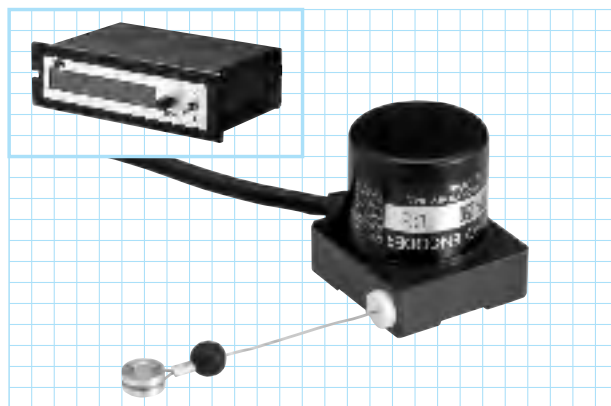


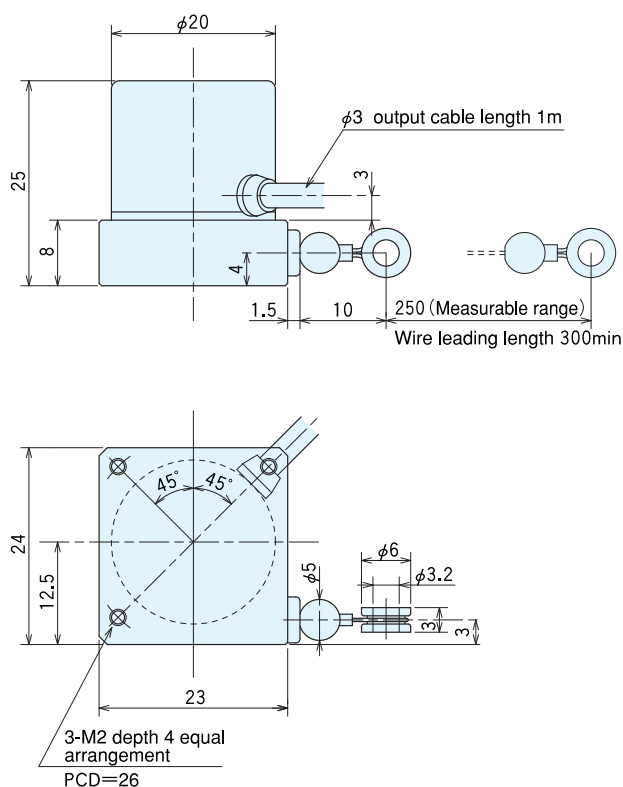
[Square Wave/Incremental]

- Smallest in the series: Outside dimensions 23×24×25 (H)
- Stroke: 250 mm
- Resolution: Selection from among 0.1mm, 0.04 mm
- Lightweight: 60 g



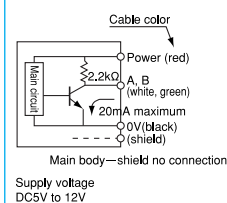
## Outside dimensions

MLS-12

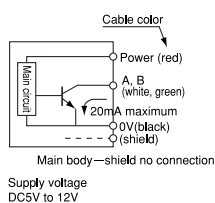


### Output circuit diagram

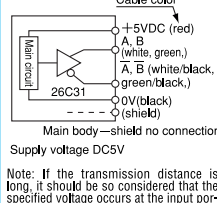
Voltage output (standard type)



Open collector output (option)



Line driver output (option)



