Plug-in Signal Conditioners M-UNIT

HIGH AC CURRENT TRANSMITTER

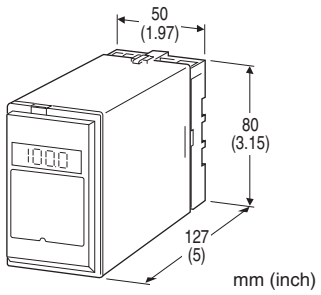
(wide bandwidth; clamp-on current sensor)

Functions & Features

• Converts an alternating current into a standard process signal
• Easy-to-install clamp-on type current sensor without needing a current transformer
• Clamp-on current sensor included
• Wide input range from 10 A up to 400 A
• Wide frequency band can be accepted
• Over-voltage clamp element for safety in open circuit
• LCD meter (engineering unit display selectable)
• Simple loop test output (0 % and 100 %)
• High-density mounting

Typical Applications

• Measurement in tight places as never before possible
• Monitoring load current of motors employing inverters
• Detecting failures of a pump or other device by monitoring abnormal load current of motors
• Monitoring current of electric welding machine



MODEL: CTCS-[1][2][3]-[4][5]

ORDERING INFORMATION

• Code number: CTCS-[1][2][3]-[4][5]
Specify a code from below for each of [1] through [5].
(e.g. CTCS-1100A-C/E2/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 (Not selectable with the sensor type code 2 'Screw terminal type CLSB')

[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 100 Ω min.)
4: 0 – 10 V DC (Load resistance 1000 Ω min.)
5: 0 – 5 V DC (Load resistance 500 Ω min.)
6: 1 – 5 V DC (Load resistance 500 Ω min.)
4W: -10 – +10 V DC (Load resistance 2000 Ω min.)
5W: -5 – +5 V DC (Load resistance 1000 Ω min.)
0: Specify voltage (See OUTPUT SPECIFICATIONS)

[4] POWER INPUT

AC Power

B: 100 V AC
C: 110 V AC
D: 115 V AC
F: 120 V AC
G: 200 V AC
H: 220 V AC
J: 240 V AC

DC Power

S: 12 V DC
R: 24 V DC
V: 48 V DC
P: 110 V DC (Not selectable with Option /E2)

[5] OPTIONS (multiple selections)

Input Signal Indicator

blank: Without
/E: With (0.0 - 100.0 % display)
/E2: With (in engineering unit with backlight and the simple loop test output)

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 – 400 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 – 350 A Use
Sensor model No.: CLSB-40
Applicable cable diameter: Max. 35.0
Weight: 300 g (10.6 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: M3.5 screw terminals
Screw terminal: Chromated steel (standard) or stainless steel
Housing material: Flame-resistant resin (black)
Isolation: Sensor core to sensor output or input to output to power
Overrange output: 0 to 120 % at 1 – 5 V
Zero adjustment: -5 to +5 % (front)
Span adjustment: 95 to 105 % (front)
Simple loop test output: 0 % and 100 % signal simulated by selecting the front switch positions. (Only for option code /E2)

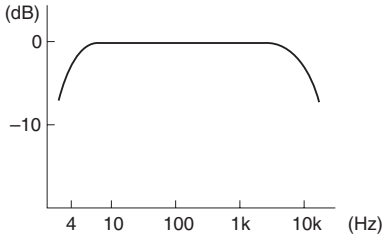
■ DISPLAY (Input indicator)

• Option code: /E

LCD digital display: 0.0 - 100.0 % (min. digit 0.1 %)
(No scaling)
• **Option code: /E2**
LCD digital display: Engineering unit
Display scaling: -10000 – +10000
Decimal position: 10^{-1} - 10^{-4} or no decimal point
Engineering unit: %, µV, mV, V, mA, A, °C, °F, Ω, DEG K, mHz, Hz, kHz, VAC, AAC, mg, g, kg, t, rpm or rps selectable
Back light: Green at normal, red at loop test output enable
Factory setting: scaling 0.00 - 100.00, unit: %

INPUT SPECIFICATIONS

Frequency: 4 Hz – 10 kHz
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
Operational range: 0 – 120 % of rating
Be sure that the input voltage is of 440 V or less.



