

**Mounting Brackets** A Mounting Bracket is not enclosed with the Sensor. Order a Mounting Bracket separately if required.

| Appearance                                                                        | Model (material)               | Quantity | Remarks                             | Appearance                                                                        | Model (material)               | Quantity | Remarks                                                                                                          |
|-----------------------------------------------------------------------------------|--------------------------------|----------|-------------------------------------|-----------------------------------------------------------------------------------|--------------------------------|----------|------------------------------------------------------------------------------------------------------------------|
|  | <b>E39-L153</b><br>(SUS304) *1 | 1        | Mounting Brackets                   |  | <b>E39-L98</b><br>(SUS304) *2  | 1        | Metal Protective Cover Bracket                                                                                   |
|  | <b>E39-L104</b><br>(SUS304) *1 | 1        |                                     |  | <b>E39-L150</b><br>(SUS304)    | 1        | (Sensor adjuster)                                                                                                |
|  | <b>E39-L43</b><br>(SUS304) *2  | 1        | Horizontal Mounting Brackets        |  | <b>E39-L151</b><br>(SUS304)    | 1        | Easily mounted to the aluminum frame rails of conveyors and easily adjusted.<br><br>For left to right adjustment |
|  | <b>E39-L142</b><br>(SUS304) *2 | 1        | Horizontal Protective Cover Bracket |                                                                                   |                                |          |                                                                                                                  |
|  | <b>E39-L44</b><br>(SUS304)     | 1        | Rear Mounting Bracket               |  | <b>E39-L144</b><br>(SUS304) *2 | 1        | Compact Protective Cover Bracket (For E3Z only)                                                                  |

**Note:** 1. When using Through-beam models, order one bracket for the Receiver and one for the Emitter.

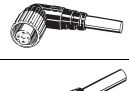
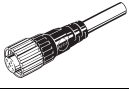
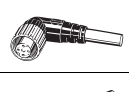
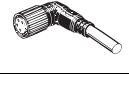
2. Refer to *Mounting Brackets on E39-L/E39-S/E39-R* on your OMRON website for details.

\*1. Cannot be used for Standard Connector models with mounting surface on the bottom. In that case, use Pre-wired Connector models.

\*2. Cannot be used for Standard Connector models.

### Sensor I/O Connectors

(Models for Connectors and Pre-wired Connectors: A Connector is not provided with the Sensor. Be sure to order a Connector separately.)

| Size                   | Type                             | Appearance                                                                                                                           | Cable length | Model                  |
|------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------|
| M12                    | Socket on one cable end          | Smartclick connector Straight *2<br>              | 2 m          | <b>XS5F-D421-D80-F</b> |
|                        |                                  |                                                                                                                                      | 5 m          | <b>XS5F-D421-G80-F</b> |
|                        |                                  | Smartclick connector L-shape *2 *3<br>            | 2 m          | <b>XS5F-D422-D80-F</b> |
|                        |                                  |                                                                                                                                      | 5 m          | <b>XS5F-D422-G80-F</b> |
|                        | Socket and plug on cable ends *1 | Smartclick connector Straight/<br>Straight *2<br> | 2 m          | <b>XS5W-D421-D81-F</b> |
|                        |                                  |                                                                                                                                      | 5 m          | <b>XS5W-D421-G81-F</b> |
|                        |                                  | Smartclick connector L-shape/L-shape *2 *3<br>    | 2 m          | <b>XS5W-D422-D81-F</b> |
|                        |                                  |                                                                                                                                      | 5 m          | <b>XS5W-D422-G81-F</b> |
| M8                     | Socket on one cable end          | Straight *3<br>                                   | 2 m          | <b>XS3F-M421-402-A</b> |
|                        |                                  |                                                                                                                                      | 5 m          | <b>XS3F-M421-405-A</b> |
|                        |                                  | L-shape *3 *4<br>                                 | 2 m          | <b>XS3F-M422-402-A</b> |
|                        |                                  |                                                                                                                                      | 5 m          | <b>XS3F-M422-405-A</b> |
| M8 socket/<br>M12 plug | Socket and plug on cable ends    | M8-M12 (Smartclick) conversion cable *2<br>       | 0.2 m        | <b>XS3W-M42C-4C2-A</b> |

**Note:** 1. When using Through-beam models, order one connector for the Receiver and one for the Emitter.

2. Refer to *Sensor I/O Connectors/Sensor Controllers* on your OMRON website for details.

\*1. Straight type/L-shape type combinations are also available.

