



## ML3 Series Ultraminiature Sensors

- Self-contained ultraminiature sensors
- Wide range of aperture attachments
- Visible red and infrared light sources
- Vertical and horizontal styles



### Convergent Beam Mode

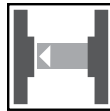
See pages 432-434

**Features:**

- Fixed sensing range
- Visible red or infrared LED light sources

**Sensing Range:** 30 mm

**Outputs:** NPN, PNP



### Thru-Beam Mode

See pages 435-438

**Features:**

- Long-range scanning
- Separate transmitter and receiver housing

**Sensing Range:** 1.5 m



**Outputs:** NPN, PNP

See pages 439-440 for ML3 Series wiring and dimensions.



## Convergent Beam Mode

Photoelectric ML3 Series Ultraminiature

Specifications		
SENSING RANGE	30 mm	30 mm
SENSITIVITY ADJUSTMENT	Yes	Yes
DIRECTIONAL MOUNTING	Vertical	Vertical
MODEL NUMBER(S)	ML3-8-C-30-RT/25/115/148 ⚡ ML3-8-C-30-RT/25/115/149	ML3-8-C-30-IR/25/115/148 —
OUTPUT: Transistor, /148 Open collector /149	1 NPN 1 PNP	1 NPN —
LOAD CURRENT	80 mA max.	80 mA max.
VOLTAGE DROP	1 VDC	1 VDC
SHORT CIRCUIT AND OVERLOAD PROTECTION	No	No
REVERSE POLARITY PROTECTION	Yes	Yes
SUPPLY VOLTAGE	10.8-26.4 VDC	10.8-26.4 VDC
VOLTAGE RIPPLE	10% max.	10% max.
LED(s)	Yes (1)*	Yes (1)*
CURRENT CONSUMPTION	≤ 20 mA	≤ 20 mA
OPERATING MODE	Light on	Light on
RESPONSE TIME	≤ 1 ms	≤ 1 ms
SWITCHING FREQUENCY	500 Hz	500 Hz
PROTECTION (IEC)	IP40	IP40
LIGHT SOURCE	Visible red LED	Infrared LED
AMBIENT LIGHT RESISTANCE	≤ 10,000 lux	≤ 10,000 lux
TEMPERATURE RANGE	WORKING: -4 °F to +122 °F STORAGE: -40 °F to +158 °F	-4 °F to +122 °F -40 °F to +158 °F
HOUSING MATERIAL	Polycarbonate	Polycarbonate
LENS	Polycarbonate	Polycarbonate
WEIGHT	≈ 0.7 oz	≈ 0.7 oz
STANDARDS	EN 60947-5-2	EN 60947-5-2
APPROVALS	CE	CE
ELECTRICAL CONNECTION	 2-meter cable, PVC covered, 3-conductor, #28 AWG	 2-meter cable, PVC covered, 3-conductor, #28 AWG
ADDITIONAL DATA	<b>See pages 439-440</b>	