## Specifications

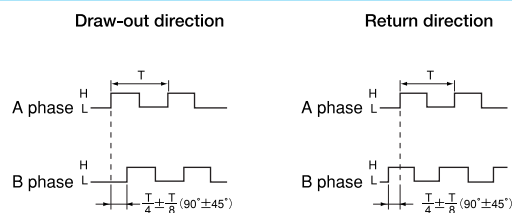
| Specifications                           |                                                       | Type name                                                                            | MLS-12- <div><div></div><div></div></div> -250 |
|------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------|
| Item                                     |                                                       | Pulse number                                                                         | Output circuit                                 |
| Measuring range                          |                                                       | 250mm                                                                                |                                                |
| Supply voltage                           |                                                       | DC5V~12V ±10%                                                                        |                                                |
| Current consumption                      |                                                       | 40mA or less (under no load)                                                         |                                                |
| Detection system                         |                                                       | Incremental                                                                          |                                                |
| Stroke speed mm/sec                      |                                                       | 250                                                                                  |                                                |
| Wire tensile force                       |                                                       | 0.39N~0.78N (40~80gf)                                                                |                                                |
| Output                                   | Output pulse number<br>[Minimum resolution]           | 600<br>[0.1mm]                                                                       | 1,500<br>[0.04mm]                              |
|                                          | Output phase                                          | A, B phase                                                                           |                                                |
|                                          | Output form                                           | Square wave                                                                          |                                                |
|                                          | Output capacity                                       | Sink current: 20mA<br>Residual voltage: 0.5V<br>or less (at 10mA)                    |                                                |
|                                          | Maximum response frequency<br>(response pulse number) | 50kHz                                                                                |                                                |
| Working ambient temperature/<br>humidity |                                                       | 0°C~50°C<br>RH95% no dewing                                                          |                                                |
| Storing ambient temperature              |                                                       | -20°C~80°C                                                                           |                                                |
| Vibration resistance                     |                                                       | Durability 55Hz, double amplitude 1.5mm<br>2 hours each in X, Y, and Z directions    |                                                |
| Impact resistance                        |                                                       | Durability 500m/s <sup>2</sup> (about 50G)<br>3 times each in X, Y, and Z directions |                                                |
| Cable                                    |                                                       | Outside diameter φ3 4-core<br>Insulated shield cable (length 1m)                     |                                                |
| Mass                                     |                                                       | 60g                                                                                  |                                                |

**Specifications/micro linear scale** (detecting portion + indicating portion)

| Type name              | MLS-12-01-250                                             | MLS-12-001-250    |
|------------------------|-----------------------------------------------------------|-------------------|
| Measuring range mm     | 250                                                       |                   |
| Output pulse/1mm       | 10                                                        | 100               |
| Counter accuracy pulse | $\pm 1$                                                   | $\pm 1$           |
| Minimum reading        | 0.1                                                       | 0.01              |
| Power                  | AC100V 50/60Hz 180mA max                                  |                   |
| Counter mode           | 10 Decimal                                                |                   |
| Count indication       | 0~ $\pm 999999.9$                                         | 0~ $\pm 99999.99$ |
| Reset                  | Reset switch provided *External signal resetting possible |                   |
| External output        | *BCD parallel output                                      |                   |
| Mass                   | 700g                                                      |                   |
| Power cord             | 2m with plug                                              |                   |

Note: For counter specifications, see DC Series. \* indicates option.

