

Power Transducer Series L-UNIT

VAR TRANSDUCER

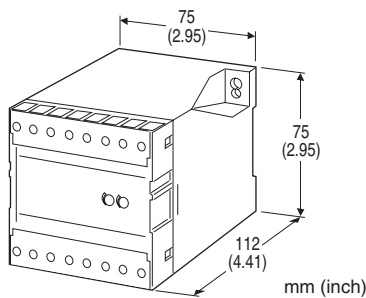
(self-powered)

Functions & Features

- Providing a DC output signal in proportion to AC reactive power
- DC output containing little ripple is ideal for computer input
- "Time division multiplication" method accepts distorted waveforms
- Isolation up to 2000 V AC
- High-density mounting
- No auxiliary power source required

Typical Applications

- Centralized monitoring and control of power management system in a manufacturing facility or building



MODEL: LRPN-[1][2][3][4][5]

ORDERING INFORMATION

- Code number: LRPN-[1][2][3][4][5]
Specify a code from below for each [1] through [5].
(e.g. LRPN-11PA/Q)
- Calibration range (e.g. lag 1000 – lead 1000 var)
Specify the range with lag and lead. Don't use plus or minus.
- VT ratio, CT ratio (e.g. VT 3300/110 V, CT 250/5 A)
- 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)

(Voltage must be balanced.)

- 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 k Ω 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 k Ω min.)

2W: -100 – +100 mV DC (Load resistance 100 k Ω min.)

3W: -1 – +1 V DC (Load resistance 1000 Ω min.)

4W: -10 – +10 V DC (Load resistance 10 k Ω min.)

5W: -5 – +5 V DC (Load resistance 5000 Ω min.)

0: Specify voltage (See OUTPUT SPECIFICATIONS)

[5] 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
Computation: Time division multiplication
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 - 110 % of rating

Overload capacity: 150 % of rating for 10 sec., 110 % continuous

• Current Input

Operational range: 0 - 120 % of rating

Overload capacity: 1000 % of rating for 3 sec., 200 % for 10 sec., 120 % continuous

■ How To Determine Var Range

Calibration Range [var] = (Measuring Range) ÷
 ((VT Ratio) × (CT Ratio))

Check that the required calibration range is within the available range in the table.

[example]

3-phase / 3-wire, measuring range 75 kvar,

VT 220 / 110 V, CT 250 / 5 A

$(75 \times 10^3 \text{ [var]}) \div ((220 / 110) \times (250 / 5)) = 750 \text{ [var]}$

■ LRPN INPUT RANGE

• 3-phase / 3-wire

INPUT	STD. RANGE	AVAILABLE RANGE	BURDEN (VA)	
			VOLT.	CURR.
110V/1A	200 var	100 - 240 var	P ₁ : 2.5	0.1/ph
110V/5A	1000 var	500 - 1200 var	P ₃ : 0.2	0.5/ph
220V/1A	400 var	200 - 480 var	P ₁ : 2.5	0.1/ph
220V/5A	2000 var	1000 - 2400 var	P ₃ : 0.4	0.5/ph

• 3-phase / 4-wire

INPUT	STD. RANGE	AVAILABLE RANGE	BURDEN (VA)	
			VOLT.	CURR.
$\frac{110V}{\sqrt{3}}$ /1A	200 var	100 - 240 var	P ₁ - P ₂ : 2.5	0.1 /phase
$\frac{110V}{\sqrt{3}}$ /5A	1000 var	500 - 1200 var	P ₃ : 0.1	0.5 /phase
$\frac{190V}{\sqrt{3}}$ /1A	350 var	175 - 420 var	P ₁ : 2.5	0.1 /phase
$\frac{190V}{\sqrt{3}}$ /5A	1750 var	875 - 2100 var	P ₂ , P ₃ : 0.2	0.5 /phase
$\frac{220V}{\sqrt{3}}$ /1A	400 var	200 - 480 var	P ₁ - P ₂ : 2.5	0.1 /phase
$\frac{220V}{\sqrt{3}}$ /5A	2000 var	1000 - 2400 var	P ₃ : 0.3	0.5 /phase
$\frac{380V}{\sqrt{3}}$ /1A	700 var	350 - 840 var	P ₁ : 2.5	0.1 /phase
$\frac{380V}{\sqrt{3}}$ /5A	3500 var	1750 - 4200 var	P ₂ , P ₃ : 0.4	0.5 /phase

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

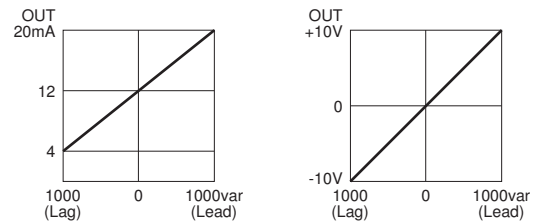
Minimum span: 5 mV

Offset: Max. 1.5 times span

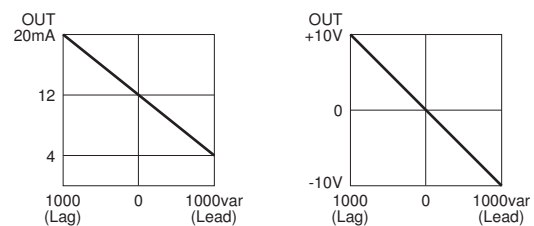
Load resistance: Output drive 1 mA max. at ≥ 0.5 V

■ OPERATION DIAGRAM (example)

• Negative in lag, positive in lead



• Negative in lead, positive in lag



INSTALLATION

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: ±0.5 % (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.