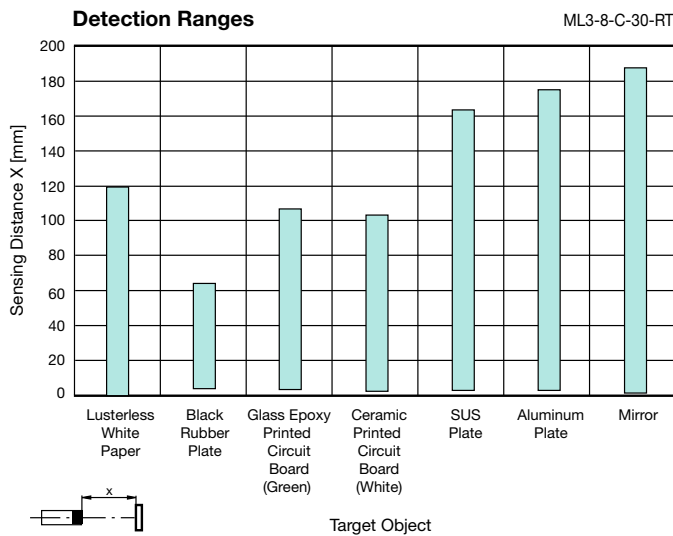
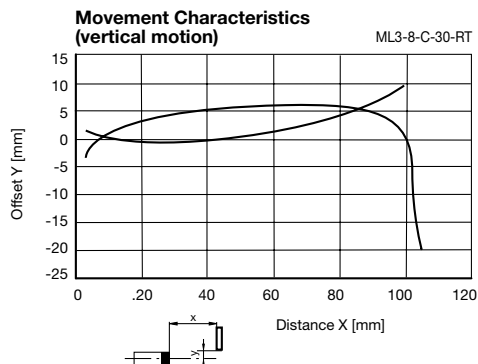
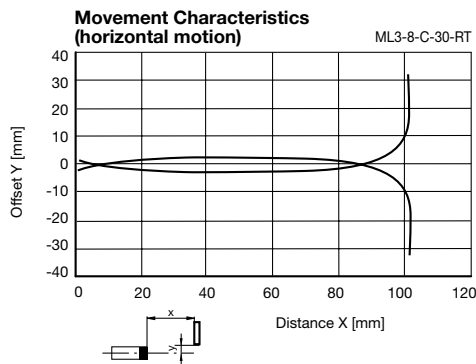
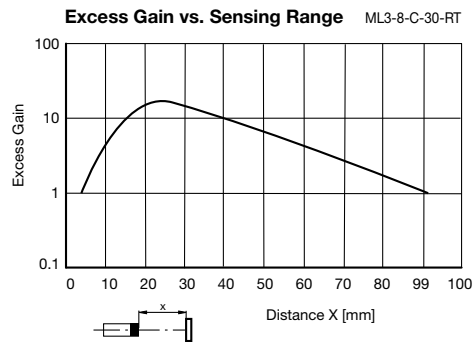
- ⚡ Stocked item
- Typical delivery 4 weeks or less  
Consult factory for all other models

\*See dimensional drawings for LED functions.



# Convergent Beam Mode

## Sensing Characteristics

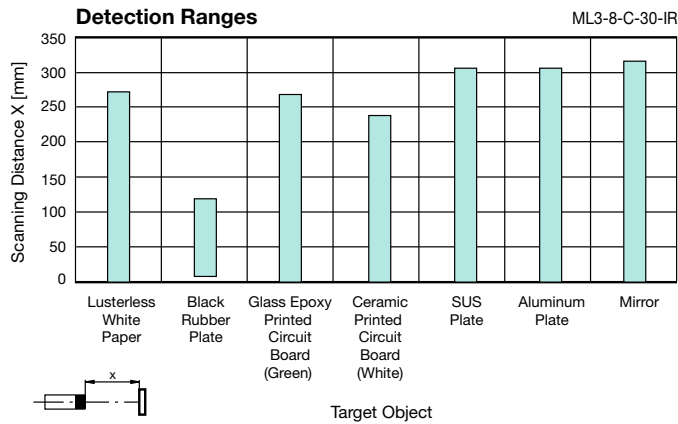
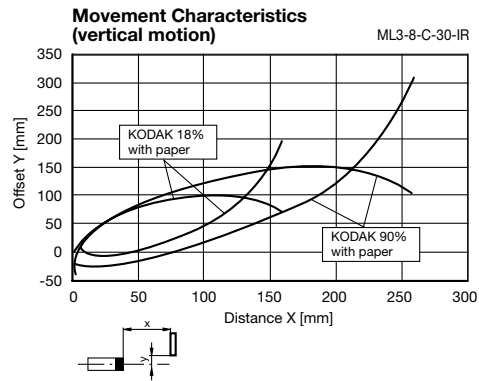
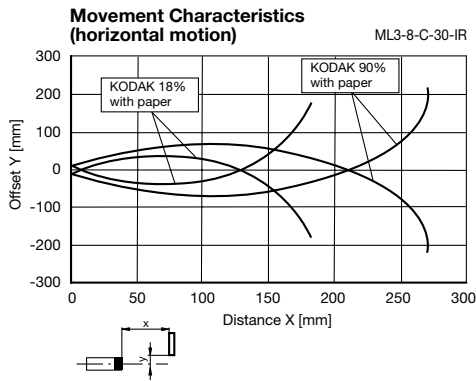
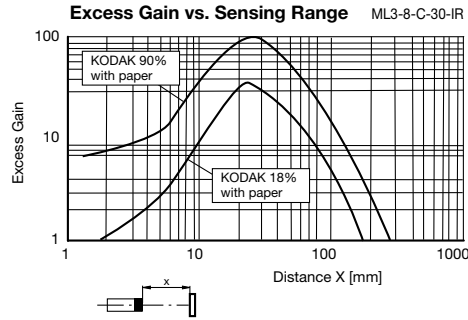




