

## Power Transducer Series L-UNIT

### PHASE ANGLE TRANSDUCER

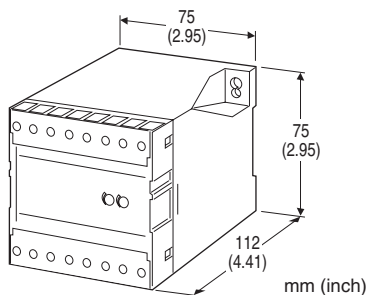
(for unbalanced load)

#### Functions & Features

- Provides a DC output signal in proportion to phase angle
- Usable with unbalanced load
- DC output containing little ripple is ideal for computer input
- Isolation up to 2000 V AC
- High-density mounting

#### Typical Applications

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



## MODEL: LPAU-[1][2][3][4][5]-[6][7]

### ORDERING INFORMATION

- Code number: LPAU-[1][2][3][4][5]-[6][7]
- Specify a code from below for each of [1] through [7].  
(e.g. LPAU-111PA-C/Q)
- Special output range (For codes Z & 0)
- Specify the specification for option code /Q  
(e.g. /C01/S01)

#### [1] CONFIGURATION

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

#### [2] INPUT (unbalanced load)

- 1: 110 V / 5 A AC
- 2: 110 V / 1 A AC
- 3: 220 V / 1 A AC
- 4: 220 V / 5 A AC
- 5: 220 V / 380 V / 1 A AC (3-phase / 4-wire)
- 6: 220 V / 380 V / 5 A AC (3-phase / 4-wire)

- 7: 110 V / 190 V / 1 A AC (3-phase / 4-wire)
  - 8: 110 V / 190 V / 5 A AC (3-phase / 4-wire)
- (220 V in code 5 and 6, and 110 V in code 7 and 8 are phase voltage)

#### [3] FREQUENCY

- 1: 50 Hz
- 2: 60 Hz

#### [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 600 Ω max.)
  - FW: -10 - +10 mA DC (Load resistance 1000 Ω max.)
  - GW: -1 - +1 mA DC (Load resistance 10 kΩ max.)
  - JW: -5 - +5 mA DC (Load resistance 2000 Ω max.)
  - Z: Specify current (See OUTPUT SPECIFICATIONS)
- Voltage
- 6: 1 - 5 V DC (Load resistance 5000 Ω min.)
  - 1W: -10 - +10 mV DC (Load resistance 10 kΩ min.)
  - 2W: -100 - +100 mV DC (Load resistance 100 kΩ min.)
  - 3W: -1 - +1 V DC (Load resistance 1000 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)

#### [6] AUXILIARY POWER SUPPLY

- 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
- R: 24 V DC
- V: 48 V DC
- P: 110 V DC

#### [7] OPTIONS

- blank: none
- /Q: With options (specify the specification)

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

COATING (For the detail, refer to our web site.)

/C01: Silicone coating

/C02: Polyurethane coating  
 /C03: Rubber coating  
 TERMINAL SCREW MATERIAL  
 /S01: Stainless steel

## GENERAL SPECIFICATIONS

**Construction:** Stand-alone; terminal access at the front  
**Connection:** M3.5 screw terminals (torque 0.8 N·m)  
**Screw terminal:** Nickel-plated steel (standard) or stainless 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

### INPUT

**Frequency:** 50 or 60 Hz

- Voltage Input**  
**Input burden:** 0.5 VA  
**Operational range:** 85 - 120 % of rating  
**Overload capacity:** 150 % of rating for 10 sec., 120 % continuous
- Current Input**  
**Input burden:** 0.1 VA (input 1 A)  
 0.5 VA (input 5 A)  
**Operational range:** 10 - 120 % of rating  
**Overload capacity:** 1000 % of rating for 3 sec., 200 % for 10 sec., 120 % continuous

**Input range:**  
 Lag 60° - 0 - lead 60°  
 Lead 60° - 0 - lag 60°

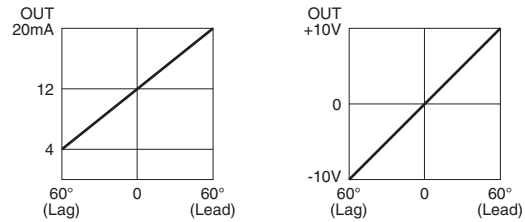
## OUTPUT SPECIFICATIONS

**DC Current:** -10 - + 20 mA DC  
**Span:** Min. 1 mA, max. 20 mA  
**Offset:** Max. 1.5 times span  
**Load resistance:** Output drive 12 V maximum; 10 V for [±] output

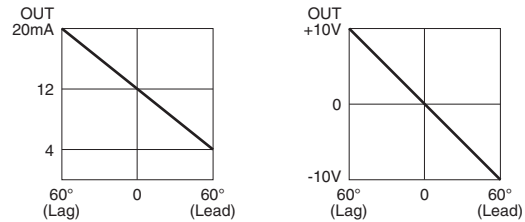
**DC Voltage:** -10 - +12 V DC  
**Minimum span:** 5 mV  
**Offset:** Max. 1.5 times span  
**Load resistance:** Output drive 1 mA max. at ≥ 0.5 V

## 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 transducer output equals approximately to '0' (phase angle).

## INSTALLATION

### Auxiliary power supply

- AC:** Operational voltage range: rating -15/+10 %, 50/60 Hz, approx. 2 VA
- DC:** Operational voltage range: rating ±10 %, or 85 - 150 V for 110 V rating, ripple 10 %p-p max., approx. 2 W (18 mA at 110 V)