Insulation resistance: ≥ 100 MΩ with 500 V DC

Dielectric strength: 2000 V AC @ 1 minute

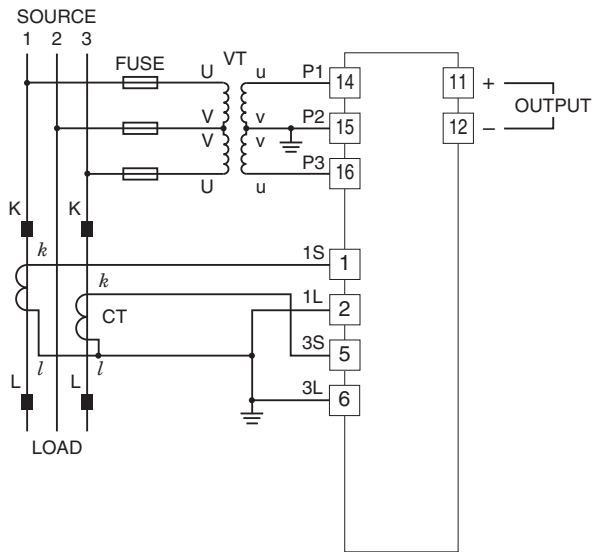
(voltage input to current input to output to ground)

Impulse withstand voltage: 1.2 / 50 μsec., ±5 kV

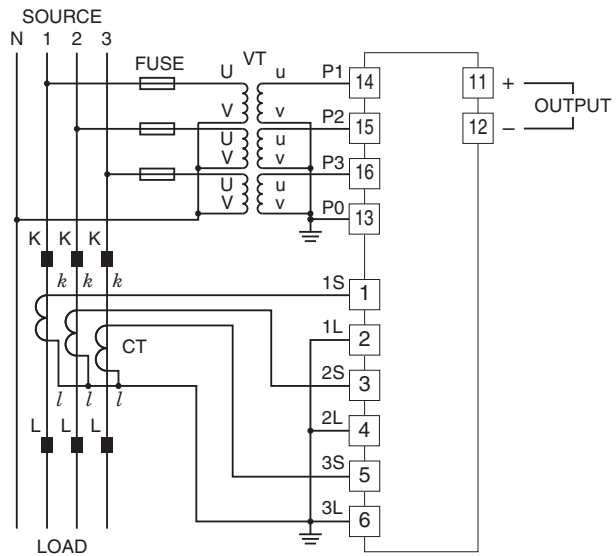
(input to output or ground)

CONNECTION DIAGRAM

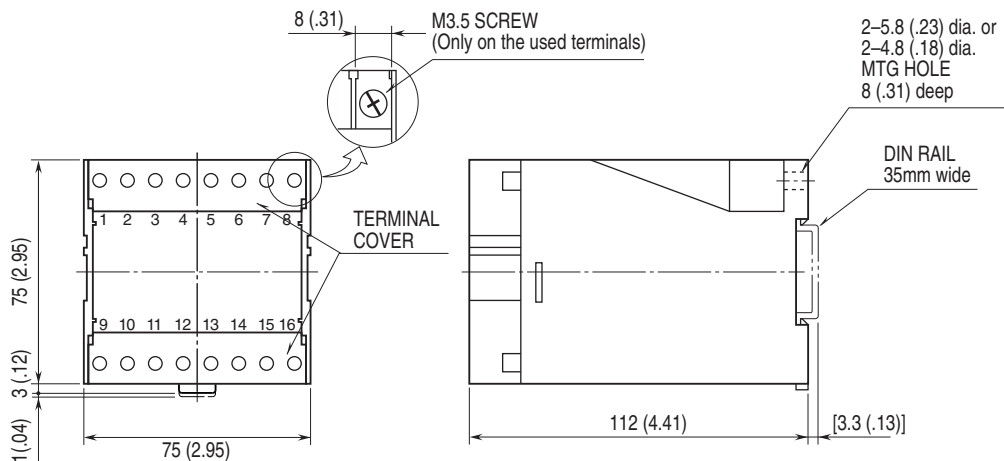
■ 3-PHASE/3-WIRE



■ 3-PHASE/4-WIRE



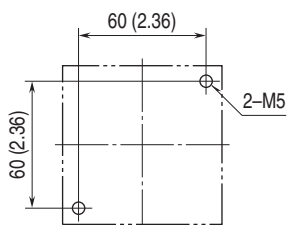
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



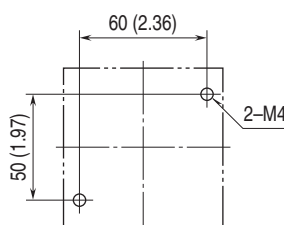
•When mounting, no extra space is needed between units.

MOUNTING REQUIREMENTS unit: mm (inch)

■ M5 SCREWS



■ M4 SCREWS



Specifications are subject to change without notice.