

M18 Photoelectric Sensor (Food & Beverage) FF

- M18
- Stainless steel AISI 316L
- LED status indicators
- Sealed teach-in reed relay magnetically operated
- Diffuse, Polarized and Through-beam models
- Complete protection against electrical damage
- IP67, IP68 and IP69K
- cULus Certified



Ordering & Ordering Codes

FF		R	3	/	B	P	-	1	E	V5			
Body Style											Body Style		
M18 Body		FF							V5		Smooth Body or Blank for M18		
Emission Type									E		Connection Type		
Visible Red		R									M12 Connector		
Infrared		I									Housing Material		
Sensing Distance (Sn)								1			Stainless steel housing AISI 316L (DIN 1.4404)		
Direct diffuse 100mm with sensitivity adj		3									Output Logic		
Direct diffuse 400mm with sensitivity adj		7					P	PNP					
Direct diffuse 800mm with sensitivity adj		8					N	NPN					
Polarized retro-reflective 4m with sensitivity adj		N					0	Emitter					
Polarized retro-reflective 4m		P									Output		
Retro-reflective 1m for transparent objects with sensitivity adj		L			B						NO + NC complimentary output 4 wire		
Emitter		H			O						LO/DO selectable output 4 wire - Emitter		
Receiver 20m without sensitivity adj		Z			X						Emitter with check		

Specifications

	Direct Diffuse			Retro-Reflective			Through-beam	
Models	FFR3	FFI7	FFI8	FFRN	FFRP	FFRL	FFIZ	FFIH
Nominal Sensing Distance (Sn)	100mm ⁽¹⁾	400mm ⁽²⁾	800mm ⁽³⁾	4m ⁽⁴⁾		1m ⁽⁵⁾	20m	
Emission	Red (660nm)	Infrared (880nm)		Red (660nm)			N/A	Infrared (880nm)
Differential Travel	≤10%							
Repeat Accuracy	5%							
Tolerance	+15/-5% Sn							
Operating Voltage	10 - 30VDC							
Ripple	≤10%							
No-load Current	35mA Maximum @ 30VDC						25mA	40mA
Load Current	100mA							N/A
Leakage Current	≤10 μA at 30VDC							N/A
Output Voltage Drop	2 Vmax. (IL = 100mA)							N/A
Output Type	NPN/PNP - LO/DO Selectable or complementary NO + NC							N/A
Switching Frequency	500Hz						250Hz	N/A
Time Delay Before Availability	200ms							
Supply Protection	Polarity reversal and transient							
Output Protection	Short circuit (auto reset)							N/A
Sensitivity Adjustment	Short circuit (auto reset)				N/A	Teach	N/A	N/A
Operating Temperature	-25° C to 80° C without freeze							
Thermal Drift	≤10% Sr							
External Light Interference	5000 lux incandescent lamp, 10000 lux sunlight							

Specifications cont.

	Direct Diffuse			Retro-Reflective			Through-beam	
Models	FFR3	FFI7	FFI8	FFRN	FFRP	FFRL	FFIZ	FFIH
Protection Degree	IP67, IP68 (1m, 7 days) and IP69K (according to DIN 40050 part 9) ⁽⁶⁾							
LED Indicator	Green ON = Teach Function Available OFF = Teach Function Blocked Flashing Fast = Fine Teach Active Slow Flashing = Teach In Progress Yellow Output State / Excess Gain* (O Models) Light State / Excess Gain* (B Models)						Yellow: Output State (O Models); Light State (B Models)	Yellow: Power On
Housing Material	Stainless steel AISI 316L (DIN 1.4404)							
Exit Plug Material	Grilamid							
Optic Material	Plastic (FDA certified)							
Tightening Torque	50Nm							
Weight	120g							

⁽¹⁾ White target Kodak 90% reflection 100x100mm

⁽³⁾ White target Kodak 90% reflection 400x400mm

⁽⁵⁾ With RL113G or RL116 reflector

⁽²⁾ White target Kodak 90% reflection 200x200mm

⁽⁴⁾ With RL110 reflector

⁽⁶⁾ IP rating guaranteed only with installation using accessories with the same IP rating or higher

