

GuardShield Safety Light Curtain Specifications

Catalog Numbers 450L-B4FNxYD, 450L-B4HNxYD, 450L-E4FLxYD, 450L-E4HLxYD

Specifications

Table 1 - Safety Ratings

Attribute	450L-B4FNxYD, 450L-B4HNxYD	450L-E4FLxYD, 450L-E4HLxYD
Standards	IEC 61508, EN/ISO 13849-1, IEC 62061, UL 508 (for more details, see the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declaration of Conformity)	
Safety classification	Type 4 according to IEC 61496-1/-2 Up to PLe (Category 4) per ISO 13849-1, SIL 3 per IEC 61508 SILcl 3 per IEC 62061 Laser alignment of GuardShield 450L-E safety light curtain: Laser class 2 according to IEC 60285-1.	
Functional safety data	Pair: PFHD: $12.7 \cdot 10^{-9}$ Mission time/PTI: 20 years Mode of operation: High demand mode	Pair: PFHD: $12.7 \cdot 10^{-9}$ (not cascaded) Cascading plug-in PFHD: $0.96 \cdot 10^{-9}$ Mission time/PTI: 20 years Mode of operation: High demand mode

Table 2 - Operating Characteristics

Attribute	450L-B4FNxYD, 450L-B4HNxYD	450L-E4FLxYD, 450L-E4HLxYD
Switch function	OSSDs enable (on, high, 24V DC) when protective field not interrupted	
Protective field length	150...1950 mm (5.91...76.77 in.) in 150 mm (5.91 in.) increments	
Resolution	Finger: 14 mm (0.56 in.); Hand: 30 mm (1.19 in.)	
Number of active lenses (see Figure 11 on page 24)	Finger: 16 per 150 mm (5.91 in.) increment; Hand: 8 per 150 mm (5.91 in.) increment	
Operating range	Resolution 14 mm (0.56 in.): 0.5...4 m (1.64...13.12 ft) Resolution 30 mm (1.19 in.): 0.9...7.0 m (2.95...22.97 ft) Reduced operating range (selected with DIP switch): Resolution 14 mm (0.56 in.): 0.9...2 m (2.95...6.56 ft) Resolution 30 mm (1.19 in.): 1.2...3.5 m (3.94...11.48 ft)	Resolution 14 mm (0.56 in.): 0.5...9 m (1.64...29.53 ft) Resolution 30 mm (1.19 in.): 0.9...16.2 m (2.95...53.15 ft) Reduced operating range (selected with DIP switch): Resolution 14 mm (0.56 in.): 0.9...4.5 m (2.95...14.76 ft) Resolution 30 mm (1.19 in.): 1.2...8.0 m (3.94...26.25 ft)
Response time	OSSD – ON to OFF Finger resolution <25 ms Hand resolution <15 ms (For details, see Response Time on page 48 of the GuardShield Safety Light Curtain User Manual.)	OSSD – ON to OFF (no blanking, muting, beam coding, or cascading functionality configured): Finger resolution <20 ms Hand resolution <13 ms (For details, see Response Time on page 48 of the GuardShield Safety Light Curtain User Manual.)
Power up time	Maximum 5 seconds	
OSSD restart time after clearance of the protective field if automatic reset	210 ms (For details, see Response Time on page 48 of the GuardShield Safety Light Curtain User Manual.)	
Power Supply	24V DC \pm 15%; Power supply must meet the requirements of IEC 60204-1 and IEC 61496-1. Reverse connection protection integrated.	
Protection class (EN50178)	II (safety extra low voltage SELV/PELV)	
Power consumption (single stick)	Protective height: 150 mm (5.91 in.): 64 mA maximum 1950 mm (76.77 in.): 214 mA (outputs not loaded)	150 mm (5.91 in.): 70 mA maximum 1950 mm (76.77 in.): 221 mA (Output that is not loaded) 450L-APC-IO-8: additional 40 mA (with termination plug)
Peak current during power-up cycle	800 mA maximum (outputs not loaded)	



Table 2 - Operating Characteristics

Attribute	450L-B4FNxYD, 450L-B4HNxYD	450L-E4FLxYD, 450L-E4HLxYD
Duration of peak current during power-up cycle	100 ms	
Power down time (OSSD < 2 V)	3000 ms	
Transmitted infrared wave length	Infrared (wave length 855 nm)	
Aperture angle	Within $\pm 2.5^\circ$ @ 3 m (9.8 ft)	
Synchronization	Optical	
DIP switch selectable functions	Depends on inserted plug-in: 450L-B: start mode; external device monitoring (EDM); maximum operating range, beam coding 450L-E: blanking and muting functionalities	
Ambient light	Incandescent lamp: 3000 lux or less Sunlight: 100,000 lux or less Voltage level for Logic Hi/1: > 16V DC Current: 7 mA typical	

Table 3 - Inputs Receiver Plug-ins and Universal Plug-in

Attribute	450L-B4FNxYD, 450L-B4HNxYD	450L-E4FLxYD, 450L-E4HLxYD
Input receiver plug-in Manual start	Minimum duration 50 ms; maximum duration 5 seconds Voltage level for Logic Low/0: 0...5V DC Voltage level for Logic Hi/1: > 16V DC Current: 7 mA typical	
Input receiver plug-in EDM	300 ms after activation of OSSD Voltage level for Logic Low/0: 0...5V DC Voltage level for Logic Hi/1: > 16V DC Current: 7 mA typical	

Table 4 - Safety Outputs (OSSDs)

