Power Transducer Series LT-UNIT

PHASE ANGLE TRANSDUCER

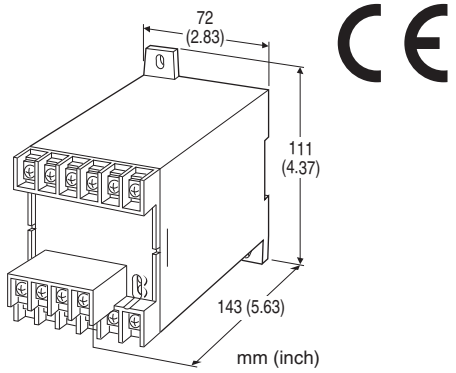
(for unbalanced load)

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
- 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



CE

MODEL: LTPAU–[1][2][3][4][5][6]–[7][8]

ORDERING INFORMATION

- Code number: LTPAU–[1][2][3][4][5][6]–[7][8]

Specify a code from below for each of [1] through [8].
(e.g. LTPAU-1151PA-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 / √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 (unbalanced load)

Current
1: 1 A AC
2: 2 A AC
5: 5 A AC

[4] FREQUENCY

1: 50 Hz
2: 60 Hz

[5] OUTPUT SIGNAL POLARITY

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

[6] OUTPUT

Current
A: 4 – 20 mA DC (Load resistance 500 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)

[7] 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 ±10 %, ripple 10 %p-p max.)
V: 48 V DC
(Operational voltage range 48 V ± 10 % , ripple 10 % p-p max.)
P: 110 V DC
(Operational voltage range 85 – 150 V, ripple 10 %p-p max.)
(CE not available)

[8] 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

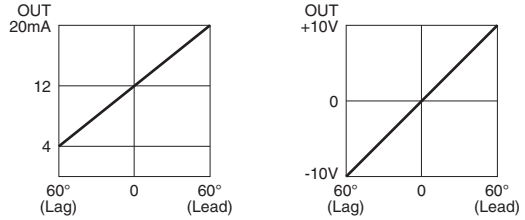
Frequency: 50 or 60 Hz
■ **VOLTAGE INPUT**
Operational range: 85 – 120 % of rating
Overload capacity: 150 % of rating for 10 sec., 120 % continuous
Input burden: 0.5 VA
■ **CURRENT INPUT**
Operational range: 10 – 120 % of rating
Overload capacity: 4000 % of rating for 1 sec., 2000 % for 4 sec., 120 % 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

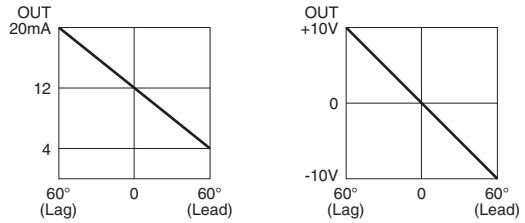
■ **DC Current**: -10 – +20 mA DC
Span: Min. 1 mA, max. 20 mA
Offset: Max. 1.5 times span
Load resistance: Output drive 10 V max.
■ **DC Voltage**: -10 – +12 V DC
Minimum span: 5 mV
Offset: Max. 1.5 times span
Load resistance: Output drive 1 mA max. at ≥ 0.5 V

■ **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

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: ±2 % with balanced load
(at 23°C ±10°C or 73.4°F ±18°F, at rated frequency ±10 % [±5 % for 3-phase/4 wire])
Magnetic field (ext. origin) effect: ±2 % (400 A/m)
Response time: ≤ 2 sec. (0 – 100 % ±1 %)
Ripple: 0.5 %p-p max.
Line voltage effect: ±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)

