FAI7/BP-2A	
		Metallico Metal	No	FAI6/BN-1A	FAI6/BP-1A	FAI6/BN-3A	FAI6/BP-3A	
			Si / Yes	FAI7/BN-1A	FAI7/BP-1A	FAI7/BN-3A	FAI7/BP-3A	
	1000 mm (assiale/axial) 800 mm (90°)	Plastico Plastic	Si / Yes	FAI8/BN-0A	FAI8/BP-0A	FAI8/BN-2A	FAI8/BP-2A	
		Metallico Metal	Si / Yes	FAI8/BN-1A	FAI8/BP-1A	FAI8/BN-3A	FAI8/BP-3A	
	Catarifrangente Retroreflective	4 m	Plastico Plastic	No	FAIC/BN-0A	FAIC/BP-0A	FAIC/BN-2A	FAIC/BP-2A
				Si / Yes	FAIM/BN-0A	FAIM/BP-0A	FAIM/BN-2A	FAIM/BP-2A
Metallico Metal			No	FAIC/BN-1A	FAIC/BP-1A	FAIC/BN-3A	FAIC/BP-3A	
			Si / Yes	FAIM/BN-1A	FAIM/BP-1A	FAIM/BN-3A	FAIM/BP-3A	
Polarizzata Polarized	3 m	Plastico Plastic	No	FARP/BN-0A	FARP/BP-0A	FARP/BN-2A	FARP/BP-2A	
			Si / Yes	FARN/BN-0A	FARN/BP-0A	FARN/BN-2A	FARN/BP-2A	
		Metallico Metal	No	FARP/BN-1A	FARP/BP-1A	FARP/BN-3A	FARP/BP-3A	
			Si / Yes	FARN/BN-1A	FARN/BP-1A	FARN/BN-3A	FARN/BP-3A	
Trasparenti Transparents	0,1...1 m	Plastico / Plastic	Si / Yes	FARL/BN-0A	FARL/BP-0A	FARL/BN-2A	FARL/BP-2A	
		Metallico / Metal	Si / Yes	FARL/BN-1A	FARL/BP-1A	FARL/BN-3A	FARL/BP-3A	
Barriera Through-beam	20 m (assiale/axial)	Plastico Plastic	Emettit.	FAIH/00-0A		FAIH/00-2A		
			Em+check	FAIH/X0-0A		FAIH/X0-2A		
			Ricev.	FAIZ/BN-0A	FAIZ/BP-0A	FAIZ/BN-2A	FAIZ/BP-2A	
			Receiv. reg.	FAID/BN-0A	FAID/BP-0A	FAID/BN-2A	FAID/BP-2A	
	15 m (90°)	Metallico Metal	Emettit.	FAIH/00-1A		FAIH/00-3A		
			Em+check	FAIH/X0-1A		FAIH/X0-3A		
			Ricev.	FAIZ/BN-1A	FAIZ/BP-1A	FAIZ/BN-3A	FAIZ/BP-3A	
			Receiv. reg.	FAID/BN-1A	FAID/BP-1A	FAID/BN-3A	FAID/BP-3A	

