

## Super-mini Signal Conditioners Mini-M Series

### AC CURRENT TRANSMITTER

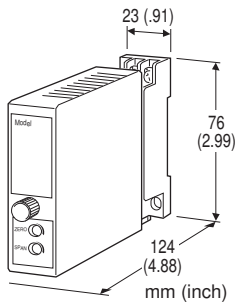
(clamp-on current sensor)

#### Functions & Features

- Converts an alternating current into a standard process signal
- Easy-to-install clamp-on type current sensor with no need of a current transformer
- Clamp-on current sensor included
- Wide input range from 10A up to 600A
- Input frequency 50 / 60 / 400 Hz
- Over-voltage clamp element for safety in open circuit
- True RMS sensing
- Universal power input
- High-density mounting

#### Typical Applications

- Centralized monitoring and control of motors at a supervisory panel
- Monitoring abnormal load current at motors to detect pump malfunctions



### MODEL: M2CEC-[1][2][3]-[4][5]

#### ORDERING INFORMATION

- Code number: M2CEC-[1][2][3]-[4][5]
- Specify a code from below for each [1] through [5].  
(e.g. M2CEC-150A-M/Q)
- Special output range (For codes Z & 0)
- Specify the specification for option code /Q  
(e.g. /C01/S01)

#### [1] SENSOR

- 1: Leadwire type CLSA
- 2: Screw terminal type CLSB

#### [2] INPUT

- 10: 0 - 10 A AC
- 15: 0 - 15 A AC
- 20: 0 - 20 A AC
- 30: 0 - 30 A AC
- 40: 0 - 40 A AC
- 50: 0 - 50 A AC
- 60: 0 - 60 A AC
- 75: 0 - 75 A AC
- 100: 0 - 100 A AC
- 125: 0 - 125 A AC
- 150: 0 - 150 A AC
- 175: 0 - 175 A AC
- 200: 0 - 200 A AC
- 225: 0 - 225 A AC
- 250: 0 - 250 A AC
- 300: 0 - 300 A AC
- 350: 0 - 350 A AC
- 400: 0 - 400 A AC
- 500: 0 - 500 A AC
- 600: 0 - 600 A AC (Not selectable with the sensor type code 1 'Leadwire type CLSA')

#### [3] OUTPUT

##### Current

- A: 4 - 20 mA DC (Load resistance 750 Ω max.)
- B: 2 - 10 mA DC (Load resistance 1500 Ω max.)
- C: 1 - 5 mA DC (Load resistance 3000 Ω max.)
- D: 0 - 20 mA DC (Load resistance 750 Ω max.)
- E: 0 - 16 mA DC (Load resistance 900 Ω max.)
- F: 0 - 10 mA DC (Load resistance 1500 Ω max.)
- G: 0 - 1 mA DC (Load resistance 15 kΩ max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

##### Voltage

- 1: 0 - 10 mV DC (Load resistance 10 kΩ min.)
- 2: 0 - 100 mV DC (Load resistance 100 kΩ min.)
- 3: 0 - 1 V DC (Load resistance 1000 Ω min.)
- 4: 0 - 10 V DC (Load resistance 10 kΩ min.)
- 5: 0 - 5 V DC (Load resistance 5000 Ω min.)
- 6: 1 - 5 V DC (Load resistance 5000 Ω min.)
- 4W: -10 - +10 V DC (Load resistance 10 kΩ min.)
- 5W: -5 - +5 V DC (Load resistance 5000 Ω min.)
- 0: Specify voltage (See OUTPUT SPECIFICATIONS)

#### [4] POWER INPUT

##### AC Power

- M: 85 - 264 V AC (Operational voltage range 85 - 264 V, 47 - 66 Hz)

##### DC Power

- R: 24 V DC  
(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

**R2:** 11 – 27 V DC  
 (Operational voltage range 11 – 27 V, ripple 10 %p-p max.)  
**P:** 110 V DC  
 (Operational voltage range 85 – 150 V, ripple 10 %p-p max.)

## [5] OPTIONS

### Other Options

blank: none  
 /Q: Option other than the above (specify the specification)

### SPECIFICATIONS OF OPTION: Q (multiple selections)

#### COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating  
 /C02: Polyurethane coating  
 /C03: Rubber coating

#### TERMINAL SCREW MATERIAL

/S01: Stainless steel

## ACCESSORIES

The clamp-on current sensor is included in the product package.