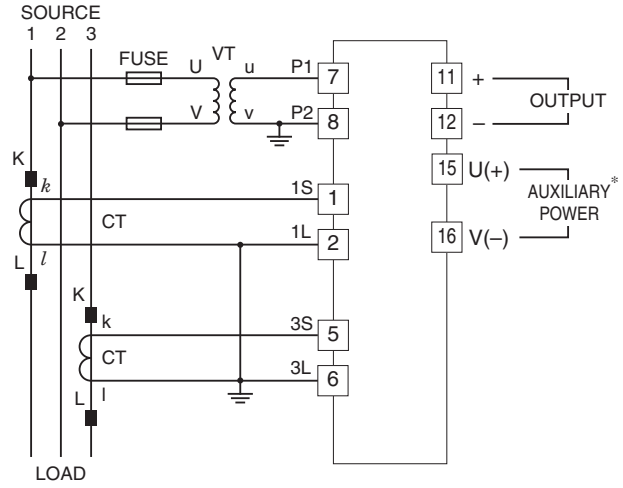
STANDARDS & APPROVALS

EU conformity:
EMC Directive
EMI EN 61000-6-4
EMS EN 61000-6-2
Low Voltage Directive

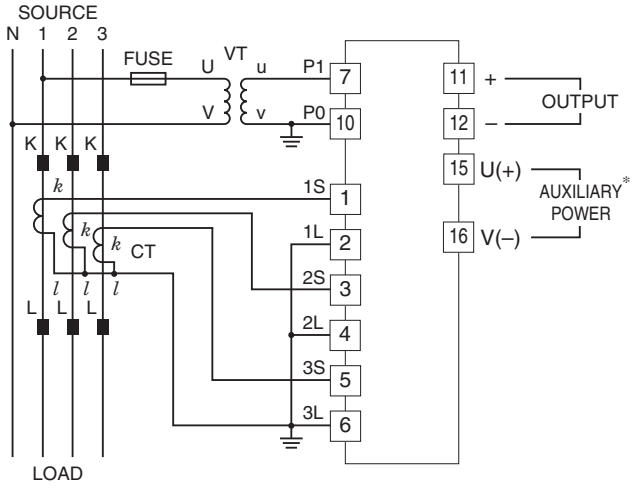
EN 61010-1
Measurement Category II (input)
Installation Category II (auxiliary power)
Pollution Degree 2
Input to output or auxiliary power: Reinforced insulation (550 V)
Output to auxiliary power: Reinforced insulation (300 V)
RoHS Directive

CONNECTION DIAGRAM

■ **3-PHASE/3-WIRE**

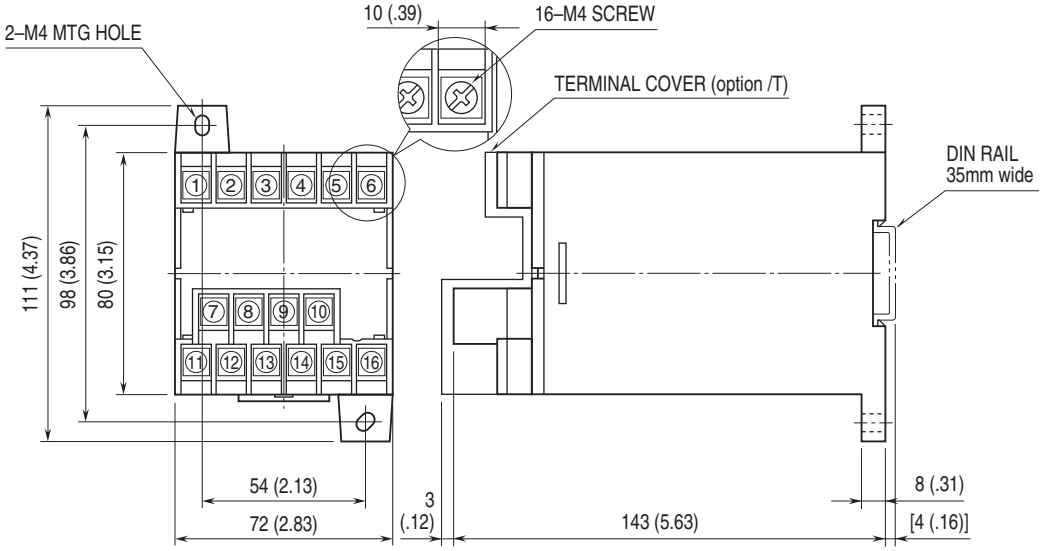


■ **3-PHASE/4-WIRE**



*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.