Funzione <i>Model</i>	Portata <i>Distance</i>	Corpo <i>Housing</i>	Regol. <i>Adj.</i>	Ottica assiale / <i>Axial optic</i>		Ottica radiale / <i>Right angle optic</i>	
				4 fili / <i>4 wires</i> NPN NO+NC	4 fili / <i>4 wires</i> PNP NO+NC	4 fili / <i>4 wires</i> NPN NO+NC	4 fili / <i>4 wires</i> PNP NO+NC
Tasteggio diretto <i>Diffuse reflection</i>	100 mm	Plastico <i>Plastic</i>	No	FAR2/BN-0E	FAR2/BP-0E	FAR2/BN-2E	FAR2/BP-2E
			Si / Yes	FAR3/BN-0E	FAR3/BP-0E	FAR3/BN-2E	FAR3/BP-2E
		Metallico <i>Metal</i>	No	FAR2/BN-1E	FAR2/BP-1E	FAR2/BN-3E	FAR2/BP-3E
			Si / Yes	FAR3/BN-1E	FAR3/BP-1E	FAR3/BN-3E	FAR3/BP-3E
	400 mm	Plastico <i>Plastic</i>	No	FAI6/BN-0E	FAI6/BP-0E	FAI6/BN-2E	FAI6/BP-2E
			Si / Yes	FAI7/BN-0E	FAI7/BP-0E	FAI7/BN-2E	FAI7/BP-2E
		Metallico <i>Metal</i>	Si / Yes	FAI7/BN-1E	FAI7/BP-1E	FAI6/BN-3E	FAI6/BP-3E
1000 mm (assiale/ <i>axial</i> ) 800 mm (90°)	Plastico <i>Plastic</i>	Si / Yes	FAI8/BN-0E	FAI8/BP-0E	FAI8/BN-2E	FAI8/BP-2E	
	Metallico <i>Metal</i>	Si / Yes	FAI8/BN-1E	FAI8/BP-1E	FAI8/BN-3E	FAI8/BP-3E	
Catarifrangente <i>Retroreflective</i>	4 m	Plastico <i>Plastic</i>	No	FAIC/BN-0E	FAIC/BP-0E	FAIC/BN-2E	FAIC/BP-2E
			Si / Yes	FAIM/BN-0E	FAIM/BP-0E	FAIM/BN-2E	FAIM/BP-2E
		Metallico <i>Metal</i>	No	FAIC/BN-1E	FAIC/BP-1E	FAIC/BN-3E	FAIC/BP-3E
			Si / Yes	FAIM/BN-1E	FAIM/BP-1E	FAIM/BN-3E	FAIM/BP-3E
Polarizzata <i>Polarized</i>	3 m	Plastico <i>Plastic</i>	No	FARP/BN-0E	FARP/BP-0E	FARP/BN-2E	FARP/BP-2E
			Si / Yes	FARN/BN-0E	FARN/BP-0E	FARN/BN-2E	FARN/BP-2E
		Metallico <i>Metal</i>	No	FARP/BN-1E	FARP/BP-1E	FARP/BN-3E	FARP/BP-3E
			Si / Yes	FARN/BN-1E	FARN/BP-1E	FARN/BN-3E	FARN/BP-3E
Trasparenti <i>Transparents</i>	0,1...1 m	Plastico / <i>Plastic</i>	Si / Yes	FARL/BN-0E	FARL/BP-0E	FARL/BN-2E	FARL/BP-2E
		Metallico / <i>Metal</i>	Si / Yes	FARL/BN-1E	FARL/BP-1E	FARL/BN-3E	FARL/BP-3E
Barriera <i>Through-beam</i>	20 m (Assiale <i>/ Axial</i> )	Plastico <i>Plastic</i>	Emettit.	FAIH/00-0E		FAIH/00-2E	
			Em+check	FAIH/X0-0E		FAIH/X0-2E	
			Ricev.	FAIZ/BN-0E	FAIZ/BP-0E	FAIZ/BN-2E	FAIZ/BP-2E
			Receiv. reg.	FAID/BN-0E	FAID/BP-0E	FAID/BN-2E	FAID/BP-2E
	15 m (90°)	Metallico <i>Metal</i>	Emettit.	FAIH/00-1E		FAIH/00-3E	
			Em+check	FAIH/X0-1E		FAIH/X0-3E	
			Ricev.	FAIZ/BN-1E	FAIZ/BP-1E	FAIZ/BN-3E	FAIZ/BP-3E
			Receiv. reg.	FAID/BN-1E	FAID/BP-1E	FAID/BN-3E	FAID/BP-3E

# SENSORI FOTOELETTRICI CILINDRICI - SERIE FA

## FA SERIES - CYLINDRICAL PHOTOELECTRIC SENSORS

Fotocellula M18 a catarifrangente per oggetti trasparenti  
M18 retroreflective photoelectric sensor for transparent objects

Funzione / Model	Portata Distance	Corpo / Housing	4 fili / 4 wires NO+NC NPN		4 fili / 4 wires NO+NC PNP	
			Cavo Cable	Connettore Plug	Cavo Cable	Connettore Plug
Catarifrangente Retro-reflective	0,1...1 m	Plastico assiale / Axial plastic	FARL/BN-0A	FARL/BN-0E	FARL/BP-0A	FARL/BP-0E
		Metallico assiale / Axial metal	FARL/BN-1A	FARL/BN-1E	FARL/BP-1A	FARL/BP-1E
		Plastico 90° / 90° plastic	FARL/BN-2A	FARL/BN-2E	FARL/BP-2A	FARL/BP-2E
		Metallico 90° / 90° metal	FARL/BN-3A	FARL/BN-3E	FARL/BP-3A	FARL/BP-3E

