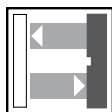




ML20 Series Long-Range Miniature Sensors

- Long-range miniature sensor
- Wide temperature rating
- Mode switch on housing bottom to prevent accidental change



Diffuse Mode

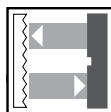
See pages 486-487

Features:

- Cross-talk immune for 2 units
- Divergent beam versions available

Sensing Ranges: 100 mm, 1 m

Output: NPN, PNP



Retro-Reflective Mode

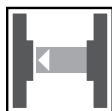
See page 488

Features:

- Cross-talk immune for 2 units
- Polarized filter detects shiny objects

Sensing Range: 5 m

Output: NPN, PNP



Thru-Beam Mode

See page 489

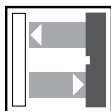
Features:

- Alignment LED in lens for alignment ease
- Wide operating angle

Sensing Range: 15 m

Output: NPN, PNP

See pages 490-492 for ML20 Series specifications, wiring and dimensions.

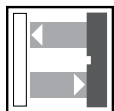


Diffuse Mode

Specifications		Wide Beam			
SENSING RANGE		0-100 mm	0-100 mm	0-1 m	0-1 m
SENSITIVITY ADJUSTMENT		Yes	Yes	Yes	Yes
REFERENCE TARGET		100 x 100 mm white test card	100 x 100 mm white test card	300 x 300 mm white test card	300 x 300 mm white test card
MODEL NUMBER(S)		ML20-8-W-100/102/115 ⚡	ML20-8-W-100/102/115b	ML20-8-1000/102/115	ML20-8-1000/102/115b
		ML20-8-W-100/103/115	ML20-8-W-100/103/115b	ML20-8-1000/103/115	ML20-8-1000/103/115b
OUTPUT: Transistor, Normally Open or Normally Closed					
		/102	1 NPN	1 NPN	1 NPN
		/103	1 PNP	1 PNP	1 PNP
LOAD CURRENT		100 mA max.	100 mA max.	100 mA max.	100 mA max.
VOLTAGE DROP		≤ 3 VDC	≤ 3 VDC	≤ 3VDC	≤ 3 VDC
SHORT CIRCUIT AND OVERLOAD PROTECTION		Yes	Yes	Yes	Yes
REVERSE POLARITY PROTECTION		Yes	Yes	Yes	Yes
SUPPLY VOLTAGE		10-30 VDC	10-30 VDC	10-30 VDC	10-30 VDC
VOLTAGE RIPPLE		10%	10%	10%	10%
LED(s)		Yes (2)*	Yes (2)*	Yes (2)*	Yes (2)*
CURRENT CONSUMPTION		≤ 16 mA	≤ 16 mA	≤ 20 mA	≤ 20 mA
OPERATING MODE		Light on/dark on	Light on/dark on	Light on/dark on	Light on/dark on
RESPONSE TIME		≤ 0.5 ms	≤ 0.5 ms	≤ 0.5 ms	≤ 0.5 ms
SWITCHING FREQUENCY		1 kHz	1 kHz	1 kHz	1 kHz
PROTECTION (IEC)		IP67	IP67	IP67	IP67
LIGHT SOURCE		Infrared LED	Infrared LED	Infrared LED	Infrared LED
AMBIENT LIGHT RESISTANCE		≤ 40,000 lux (sunlight) ≤ 10,000 lux (incandescent)	≤ 40,000 lux (sunlight) ≤ 10,000 lux (incandescent)	≤ 40,000 lux (sunlight) ≤ 10,000 lux (incandescent)	≤ 40,000 lux (sunlight) ≤ 10,000 lux (incandescent)
TEMPERATURE RANGE	WORKING	-22 °F to +140 °F	-22 °F to +140 °F	-22 °F to +140 °F	-22 °F to +140 °F
	STORAGE	-40 °F to +158 °F	-40 °F to +158 °F	-40 °F to +158 °F	-40 °F to +158 °F
HOUSING MATERIAL		PBT	PBT	PBT	PBT
LENS		PMMA	PMMA	PMMA	PMMA
WEIGHT		1.9 oz	1.0 oz	1.9 oz	1.0 oz
APPROVALS		CE cUL _{us}	CE cUL _{us}	CE cUL _{us}	CE cUL _{us}
ELECTRICAL CONNECTION		 2-meter cable, PVC covered, 3-conductor, #24 AWG	 300 mm pigtail, PVC covered, quick disconnect type V1	 2-meter cable, PVC covered, 3-conductor, #24 AWG	 300 mm pigtail, PVC covered, quick disconnect type V1
ADDITIONAL DATA		See pages 490-492			