# Convergent Beam Mode




## Sensing Characteristics

Photoelectric ML3 Series Ultraminiature



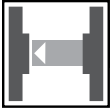


## Thru-Beam Mode

Specifications				
<b>SENSING RANGE</b>		<b>0-1.5 m</b>	<b>0-1.5 m</b>	<b>0-1.5 m</b>
<b>SENSITIVITY ADJUSTMENT</b>		No	No	No
<b>DIRECTIONAL MOUNTING</b>		Horizontal	Vertical	Vertical
<b>MODEL NUMBER(S)</b>	<i>Transmitter</i>	<b>M31/115</b>	<b>M3/115</b> ⚡	<b>M3/115</b> ⚡
	<i>Receiver</i>	<b>MV31/59/115/148</b>	<b>MV3/59/115/148</b> ⚡	<b>MV3/25/115/148</b>
		—	<b>MV3/59/115/149</b>	—
<b>OUTPUT:</b> Transistor, Open collector	<i>/148</i>	1 NPN	1 NPN	1 NPN
	<i>/149</i>	—	1 PNP	—
<i>LOAD CURRENT</i>		100 mA max.	100 mA max.	100 mA max.
<i>VOLTAGE DROP</i>		1 VDC	1 VDC	1 VDC
<i>SHORT CIRCUIT AND OVERLOAD PROTECTION</i>		No	No	No
<i>REVERSE POLARITY PROTECTION</i>		Yes	Yes	Yes
<b>SUPPLY VOLTAGE</b>		10.8-26.4 VDC	10.8-26.4 VDC	10.8-26.4 VDC
<b>VOLTAGE RIPPLE</b>		10% max.	10% max.	10% max.
<b>LED(s)</b>		Yes (1)*	Yes (1)*	Yes (1)*
<b>CURRENT CONSUMPTION</b>		≤ 40 mA	≤ 40 mA	≤ 40 mA
<b>OPERATING MODE</b>		Dark on	Dark on	Light on
<b>RESPONSE TIME</b>		≤ 1 ms	≤ 1 ms	≤ 1 ms
<b>SWITCHING FREQUENCY</b>		500 Hz	500 Hz	500 Hz
<b>PROTECTION (IEC)</b>		IP40	IP40	IP40
<b>LIGHT SOURCE</b>		Infrared LED	Infrared LED	Infrared LED
<b>AMBIENT LIGHT RESISTANCE</b>		≤ 10,000 lux	≤ 10,000 lux	≤ 10,000 lux
<b>TEMPERATURE RANGE</b>	<i>WORKING</i>	-4 °F to +122 °F	-4 °F to +122 °F	-4 °F to +122 °F
	<i>STORAGE</i>	-40 °F to +158 °F	-40 °F to +158 °F	-40 °F to +158 °F
<b>HOUSING MATERIAL</b>		Polycarbonate	Polycarbonate	Polycarbonate
	<i>LENS</i>	Polycarbonate	Polycarbonate	Polycarbonate
<b>WEIGHT</b>		≈ 0.7 oz (per housing)	≈ 0.7 oz (per housing)	≈ 0.7 oz (per housing)
<b>STANDARDS</b>		EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
<b>APPROVALS</b>		<b>CE</b>	<b>CE</b>	<b>CE</b>
<b>ELECTRICAL CONNECTION</b>		 2-meter cable, PVC covered, 3-conductor, #28 AWG	 2-meter cable, PVC covered, 3-conductor, #28 AWG	 2-meter cable, PVC covered, 3-conductor, #28 AWG
<b>ADDITIONAL DATA</b>		<b>See pages 439-440</b>		

