

**Power Transducer Series L-UNIT**

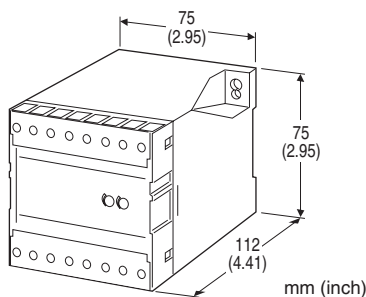
**VAR TRANSDUCER**

**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

**Typical Applications**

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



**MODEL: LRP-[1][2][3][4]-[5][6]**

**ORDERING INFORMATION**

- Code number: LRP-[1][2][3][4]-[5][6]
- Specify a code from below for each of [1] through [6]. (e.g. LRP-11PA-C/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 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

## 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:** 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:** 0 - 120 % of rating  
**Overload capacity:** 150 % of rating for 10 sec., 120 % 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  
 $(75 \times 10^3 \text{ [var]}) \div ((220 \div 110) \times (250 \div 5)) = 750 \text{ [var]}$

### ■ INPUT RANGE

#### • 3-phase / 3-wire

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

#### • 3-phase / 4-wire

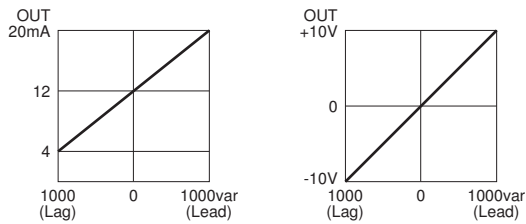
INPUT		AVAILABLE RANGE	BURDEN (VA)	
	STD.RANGE		VOLT.	CURR.
$\frac{110V}{\sqrt{3}}$ /1A	200 var	100 - 240 var	0.1 /phase	0.1 /phase
$\frac{110V}{\sqrt{3}}$ /5A	1000 var	500 - 1200 var		0.5 /phase
$\frac{190V}{\sqrt{3}}$ /1A	350 var	175 - 420 var	0.2 /phase	0.1 /phase
$\frac{190V}{\sqrt{3}}$ /5A	1750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

## OUTPUT SPECIFICATIONS

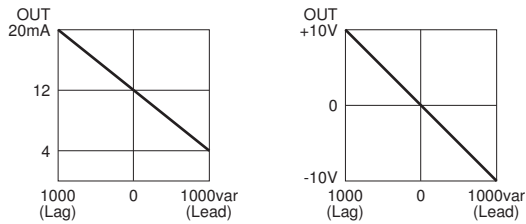
■ **DC Current:** -10 - + 20 mA DC  
**Span:** Min. 1 mA, max. 20 mA  
**Offset:** Max. 1.5 times span  
**Load resistance:** Output drive 12 V maximum; 10 V for [±] output  
 ■ **DC Voltage:** -10 - +12 V DC  
**Minimum span:** 5 mV  
**Offset:** Max. 1.5 times span  
**Load resistance:** Output drive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

## ■ OPERATION DIAGRAM (example)

### • Negative in lag, positive in lead



### • Negative in lead, positive in lag



## INSTALLATION

### Auxiliary power supply

• **AC:** Operational voltage range: rating  $-15/+10\%$ ,  
50/60 Hz, approx. 2 VA

• **DC:** Operational voltage range: rating  $\pm 10\%$ ,  
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  $+55^{\circ}\text{C}$  ( $14$  to  $131^{\circ}\text{F}$ )

**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:**  $\pm 0.5\%$  (at  $23^{\circ}\text{C} \pm 10^{\circ}\text{C}$  or  $73.4^{\circ}\text{F} \pm 18^{\circ}\text{F}$ ,  
45 - 65 Hz)

**Response time:**  $\leq 2$  sec. ( $0 - 100\% \pm 1\%$ )

**Ripple:** 0.5 %p-p max. (The output ripple may increase when  
there is great difference between the frequencies of input  
signal and power supply)

