



M18 Tubular Metal Photoelectric Sensors FKL Series

M18 (18mm) Tubular Metal Photoelectric Sensors - DC FKL Series

Overview

The AchieVe FKL series M18 tubular photoelectric sensors offer DC digital sensitivity adjustment by teach-in button or potentiometer, and multifunction LED status indicator. This series offers diffuse with background suppression, diffuse, polarized retroreflective, and through-beam models. Housings have an IP67 enclosure rating with complete protection against electrical damage.



Features

- Diffuse with background suppression, diffuse, polarized retroreflective, and through-beam models available
- M12 quick-disconnect (purchase cable separately)
- Multifunction LED status indicator
- Class 1 or 2 red laser
- Axial or 90-degree optical head
- IP67 protection degree
- 3-year warranty



FKLS-BN-1E



FKLS-BP-3E

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Part Number	Price	Sensing Distance	Switching Frequency	Light Emission	Logic	Output Function	Head Angle	Connection Type *	Wiring	Weight g [oz]	Drawing Link
Diffuse With Background Suppression - Potentiometer											
FKLS-BN-1E	\$108.00	30-100mm [1.18-3.93in]	1.5 kHz	Class 1 red laser 650nm	NPN	Complementary light-on/dark-on	Axial	4-pin M12 quick-disconnect	Diagram 1	65 [2.29]	PDF
FKLS-BP-1E	\$108.00				PNP		Axial		Diagram 2	65 [2.29]	PDF
FKLS-BN-3E	\$117.00	30-80mm [1.18-3.14in]			NPN		90-degree		Diagram 1	68 [2.39]	PDF
FKLS-BP-3E	\$117.00				PNP		90-degree		Diagram 2	68 [2.39]	PDF
FKLW-BN-1E	\$108.00	30-150mm [1.18-5.90in]		Class 2 red laser 650nm	NPN		Axial		Diagram 1	65 [2.29]	PDF
FKLW-BP-1E	\$108.00				PNP		Axial		Diagram 2	65 [2.29]	PDF
FKLW-BN-3E	\$117.00	30-130mm [1.18-5.11in]			NPN		90-degree		Diagram 1	68 [2.39]	PDF
FKLW-BP-3E	\$117.00				PNP		90-degree		Diagram 2	68 [2.39]	PDF
Diffuse - Teach-in Button											
FKL4-BN-1E	\$108.00	0-300mm [0-11.8in]	1 kHz	Class 1 red laser 650nm	NPN	Complementary light-on/dark-on	Axial	4-pin M12 quick-disconnect	Diagram 1	75 [2.64]	PDF
FKL4-BP-1E	\$108.00				PNP		Axial		Diagram 2	75 [2.64]	PDF
FKL4-BN-3E	\$117.00	0-200mm [0-7.87in]			NPN		90-degree		Diagram 1	80 [2.82]	PDF
FKL4-BP-3E	\$117.00				PNP		90-degree		Diagram 2	80 [2.82]	PDF
Polarized Retroreflective Teach-in Button **											
FKLN-BN-1E	\$108.00	0.05-30m [0.16-98.42ft]	1 kHz	Class 1 red laser 650nm	NPN	Complementary light-on/dark-on	Axial	4-pin M12 quick-disconnect	Diagram 1	75 [2.64]	PDF
FKLN-BP-1E	\$108.00				PNP		Axial		Diagram 2	75 [2.64]	PDF
FKLN-BN-3E	\$117.00				NPN		90-degree		Diagram 1	80 [2.82]	PDF
FKLN-BP-3E	\$117.00				PNP		90-degree		Diagram 2	80 [2.82]	PDF
Through-beam Receiver - Potentiometer ***											
FKLD-BN-1E	\$38.00	0.05-50m [0.16-164.04ft]	1 kHz	—	NPN	Complementary light-on/dark-on	Axial	4-pin M12 quick-disconnect	Diagram 1	65 [2.29]	PDF
FKLD-BP-1E	\$38.00				PNP		Axial		Diagram 2	65 [2.29]	PDF
FKLD-BN-3E	\$43.00				NPN		90-degree		Diagram 1	68 [2.39]	PDF
FKLD-BP-3E	\$43.00				PNP		90-degree		Diagram 2	68 [2.39]	PDF
Through-beam Emitter ***											
FKLH-X0-1E	\$70.00	0.05-50m [0.16-164.04ft]	—	Class 1 red laser 650nm	—	—	Axial	4-pin M12 quick-disconnect	Diagram 3	75 [2.64]	PDF
FKLH-X0-3E	\$75.00						90-degree		Diagram 3	80 [2.82]	PDF