Frequency Characteristics Example

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 10 mA max.; 5 mA for negative voltage output; at ≥ 0.5 V

INSTALLATION

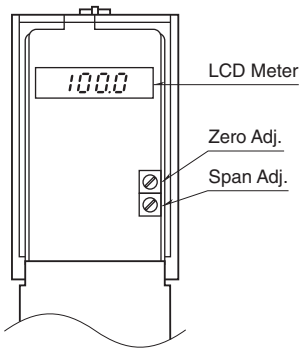
Power input
•**AC**: Operational voltage range: rating ±10 %, 50/60 ±2 Hz, approx. 3 VA
•**DC**: Operational voltage range: rating ±10 %, or 85 – 150 V for 110 V rating (ripple 10 % p-p max.) approx. 2 W (80 mA at 24 V; approx. 3 W with Option /E2)
Operating temperature: -5 to +60°C (23 to 140°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Mounting: Surface or DIN rail
Weight: 400 g (Except clamp-on current sensor)

PERFORMANCE in percentage of span

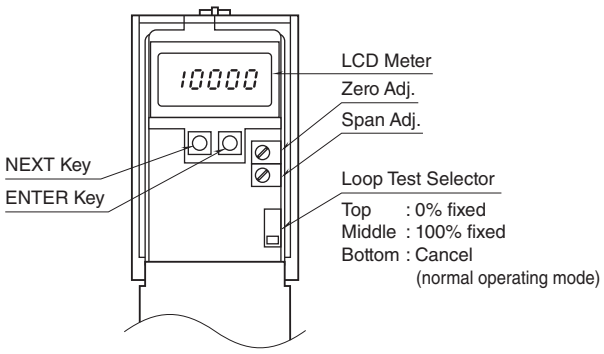
Accuracy: ±1.5 % (20 – 500 Hz)
Display accuracy: ± (1.5 % of FS + 1 digit)
Simple loop test output setting accuracy: ±0.5 %
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
Response time: ≤ 0.5 sec. (0 – 90 %)
Ripple: 0.5 %p-p max.
Line voltage effect: ±0.1 % over voltage range
Insulation resistance: ≥ 100 MΩ 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 VIEW

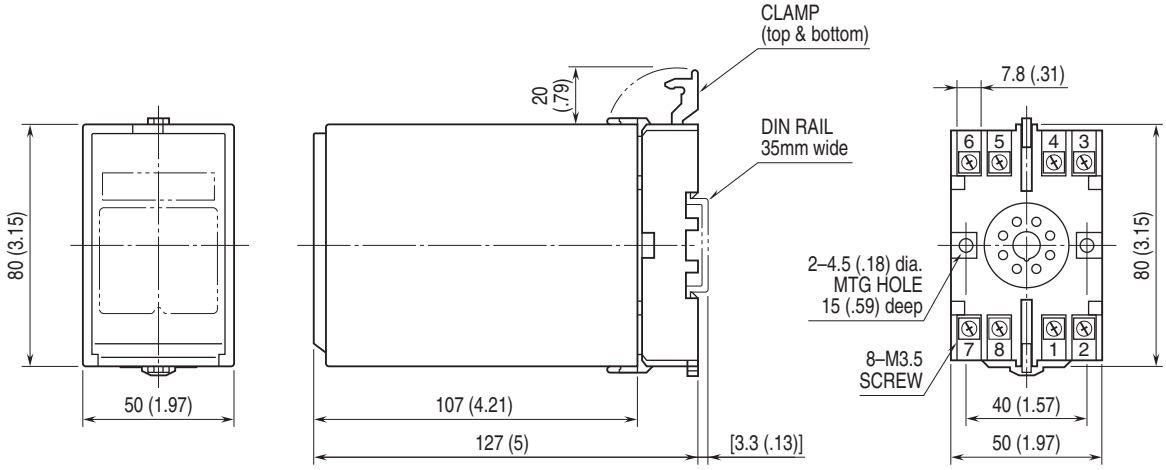
■ **OPTION /E**



■ **OPTION /E2**

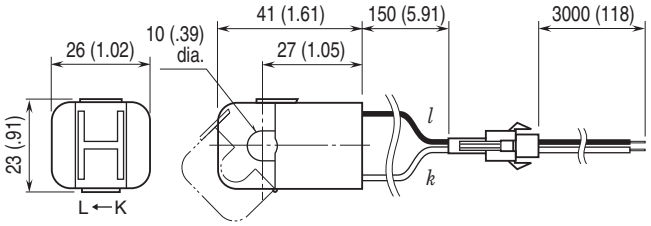


EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)

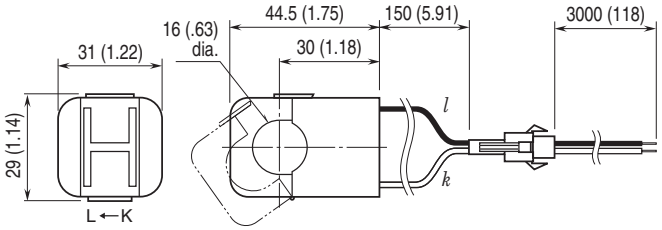


• When mounting, no extra space is needed between units.