\*2. The connectors will not rotate after they are connected.

\*3. The cable is fixed at an angle of 180° from the sensor emitter/receiver surface.

## Ratings and Specifications

### IO-Link Model

| Model<br><br>Item                            | Sensing method            |                              | Through-beam                                                                                                                                                                                                                                                                                                                                                                                                                              | Retro-reflective<br>with MSR function                                                                                                               | Diffuse-reflective                    | Narrow-beam Models                           |
|----------------------------------------------|---------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|----------------------------------------------|
|                                              | PNP<br>output             | Pre-wired                    | E3Z-T81-IL□                                                                                                                                                                                                                                                                                                                                                                                                                               | E3Z-R81-IL□                                                                                                                                         | E3Z-D82-IL□                           | E3Z-L81-IL□                                  |
|                                              |                           | Pre-wired<br>connector (M12) | E3Z-T81-M1TJ-IL□                                                                                                                                                                                                                                                                                                                                                                                                                          | E3Z-R81-M1TJ-IL□                                                                                                                                    | E3Z-D82-M1TJ-IL□                      | E3Z-L81-M1TJ-IL□                             |
|                                              |                           | Connector (M8)               | E3Z-T86-IL□                                                                                                                                                                                                                                                                                                                                                                                                                               | E3Z-R86-IL□                                                                                                                                         | E3Z-D87-IL□                           | E3Z-L86-IL□                                  |
| Sensing distance                             |                           |                              | 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4 m (100 mm) *<br>(when using E39-R1S)<br>3 m (100 mm) *<br>(when using E39-R1)                                                                     | 1 m<br>(white paper: 300 ×<br>300 mm) | 90 + 30 mm<br>(white paper: 100 ×<br>100 mm) |
| Spot diameter (reference value)              |                           |                              | ---                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                     |                                       | 2.5 dia. and sensing distance of 90 mm       |
| Standard sensing object                      |                           |                              | Opaque: 12-mm dia. min.                                                                                                                                                                                                                                                                                                                                                                                                                   | Opaque: 75-mm dia. min.                                                                                                                             | ---                                   |                                              |
| Minimum detectable object (reference value)  |                           |                              | ---                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                     |                                       | 0.1 mm (copper wire)                         |
| Differential travel (representative example) |                           |                              | ---                                                                                                                                                                                                                                                                                                                                                                                                                                       | ---                                                                                                                                                 | 20% max. of setting distance          | Refer to <i>Engineering data</i> on page 6.  |
| Directional angle                            |                           |                              | Both emitter and receiver: 3 to 15°                                                                                                                                                                                                                                                                                                                                                                                                       | 2 to 10°                                                                                                                                            | ---                                   |                                              |
| Light source (wavelength)                    |                           |                              | Infrared LED (870 nm)                                                                                                                                                                                                                                                                                                                                                                                                                     | Red LED (660 nm)                                                                                                                                    | Infrared LED (860 nm)                 | Red LED (650 nm)                             |
| Power supply voltage                         |                           |                              | 10 to 30 VDC (including 10% ripple (p-p))                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                     |                                       |                                              |
| Current consumption                          |                           |                              | 50 mA max. (Emitter: 25 mA max., Receiver: 25 mA max.)                                                                                                                                                                                                                                                                                                                                                                                    | 30 mA max.                                                                                                                                          |                                       |                                              |
| Control output                               |                           |                              | Load power supply voltage: 30 VDC max., Load current: 100 mA max.<br>Residual voltage: Load current of less than 10 mA: 1 V max.<br>Load current of 10 to 100 mA: 2 V max.<br>PNP open collector output<br>Light-ON/Dark-ON selectable                                                                                                                                                                                                    |                                                                                                                                                     |                                       |                                              |
| Indicators                                   |                           |                              | In the Standard I/O mode (SIO mode): Operation indicator (orange, lit) and stability indicator (green, lit)<br>In the IO-Link Mode: Operation indicator (orange, lit) and communication indicator (green, blinking at 1 s intervals)                                                                                                                                                                                                      |                                                                                                                                                     |                                       |                                              |