* Purchase cable separately

** Purchase reflector separately.

*** Purchase one receiver and one emitter for a complete set.



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Wiring Diagrams

Diagram 1
NPN Output

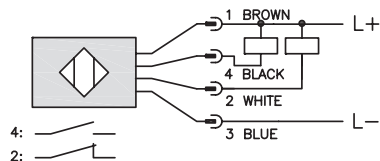


Diagram 2
PNP Output

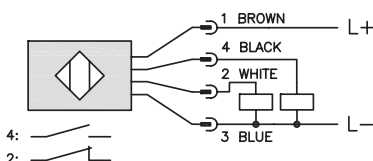
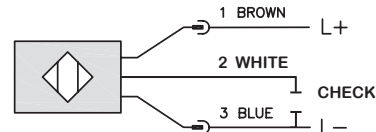


Diagram 3
Emitter with check



Cable Assembly Wiring Colors:

Pin 1 - Brown

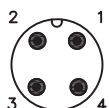
Pin 2 - White

Pin 3 - Blue

Pin 4 - Black

Note: Wiring colors are based on AutomationDirect 4-pole cable assemblies.

M12 Connector



Note:

Dark-on = Signal ON when receiver is NOT sensing emitter.

Light-on = Signal ON when receiver is sensing emitter.

Switching Element Function

	<i>Through-beam and Reflective Models</i>	<i>Diffuse Models</i>
Light-on	N.C.	N.O.
Dark-on	N.O.	N.C.

M12 Connector: check is Pin 2 (white)

Check input: This condition simulates the presence of a target within the detection range and forces the receiver output to switch. If switching does not occur, it indicates a fault in the system.