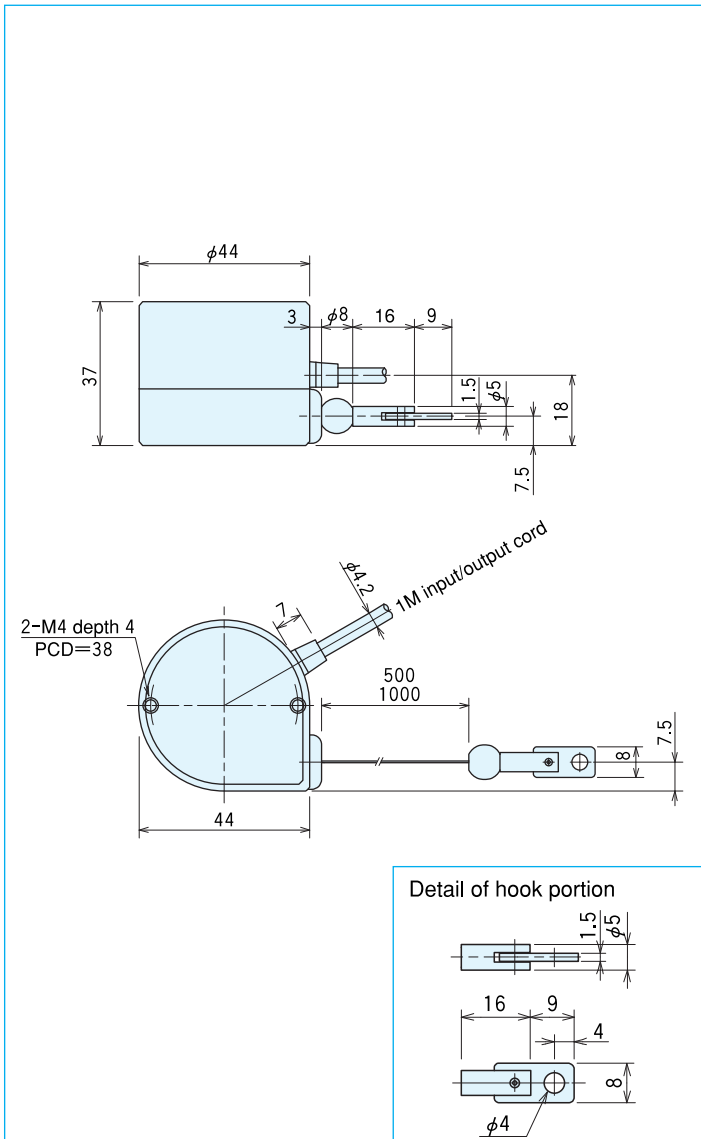
## Output waveform



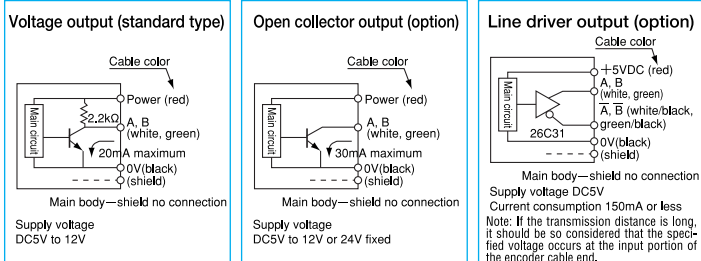
# MLS-30 series

[Wire-Type Linear Scale]

## Outside dimensions



## Output circuit diagram



A capacitor (0.1  $\mu$ F) is connected between 0V and FG (frame ground).



## Specifications/linear scale encoder (detection portion)

| Type name                            | MLS-30-450-500                                                               | MLS-30-450-1000 | MLS-30-4500-500          | MLS-30-4500-1000 |
|--------------------------------------|------------------------------------------------------------------------------|-----------------|--------------------------|------------------|
| Measuring range mm                   | 500                                                                          | 1,000           | 500                      | 1,000            |
| Output pulse/1mm                     | 5                                                                            | 5               | 50                       | 50               |
| Stroke speed mm/sec                  | 1,000                                                                        | 1,000           | 1,000                    | 1,000            |
| Absolute accuracy mm                 | ±0.05/100mm                                                                  |                 |                          |                  |
| Minimum resolution mm                | 0.2                                                                          | 0.2             | 0.02                     | 0.02             |
| Supply voltage                       | DC5~12V±10%<br>DC24V±10%(option)                                             |                 | DC5~12V±10%<br>DC24V±10% |                  |
| Current consumption                  | 60mA or less (under no load)                                                 |                 |                          |                  |
| Output phase                         | A phase, B phase                                                             |                 |                          |                  |
| Output form                          | Square wave                                                                  |                 |                          |                  |
| Output capacity                      | Sink current 20mA or less, residual voltage 0.5V or less (at 10mA)           |                 |                          |                  |
| Response frequency                   | 50kHz                                                                        |                 |                          |                  |
| Output phase                         | A, B phase difference 90°±45°                                                |                 |                          |                  |
| Waveform rise/fall time              | 2μsec or less                                                                |                 |                          |                  |
| Wire tensile force                   | 1.4N~2.9N (150~300gf)                                                        |                 |                          |                  |
| Working ambient temperature/humidity | 0℃~50℃/RH35%~90%                                                             |                 |                          |                  |
| Storage ambient temperature          | -20~80℃                                                                      |                 |                          |                  |
| Vibration resistance                 | Endurance 10 to 55Hz Double amplitude 2 hours each in X, Y, and Z directions |                 |                          |                  |
| Impact resistance                    | 50G                                                                          |                 |                          |                  |
| Cable                                | Insulated shield wire Outside diameter φ4.2 4-core vinyl wire                |                 |                          |                  |
| Mass                                 | 185g                                                                         |                 |                          |                  |