Modello / Model	Emissione LED rossa / Red LED emission		Emissione LED infrarossa / Infrared Led emission		
	FAR2/B*..**	FAR3/B*..**	FAI6/B*..**	FAI7/B*..**	FAI8/B*..**
Distanza di rilevazione nominale Nominal sensing distance	100 mm <sup>(1)</sup>	100 mm <sup>(1)</sup>	400 mm <sup>(2)</sup>	400 mm <sup>(2)</sup>	1000 mm <sup>(3)</sup> (assiale / axial) 800 mm <sup>(3)</sup> (90°)
Emissione / Emission	Rosso / Red (660 nm)		Infrarosso / Infrared (880 nm)		
Corsa differenziale / Differential travel	≤ 10%				
Ripetibilità / Repeat accuracy	5%				
Tensione alimentazione / Operating voltage	10-30 Vc.c./Vd.c.				
Ondulazione residua / Ripple	≤ 10%				
Corrente assorbita / No load supply current	30 mA				
Corrente di uscita / Load current	100 mA				
Corrente di perdita / Leakage current	10 µA				
Caduta di tensione in uscita / Output voltage drop	2 Vmax. IL = 100 mA				
Tipo uscita / Output type	NPN o / or PNP NO+NC				
Frequenza di commutazione / Switching frequency	250 Hz				
Ritardo alla disponibilità / Time delay before availability	200 ms				
Protezione elettriche alimentazione Supply electrical protections	Inversione di polarità, sovratensioni impulsive Polarity reversal, impulsive overvoltage				
Protezione elettriche uscita / Protection electrical output	Cortocircuito (autoripristinante) / Short circuit (autoreset) Overvoltage				
Regolazione di sensibilità / Sensitivity adjustment	No	Si / Yes	NO	Si / Yes	Si / Yes
Limiti di temperatura operativa / Operative temperature range	-25°C... +70°C (senza condensa / without freeze)				
Deriva termica / Temperature drift	10% Sr				
Interferenza alla luce esterna Interference external light	5000 lux (lampada ad incandescenza) - 10000 lux (luce solare) 5000 lux (incandescence lamp) - 10000 lux (sun light)				
Grado di protezione / Protection degree	IP67 (EN60529) <sup>(4)</sup>				
Compatibilità elettromagnetica EMC	Accordo / According to EN50082-2; 1995; EN60947-5-2; 1999 Accordo / According to EN50081-1; 1993				
Indicatori LED LED indicators	Giallo (Stato luce) o (stato dell'uscita nelle versioni speciali LO/DO) Yellow (Light status) or (output status in the LO/DO special versions)				
Materiale contenitore Housing material	PBT (plastico / plastic) / Ottone nichelato-nicked plated brass (metallico / metallic) / PC (passacavo / cable exit)				
Materiale ottica / Optic material	PC				

<sup>(1)</sup> Con ostacolo bianco kodak 90% 100 x 100 mm / White target kodak 90% reflection 100 x 100 mm

<sup>(2)</sup> Con ostacolo bianco kodak 90% 200 x 200 mm / White target kodak 90% reflection 200 x 200 mm

<sup>(3)</sup> Con ostacolo bianco kodak 90% 400 x 400 mm / White target kodak 90% reflection 400 x 400 mm

<sup>(4)</sup> Protezione garantita solo con il cavo a connettore correttamente montato / Protection guaranteed only with plug cable well mounted