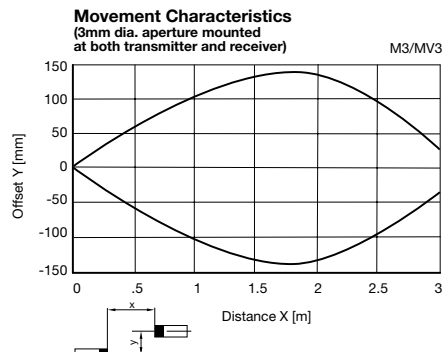
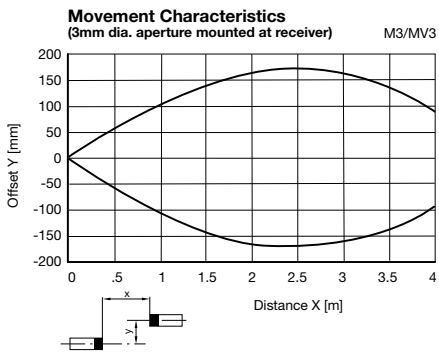
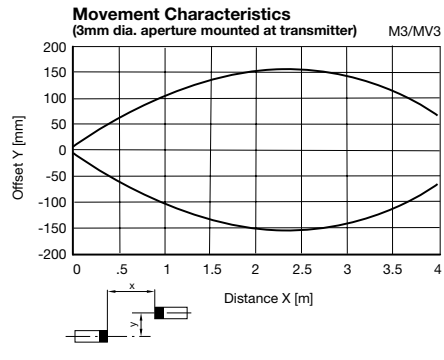
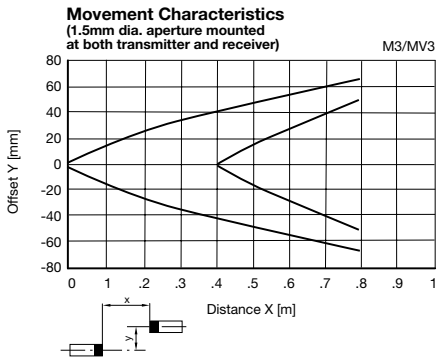
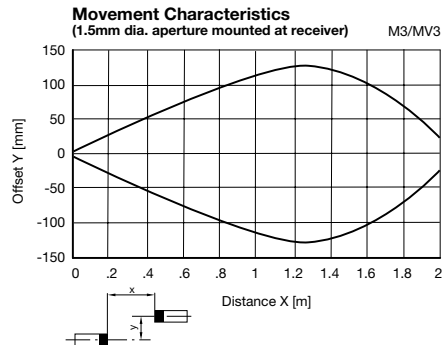
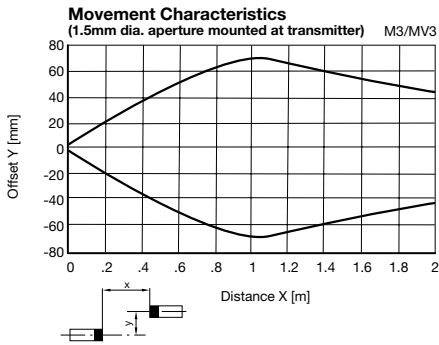
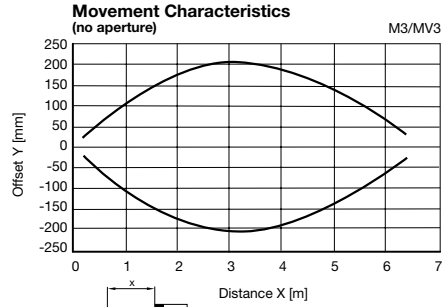
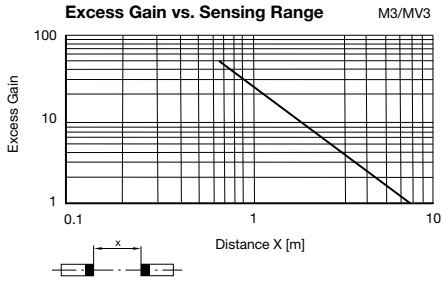
\*See dimensional drawings for LED functions.