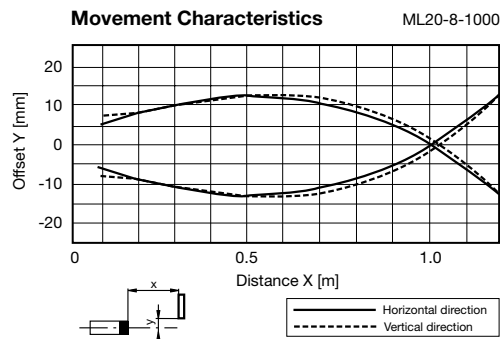
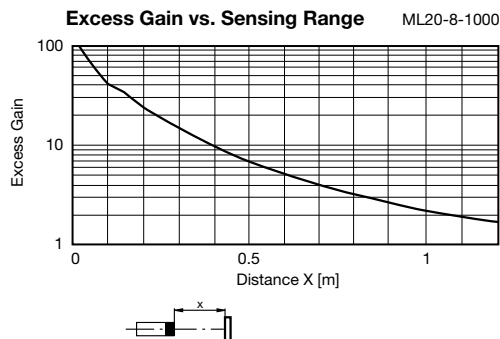
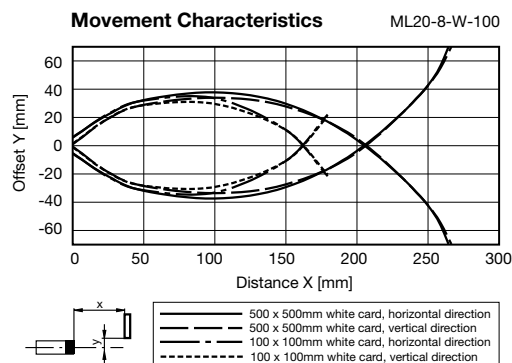
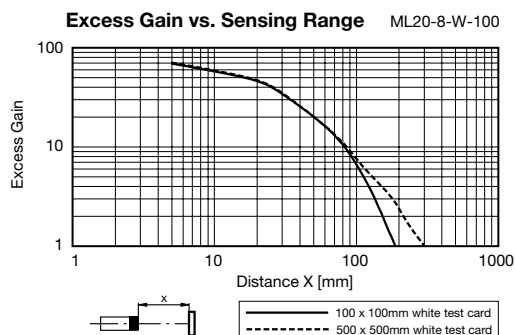
*See dimensional drawings for LED functions.

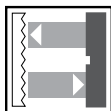
- ⚡ Stocked item
- Typical delivery 4 weeks or less
Consult factory for all other models



Diffuse Mode

Sensing Characteristics





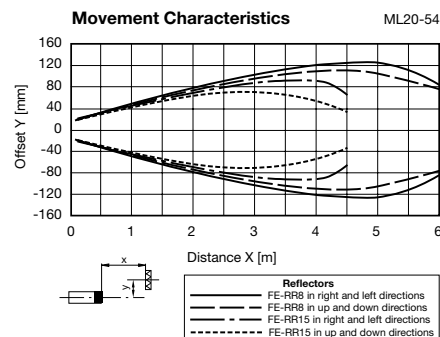
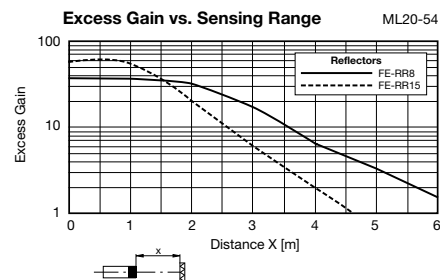
Retro-Reflective Mode