| Protection circuits                          |                           |                              | Reversed power supply polarity protection, output short-circuit protection, and reversed output polarity protection                                                                                                                                                                                                                                                                                                                       | Reversed power supply polarity protection, output short-circuit protection, reversed output polarity protection, and mutual interference prevention |                                       |                                              |
| Response time                                |                           |                              | Operate or reset: 1 ms max.                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                     |                                       |                                              |
| Sensitivity adjustment                       |                           |                              | Sensitivity adjuster / IO-Link communications                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                     |                                       |                                              |
| Ambient illumination (Receiver side)         |                           |                              | Incandescent lamp: 3,000 lx max.<br>Sunlight: 10,000 lx max.                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                     |                                       |                                              |
| Ambient temperature range                    |                           |                              | Operating: -25 to 55°C (with no icing or condensation)<br>Storage: -40 to 70°C (with no icing or condensation)                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                     |                                       |                                              |
| Ambient humidity range                       |                           |                              | Operating: 35% to 85%, Storage: 35% to 95% (with no condensation)                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                     |                                       |                                              |
| Insulation resistance                        |                           |                              | 20 MΩ min. at 500 VDC                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                     |                                       |                                              |
| Dielectric strength                          |                           |                              | 1,000 VAC, 50/60 Hz for 1 min                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                     |                                       |                                              |
| Vibration resistance                         |                           |                              | Destruction: 10 to 55 Hz, 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                     |                                       |                                              |
| Shock resistance                             |                           |                              | Destruction: 500 m/s <sup>2</sup> 3 times each in X, Y, and Z directions                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                     |                                       |                                              |
| Degree of protection                         |                           |                              | IEC 60529 IP67                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                     |                                       |                                              |
| Connection method                            |                           |                              | Pre-wired cable (standard cable length 2 m), M12 pre-wired connector (standard cable length 0.3 m), M8 connector                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                     |                                       |                                              |
| Weight (packed state)                        | Pre-wired cable (2 m)     |                              | Approx. 120 g                                                                                                                                                                                                                                                                                                                                                                                                                             | Approx. 65 g                                                                                                                                        |                                       |                                              |
|                                              | Pre-wired connector (M12) |                              | Approx. 60 g                                                                                                                                                                                                                                                                                                                                                                                                                              | Approx. 30 g                                                                                                                                        |                                       |                                              |
|                                              | Connector (M8)            |                              | Approx. 30 g                                                                                                                                                                                                                                                                                                                                                                                                                              | Approx. 20 g                                                                                                                                        |                                       |                                              |
| Material                                     |                           | Case                         | Polybutylene terephthalate (PBT)                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                     |                                       |                                              |
|                                              |                           | Display                      | Modified polyarylate                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                     |                                       |                                              |
|                                              |                           | Lens                         | Modified polyarylate                                                                                                                                                                                                                                                                                                                                                                                                                      | Methacrylate resin (PMMA)                                                                                                                           | Modified polyarylate                  |                                              |
| Main IO-Link functions                       |                           |                              | Operation mode switching between Light ON and Dark ON, setup of the instability detection level for light receiving and non-light receiving, timer function of the control output and timer time selecting, instability output (IO-Link mode) ON delay timer time selecting, setup of a teaching level and execution of teaching, setup of light receiving sensitivity level, monitor output, operating hours read-out, and initial reset |                                                                                                                                                     |                                       |                                              |
| Communication specifications                 | IO-Link specification     |                              | Ver 1.1                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                     |                                       |                                              |
|                                              | Baud rate                 |                              | -IL3: COM3 (230.4 kbps), -IL2: COM2 (38.4 kbps)                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                     |                                       |                                              |
|                                              | Data length               |                              | PD size: 2 bytes, OD size: 1 byte (M-sequence type: TYPE_2_2)                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                     |                                       |                                              |
|                                              | Minimum cycle time        |                              | -IL3 (COM3): 1 ms, -IL2 (COM2): 2.3 ms                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                     |                                       |                                              |
| Accessories                                  |                           |                              | Instruction manual (Neither Reflectors nor Mounting Brackets are provided with any of the above models.)                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                     |                                       |                                              |

\* Values in parentheses indicate the minimum required distance between the Sensor and Reflector.