



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

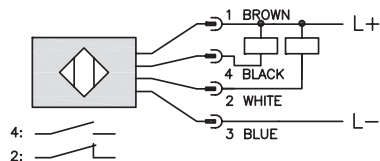


Diagram 2
PNP Output

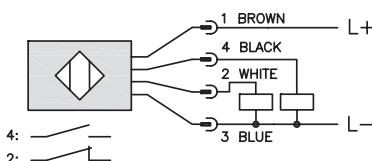
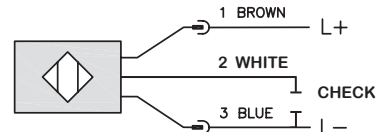


Diagram 3
Emitter with check



Cable Assembly Wiring Colors:

Pin 1 - Brown

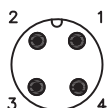
Pin 2 - White

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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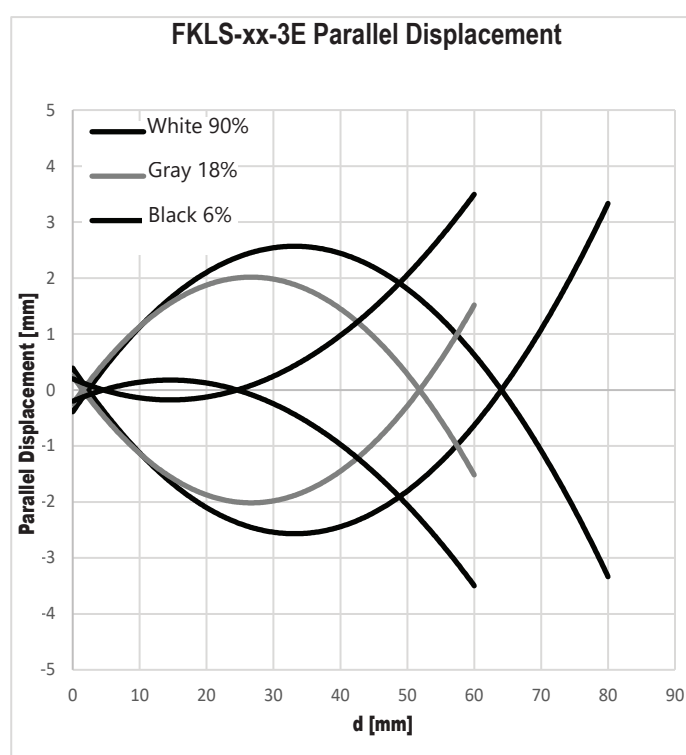
