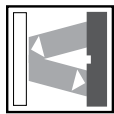




MHP Series Miniature High-Performance Sensors

- Rugged IP69K housing withstands harsh environments and high-pressure washdown areas
- Cable or quick-disconnect models
- DC and AC models



Convergent Beam Mode

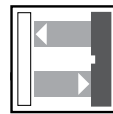
See pages 418-419

Features:

- Fixed-field, ignores foreground and background
- Consistent detection of light and dark objects

Sensing Range: 25 mm, 63 mm

Outputs: NPN and PNP



Diffuse Mode

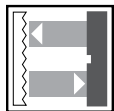
See pages 420-421

Features:

- Infrared and visible red light sources
- Adjustable sensing range

Sensing Range: 150 mm, 450 mm

Outputs: NPN and PNP, thyristor



Retro-Reflective Mode

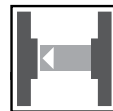
See pages 422-423

Features:

- Polarization filter models detect shiny objects
- Infrared and visible red light sources

Sensing Range: 2.4 m, 9.1 m

Outputs: NPN and PNP, thyristor



Thru-Beam Mode

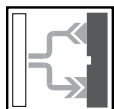
See pages 424

Features:

- Long-range scanning
- Separate transmitter and receiver housings

Sensing Range: 30.4 m

Outputs: NPN and PNP, thyristor



Fiber Optic Diffuse and Thru-Beam Mode

See pages 425-426

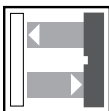
Features:

- High-temperature applications
- Wide selection of fiber optic cables





Sensing Range: Determined by fiber optic cable

Outputs: NPN and PNP, thyristor

See pages 427-430 for MHP Series specifications, wiring and dimensions.





Diffuse Mode

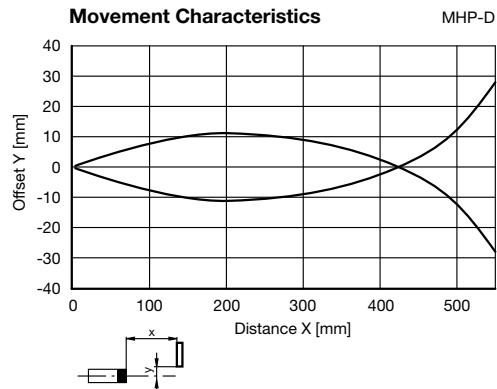
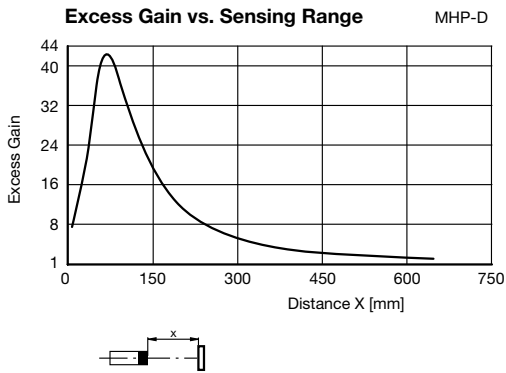
Specifications		150 mm	150 mm	450 mm	450 mm
SENSING RANGE		150 mm	150 mm	450 mm	450 mm
SENSITIVITY ADJUSTMENT		Yes	Yes	Yes	Yes
MODEL NUMBER(S)		MHP-DR33L	MHP-DR33Q •	MHP-D33L ⚡	MHP-D33Q ⚡
		—	—	—	—
OUTPUT	<i>33 (DC)</i>	1 NPN and 1 PNP	1 NPN and 1 PNP	1 NPN and 1 PNP	1 NPN and 1 PNP
	<i>2A (AC)</i>	—	—	—	—
LOAD CURRENT		250 mA max. (NPN) 150 mA max. (PNP)	250 mA max. (NPN) 150 mA max. (PNP)	250 mA max. (NPN) 150 mA max. (PNP)	250 mA max. (NPN) 150 mA max. (PNP)
LEAKAGE CURRENT		10 µA	10 µA	10 µA	10 µA
INRUSH CURRENT		—	—	—	—
VOLTAGE DROP		≤ 1.0 VDC (NPN) ≤ 2.0 VDC (PNP)	≤ 1.0 VDC (NPN) ≤ 2.0 VDC (PNP)	≤ 1.0 VDC (NPN) ≤ 2.0 VDC (PNP)	≤ 1.0 VDC (NPN) ≤ 2.0 VDC (PNP)
SUPPLY VOLTAGE		10-30 VDC	10-30 VDC	10-30 VDC	10-30 VDC
CURRENT CONSUMPTION		≤ 35 mA	≤ 35 mA	≤ 35 mA	≤ 35 mA
RESPONSE TIME		≤ 1.0 ms	≤ 1.0 ms	≤ 1.0 ms	≤ 1.0 ms
SWITCHING FREQUENCY		500 Hz	500 Hz	500 Hz	500 Hz
LIGHT SOURCE		Visible red LED	Visible red LED	Visible red LED	Visible red LED
WEIGHT		4.6 oz	1.5 oz	4.6 oz	1.5 oz
ELECTRICAL CONNECTION		 2-meter cable, PVC covered 4-conductor,	 Quick disconnect type V1	 2-meter cable, PVC covered 4-conductor,	 Quick disconnect type V1
ADDITIONAL DATA		See pages 427-430			