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



# Thru-Beam Mode

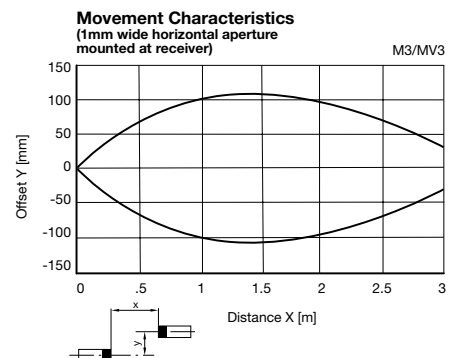
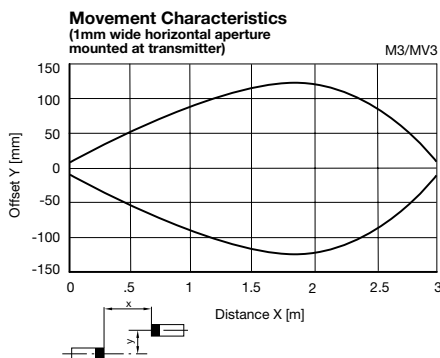
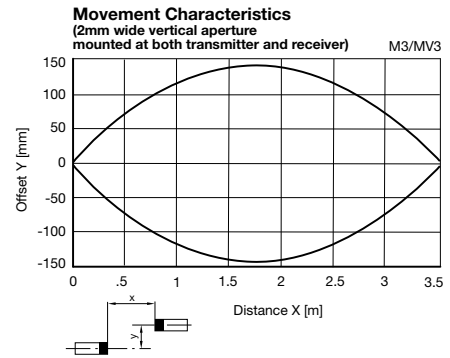
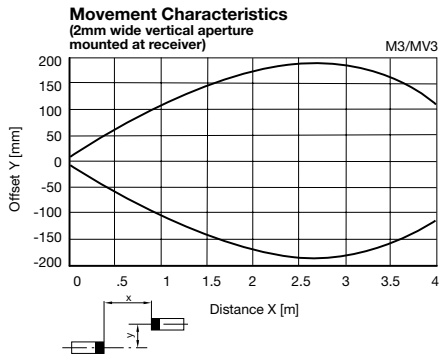
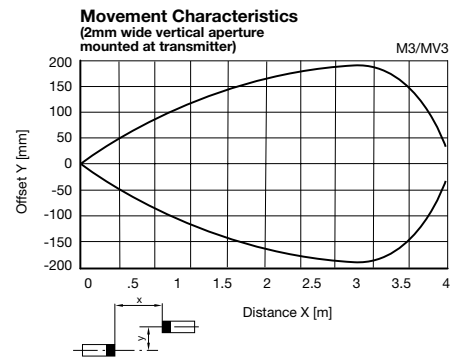
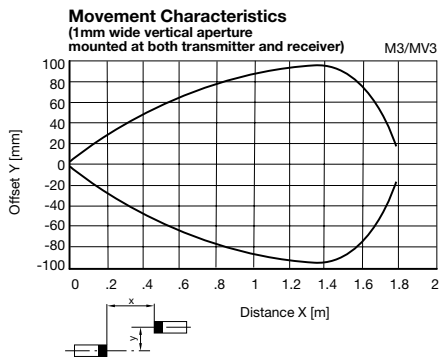
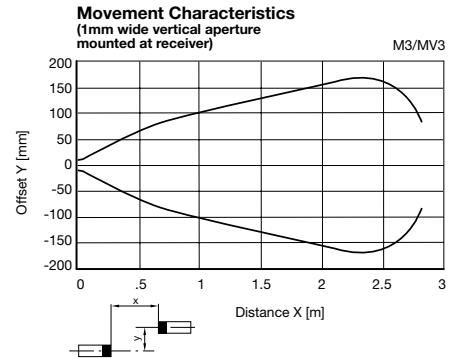
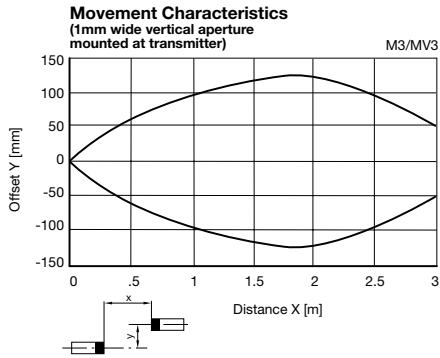
## Sensing Characteristics