	Catarifrangente Retroreflective		Polarizzata Polarized		Letture trasparente Transparent objects detection
	FAIC/B*_*** <sup>(1)</sup>	FAIM/B*_*** <sup>(1)</sup>	FARP/B*_*** <sup>(1)</sup>	FARN/B*_*** <sup>(1)</sup>	FARL*/B*_*** <sup>(2)</sup>
<b>Modelli / Models</b>					
Distanza di rilevazione nominale <i>Nominal sensing distance</i>	4 m		3 m assiali / <i>axial</i> 2 m radiale / <i>radial</i>		1 m
Emissione / <i>Emission</i>	Infrarosso / <i>Infrared</i> (880 nm)		Rosso / <i>Red</i> (660 nm)		
Corsa differenziale / <i>Differential travel</i>	≤ 10%				
Ripetibilità / <i>Repeat accuracy</i>	5%				
Tensione alimentazione / <i>Operating voltage</i>	10-30 Vcc / <i>Vdc</i>				
Ondulazione residua / <i>Ripple</i>	≤ 10%				
Corrente assorbita / <i>No load supply current</i>	30 mA				
Corrente di uscita / <i>Load current</i>	100 mA				
Corrente di perdita / <i>Leakage current</i>	≤ 10 µA				
Caduta di tensione in uscita / <i>Output voltage drop</i>	2 Vmax. I <sub>L</sub> = 100mA				
Tipo uscita / <i>Output type</i>	NPN 0 / <i>or</i> PNP NO+NC				
Frequenza di commutazione / <i>Switching frequency</i>	250 Hz				
Ritardo alla disponibilità / <i>Time delay before availability</i>	200 ms				
Protezione elettriche alimentazione <i>Supply electrical protections</i>	Inversione di polarità, sovratensioni impulsive <i>Polarity reversal, transient</i>				
Protezione elettriche uscita / <i>Protection electrical output</i>	Cortocircuito (autoprismante) / <i>Short circuit (autoreset) Overvoltage</i>				
Regolazione di sensibilità <i>Sensitivity adjustment</i>	No	Si / Yes Trimmer	No	Si / Yes Trimmer	Si / Yes Trimmer
Limiti di temperatura operativa / <i>Operative temperature range</i>	-25°... +70° (senza condensa / <i>without freeze</i> )				
Deriva termica / <i>Temperature drift</i>	10% Sr				
Compatibilità elettromagnetica <i>EMC</i>	Accordo / <i>According to</i> EN50082-2; 1995; EN60647-5-2; 1999 Accordo / <i>According to</i> EN50081-1; 1993				
Interferenza alla luce esterna <i>Interference external light</i>	5000 lux (lampada ad incandescenza / <i>incandescence lamp</i> ) 10000 lux (luce solare / <i>sunlight</i> )				
Grado di protezione / <i>Protection degree</i>	IP67 (EN60529) <sup>(3)</sup>				
Indicatori LED <i>LED indicators</i>	Giallo / <i>Yellow</i> (Stato luce o stato dell'uscita nelle versioni speciali <i>LO/DO / Light state or status of the LO/DO output in special versions</i> )				
Materiale contenitore <i>Housing material</i>	PBT (plastico / <i>plastic</i> ) / Ottone nichelato- <i>Nicked plated brass</i> (metallico / <i>metallic</i> ) PC (passacavo / <i>cable exit</i> )				
Materiale ottica / <i>Optic material</i>	PC		Plastico / <i>Plastic</i>		PC

<sup>(1)</sup> Con riflettore RL 110 / *With RL 110 reflector*

<sup>(2)</sup> Con riflettore RL 113G o RL 116 / *With RL 113G or RL 116 reflector*

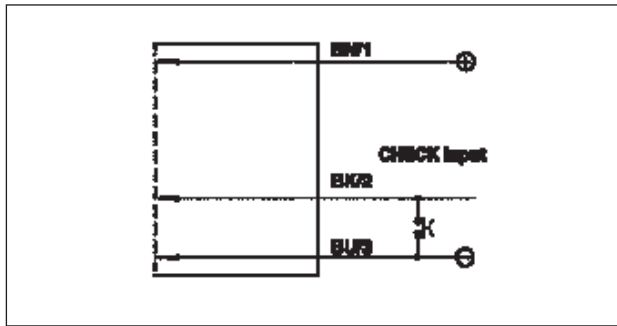
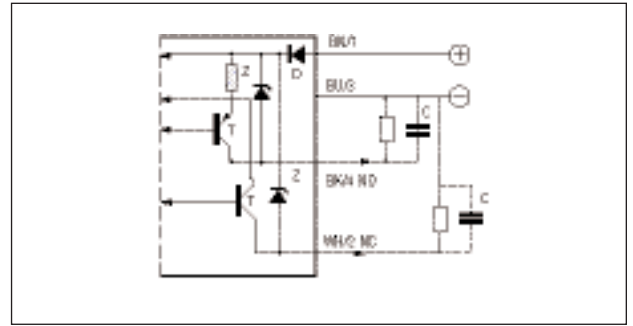
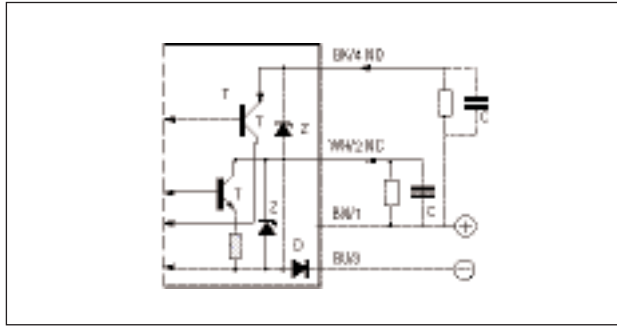
<sup>(3)</sup> Protezione garantita solo con il cavo a connettore correttamente montato / *Protection guaranteed only with plug cable well mounted*

