

**Power Transducer Series LT-UNIT**

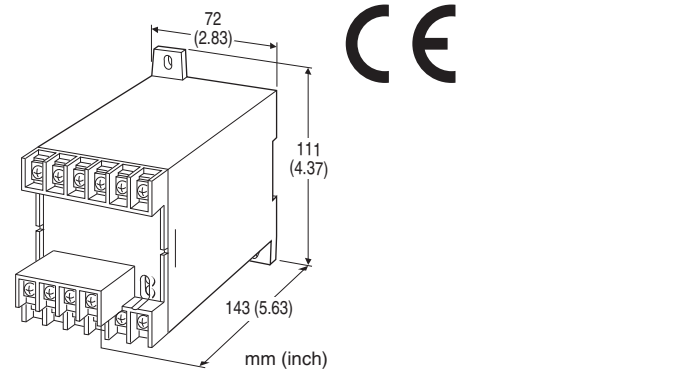
**PHASE ANGLE TRANSDUCER**

**Functions & Features**

- Provides a DC output signal in proportion to power angle
- DC output containing little ripple is ideal for computer input
- Isolation up to 2000 V AC
- High-density mounting
- Conforms to IEC 60688

**Typical Applications**

- Centralized monitoring and control of power management system in a manufacturing facility or building
- Measuring phase angle for a motor



**MODEL: LTPA-[1][2][3][4][5]-[6][7]**

**ORDERING INFORMATION**

- Code number: LTPA-[1][2][3][4][5]-[6][7]
- Specify a code from below for each of [1] through [7].  
(e.g. LTPA-115PA-R/T/Q)
- Special output range (For codes Z & 0)
- Specify the specification for option code /Q  
(e.g. /C01)

**[1] CONFIGURATION**

- 1: 3-phase / 3-wire
- 4: 3-phase / 4-wire

**[2] VT INPUT (balanced load)**

- For 3-phase / 4-wire, phase voltages (e.g. 110 V /  $\sqrt{3}$  ) are used.
- 1: 100, 110, 115, 120 V AC
  - 2: 190, 200, 210, 220, 230, 240 V AC
  - 4: 380, 400, 415, 430, 440, 480 V AC

**[3] CT INPUT (balanced load)**

- Current**
- 1: 1 A AC
  - 2: 2 A AC
  - 5: 5 A AC

**[4] OUTPUT SIGNAL POLARITY**

- P: Negative in lag, positive in lead  
M: Negative in lead, positive in lag

**[5] OUTPUT**

- Current**
- A: 4 - 20 mA DC (Load resistance 500  $\Omega$  max.)
  - FW: -10 - +10 mA DC (Load resistance 1000  $\Omega$  max.)
  - GW: -1 - +1 mA DC (Load resistance 10 k $\Omega$  max.)
  - JW: -5 - +5 mA DC (Load resistance 2000  $\Omega$  max.)
  - Z: Specify current (See OUTPUT SPECIFICATIONS)
- Voltage**
- 6: 1 - 5 V DC (Load resistance 5000  $\Omega$  min.)
  - 1W: -10 - +10 mV DC (Load resistance 10 k $\Omega$  min.)
  - 2W: -100 - +100 mV DC (Load resistance 100 k $\Omega$  min.)
  - 3W: -1 - +1 V DC (Load resistance 1000  $\Omega$  min.)
  - 4W: -10 - +10 V DC (Load resistance 10 k $\Omega$  min.)
  - 5W: -5 - +5 V DC (Load resistance 5000  $\Omega$  min.)
  - 0: Specify voltage (See OUTPUT SPECIFICATIONS)

**[6] AUXILIARY POWER SUPPLY**

- AC Power**
- K3: 100 - 120V AC  
(Operational voltage range 85 - 132 V, 47 - 66 Hz)
  - L3: 200 - 240V AC  
(Operational voltage range 170 - 264 V, 47 - 66 Hz)
- DC Power**
- R: 24 V DC  
(Operational voltage range 24 V  $\pm$ 10 %, ripple 10 %p-p max.)
  - V: 48 V DC  
(Operational voltage range 48 V  $\pm$  10 % , ripple 10 % p-p max.)
  - P: 110 V DC  
(Operational voltage range 85 - 150 V, ripple 10 %p-p max.)  
(CE not available)