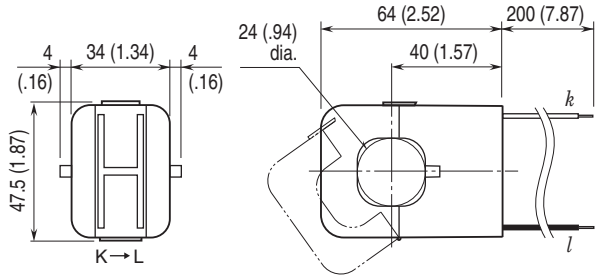
■ **Sensor model No.: CLSA-08**



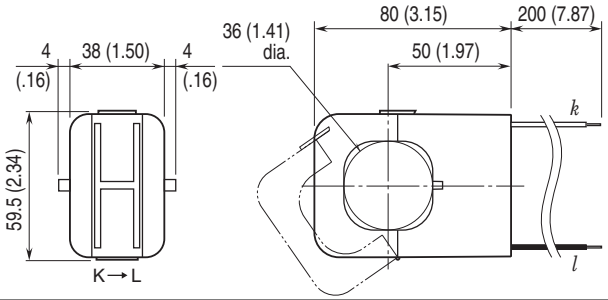
■ **Sensor model No.: CLSA-12**



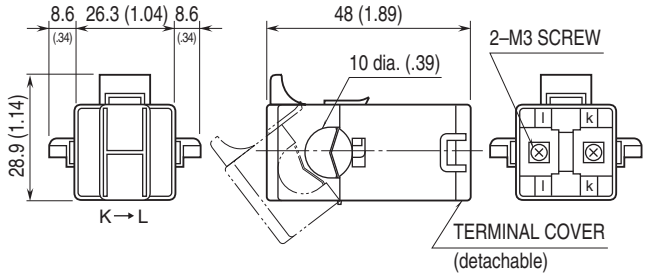
■ **Sensor model No.: CLSA-30**



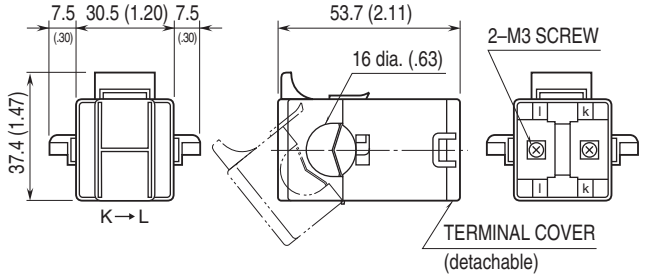
■ **Sensor model No.: CLSA-50**



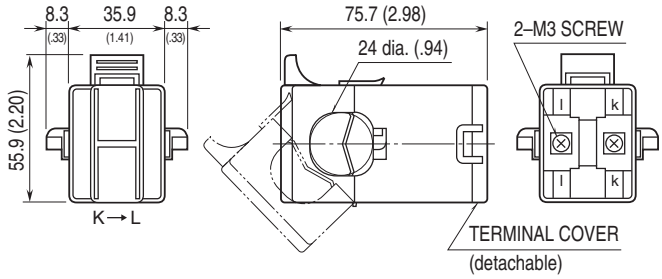
■ **Sensor model No.: CLSB-05**



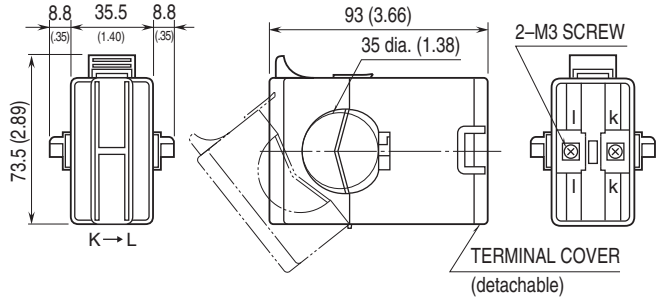
■ **Sensor model No.: CLSB-10**



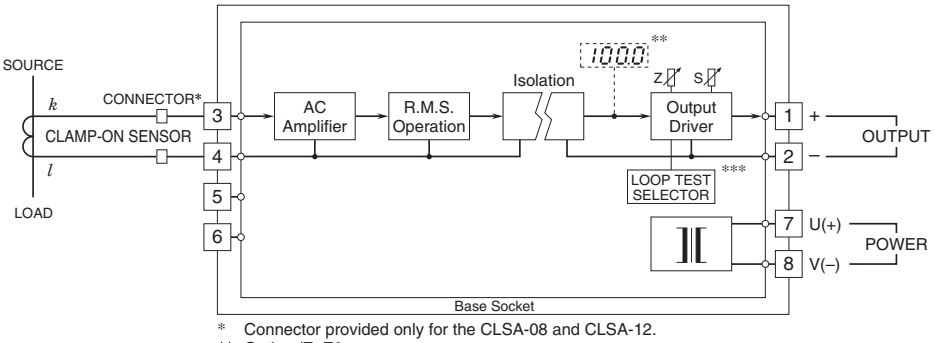
■ **Sensor model No.: CLSB-20**



■ **Sensor model No.: CLSB-40**



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



* Connector provided only for the CLSA-08 and CLSA-12.
** Option /E, E2
*** Option /E2

⚠ Specifications are subject to change without notice.