Power Transducer Series L-UNIT

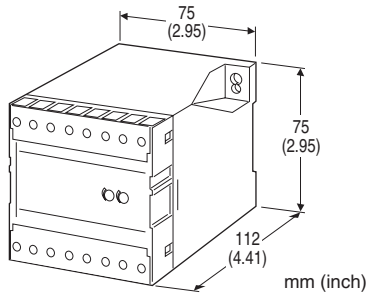
PHASE ANGLE TRANSDUCER

Functions & Features

- Providing a DC output signal in proportion to phase angle
- 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: LPA-[1][2][3][4]-[5][6]

ORDERING INFORMATION

- Code number: LPA-[1][2][3][4]-[5][6]

Specify a code from below for each of [1] through [6].
(e.g. LPA-11PA-C/Q)

- Special DC 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 (balanced 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] OUTPUT SIGNAL POLARITY

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

[4] 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)

[5] 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

[6] 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

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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

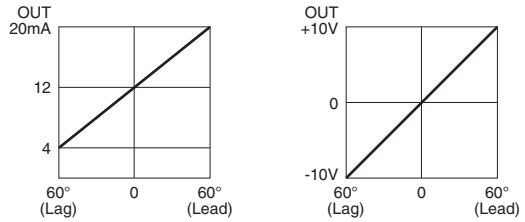
■**INPUT**
Frequency: 50 or 60 Hz
• **Voltage Input**
Input burden: 0.5 VA
Operational range: 85 – 120 % of rating
Overload capacity: 150 % of rating for 10 sec., 120 % continuous
• **Current Input**
Input burden: 0.1 VA (input 1 A)
0.5 VA (input 5 A)
Operational range: 10 – 120 % of rating
Overload 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

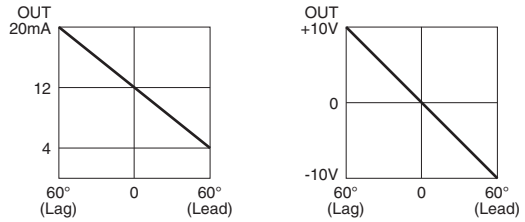
■ **DC Current**: -10 – + 20 mA DC
Span: Min. 1 mA, max. 20 mA
Offset: Max. 1.5 times span
Load resistance: Output drive 12 V maximum; 10 V for [±] output
■ **DC Voltage**: -10 – +12 V DC
Minimum span: 5 mV
Offset: Max. 1.5 times span
Load resistance: Output drive 1 mA max. at ≥ 0.5 V

■ **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 output may become unstable (hunting).

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 % with balanced load
(at 23°C ±10°C or 73.4°F ±18°F, 45 – 65 Hz)
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)

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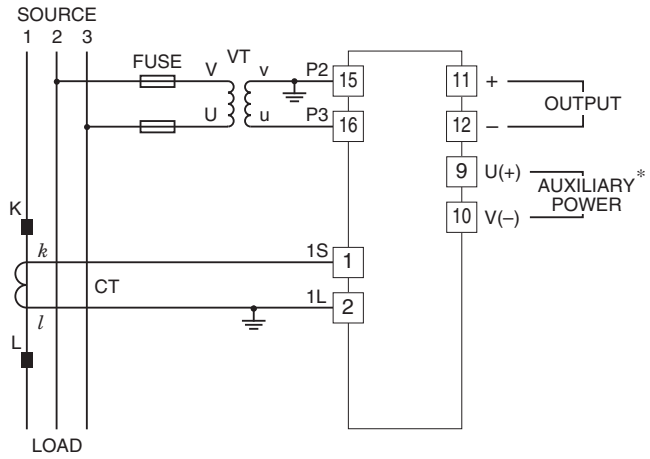
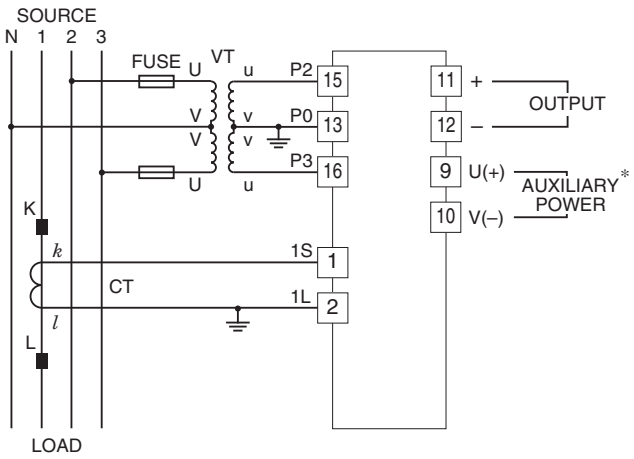
CONNECTION DIAGRAM

■ 3-PHASE/3-WIRE

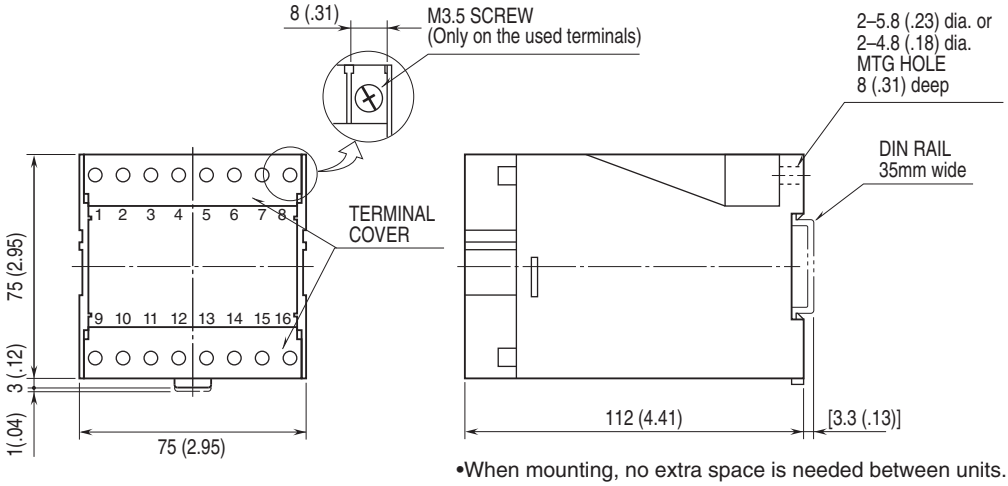


■ 3-PHASE/4-WIRE



*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.

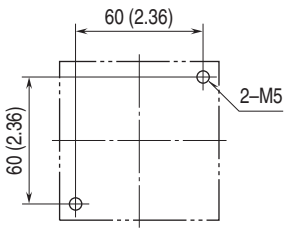
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



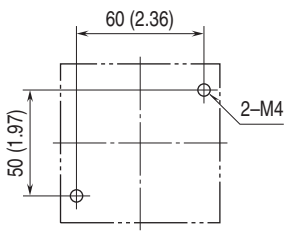
•When mounting, no extra space is needed between units.

MOUNTING REQUIREMENTS unit: mm [inch]

■ M5 SCREWS



■ M4 SCREWS



⚠ Specifications are subject to change without notice.

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