Attribute	450L-B4FNxYD, 450L-B4HNxYD	450L-E4FLxYD, 450L-E4HLxYD
Safety outputs (OSSDs)	Two solid-state outputs	
Switching capacity	500 mA each, maximum	
Max. OFF-current	< 2mA	
Residual voltage (drop from power supply)	2V (excl. voltage drop through cables), maximum	
Connection cable length	100 m (330 ft) maximum with 22AWG; Condition: power supply 24V and maximum load on outputs 50 mA total	
Switching voltage to HIGH (Ueff)	11...30V	
Switching voltage to LOW	-3...2V	
Load capacity	0.5 μ F maximum	
Short circuit protection	Yes	
Test pulse data	For details, see OSSD Output on page 98 of the GuardShield Safety Light Curtain User Manual .	
Short circuit detection	Yes	
Galvanic isolation: I/O from Logic	No	

Table 5 - Status Outputs

Attribute	450L-B4FNxYD, 450L-B4HNxYD	450L-E4FLxYD, 450L-E4HLxYD
Number of status outputs	Up to three nonsafety solid-state output (depends on plug-in)	
Switching capacity	200 mA each, maximum	
Residual voltage (drop from power supply)	2V (excl. voltage drop through cables), maximum	
Short circuit protection	Yes	
Galvanic isolation: I/O from Logic	No	

Table 6 - Environmental and General Protection

Attribute	450L-B4FNxYD, 450L-B4HNxYD	450L-E4FLxYD, 450L-E4HLxYD
Operating temperature	-10...+55 °C (+14...+131 °F)	
Storage temperature	-25...+75 °C (-13...+167 °F)	
Operating humidity	5... 95% (without condensation)	
Enclosure rating	IP65	
Vibration Resistance	Per IEC 61496-1, IEC 60068-2-6 Frequency 10...55 Hz Amplitude 0.35 mm (0.01 in.)	
Shock	Per IEC 61496-1, IEC 60068-2-29 Acceleration 10 g (0.35 oz), Duration 16 ms	
Pollution level	2	

Table 7 - Electrical Protection

Attribute	450L-B4FNxYD, 450L-B4HNxYD,	450L-E4FLxYD, 450L-E4HLxYD
Short circuit protection	Incorporated	
Current limitation	Incorporated	
Overload protection	Incorporated	
Reverse polarity protection	Incorporated	
Overvoltage protection	Incorporated (up to 60V max.)	
Thermal shutdown/restart	Incorporated	

Table 8 - General

Attribute	450L-B4FNxYD, 450L-B4HNxYD, 450L-E4FLxYD, 450L-E4HLxYD	
Materials	Transceiver Stick Profile: End caps: Front window: Screws:	Extruded aluminum, powder coated Polyamide Polycarbonate Steel
	Plug-in (450L-AP...): Pig tail cable: M12 Connector: Body:	 Polyurethane Bare copper, SR-PVC, PUR Polyamide
	Mounting brackets: Top/Bottom 450L-AM-TBM: Bracket: Screws:	 Steel, powder coated Steel
	Side mounting, 450L-AM-SM: Body: Screws:	Polyamide Steel
	Replacement, 450L-AM-RK: Bracket: Screws:	Aluminum, black anodized Steel
	Laser-alignment tool bracket 450L-ALAT-C: Test rod: Optical Interface Device 450L-AD-OID:	Polyamide Aluminum Polyamide
Stick dimensions Cross section Length	30 x 30 mm (1.19 x 1.19 in.) N x 150 mm (N x 5.9 in.) [N = 1 ... 13]	
Screw type and maximum torque of top/bottom mounting bracket	M3 x 10; Phillips screw 0.7 N•m (xx lb•in) max	
Screw type and maximum torque for M2 screws of plug-in	M2 x 8; Phillips screw 0.38 N•m (xx lb•in) max	
Maximum torque for screws of side mounting bracket	Screws: M6: Maximum 11 Nm M4: Maximum 2.8 Nm	

Table 8 - General

Attribute	450L-B4FNxYD, 450L-B4HNxYD, 450L-E4FLxYD, 450L-E4HLxYD
Indicators stick	450L-B and 450L-E: Transceiver type (Rx or Tx) Status Intensity (for two regions) Start/Restart Output
Connection plug	Depending on installed plug-in: M12 5-pin (male) or M12 8-pin (male) fixed at pigtail with cable length: Connection plug-ins: 150 mm (11.81 in.) IO cascading plug-in: 60 mm (2.36 in.); Minimum outer bend radius of pigtail: > 3xD: 5 pin: D = 4.4 mm (0.17 in.) 8 pin: D = 5.5 mm (0.22 in.)
Connection cable length	Maximum 100 m (330 ft) with wire section AWG 22 (Condition: Power supply 24V and maximum load on outputs 50 mA total)
Accessories included	Test rod, top/bottom mounting brackets and installation instruction
Silicon	The unit does not release any silicone or other LABS-critical substances and is suitable for use in paint shops.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
GuardShield™ Safety Light Curtain User Manual, http://literature.rockwellautomation.com/idc/groups/literature/documents/um/450L-um001_-en-p.pdf	Provides information for installation, maintenance, and troubleshooting of the GuardShield Safety Light Curtain.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation® industrial system.
Product Certifications website at Rockwell Automation Technical Data	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications (including translations) at <http://www.rockwellautomation.com/literature/>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Rockwell Automation Support

For technical support, visit <http://www.rockwellautomation.com/support/overview.page>.

Waste Electrical and Electronic Equipment (WEEE)



At the end of life, this equipment can be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental information on its website at <http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>.

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