Modelli / Models	Proiettore / Emitter		Ricevitore / Receiver	
	FAIH/XO-**	FAIH/OO-**	FAIZ/B*-**	FAID/B*-**
Distanza di rilevazione nominale <i>Nominal sensing distance</i>	20 m modello assiale / 15 m modello radiale <i>20 m axial model / 15 m right angle model</i>			
Emissione / Emission	Infrarosso (880 nm) / Infrared (880 nm)			
Corsa differenziale / Differential travel	≤ 10%			
Ripetibilità / Repeat accuracy	5%			
Tensione alimentazione / Operating voltage	10-30 Vcc / 10-30 Vdc			
Ondulazione residua / Ripple	≤ 10%			
Corrente assorbita / No load supply current	25 mA			
Corrente di uscita / Load current	100 mA			
Corrente di perdita / Leakage current	≤ 10 µA a Vmax			
Caduta di tensione in uscita / Output voltage drop	2 Vmax. I <sub>L</sub> = 100mA			
Tipo uscita / Output type	NPN o / or PNP NO+NC			
Frequenza di commutazione / Switching frequency	250 Hz			
Ritardo alla disponibilità <i>Time delay before availability</i>	200 ms			
Protezione elettriche alimentazione <i>Supply electrical protections</i>	Inversione di polarità, sovratensioni impulsive <i>Impulsive overvoltage polarity reversal</i>			
Protezione elettriche uscita <i>Protection electrical output</i>	Cortocircuito (autoripristinante) <i>Short circuit (autoreset) - Overvoltage</i>			
Regolazione di sensibilità / Sensitivity adjustment	No	No	Si / Yes trimmer	
Limiti di temperatura operativa / Operative Temperature range	-25°C ... +70°C (senza condensa / without freeze)			
Deriva termica / Temperature drift	10% sr			
Ingresso di test <i>Check input</i>	BK/2 collegato a 0 V spegne l'emissione <i>BK/2 connected to 0 V switches off the emission</i>			
Compatibilità elettromagnetica <i>EMC</i>	Accordo / According to EN50082-2; 1995/EN60947-5-2; 1999 Accordo / According to EN50081-1; 1993			
Interferenza alla luce esterna <i>Interference external light</i>	5000 lux (lampada ad incandescenza / incandescence lamp) 10000 lux (luce solare / sunlight)			
Grado di protezione / Protection degree	IP67 (EN60529) <sup>(1)</sup>			
Indicatori LED / LED indicators	Verde (alimentazione ON) <i>Green (power ON)</i>		Giallo (stato luce o stato dell'uscita nelle versioni LO/DO) <i>Yellow (light state or output status in the special LO/DO versions)</i>	

<sup>(1)</sup> Protezione garantita solo con il cavo a connettore correttamente montato / Protection guaranteed only with plug cable well mounted

### Schemi elettrici delle connessioni - Electrical diagrams of the connections

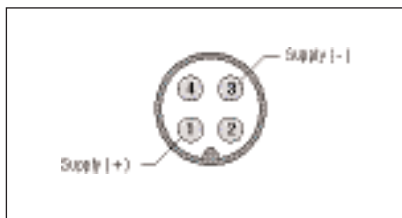
> Uscita complementare NO + NC - NO + NC Complementary output



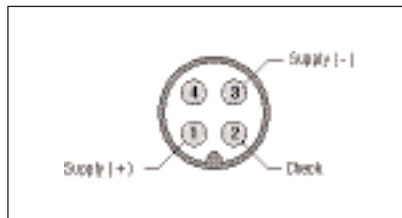
#### Legenda Key

- BN → marrone/brown
- BK → nero/black
- PK → rosa/pink
- BU → blu/blue
- WH → bianco/white
- GY → grigio/gray

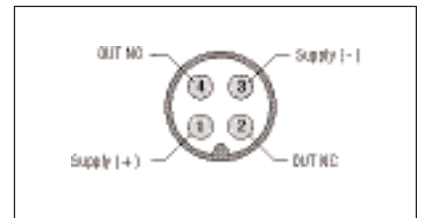
M12 Emittitore senza check  
Emitter without check



M12 Emittitore con check  
Emitter with check



M12 Modello / Model FA\*\*/B\*\*\*  
Tasteggio diretto / Diffuse reflection  
Polarizzata / Polarized  
Ricevitore / Receiver



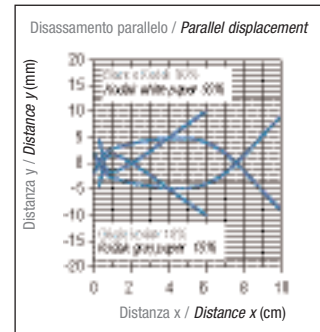
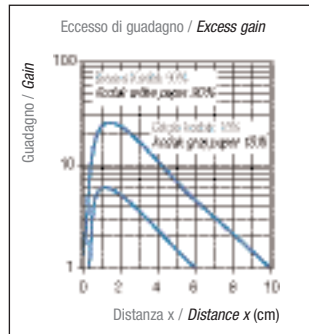
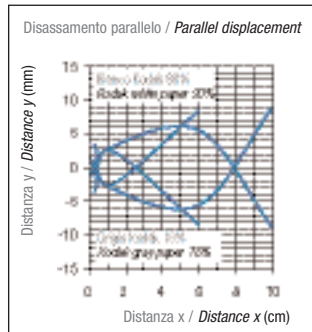
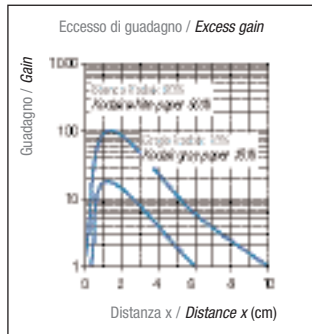