Specifications

SENSING RANGE	5 m	5 m
SENSITIVITY ADJUSTMENT	Yes	Yes
REFERENCE TARGET	FE-RR8 reflector	FE-RR8 reflector
POLARIZED FILTER	Yes	Yes
MODEL NUMBER(S)	ML20-54/102/115 ⚡ ML20-54/103/115 ⚡	ML20-54/102/115b ML20-54/103/115b
OUTPUT: Transistor, Normally Open or Normally Closed	/102 1 NPN /103 1 PNP	1 NPN 1 PNP
LOAD CURRENT	100 mA max.	100 mA max.
VOLTAGE DROP	≤ 3VDC	≤ 3 VDC
SHORT CIRCUIT AND OVERLOAD PROTECTION	Yes	Yes
REVERSE POLARITY PROTECTION	Yes	Yes
SUPPLY VOLTAGE	10-30 VDC	10-30 VDC
VOLTAGE RIPPLE	10%	10%
LED(s)	Yes (2)*	Yes (2)*
CURRENT CONSUMPTION	≤ 20 mA	≤ 20 mA
OPERATING MODE	Light on/dark on	Light on/dark on
RESPONSE TIME	≤ 0.5 ms	≤ 0.5 ms
SWITCHING FREQUENCY	1 kHz	1 kHz
PROTECTION (IEC)	IP67	IP67
LIGHT BEAM ANGLE	Sensor: 0.5° to 10° Reflector: 20°	Sensor: 0.5° to 10° Reflector: 20°
LIGHT SOURCE	Visible red LED	Visible red LED
AMBIENT LIGHT RESISTANCE	≤ 40,000 lux (sunlight) ≤ 10,000 lux (incandescent)	≤ 40,000 lux (sunlight) ≤ 10,000 lux (incandescent)
TEMPERATURE RANGE	WORKING: -22 °F to +140 °F STORAGE: -40 °F to +158 °F	-22 °F to +140 °F -40 °F to +158 °F
HOUSING MATERIAL	PBT	PBT
LENS	PMMA	PMMA
WEIGHT	1.9 oz	1.0 oz
APPROVALS	CE cULus	CE cULus
ELECTRICAL CONNECTION	2-meter cable, PVC covered, 3-conductor, #24 AWG	300 mm pigtail, PVC covered, quick disconnect type V1
ADDITIONAL DATA	See pages 490-492	

*See dimensional drawings for LED functions.

Sensing Characteristics



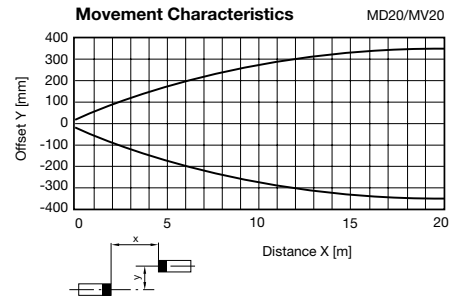
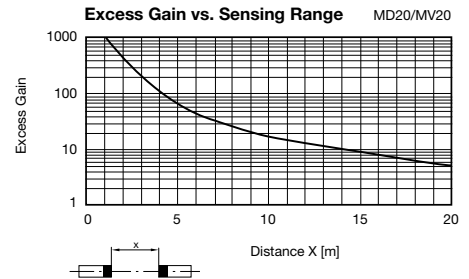
- ⚡ Stocked item
- Typical delivery 4 weeks or less
- Consult factory for all other models



Thru-Beam Mode

Specifications		
SENSING RANGE		15 m
SENSITIVITY ADJUSTMENT		Yes
REFERENCE TARGET		Receiver
MODEL NUMBER(S)	Transmitter	MD20/115
	Receiver	MV20/102/115
		MV20/103/115
OUTPUT: Transistor, Normally Open or Normally Closed	/102	1 NPN
	/103	1 PNP
LOAD CURRENT		100 mA max.
VOLTAGE DROP		≤ 3VDC
SHORT CIRCUIT AND OVERLOAD PROTECTION		Yes
REVERSE POLARITY PROTECTION		Yes
SUPPLY VOLTAGE		10-30 VDC
VOLTAGE RIPPLE		10%
LED(s)		Yes (1)*
CURRENT CONSUMPTION		≤ 20 mA transmitter ≤ 10 mA receiver
OPERATING MODE		Light on/dark on
RESPONSE TIME		≤ 0.5 ms
SWITCHING FREQUENCY		1 kHz
PROTECTION (IEC)		IP67
LIGHT BEAM ANGLE		2° to 20°
LIGHT SOURCE		Visible red LED
AMBIENT LIGHT RESISTANCE		≤ 40,000 lux (sunlight) ≤ 10,000 lux (incandescent)
TEMPERATURE RANGE	WORKING	-22 °F to +140 °F
	STORAGE	-40 °F to +158 °F
HOUSING MATERIAL		PBT
	LENS	PMMA
WEIGHT		1.9 oz
APPROVALS		CE cULus
ELECTRICAL CONNECTION		2-meter cable, PVC covered, 2- or 3-conductor, #24 AWG
ADDITIONAL DATA		See pages 490-492