### ■ CLAMP-ON CURRENT SENSOR (leadwire type CLSA)

- 0 – 10 A through 0 – 75 A Use  
 Sensor model No.: CLSA-08  
 Sensor cable model No.: CLSA-08C-30  
 Applicable cable diameter: Max. 10.0  
 Sensor leadwire: AWG 22  
 Weight: 45 g (1.6 oz)
  - 0 – 100 A Use  
 Sensor model No.: CLSA-12  
 Sensor cable model No.: CLSA-08C-30  
 Applicable cable diameter: Max. 16.0  
 Sensor leadwire: AWG 22  
 Weight: 70 g (2.5 oz)
  - 0 – 125 A through 0 – 300 A Use  
 Sensor model No.: CLSA-30  
 Applicable cable diameter: Max. 24.0  
 Sensor leadwire: AWG 18, 200 mm  
 Weight: 200 g (7.1 oz)
  - 0 – 350 A through 0 – 500 A Use  
 Sensor model No.: CLSA-50  
 Applicable cable diameter: Max. 36.0  
 Sensor leadwire: AWG 18, 200 mm  
 Weight: 300 g (10.6 oz)
- ### ■ CLAMP-ON CURRENT SENSOR (screw terminal type CLSB)
- Connection: M3 screw terminal (torque 0.5 N·m)  
 Screw terminal: Nickel-plated steel  
 Output wiring: Use AWG22 or thicker wires for the output.  
 Twist the paired wires, extendable up to 30 meters.
- 0 – 10 A through 0 – 50 A Use  
 Sensor model No.: CLSB-05

Applicable cable diameter: Max. 10.0

Weight: 45 g (1.6 oz)  
 • 0 – 60 A through 0 – 100 A Use

Sensor model No.: CLSB-10  
 Applicable cable diameter: Max. 16.0

Weight: 80 g (2.8 oz)  
 • 0 – 125 A through 0 – 200 A Use

Sensor model No.: CLSB-20  
 Applicable cable diameter: Max. 24.0

Weight: 200 g (7.1 oz)  
 • 0 – 225 A through 0 – 400 A Use

Sensor model No.: CLSB-40  
 Applicable cable diameter: Max. 35.0

Weight: 300 g (10.6 oz)  
 • 0 – 500 A through 0 – 600 A Use

Sensor model No.: CLSB-60  
 Applicable cable diameter: Max. 35.0

Weight: 360 g (12.7 oz)

Note 1: The output values may vary depending on the accuracy of engagement at the clamp connection.  
 Note 2: The sensor is detachable up to 100 times (approx.).  
 Note 3: The sensor's mechanical construction may cause it to generate resonance sound. However, it does not affect the performance of the sensor.

## GENERAL SPECIFICATIONS

Construction: Plug-in  
 Connection: M3 screw terminals (torque 0.8 N·m)  
 Screw terminal: Chromated steel (standard) or stainless steel  
 Housing material: Flame-resistant resin (black)  
 Isolation: Sensor core to input to output to power  
 Input waveform  
 RMS sensing: Up to 15 % of 3rd harmonic content  
 Overrange output: 0 to 120 % at 1 – 5 V  
 Zero adjustment: -5 to +5 % (front)  
 Span adjustment: 95 to 105 % (front)

## INPUT SPECIFICATIONS

Frequency: 50 / 60 / 400 Hz  
 Overload capacity  
 CLSA - 08: 120 A continuous  
 CLSA - 12: 300 A continuous  
 CLSA - 30: 360 A continuous  
 CLSA - 50: 600 A continuous  
 CLSB - 05: 100 A continuous  
 CLSB - 10: 200 A continuous  
 CLSB - 20: 300 A continuous  
 CLSB - 40: 600 A continuous  
 CLSB - 60: 720 A continuous  
 Operational range: 0 – 120 % of rating

Be sure that the input voltage is of 440 V or less.

## OUTPUT SPECIFICATIONS

- **DC Current:** 0 - 20 mA DC
- Minimum span:** 1 mA
- Offset:** Max. 1.5 times span
- Load resistance:** Output drive 15 V max.
- **DC Voltage:** -10 - +12 V DC
- Minimum span:** 5 mV
- Offset:** Max. 1.5 times span
- Load resistance:** Output drive 1 mA max.; at  $\geq 0.5$  V