### Curva di risposta - Response diagram

> Modelli a diffusione diretta - Direct diffuse models

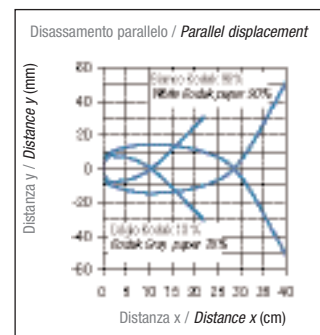
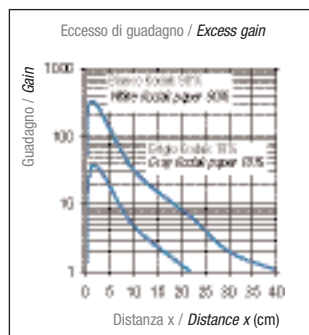
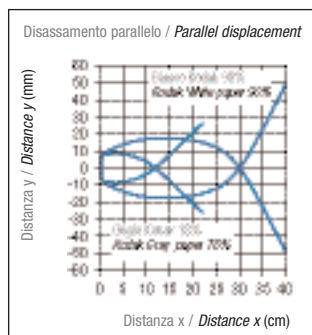
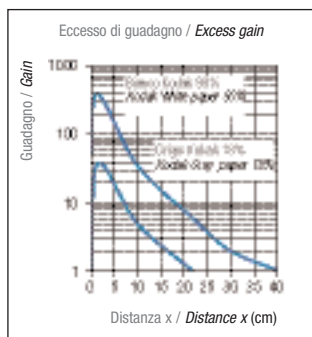
Modelli / Models: FAR2/\*\*\_\*\* FAR3/\*\*\_\*\*

Modelli / Models: FAR2/\*\*\_\*\* FAR3/\*\*\_\*\*



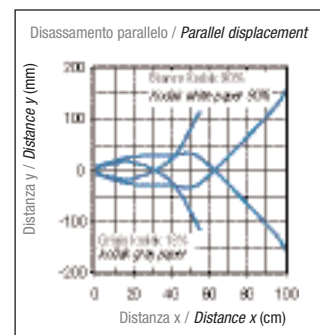
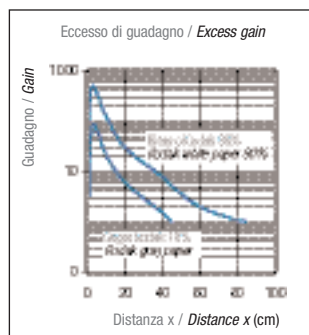
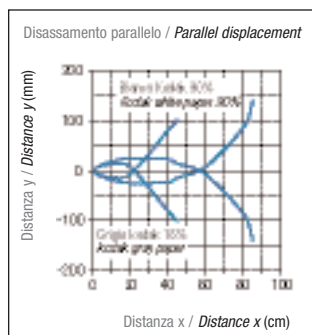
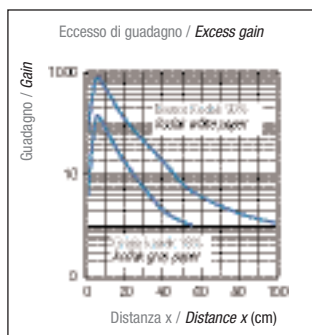
Modelli / Models: FAI6/\*\*\_\*\* FAI7/\*\*\_\*\*