Sensing Characteristics



*See dimensional drawings for LED functions.

- ⚡ Stocked item
- Typical delivery 4 weeks or less
- Consult factory for all other models

Wiring Diagrams

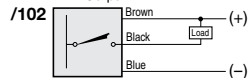
DC



Cable Connection

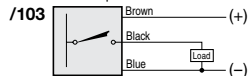
Light On or Dark On

NPN Output



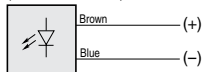
Light On or Dark On

PNP Output



Transmitter

(thru-beam models)



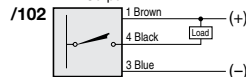
Quick Disconnect

Note: Wiring diagrams show quick disconnect pin numbers.

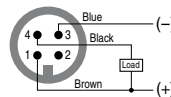
V1 Type

Light On or Dark On

NPN Output

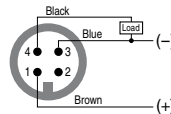
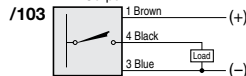


Male Receptacle End View



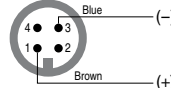
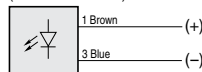
Light On or Dark On

PNP Output



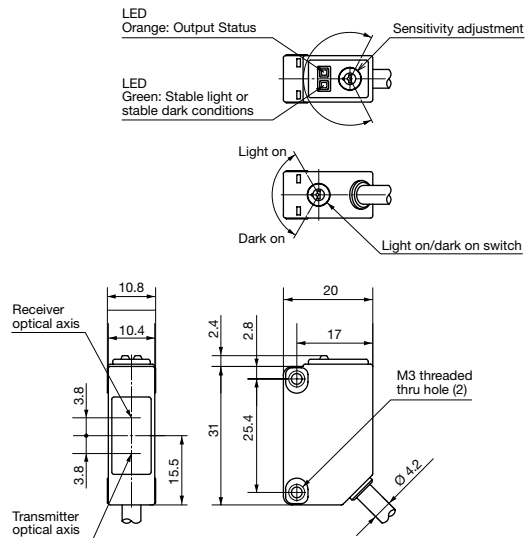
Transmitter

(thru-beam models)

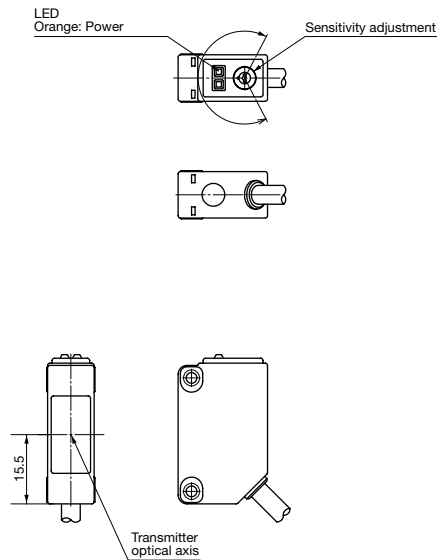


Dimensions (mm)

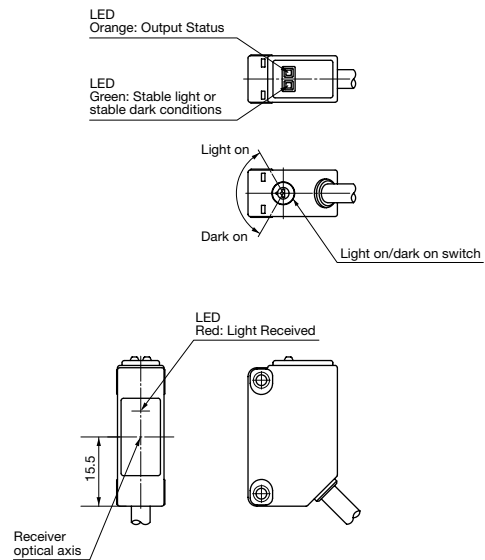
ML20...