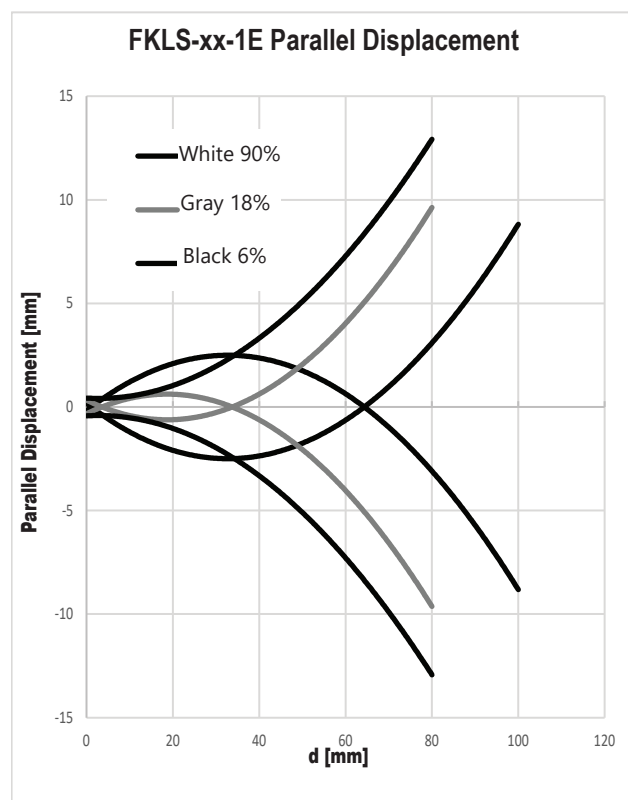
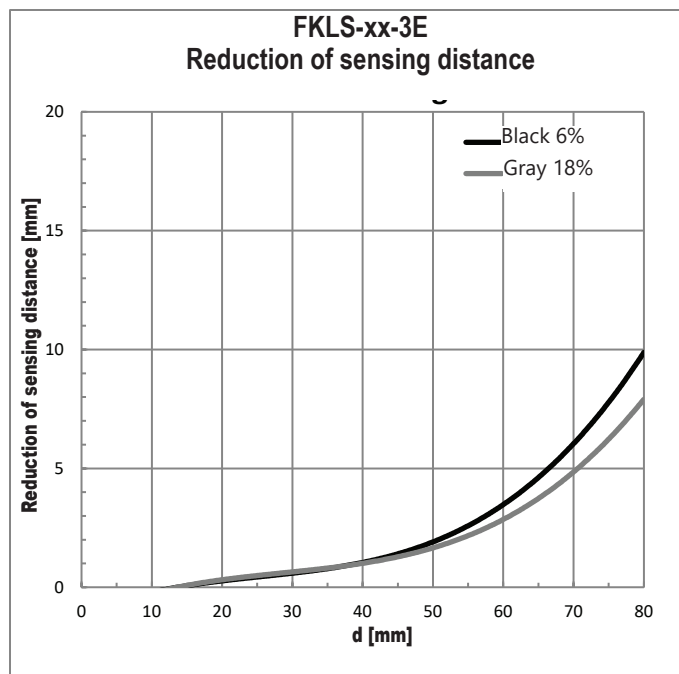
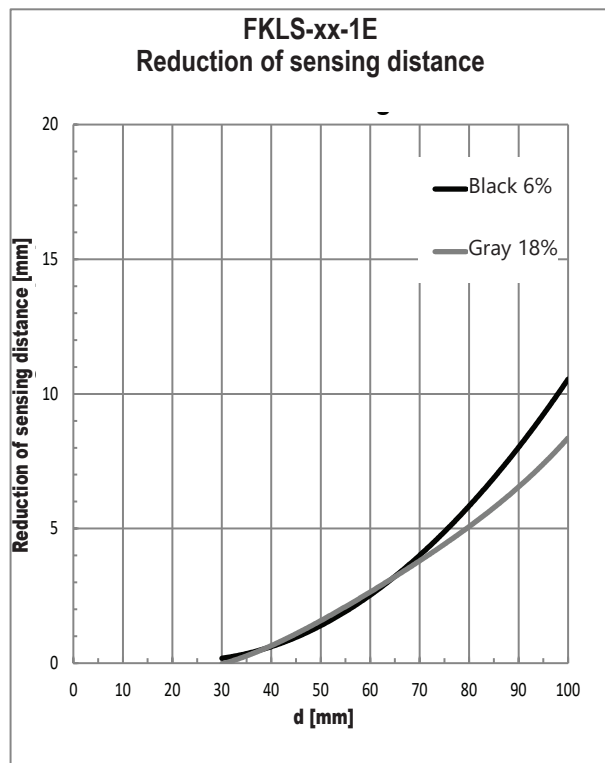
M18 (18mm)Tubular Metal - DC FKL Series Specifications				
Sensor Type	Diffuse With Background Suppression FKLS and FKLW	Diffuse FKL4	Polarized Retroreflective FKLN	Through-beam FKLD and FKLH
Temperature Drift	10% Sn	10% Sr		
Repeatability	10%	5%		10% (Receiver only)