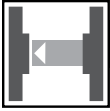




# Thru-Beam Mode

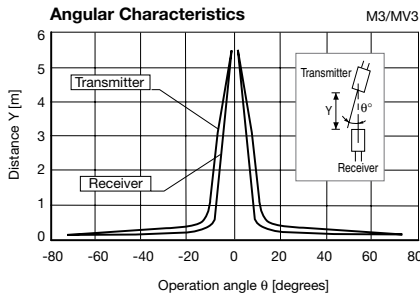
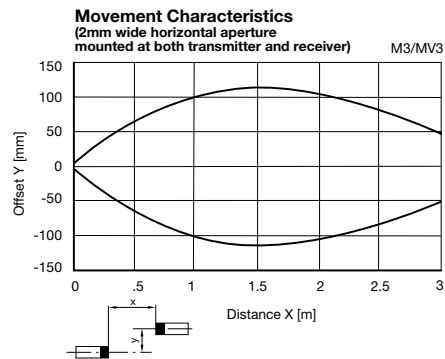
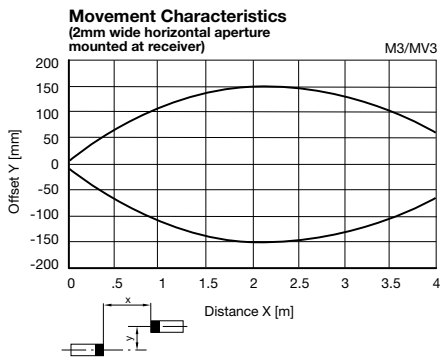
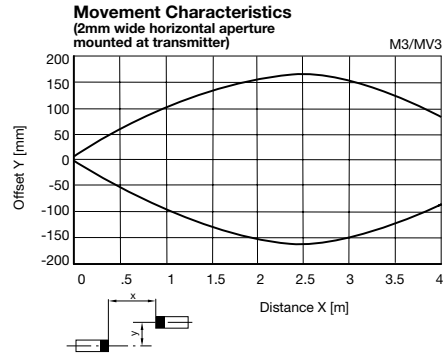
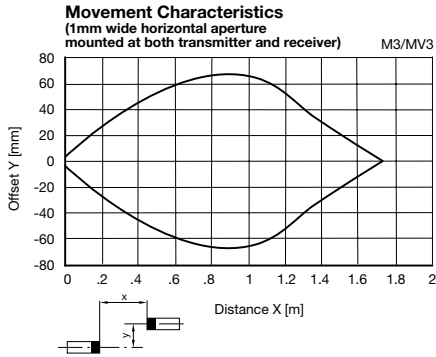
## Sensing Characteristics