Diffuse Mode

Specifications		
SENSING RANGE	450 mm	450 mm
SENSITIVITY ADJUSTMENT	Yes	Yes
MODEL NUMBER(S)	—	—
	MHP-D2AL ⚡	MHP-D2AQ ⚡
OUTPUT	—	—
33 (DC)	—	—
2A (AC)	Thyristor	Thyristor
LOAD CURRENT	5-500 mA, up to 122 °F, derated to 300 mA at 158 °F	5-500 mA, up to 122 °F, derated to 300 mA at 158 °F
LEAKAGE CURRENT	1.8 mA	1.8 mA
INRUSH CURRENT	10 A/10 ms	10 A/10 ms
VOLTAGE DROP	≤ 6.7 V	≤ 6.7 V
SUPPLY VOLTAGE	20-260 VAC, 50-60 Hz	20-260 VAC, 50-60 Hz
CURRENT CONSUMPTION	≤ 1.5 mA	≤ 1.5 mA
RESPONSE TIME	≤ 8.0 ms	≤ 8.0 ms
SWITCHING FREQUENCY	60 Hz	60 Hz
LIGHT SOURCE	Infrared LED	Infrared LED
WEIGHT	5.6 oz	1.5 oz
ELECTRICAL CONNECTION	 3-meter cable, PVC covered 2-conductor	 Quick disconnect type V12
ADDITIONAL DATA	See pages 427-430	





Sensing Characteristics



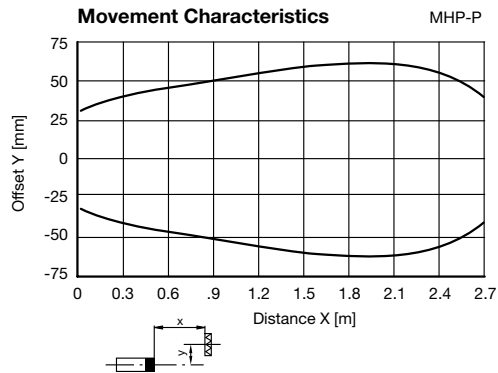
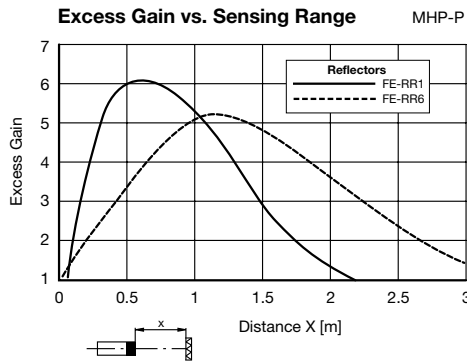