Output Types	NPN or PNP	NPN or PNP		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. (II=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 E187310, 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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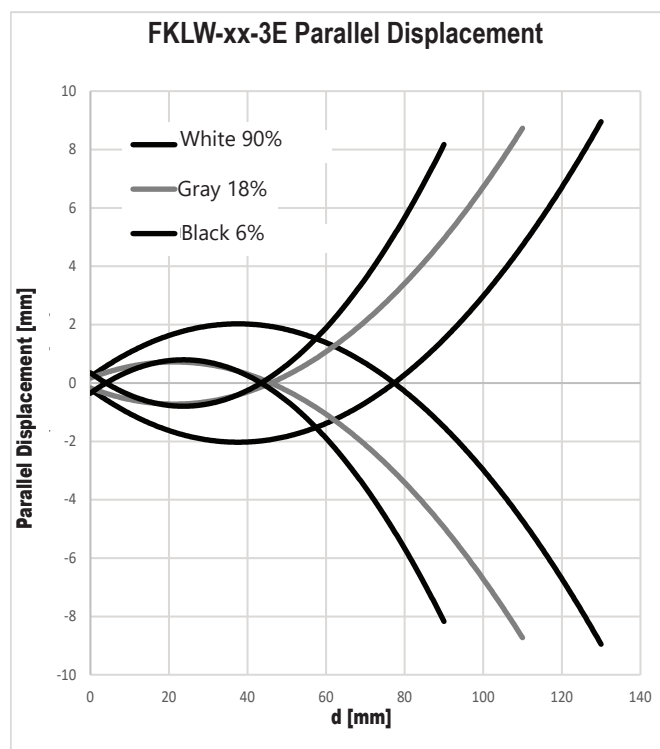
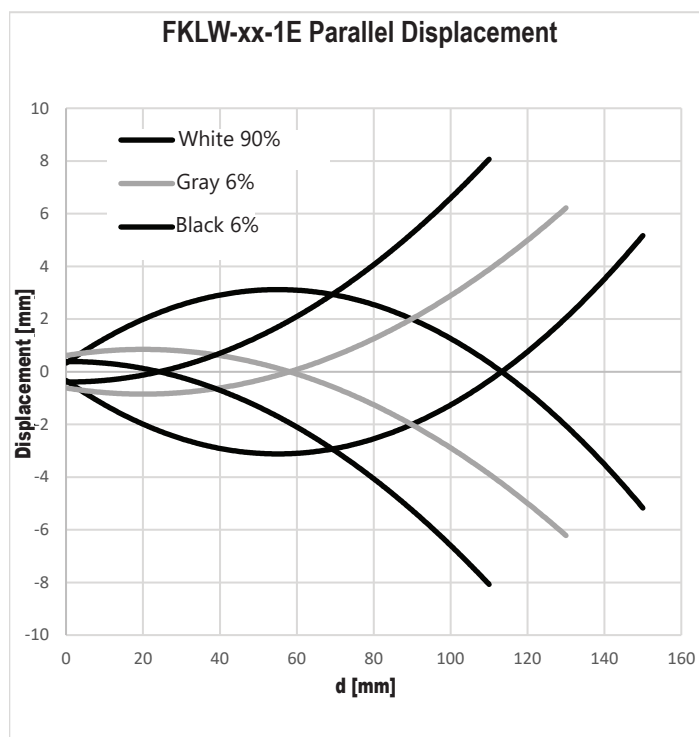
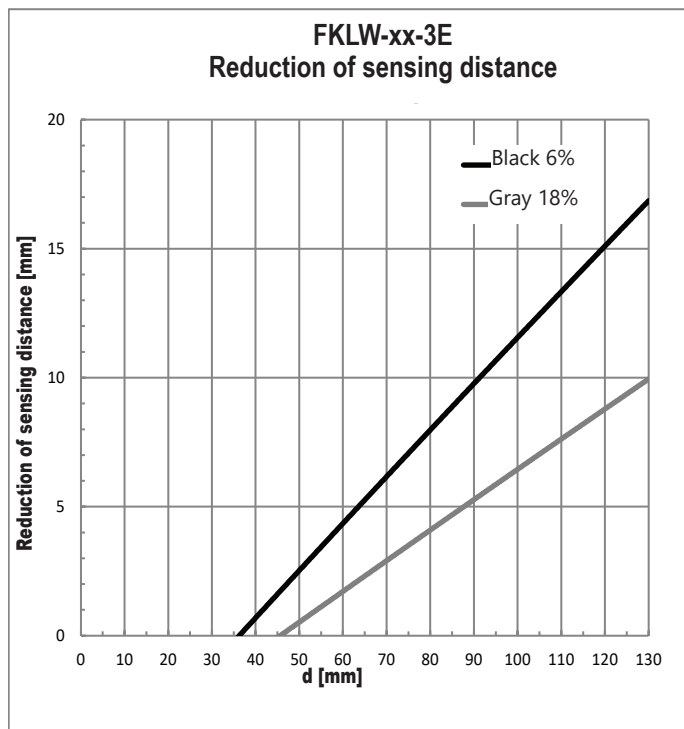
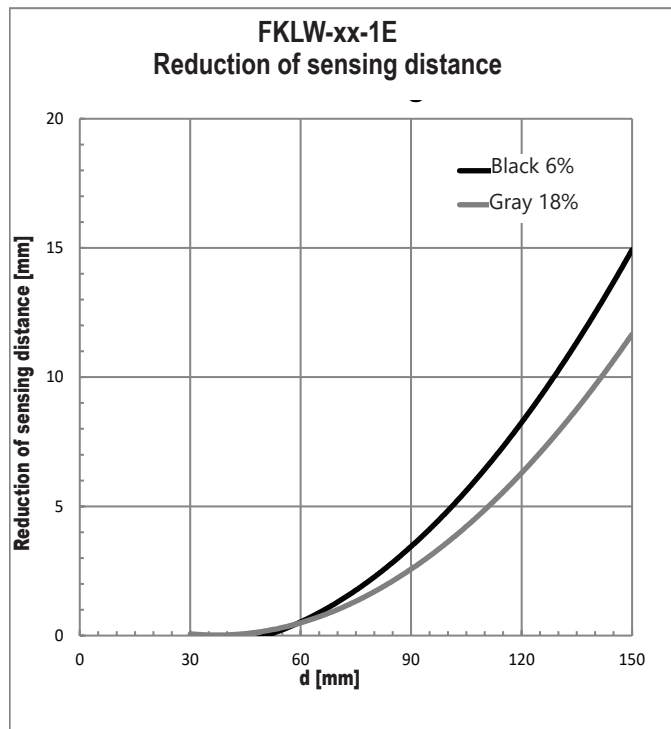
Characteristic Curves FKLS Models Diffuse With Background Suppression