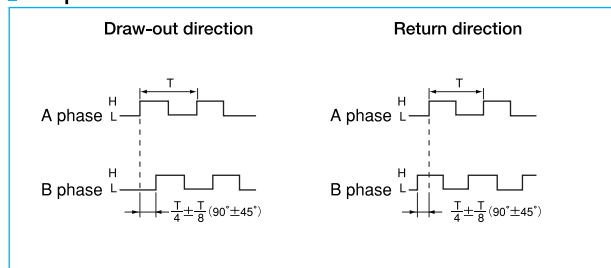
Note: The output pulse or resolution is possible to 4 multiple with the counter.

## Specifications/micro linear scale (detecting portion + indicating portion)

| Type name              | MLS-30-01-500                                             | MLS-30-01-1000 | MLS-30-001-500 | MLS-30-001-1000 |
|------------------------|-----------------------------------------------------------|----------------|----------------|-----------------|
| Measuring range mm     | 500                                                       | 1,000          | 500            | 1,000           |
| Output pulse/1mm       | 10                                                        | 10             | 100            | 100             |
| Counter accuracy pulse | ±1                                                        | ±1             | ±1             | ±1              |
| Minimum reading        | 0.1                                                       | 0.1            | 0.01           | 0.01            |
| Power                  | AC100V 50/60Hz 180mA max                                  |                |                |                 |
| Counter mode           | 10 Decimal                                                |                |                |                 |
| Count indication       | 0~±999999.9                                               |                | 0~±99999.99    |                 |
| Reset                  | Reset switch provided *External signal resetting possible |                |                |                 |
| External output        | *BCD parallel output                                      |                |                |                 |
| Mass                   | 700g                                                      |                |                |                 |
| Power cord             | 2m with plug                                              |                |                |                 |

Note: For counter specifications, see DC Series. \* indicates option.

## Output waveform



Description

SE series

ME series

MGH series

MA series

MXS series

MLS series

MLA series

REH series

MT series

DC series

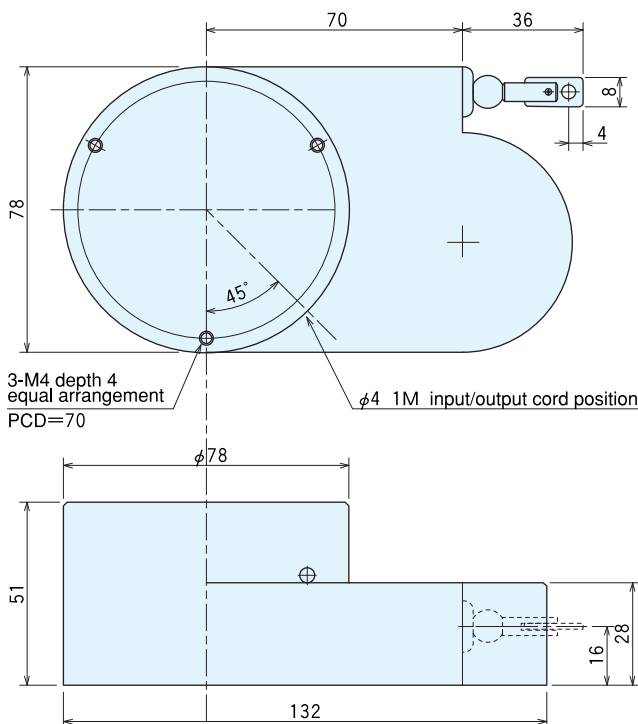
Setting Option/  
Coupling

INDEX

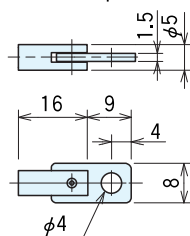
# MLS-50 series

[Wire-Type Linear Scale]