**Line voltage effect:**  $\pm 0.1\%$  over voltage range

**Insulation resistance:**  $\geq 100\text{ M}\Omega$  with 500 V DC

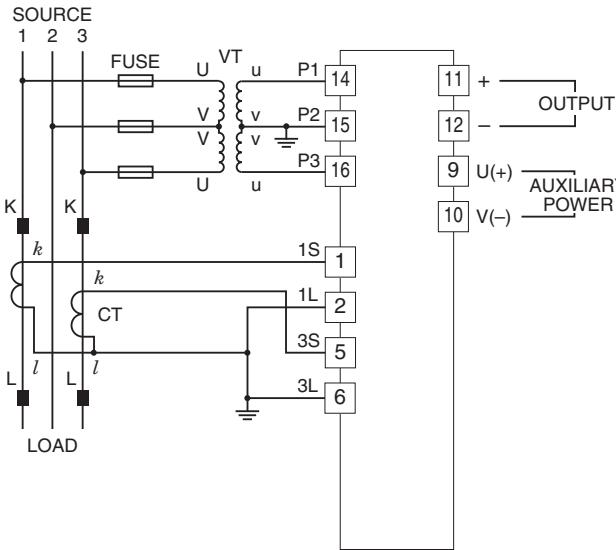
**Dielectric strength:** 2000 V AC @ 1 minute

(voltage input to current input to output to auxiliary power  
to ground)

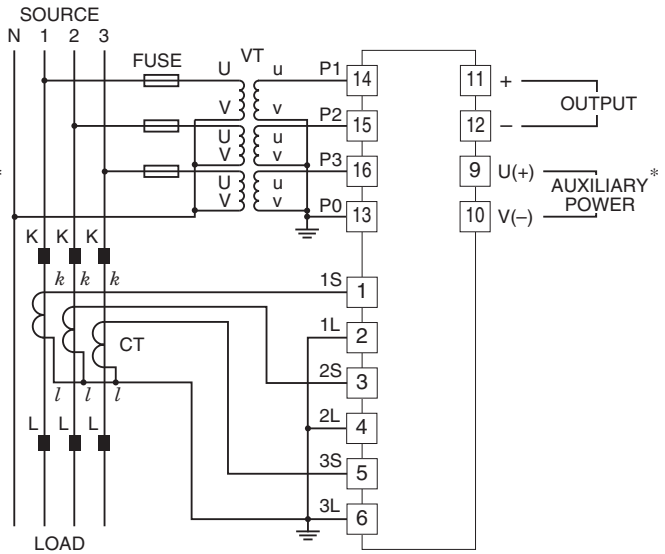
**Impulse withstand voltage:** 1.2 / 50  $\mu\text{sec.}$ ,  $\pm 5$  kV  
(input to output or ground)

## CONNECTION DIAGRAM

### 3-PHASE/3-WIRE

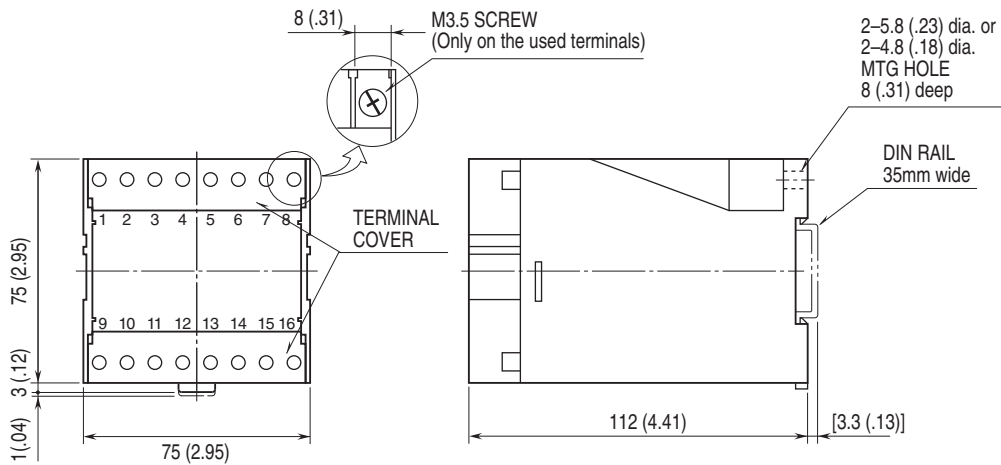


### 3-PHASE/4-WIRE



\*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.

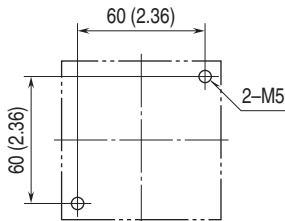
## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



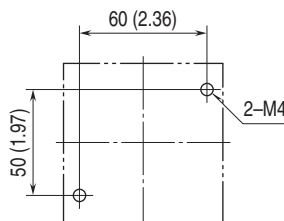
•When mounting, no extra space is needed between units.

## MOUNTING REQUIREMENTS unit: mm [inch]

### M5 SCREWS



### M4 SCREWS





Specifications are subject to change without notice.