## INSTALLATION

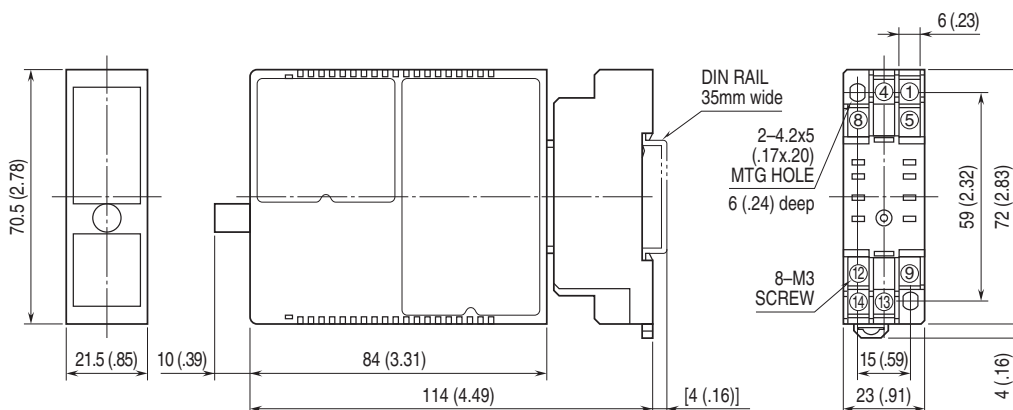
### Power Consumption

- **AC:**
  - Approx. 3 VA at 100 V
  - Approx. 4 VA at 200 V
  - Approx. 5 VA at 264 V
- **DC:** Approx. 3 W
- Operating temperature:** -5 to +55°C (23 to 131°F)
- Operating humidity:** 30 to 90 %RH (non-condensing)
- Mounting:** Surface or DIN rail
- Weight:** 150 g (0.33 lb)

## PERFORMANCE in percentage of span

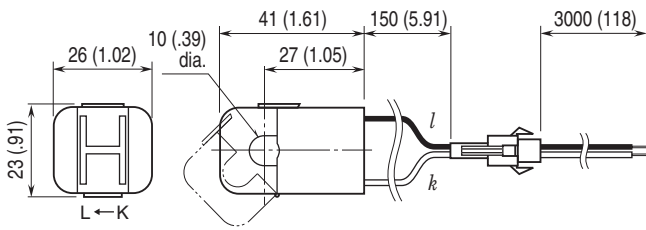
- Accuracy:**  $\pm 0.5$  % ( $\pm 1.0$  % at 400 Hz)
- Temp. coefficient:**  $\pm 0.05$  %/°C ( $\pm 0.03$  %/°F)
- Response time:**  $\leq 0.7$  sec. (0 - 90 %)
- Ripple:** 0.5 %p-p max. (50/60 Hz)
- Line voltage effect:**  $\pm 0.1$  % over voltage range
- Insulation resistance:**  $\geq 100$  M $\Omega$  with 500 V DC
- Dielectric strength:** 2000 V AC @1 minute  
(input to output to power to ground)  
1000 V AC @1 minute  
(sensor core to sensor output)

## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)

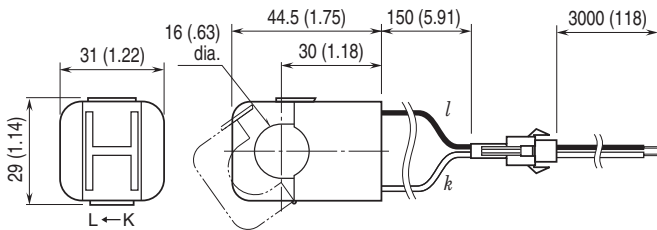


• When mounting, no extra space is needed between units.