MD20...



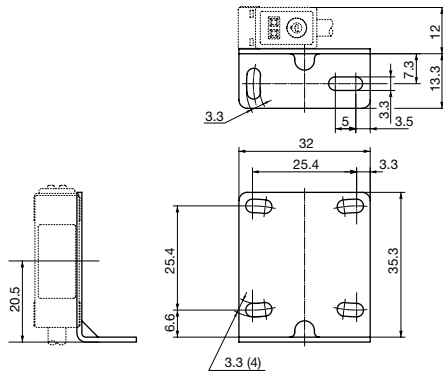
MV20...



Accessories

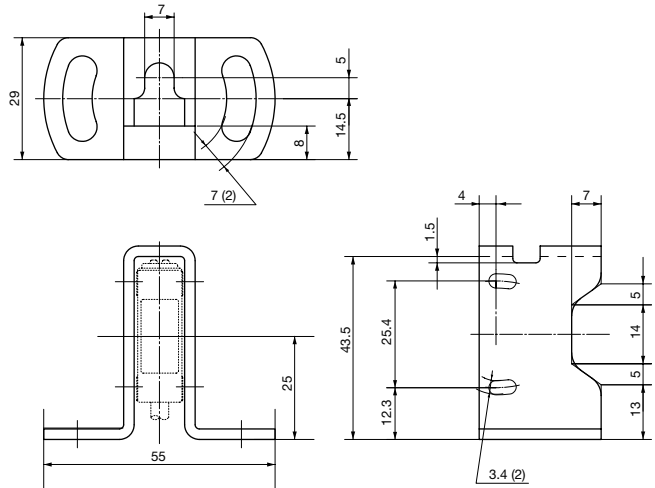
(Dimensions in mm)

Bottom-Mounting L-Bracket Model OMH-ML20-1



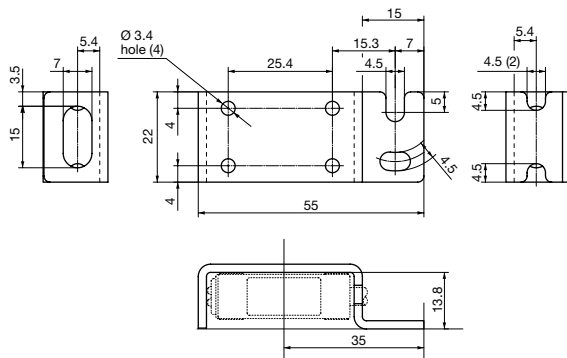
Material: Stainless steel

Wraparound Vertical Mounting Bracket Model OMH-ML20-2



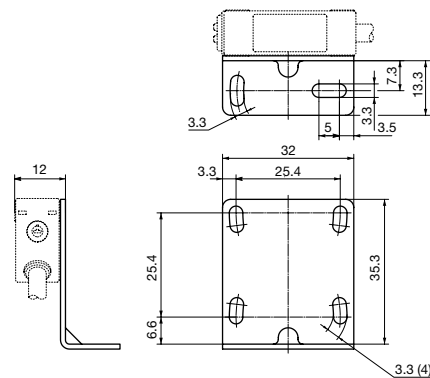
Material: Stainless steel

Wraparound Horizontal Mounting Bracket Model OMH-ML20-3



Material: Stainless steel

Rear-Mounting L-Bracket Model OMH-ML20-4



Material: Stainless steel



See pages
803-854 for
cordsets



See pages
797-802 for
reflectors



See pages 865-872
for additional
accessories

Subject to modifications without notice

Pepperl+Fuchs Group
www.pepperl-fuchs.com

USA: +1 330 486 0001
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776 0
fa-info@de.pepperl-fuchs.com

Copyright Pepperl+Fuchs
Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com

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