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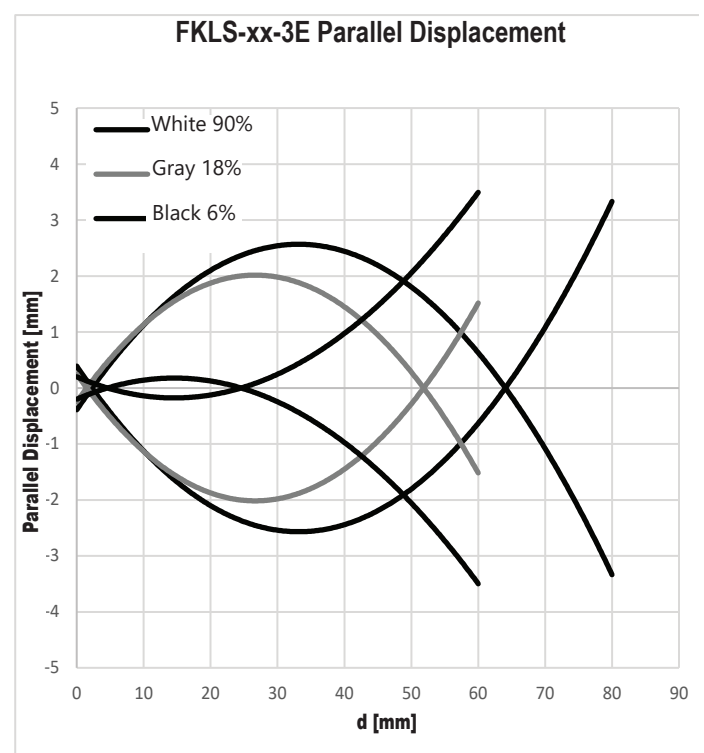
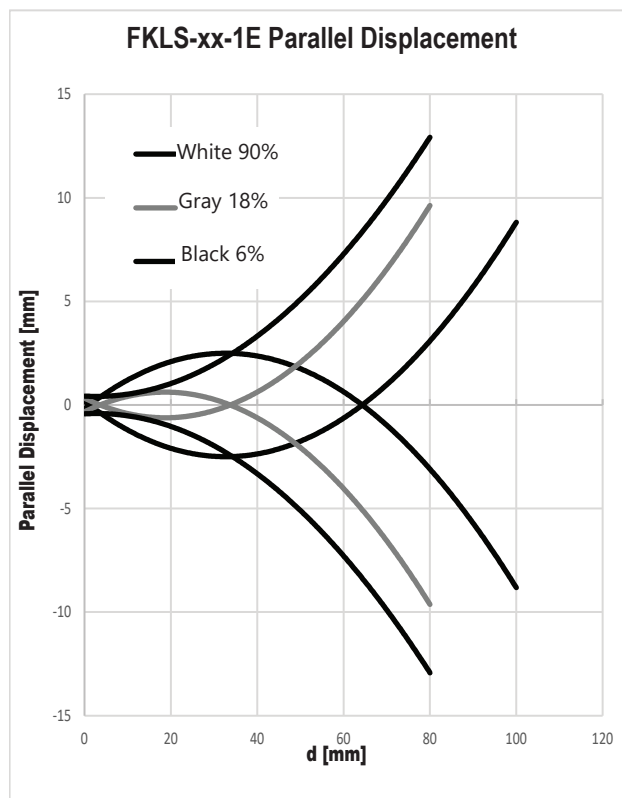
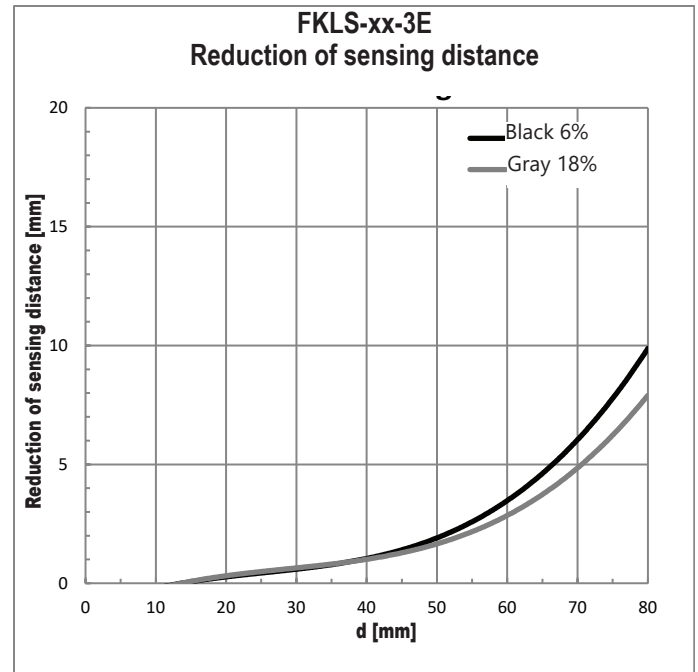
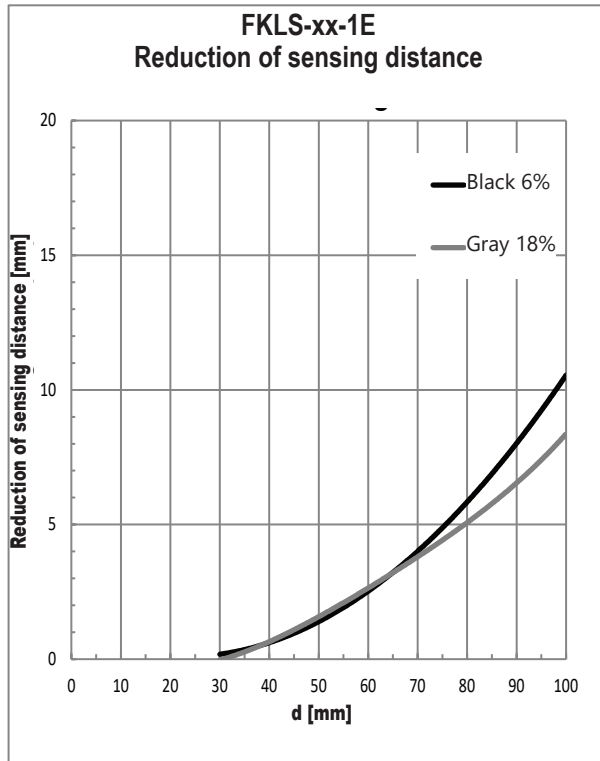
M18 (18mm)Tubular Metal - DC FKL Series Specifications				
Sensor Type	Diffuse With Background Suppression FKLS and FKLW	Diffuse FKL4	Polarized Retroreflective FKLN	Through-beam FKLD and FKLH
Temperature Drift	10% Sn	10% Sr		
Repeatability	10%	5%		10% (Receiver only)
Output Types	NPN or PNP	NPN or PNP		NPN or PNP (Receiver only)
Operating Voltage	10-30 VDC			
Maximum Residual Ripple	≤ 10%			
Leakage Current	≤10 μA (VDC max)	≤ 150μA (@ VDC AT max)		≤ 150μA (@ VDC AT max) (Receiver only)
No Load Supply Current	≤ 40 mA	≤ 35mA		≤ 25mA
Maximum DC Output Voltage Drop	2 V max. (I _L =100mA)	2V @ 100mA		2V @ 100mA (Receiver only)
Operating (Load) Current	100mA	100mA		100mA (Receiver only)
Short-circuit Protection	Yes			
Reverse Polarity Protection	Yes			
Impulsive Overvoltage Protection	Yes			
Time Delay Before Availability	200ms	200ms		200ms (Receiver only)
Operating Temperature	-10 to 50°C [14 to 122°F]	-10 to 55°C [14 to 131°F]		
Protection Degree	IP67			
LED Indicators	Yellow (output state)	Yellow: Fixed on (light state with ExG≥2) Yellow: Blink (light state with 1≤ExG<2) Yellow: Off (dark state) Green: Power on		Emitter: Yellow light state Receiver: Green: power on Yellow: On (emission enable) Yellow: Off (emission disable)
Housing Material	Nickel-plated brass / PA 12			
Lens Material	Glass on 90-degree models PMMA on axial models	Glass		
Shock/Vibration	Shock IEC 60068-2-27 Vibration IEC 60068-2-6	Shock 600068-2-27 Vibration IEC 600068-2-6		
Interference to External Light	15000 lux incandescent lamp	> 1000 lux (incandescent lamp); > 10000 lux (fluorescent lamp)		
Tightening Torque	25N•m [18.44 lb•ft]			
IO-Link	N/A			
Connectors	4-pin M12 quick-disconnect			
Agency Approvals	cULus File E328811, CE, UKCA			