## Thru-Beam Mode

### Characteristic diagrams thru-beam



### Scanning Distance Characteristics (Typical Value) when Aperture ML3-U01 Is Attached (Comparison with aperture not attached)

Type of Aperture	Used on Transmitter	Use on Transmitter or Receiver
No aperture	100%	100%
1.5 mm	5%	30%
3 mm	40%	60%
1 mm wide horizontal	20%	40%
2 mm wide horizontal	40%	60%
1 mm wide vertical	20%	40%
2 mm wide vertical	40%	60%

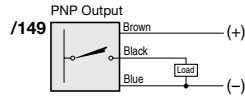
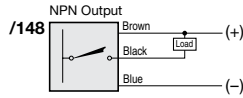


## Wiring Diagrams

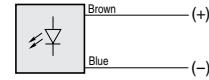
DC



### Cable Connection



### Transmitter (thru-beam models)

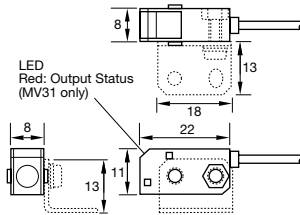


## Dimensions (mm)

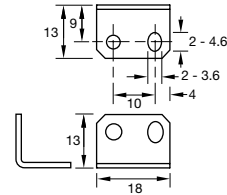
Mounting Dimension (For reference only)

**M31/115  
MV31/59/115/148**

Horizontal type — supplied with bracket OMH-ML3-1

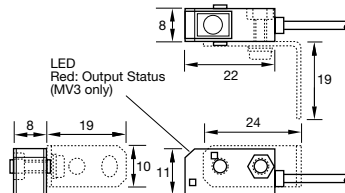


**Bracket  
OMH-ML3-1**

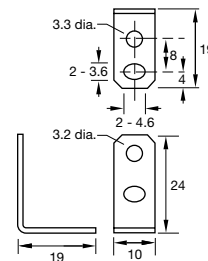


**M3/115  
MV3/59/115/148  
MV3/59/115/149  
MV3/25/115/148**

Vertical type — supplied with bracket OMH-ML3

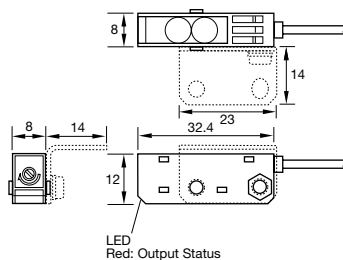


**Bracket  
OMH-ML3**

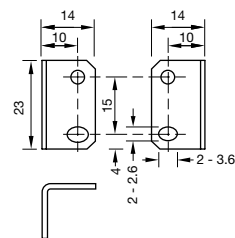


**ML3-8-C-30-RT/25/115/148  
ML3-8-C-30-RT/25/115/149  
ML3-8-C-30-IR/25/115/148**

Supplied with bracket OMH-ML3-2



**Bracket  
OMH-ML3-2**

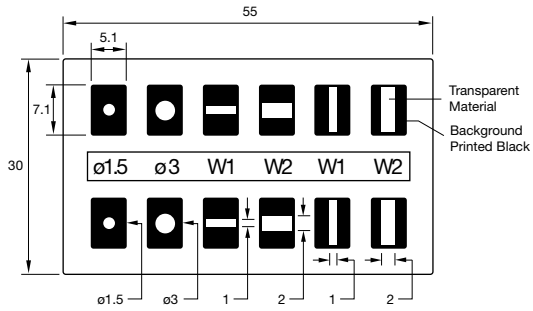


**Accessories**

(Dimensions in mm)

**Aperture  
ML3-U01**

*Attachable on thru-beam (self-adhesive)*



See pages 865-872  
for additional  
accessories