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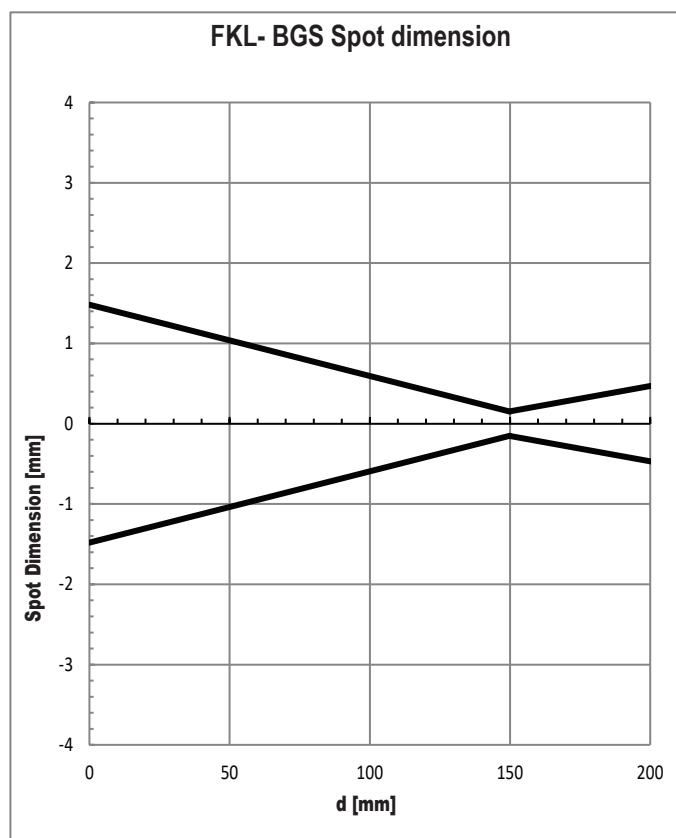
Characteristic Curves FKLW Models Diffuse With Background Suppression