To obtain the most current agency approval information, see the Agency Approval Compliance & Certifications Checklist section on the specific part number's web page.



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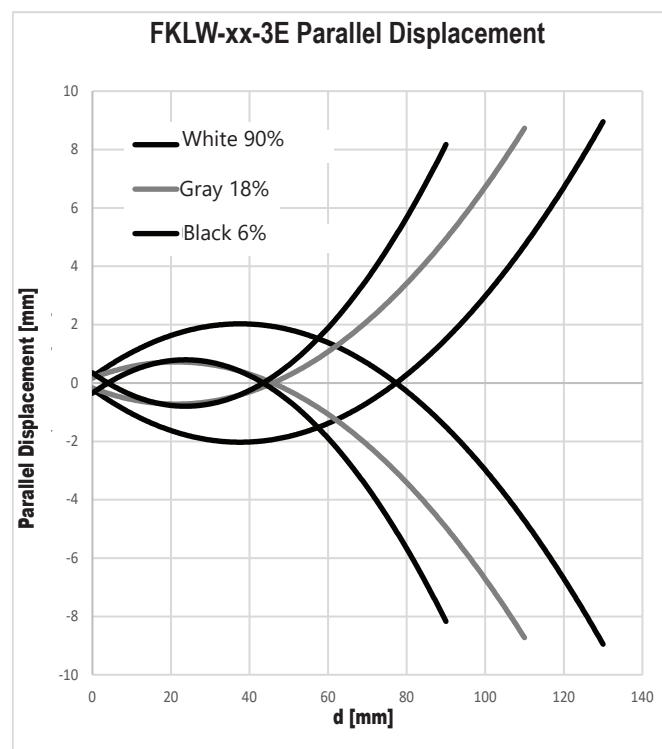
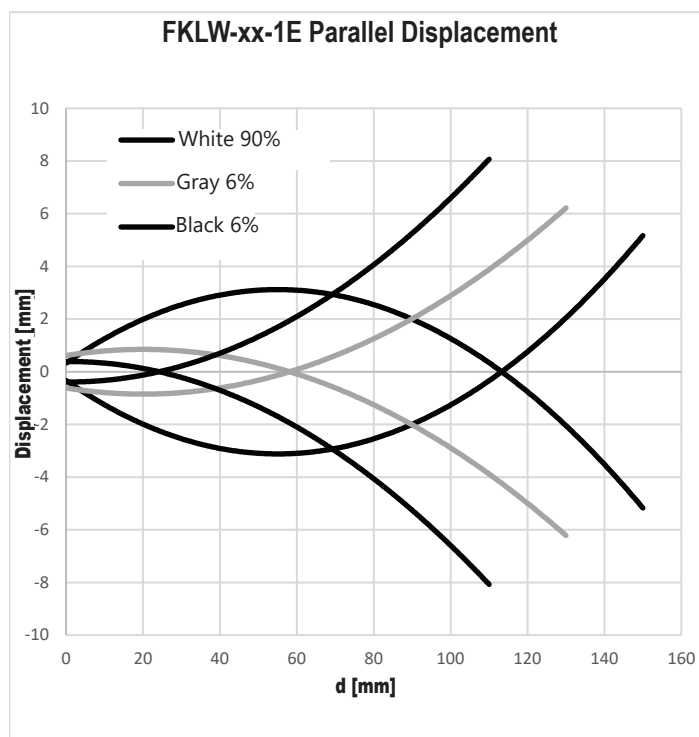
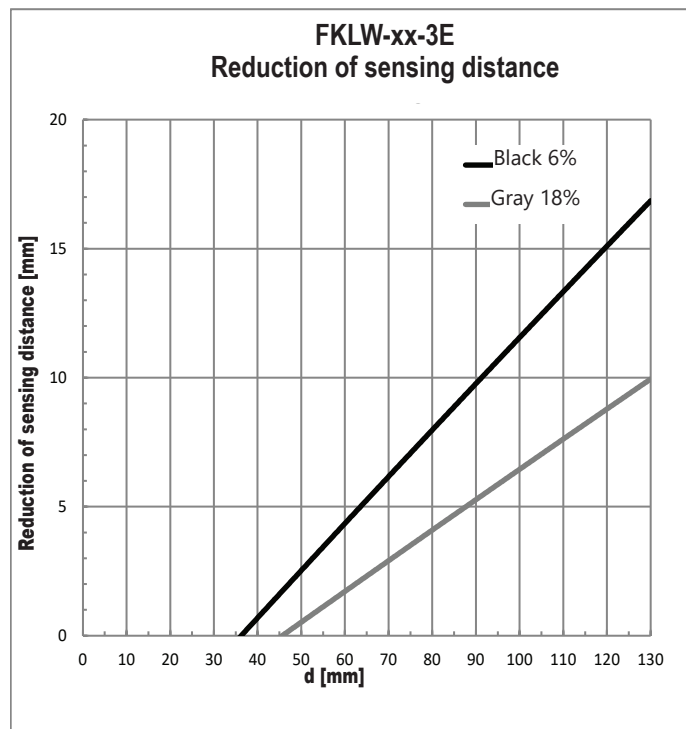
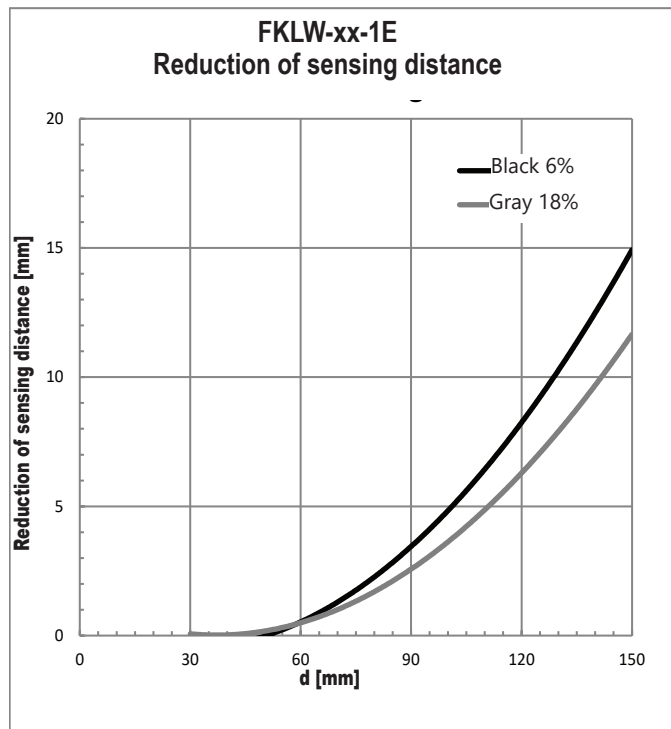
Characteristic Curves FKLS Models Diffuse With Background Suppression