**[7] OPTIONS (multiple selections)**

- Terminal Cover**
- blank: Without
  - /T: With
- Other Options**
- blank: none
  - /Q: Option other than the above (specify the specification)

## SPECIFICATIONS OF OPTION: Q

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

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

## GENERAL SPECIFICATIONS

**Connection:** M4 screw terminals (torque 1.2 N·m)

**Screw terminal:** Chrome-plated steel

**Housing material:** Flame-resistant resin (black)

**Isolation:** Voltage input to current input to output to auxiliary power

**Computation:** Phase angle detection

**Overrange output:** Approx. -10 to +120 % at 1 - 5 V

**Zero adjustment:** -5 to +5 % (front)

**Span adjustment:** 95 to 105 % (front)

## INPUT SPECIFICATIONS

**Frequency:** 50 or 60 Hz

### VOLTAGE INPUT

**Operational range:** 85 - 120 % of rating

**Overload capacity:** 150 % of rating for 10 sec., 120 % continuous

**Input burden:** 0.5 VA

### CURRENT INPUT

**Operational range:** 10 - 120 % of rating

**Overload capacity:** 4000 % of rating for 1 sec., 2000 % for 4 sec., 120 % continuous

**Input burden:** 0.1 VA (input 1 A)

0.2 VA (input 2 A)

0.5 VA (input 5 A)

### Input range:

lag 60° - 0 - lead 60°

lead 60° - 0 - lag 60°

## OUTPUT SPECIFICATIONS

**DC Current:** -10 - +20 mA DC

**Span:** Min. 1 mA, max. 20 mA

**Offset:** Max. 1.5 times span

**Load resistance:** Output drive 10 V max.

**DC Voltage:** -10 - +12 V DC

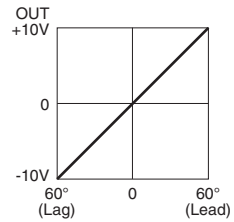
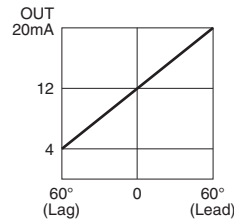
**Minimum span:** 5 mV

**Offset:** Max. 1.5 times span

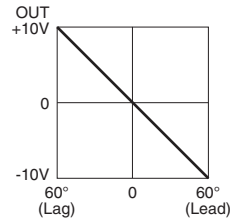
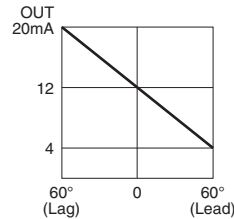
**Load resistance:** Output drive 1 mA max. at  $\geq 0.5$  V

## OPERATION DIAGRAM (example)

### Negative in lag, positive in lead



### Negative in lead, positive in lag



Note: When there is no input voltage or 5% or less of the rated input current, the output may become unstable (hunting).

## INSTALLATION

### Power Consumption

•AC: Approx. 2 VA

•DC: Approx. 2 W (18 mA at 110 V)

**Operating temperature:** -10 to +55°C (14 to 131°F)

**Operating humidity:** 30 to 85 %RH (non-condensing)

**Mounting:** Surface or DIN rail

**Weight:** 450 g (0.99 lb)

## PERFORMANCE in percentage of span

**Accuracy:**  $\pm 2$  % with balanced load

(at 23°C  $\pm 10$ °C or 73.4°F  $\pm 18$ °F, 45 - 65 Hz)

**Magnetic field (ext. origin) effect:**  $\pm 2$  % (400 A/m)

**Response time:**  $\leq 2$  sec. (0 - 100 %  $\pm 1$  %)

**Ripple:** 0.5 %p-p max.

**Line voltage effect:**  $\pm 1$  % over voltage range

**Insulation resistance:**  $\geq 100$  M $\Omega$  with 500 V DC

**Dielectric strength:** 2000 V AC @ 1 minute

(voltage input to current input to output to auxiliary power to ground)

**Impulse withstand voltage:** 1.2 / 50  $\mu$ sec.,  $\pm 5$  kV

(input to output or ground)