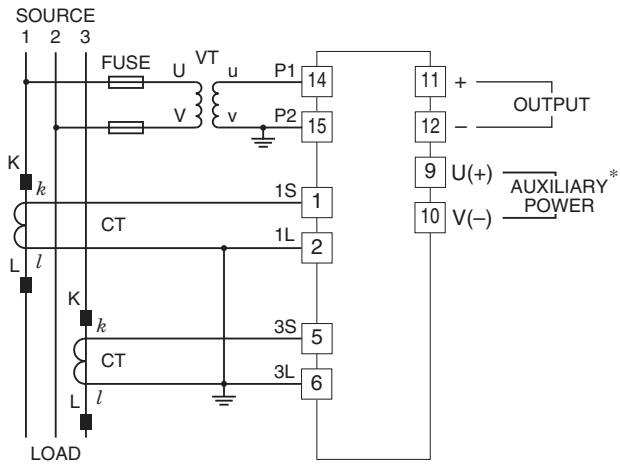
**Operating temperature:** -10 to +55°C (14 to 131°F)  
**Operating humidity:** 30 to 85 %RH (non-condensing)  
**Mounting:** Surface or DIN rail  
**Weight:** 450 g (0.99 lb)

## PERFORMANCE in percentage of span

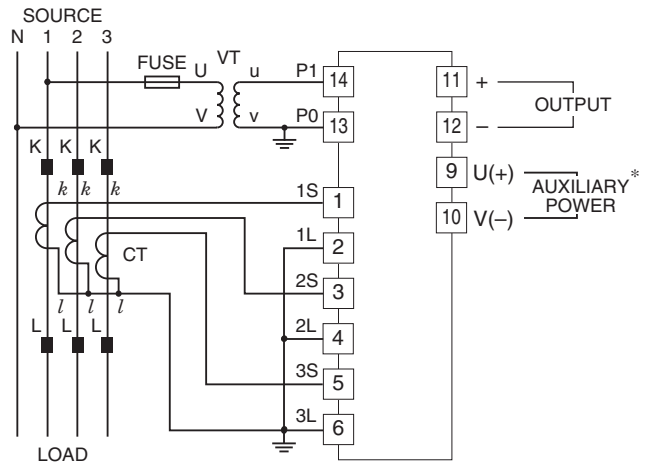
**Accuracy:** ±2 % (at 23°C ±10°C or 73.4°F ±18°F, at rated frequency ±5 %)  
**Response time:** ≤ 2 sec. (0 - 100 % ±1 %)  
**Ripple:** 0.5 %p-p max.  
**Line voltage effect:** ±0.1 % over voltage range  
**Insulation resistance:** ≥ 100 MΩ with 500 V DC  
**Dielectric strength:** 2000 V AC @ 1 minute (voltage input to current input to output to auxiliary power to ground)  
**Impulse withstand voltage:** 1.2 / 50 μsec., ±5 kV (input to output or ground)

## CONNECTION DIAGRAM

### 3-PHASE/3-WIRE

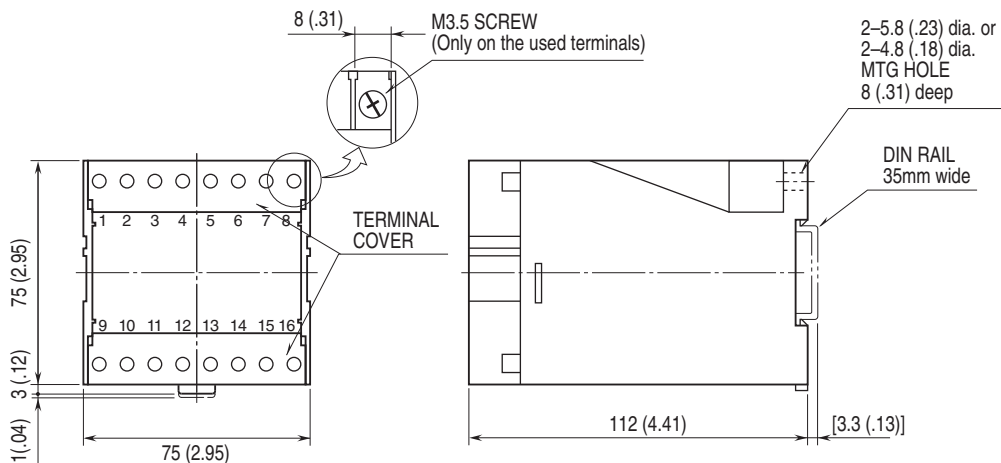


### 3-PHASE/4-WIRE



\*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.

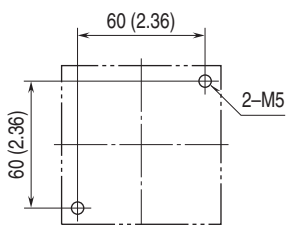
## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



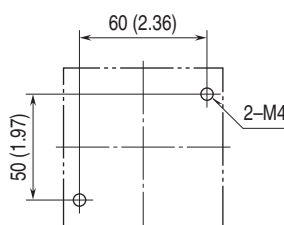
•When mounting, no extra space is needed between units.

## MOUNTING REQUIREMENTS unit: mm [inch]

### M5 SCREWS



### M4 SCREWS



Specifications are subject to change without notice.