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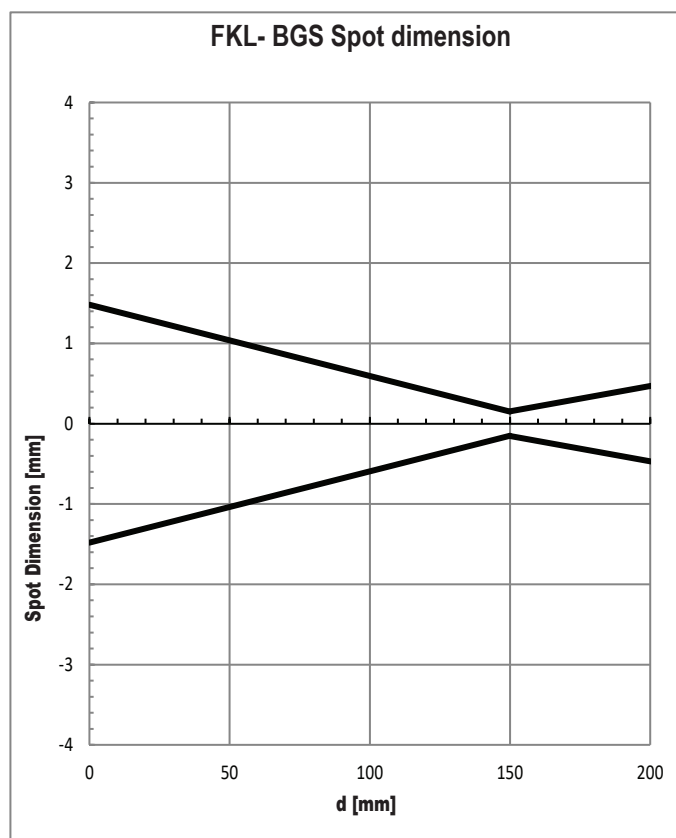
Characteristic Curves FKLW Models Diffuse With Background Suppression





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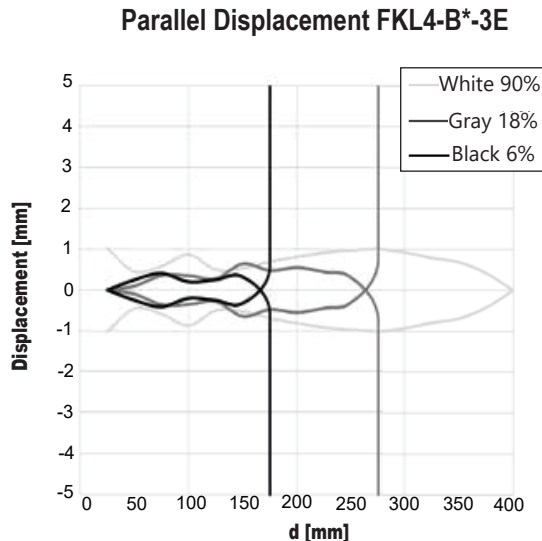
