Power Transducer Series L-UNIT

POWER FACTOR TRANSDUCER

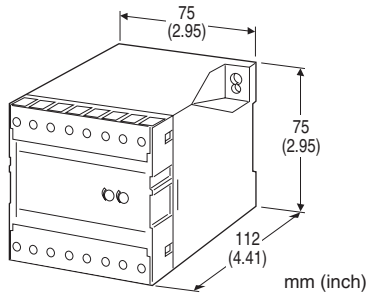
(for unbalanced load)

Functions & Features

- Providing a DC output signal in proportion to power factor
- 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 power factor for a motor



MODEL: LPFU–[1][2][3][4][5]-[6][7]

ORDERING INFORMATION

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

Specify a code from below for each [1] through [7].
(e.g. LPFU-111PA-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 (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 M-System's 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

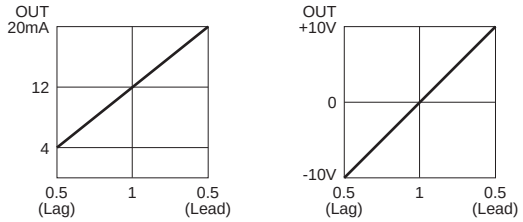
A device which employs different measuring methods may show different outputs from that of M-System's.
Frequency: 50 or 60 Hz
• **Voltage Input**
Input burden: 0.5 VA
Operational range: 85 – 120 % of rating
Overload capacity: 150 % of rating for 10 sec., 120 % continuous
• **Current Input**
Input burden: 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 0.5 – 1 – lead 0.5
Lead 0.5 – 1 – lag 0.5

OUTPUT SPECIFICATIONS

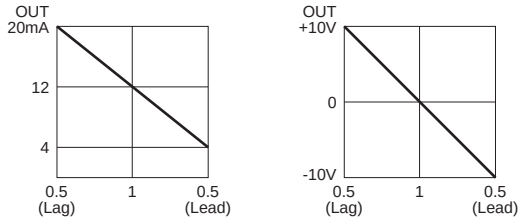
■ **DC Current**: -10 – + 20 mA DC
Span: Min. 1 mA, max. 20 mA
Offset: Max. 1.5 times span
Load resistance: Output drive 12 V maximum; 10 V for [±] output
■ **DC Voltage**: -10 – +12 V DC
Minimum span: 5 mV
Offset: Max. 1.5 times span
Load resistance: Output drive 1 mA max. at ≥ 0.5 V

■ **OPERATION DIAGRAM (example)**

• **Negative in lag, positive in lead**



• **Negative in lead, positive in lag**



Remark: When there is no input voltage or 5% or less of the rated input current, the transducer output equals approximately to '1'.

INSTALLATION

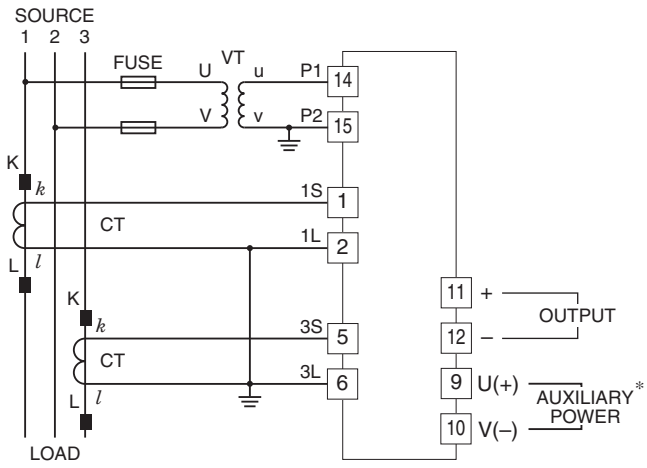
Auxiliary power supply
•**AC**: Operational voltage range: rating -15/+10 %, 50/60 Hz, approx. 2 VA
•**DC**: Operational voltage range: rating ±10 %, or 85 – 150 V for 110 V rating, ripple 10 %p-p max., approx. 2 W (18 mA at 110 V)
Operating temperature: -10 to +55°C (14 to 131°F)
Operating humidity: 30 to 85 %RH (non-condensing)
Mounting: Surface or DIN rail
Weight: 450 g (0.99 lb)