## STANDARDS & APPROVALS

**EU conformity:**

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

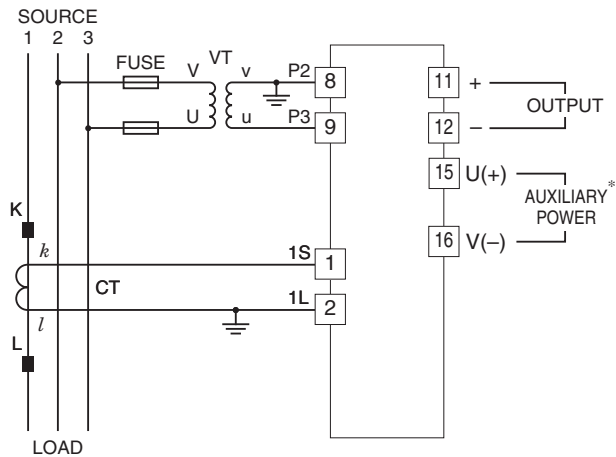
Low Voltage Directive

EN 61010-1

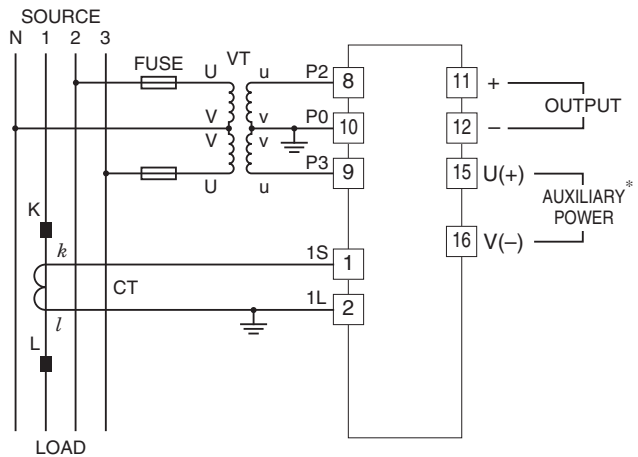
Measurement Category II (input)  
 Installation Category II (auxiliary power)  
 Pollution Degree 2  
 Input to output or auxiliary power: Reinforced insulation (550 V)  
 Output to auxiliary power: Reinforced insulation (300 V)  
 RoHS Directive

## CONNECTION DIAGRAM

### 3-PHASE/3-WIRE

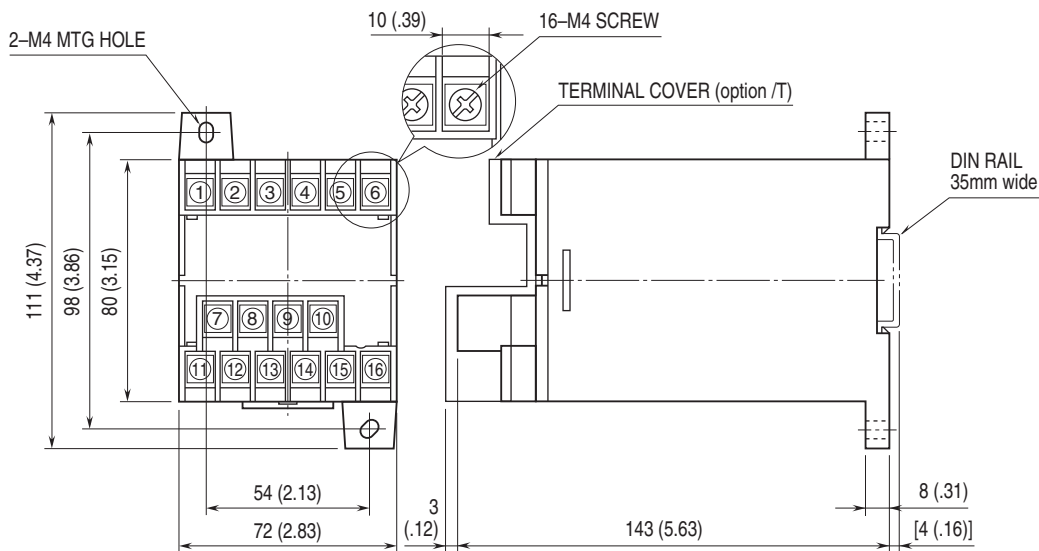


### 3-PHASE/4-WIRE



\*The transducer can be powered from the input voltage when the voltage is sufficiently stable and meets within the range of auxiliary power supply of the unit specified in the data sheet/instruction manual.

## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



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



Specifications are subject to change without notice.