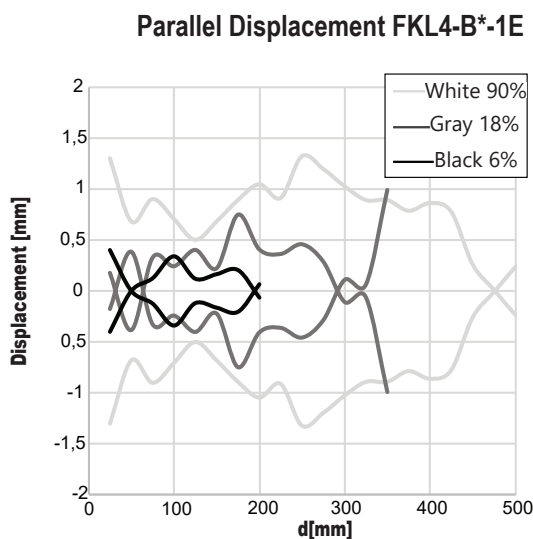
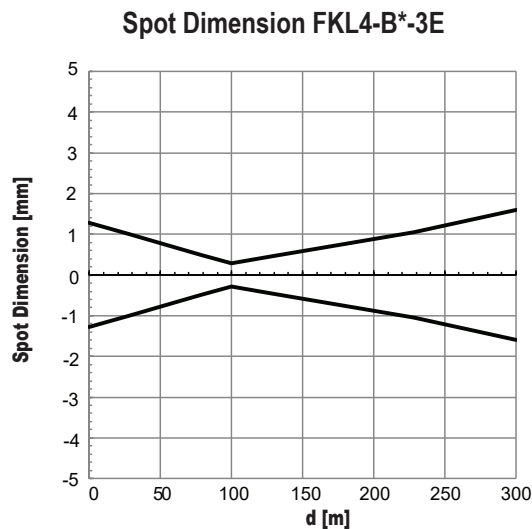
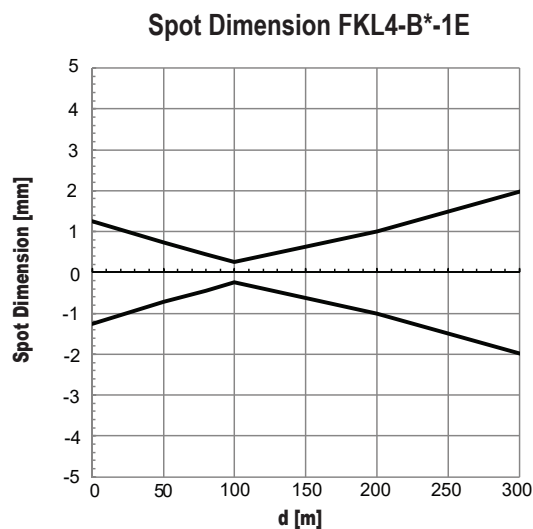
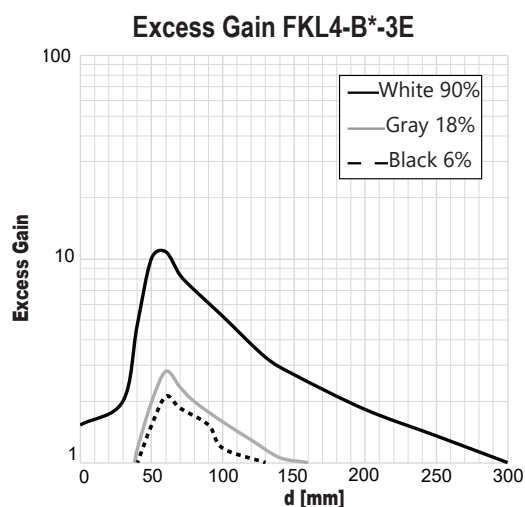
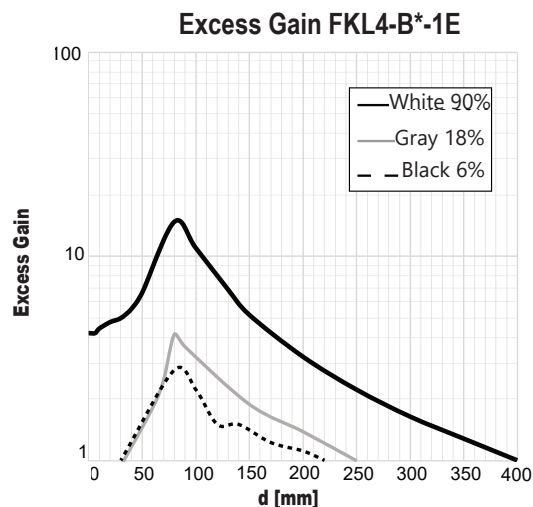
Characteristic Curves FKLW Models Diffuse With Background Suppression