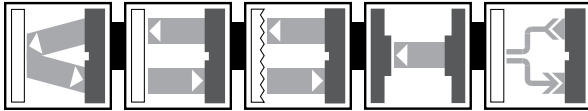
Retro-Reflective Mode

Specifications

SENSING RANGE		2.4 m	2.4 m	2.4 m	2.4 m
SENSITIVITY ADJUSTMENT		Yes	Yes	Yes	Yes
POLARIZED FILTER		Yes	Yes	Yes	Yes
MODEL NUMBER(S)		MHP-P33L •	MHP-P33Q ⚡	—	—
		—	—	MHP-P2AL	MHP-P2AQ
OUTPUT	33 (DC)	1 NPN and 1 PNP	1 NPN and 1 PNP	—	—
	2A (AC)	—	—	Thyristor	Thyristor
LOAD CURRENT		250 mA max. (NPN) 150 mA max. (PNP)	250 mA max. (NPN) 150 mA max. (PNP)	5-500 mA, up to 122 °F, derated to 300 mA at 158 °F	5-500 mA, up to 122 °F, derated to 300 mA at 158 °F
LEAKAGE CURRENT		10 µA	10 µA	1.8 mA	1.8 mA
INRUSH CURRENT		—	—	10 A/10 ms	10 A/10 ms
VOLTAGE DROP		≤ 1.0 VDC (NPN) ≤ 2.0 VDC (PNP)	≤ 1.0 VDC (NPN) ≤ 2.0 VDC (PNP)	≤ 6.7 V	≤ 6.7 V
SUPPLY VOLTAGE		10-30 VDC	10-30 VDC	20-260 VAC, 50-60 Hz	20-260 VAC, 50-60 Hz
CURRENT CONSUMPTION		≤ 35 mA	≤ 35 mA	≤ 1.5 mA	≤ 1.5 mA
RESPONSE TIME		≤ 1.0 ms	≤ 1.0 ms	≤ 8.0 ms	≤ 8.0 ms
SWITCHING FREQUENCY		500 Hz	500 Hz	60 Hz	60 Hz
LIGHT SOURCE		Visible red LED	Visible red LED	Visible red LED	Visible red LED
WEIGHT		4.6 oz	1.5 oz	5.6 oz	1.5 oz
ELECTRICAL CONNECTION		 2-meter cable, PVC covered 4-conductor,	 Quick disconnect type V1	 3-meter cable, PVC covered 2-conductor	 Quick disconnect type V12
ADDITIONAL DATA		<i>See pages 427-430</i>			

Sensing Characteristics





Series Specifications

MHP Series Specifications

SHORT CIRCUIT AND OVERLOAD PROTECTION	No	
REVERSE POLARITY PROTECTION	Yes (DC), No (AC)	
LED(s)	Yes (2)*	
OPERATING MODE	Light on/dark on	
PROTECTION (IEC)	IP69K	
TEMPERATURE RANGE	<i>WORKING</i>	-22 °F to +158 °F
	<i>STORAGE</i>	-67 °F to +185 °F
HOUSING MATERIAL		Polysulphone
	<i>LENS</i>	Polycarbonate
APPROVALS		

*See dimensional drawings for LED functions.

Wiring Diagrams

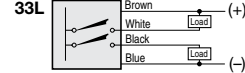
DC



Cable Connection

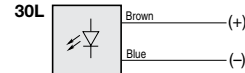
Light On/Dark On

NPN and PNP Outputs



Transmitter

(thru-beam models)



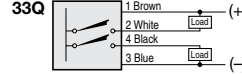
Quick Disconnect

Note: Wiring diagrams show quick disconnect pin numbers.

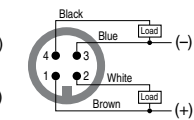
V1 Type

Light On/Dark On

NPN and PNP Outputs

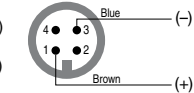
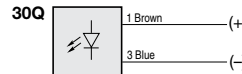


Male Receptacle End View



Transmitter

(thru-beam models)

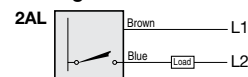


AC



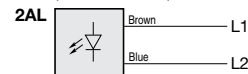
Cable Connection

Light On/Dark On



Transmitter

(thru-beam models)



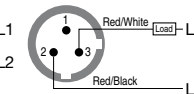
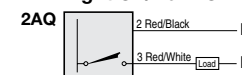
Quick Disconnect

Note: Wiring diagrams show quick disconnect pin numbers.