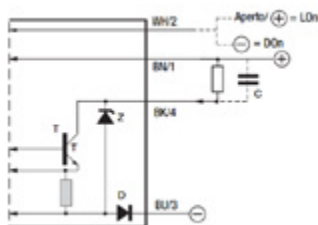
* Yellow LED fixed ON: Excess gain ≤ 2 -- Yellow LED flashing Excess gain < 2

Available Models

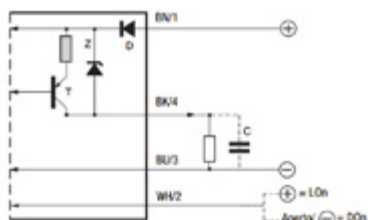
Models	Housing	Adjustment	Distance	4 Wires NPN LO/DO	4 Wires PNP LO/DO	4 Wires NPN NO+NC	4 Wires PNP NO+NC
Direct diffuse	AISI 316L (DIN 1.4404)	Teach-in	100 mm	FFR3/ON-1E	FFR3/OP-1E	FFR3/BN-1E	FFR3/BP-1E
			400 mm	FFI7/ON-1E	FFI7/OP-1E	FFI7/BN-1E	FFI7/BP-1E
			800 mm	FFI8/ON-1E	FFI8/OP-1E	FFI8/BN-1E	FFI8/BP-1E
Polarized	AISI 316L (DIN 1.4404)	Teach-in	4 m	FFRN/ON-1E	FFRN/OP-1E	FFRN/BN-1E	FFRN/BP-1E
		No	4 m	FFRP/ON-1E	FFRP/OP-1E	FFRP/BN-1E	FFRP/BP-1E
Retroreflective for transparent objects	AISI 316L (DIN 1.4404)	Teach-in	1 m	FFRL/ON-1E	FFRL/OP-1E	FFRL/BN-1E	FFRL/BP-1E
Receiver	AISI 316L (DIN 1.4404)	No	20 m	FFIZ/ON-1E	FFIZ/OP-1E	FFIZ/BN-1E	FFIZ/BP-1E
Emitter with check	AISI 316L (DIN 1.4404)	No	20 m	FFIH/XO-1E			
Emitter without check	AISI 316L (DIN 1.4404)	No	20 m	FFIH/OO-1E			

Connection Drawings

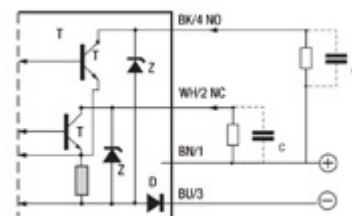
NPN LO/DO selectable



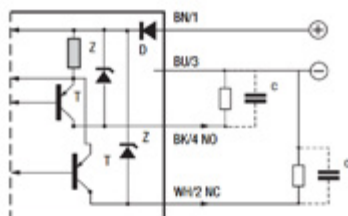
PNP LO/DO selectable



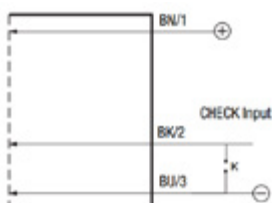
NPN NO+NC comp. output



PNP NO+NC comp. output

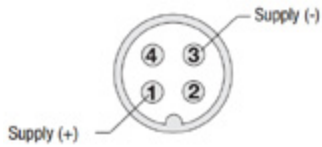


Emitter with check

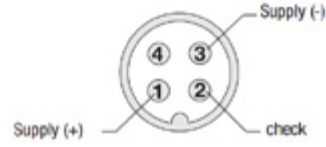


BN = Brown BK = Black
WH = White BU = Blue

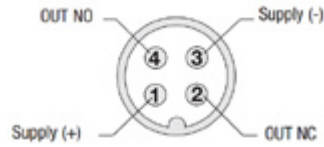
Emitter Without Check



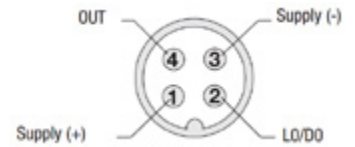
Emitter With Check



NO+NC Complimentary

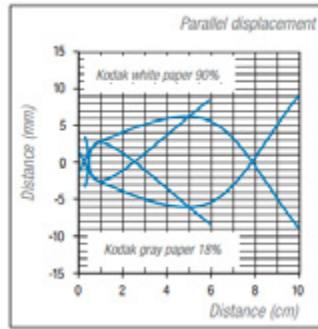
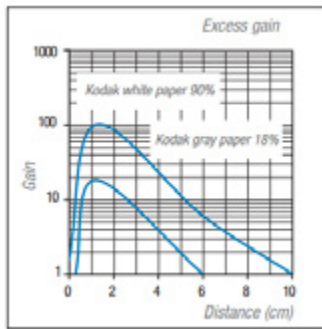