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Characteristic Curves FKL4 Models Diffuse

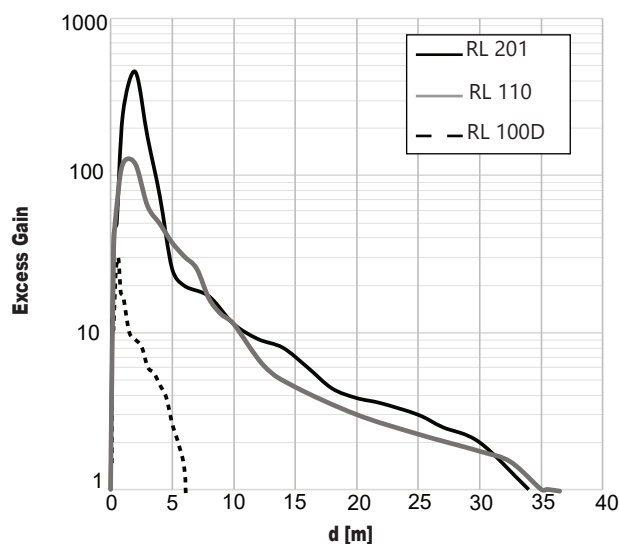




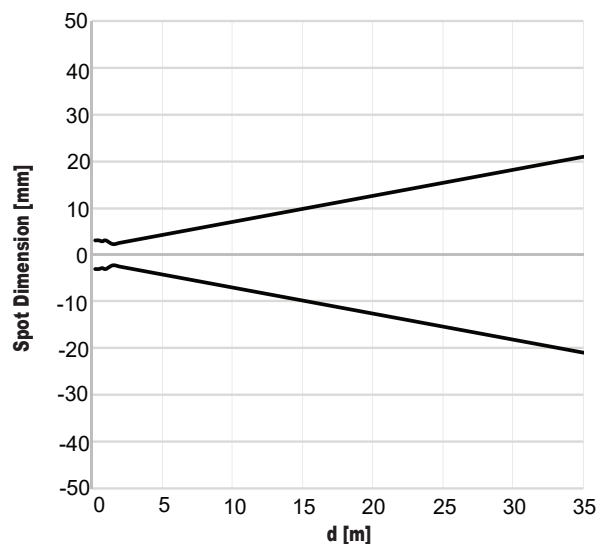
M18 Tubular Metal Photoelectric Sensors FKL Series

Characteristic Curves FKLN Models Polarized Retroreflective

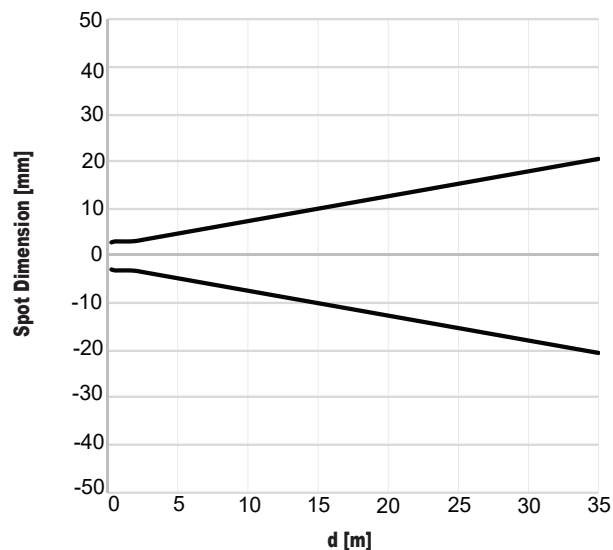
Excess Gain - All FKLN Models



Spot Dimension FKLN-B*-1E



Spot Dimension FKLN-B*-3E

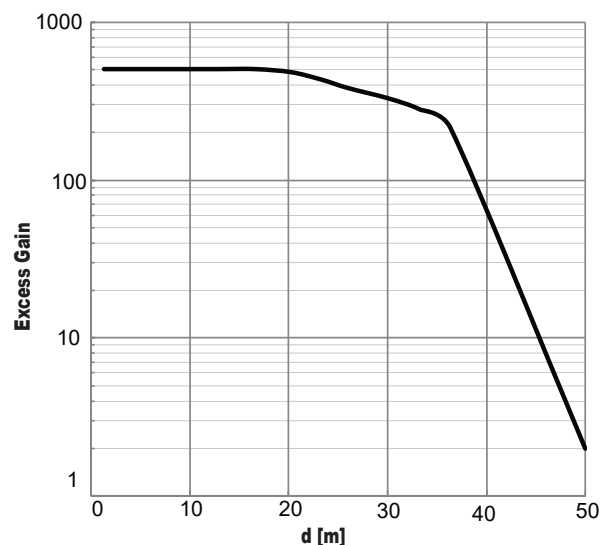




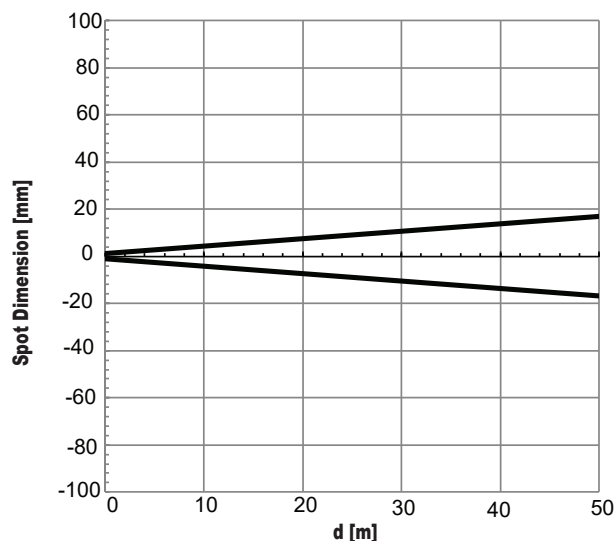
M18 Tubular Metal Photoelectric Sensors FKL Series

Characteristic Curves FKLD and FKLH Models Emitters and Receivers

Excess Gain



Spot Dimension



Parallel Displacement