PERFORMANCE in percentage of span

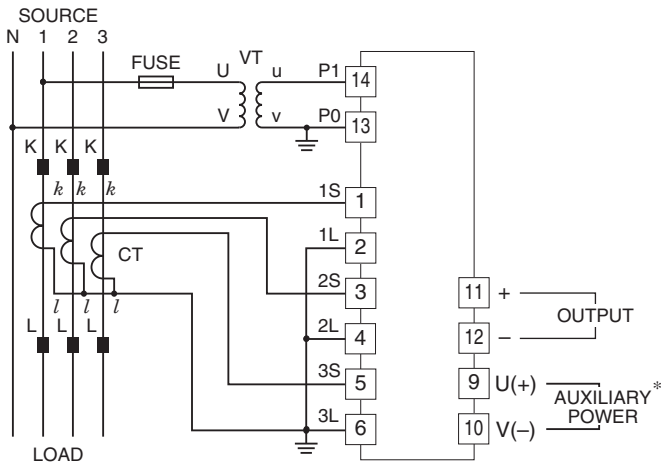
Accuracy: ±2 % with input 1 – 0.866
±4 % with input 0.866 – 0.5
(at 23°C ±10°C or 73.4°F ±18°F, at rated frequency ±5 %)
Response time: ≤ 2 sec. (0 – 100 % ±1 %)
Ripple: 0.5 %p-p max.
Line voltage effect: ±0.1 % over voltage range
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 2000 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**

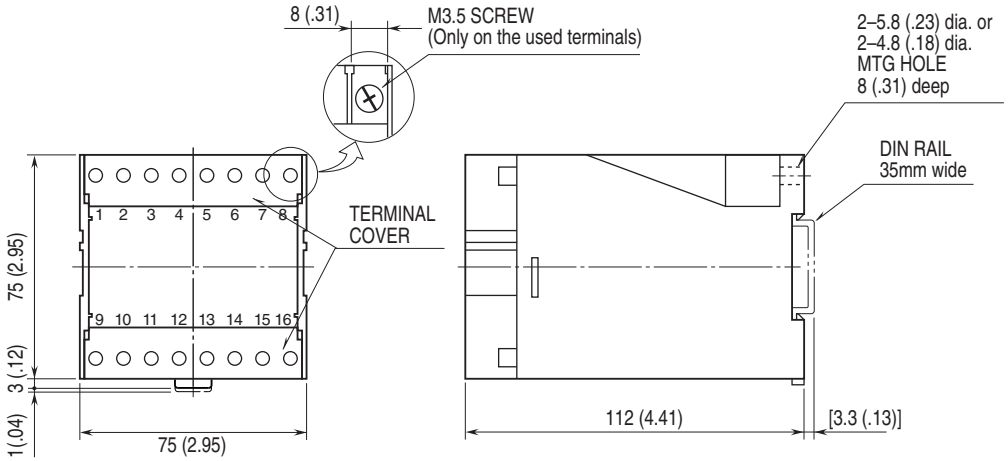


■ **3-PHASE/4-WIRE**



*The transducer can be powered from the input voltage when the voltage is sufficiently stable and meets other supply voltage requirements.

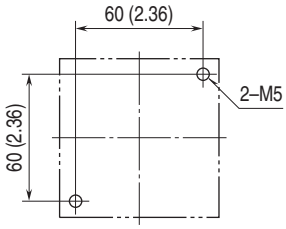
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



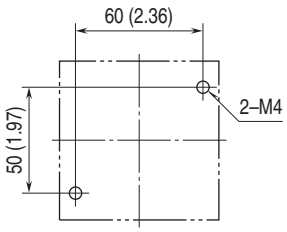
•When mounting, no extra space is needed between units.

MOUNTING REQUIREMENTS unit: mm (inch)

■ **M5 SCREWS**



■ **M4 SCREWS**



⚠ Specifications are subject to change without notice.