LO/DO Selectable

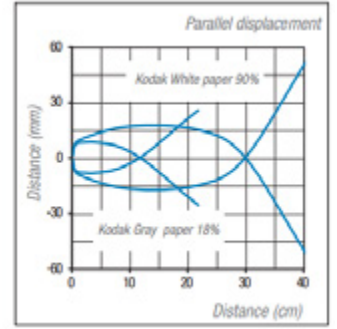
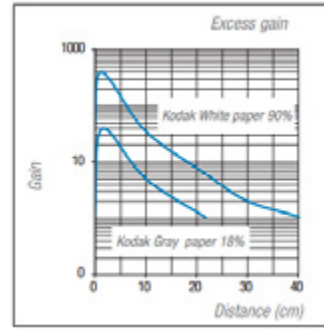


Response Graphs

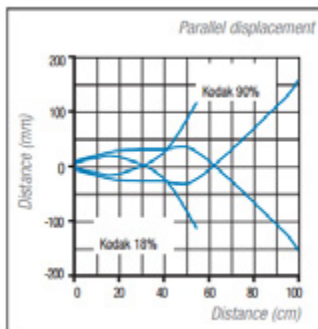
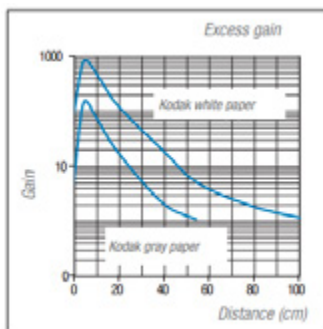
FFR3/**-1E



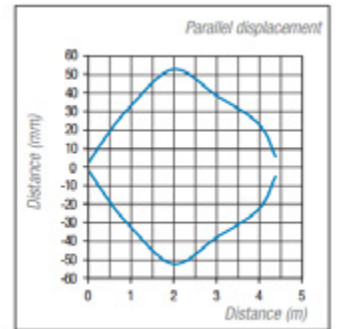
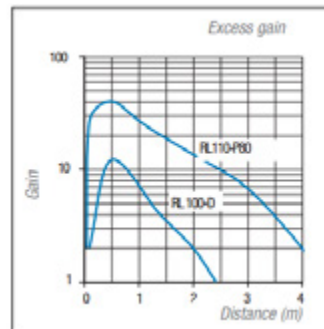
FFI7/**-1E



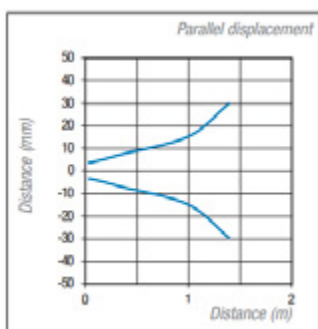
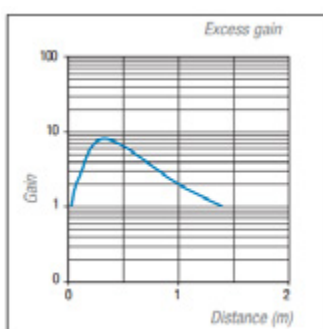
FFI8/**-1E



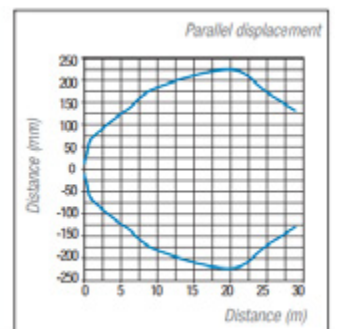
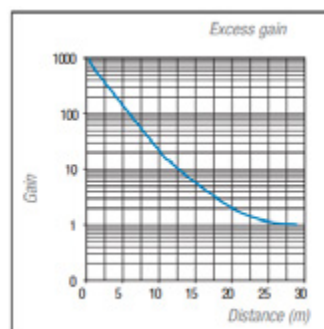
FFRN/**-1E - FFRP/**-1E



FFRL/**-1E



FFIH/**-1E + FFIZ/**-1E



Dimensions (mm)