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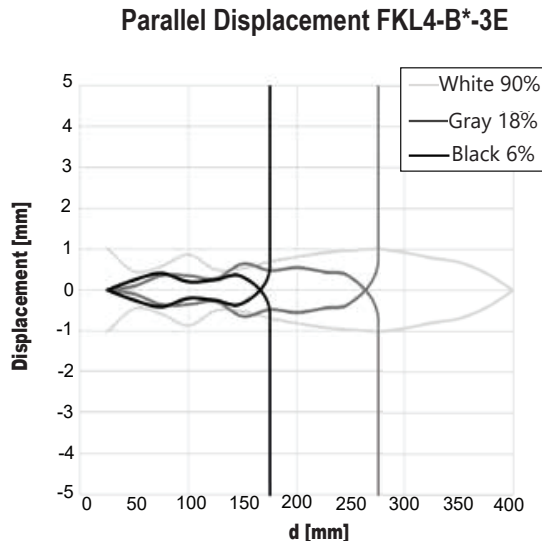
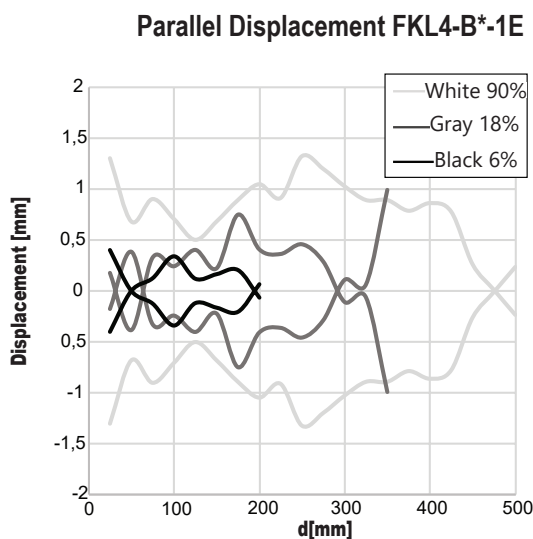
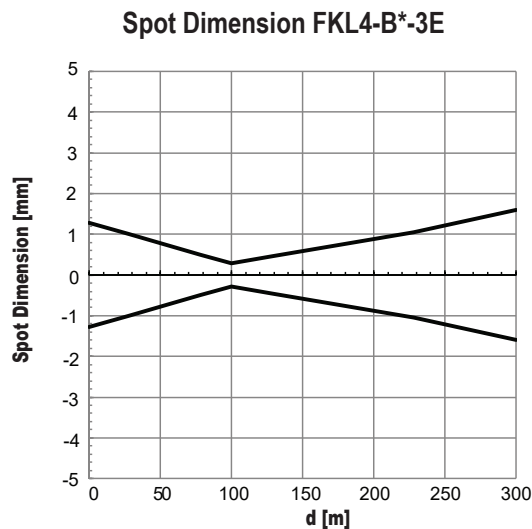
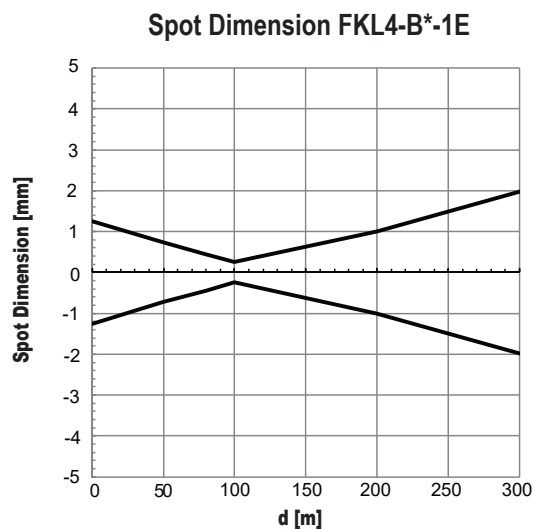
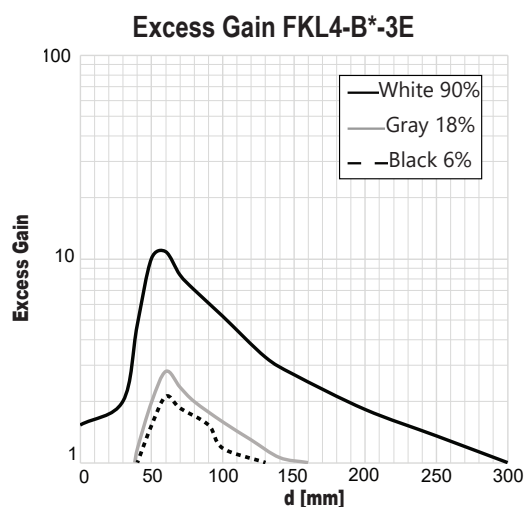
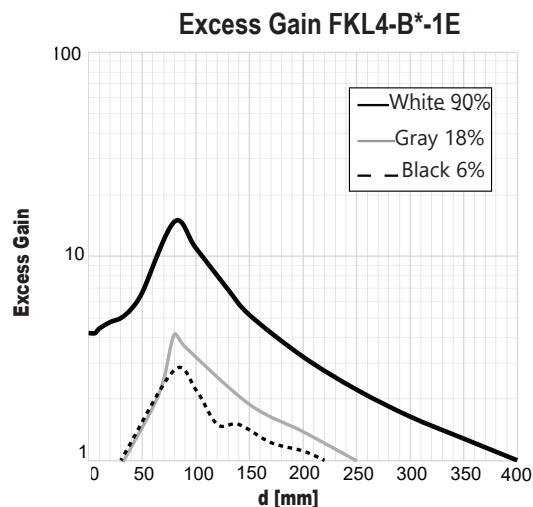
Characteristic Curves FKLW Models Diffuse With Background Suppression