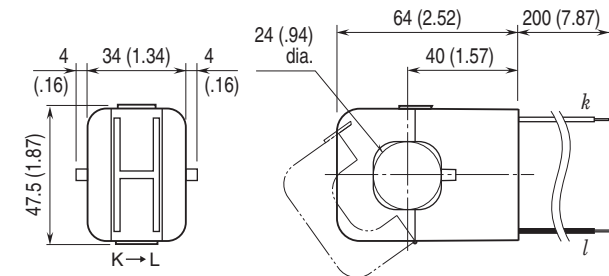
## ■ Sensor model No.: CLSA-08



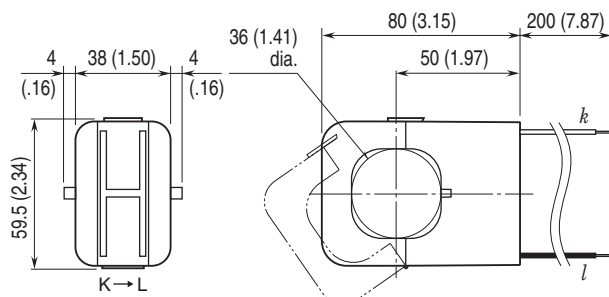
## ■ Sensor model No.: CLSA-12



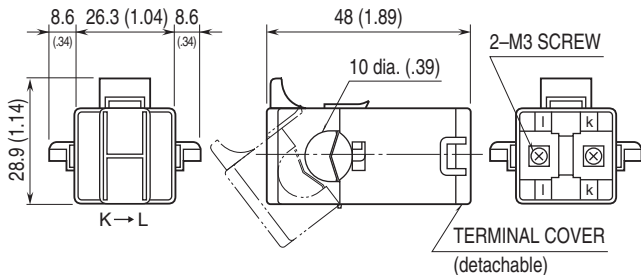
## ■ Sensor model No.: CLSA-30



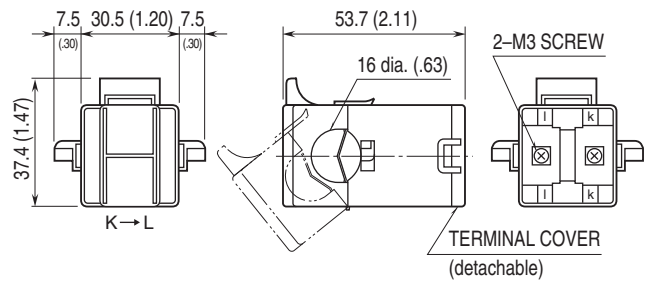
## ■ Sensor model No.: CLSA-50



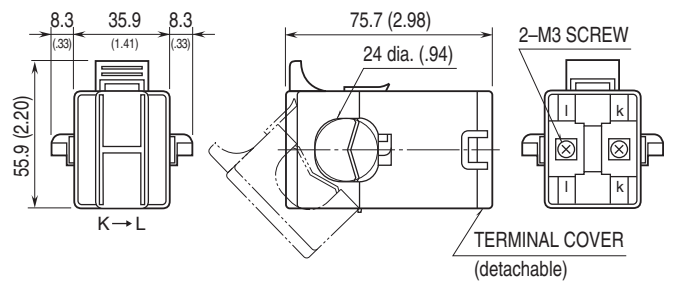
## ■ Sensor model No.: CLSB-05



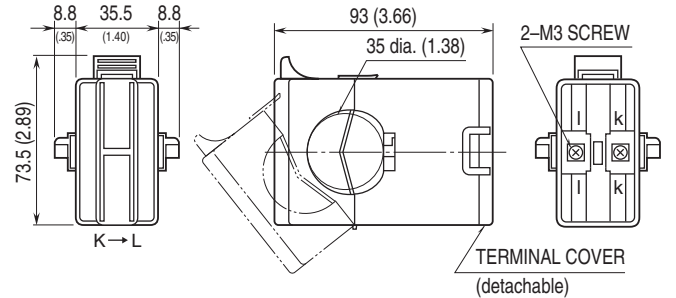
## ■ Sensor model No.: CLSB-10



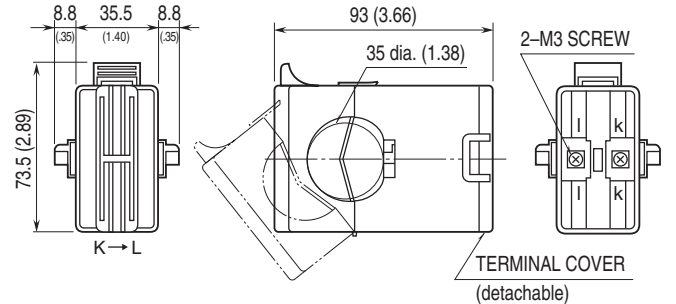
## ■ Sensor model No.: CLSB-20



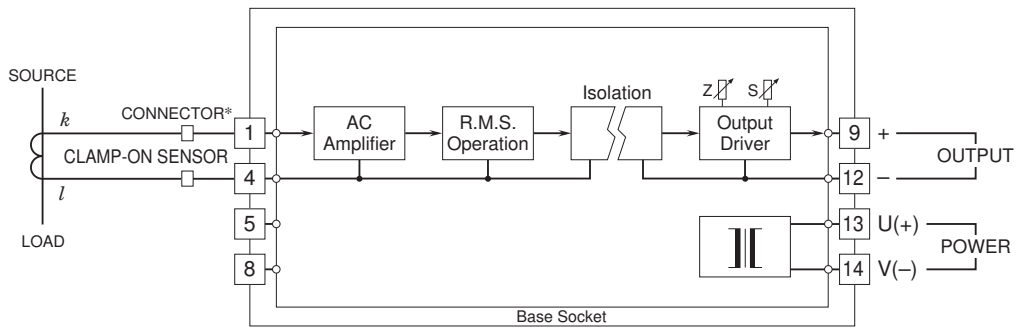
## ■ Sensor model No.: CLSB-40



## ■ Sensor model No.: CLSB-60



**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**



\*Connector provided only for the CLSA-08 and CLSA-12.



Specifications are subject to change without notice.