## Outside dimensions

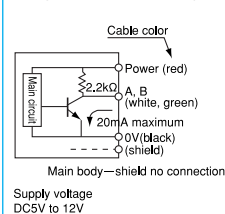


### Detail of hook portion

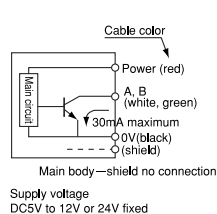


## Output circuit diagram

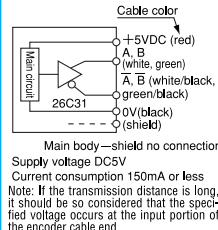
### Voltage output (standard type)



### Open collector output (option)



### Line driver output (option)



A capacitor (0.1  $\mu$ F) is connected between 0V and FG (frame ground).



## Specifications/linear scale encoder (detection portion)

| Type name                            | MLS-50-540-2000                                                              | MLS-50-540-4000 |
|--------------------------------------|------------------------------------------------------------------------------|-----------------|
| Measuring range mm                   | 2,000                                                                        | 4,000           |
| Output pulse/1mm                     | 2.5                                                                          | 2.5             |
| Stroke speed mm/sec                  | 1,000                                                                        | 1,000           |
| Absolute accuracy mm                 | 2                                                                            | 4               |
| Minimum resolution mm                | 0.4                                                                          | 0.4             |
| Supply voltage                       | DC5~12V $\pm 10\%$<br>DC24V $\pm 10\%$ (option)                              |                 |
| Current consumption                  | 60mA or less (under no load)                                                 |                 |
| Output phase                         | A phase, B phase                                                             |                 |
| Output form                          | Square wave                                                                  |                 |
| Output capacity                      | Sink current 20mA or less, residual voltage 0.5V or less (at 10mA)           |                 |
| Response frequency                   | 100kHz                                                                       |                 |
| Output phase                         | A, B phase difference $90^\circ \pm 45^\circ$                                |                 |
| Waveform rise/fall time              | 2 $\mu$ sec or less                                                          |                 |
| Wire tensile force                   | 3.9N~6.8N (400~700gf)                                                        |                 |
| Working ambient temperature/humidity | 0°C~50°C/RH35%~90%                                                           |                 |
| Storage ambient temperature          | -20~80°C                                                                     |                 |
| Vibration resistance                 | Endurance 10 to 55Hz Double amplitude 2 hours each in X, Y, and Z directions |                 |
| Impact resistance                    | 50G                                                                          |                 |
| Cable                                | Insulated shield wire Outside diameter $\phi 4.2$ 4-core vinyl wire          |                 |
| Mass                                 | 850g                                                                         |                 |

Note: The output pulse or resolution is possible to 4 multiple with the counter.

## Specifications/micro linear scale (detecting portion + indicating portion)

| Type name              | MLS-50-01-2000                                            | MLS-50-01-4000 |
|------------------------|-----------------------------------------------------------|----------------|
| Measuring range mm     | 2,000                                                     | 4,000          |
| Output pulse/1mm       | 10                                                        | 10             |
| Counter accuracy pulse | $\pm 1$                                                   | $\pm 1$        |
| Minimum reading        | 0.1                                                       | 0.1            |
| Power                  | AC100V 50/60Hz 180mA max                                  |                |
| Counter mode           | 10 Decimal                                                |                |
| Count indication       | 0~ $\pm 999999.9$                                         |                |
| Reset                  | Reset switch provided *External signal resetting possible |                |
| External output        | *BCD parallel output                                      |                |
| Mass                   | 1,350g                                                    |                |
| Power cord             | 2m with plug                                              |                |

Note: For counter specifications, see DC Series. \* indicates option.

## Output waveform