M18 Tubular Metal Photoelectric Sensors FKL Series

Characteristic Curves FKL4 Models Diffuse

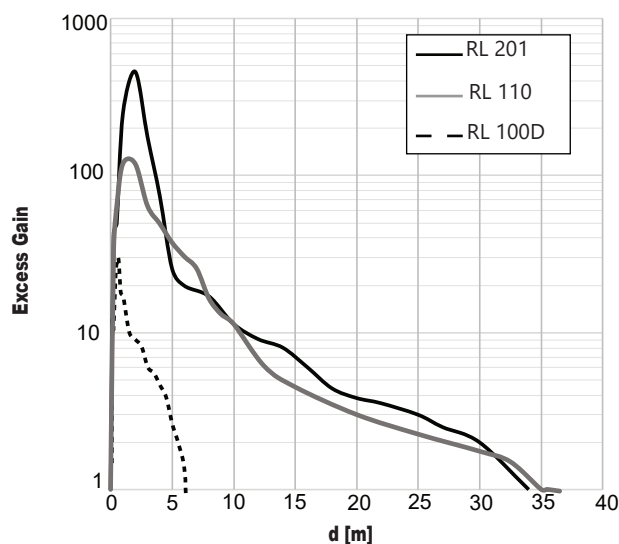




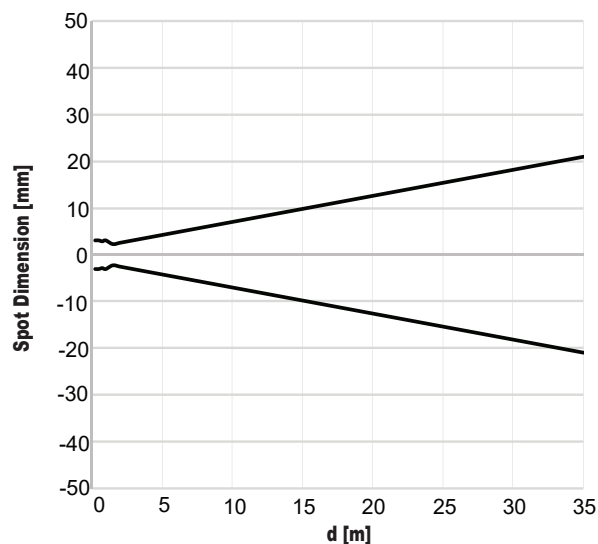
M18 Tubular Metal Photoelectric Sensors FKL Series