V12 Type

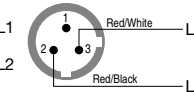
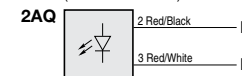
Light On/Dark On

Male Receptacle End View



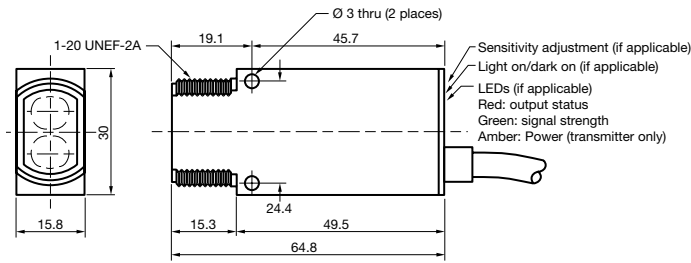
Transmitter

(thru-beam models)

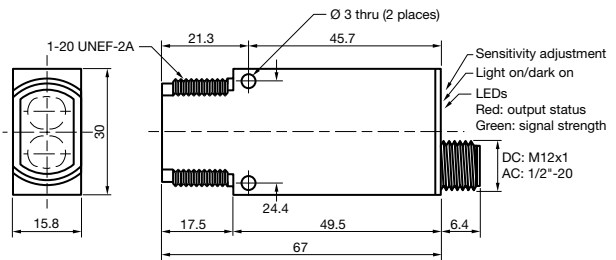
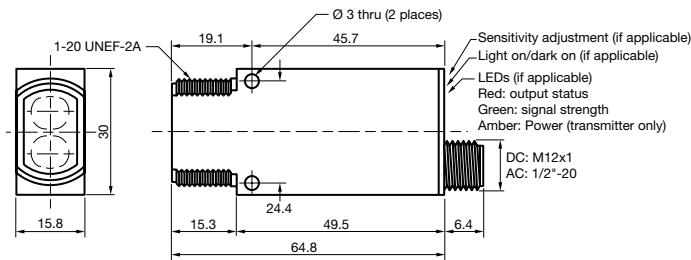
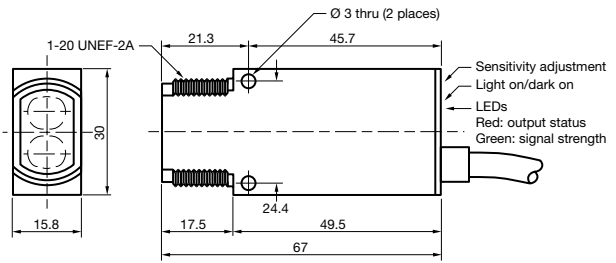


Dimensions (mm)

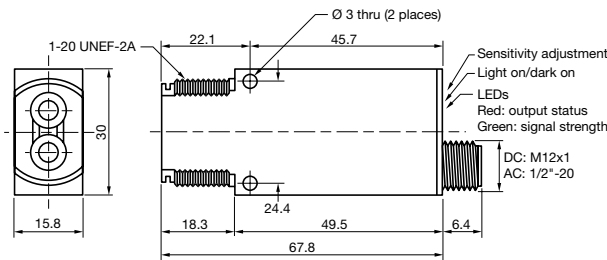
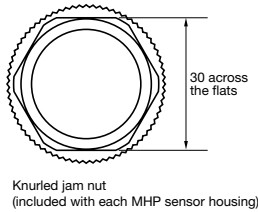
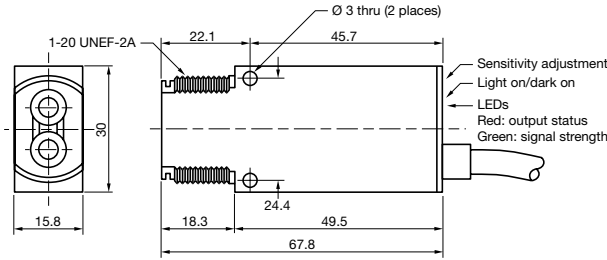
MHP-C, MHP-D, MHP-R, MHP-L, MHP-T



MHP-P



MHP-F



Typical Scan Distances for MHP Fiber Optics (Clean Air)

Sensor Type	Scan Technique	Glass W/O Lens	Plastic W/O Lens	Plastic W/Lens (FEF-PLT1)
Infrared MHP-F	Diffuse	58mm	N/A	N/A
	Thru-Beam	356mm	N/A	N/A
Visible Red MHP-FR	Diffuse	36mm	10mm	N/A
	Thru-Beam	254mm	84mm	660mm

Actual distance is limited by length of cables used. Distance values are given as a guide to relative optical power and rating using 3ft glass and 1m plastic cables.