Modelli / Models: FAI6/\*\*\_\*\* FAI7/\*\*\_\*\*



Modelli / Models: FAI8/\*\*\_\*\*

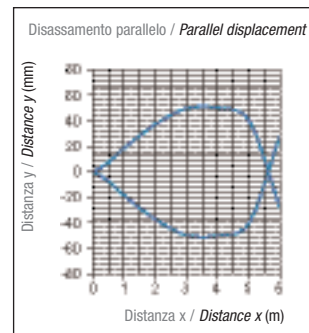
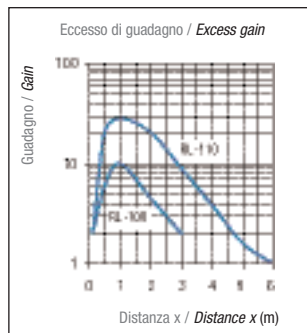
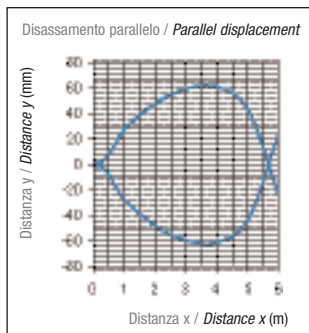
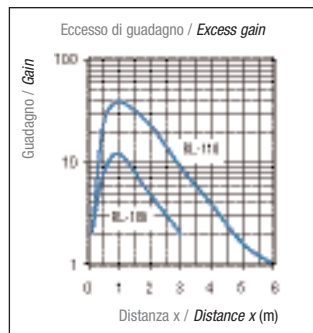
Modelli / Models: FAI8/\*\*\_\*\*



### > Modelli a catarifrangente e polarizzati - *Retro-reflective and polarized models*

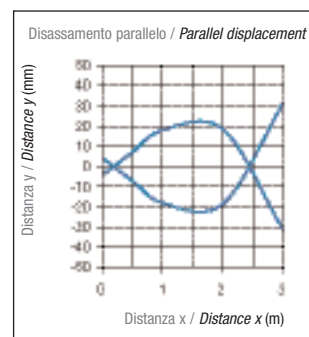
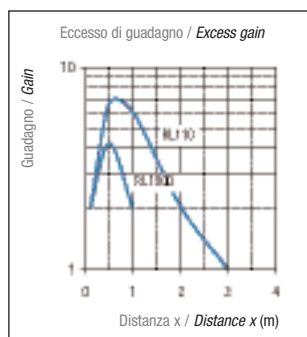
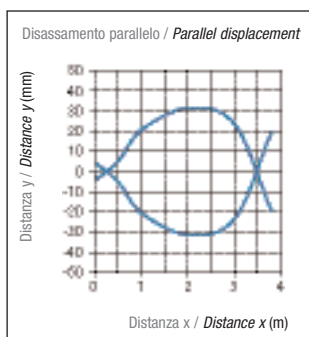
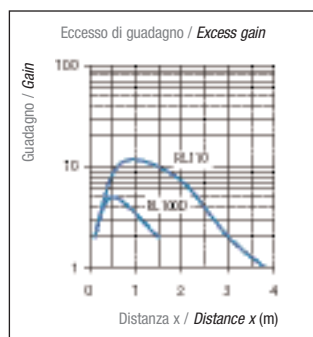
Modelli / Models: FAIC/\*\*\_\*\* FAIM/\*\*\_\*\*

Modelli / Models: FAIC/\*\*\_\*\* FAIM/\*\*\_\*\*

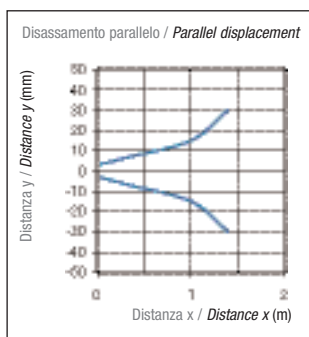
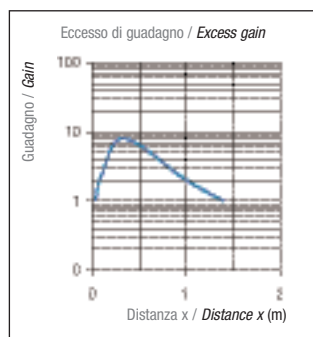