Characteristic Curves FKLN Models Polarized Retroreflective

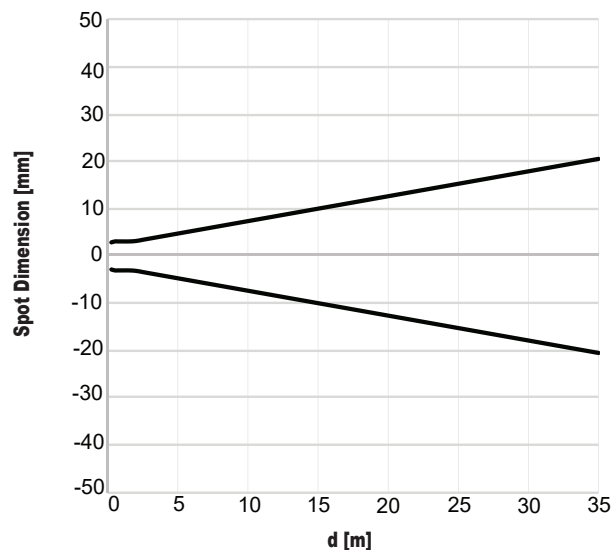
Excess Gain - All FKLN Models



Spot Dimension FKLN-B*-1E



Spot Dimension FKLN-B*-3E

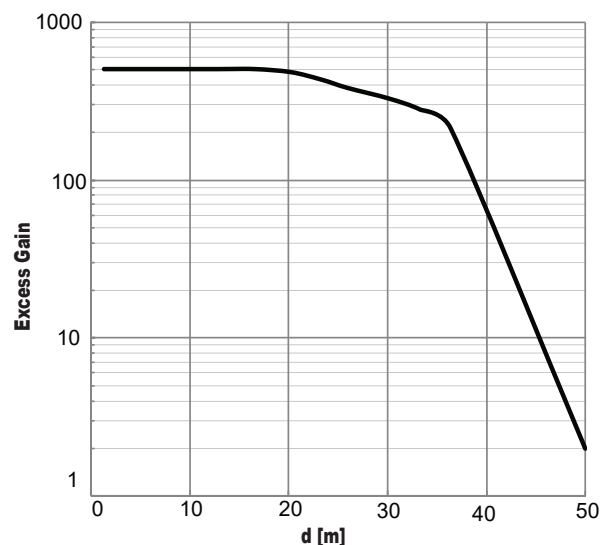




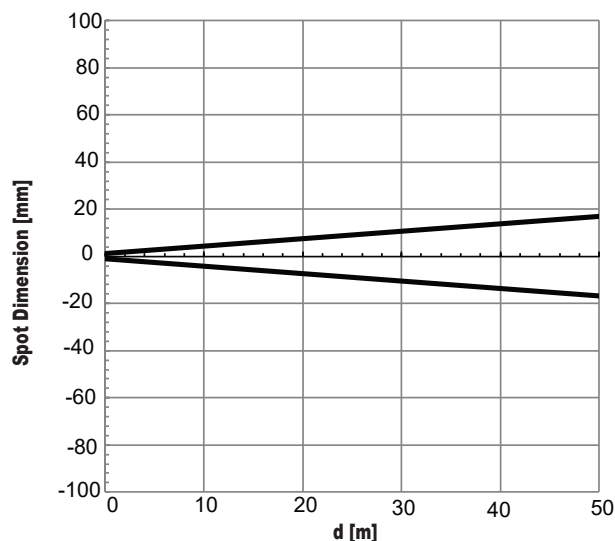
M18 Tubular Metal Photoelectric Sensors FKL Series

Characteristic Curves FKLD and FKLH Models Emitters and Receivers

Excess Gain



Spot Dimension



Parallel Displacement