Modelli / Models: FARP/\*\*\_\*\* FARN/\*\*\_\*\*

Modelli / Models: FARP/\*\*\_\*\* FARN/\*\*\_\*\*



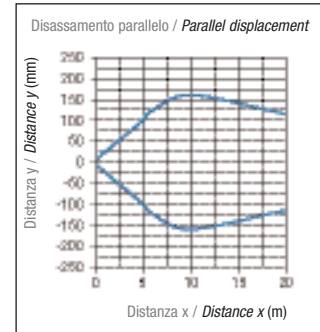
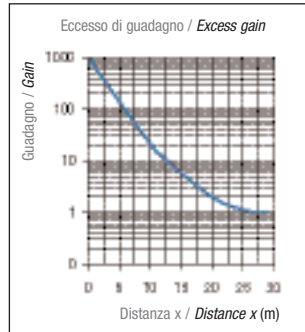
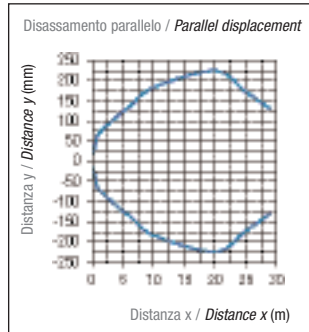
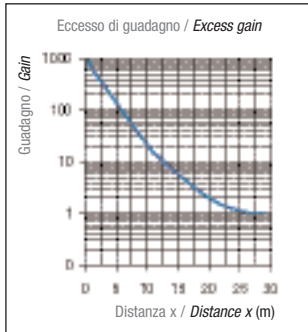
### > Modelli a catarifrangente per oggetti trasparenti - *Retro-reflective photoelectric models for transparent objects*



### > Modelli a barriera - Through beam models

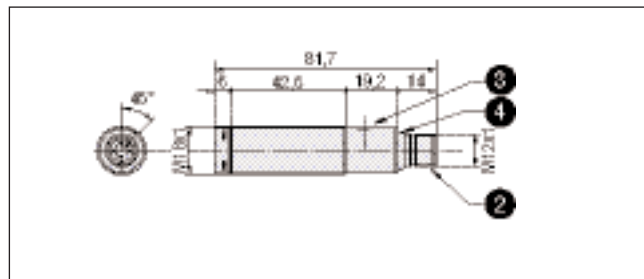
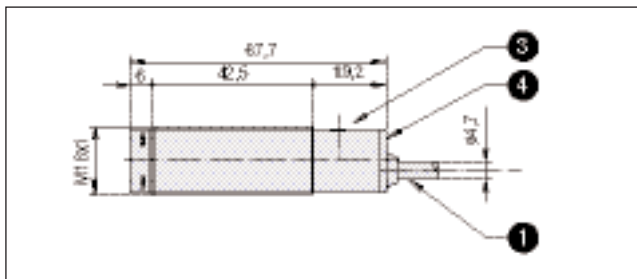
Modelli / Models: FAIH/\*\*\_\*\* FAID/\*\*\_\*\*

Modelli / Models: FAIH/\*\*\_\*\* FAID/\*\*\_\*\*



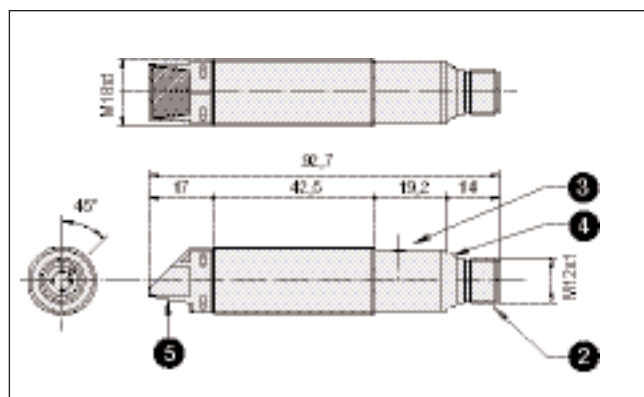
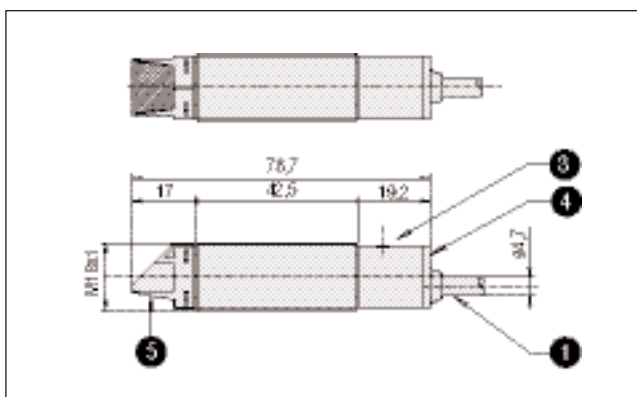
### Ottica assiale e cavo assiale Axial optic and axial cable

### Ottica assiale e connettore assiale Axial optic and axial plug



### Ottica radiale e cavo assiale Radial optic and axial cable

### Ottica radiale e connettore assiale Radial optic and axial plug



### Legenda / Key

- ① Uscita cavo assiale  
Axial cable exit
- ② Connettore assiale M12  
Axial M12 plug cable exit
- ③ Trimmer per la regolazione di sensibilità  
Trimmer for sensitivity adjustment
- ④ LED / LED
- ⑤ Asse ottica radiale / Radial optic axis
- ⑥ Uscita cavo radiale / Radial cable exit
- ⑦ Connettore radiale M12 / M12 radial plug