

Power Transducer Series LT-UNIT

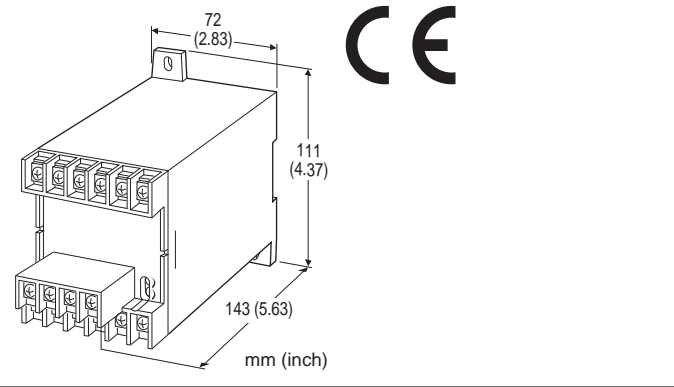
VAR TRANSDUCER

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
- Conforms to IEC 60688

Typical Applications

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



MODEL: LTRP-[1][2][3][4][5]-[6][7]

ORDERING INFORMATION

- Code number: LTRP-[1][2][3][4][5]-[6][7]
- Specify a code from below for each [1] through [7]. (e.g. LTRP-115PA-R/T)
- Special output range (For codes Z & 0)
- Use Ordering Information Sheet (No. ESU-3355).

[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 / $\sqrt{3}$) 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] 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 500 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)

[6] 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 \pm 10 %, ripple 10 %p-p max.)
 - V:** 48 V DC (Operational voltage range 48 V \pm 10 %, ripple 10 % p-p max.)
 - P:** 110 V DC (Operational voltage range 85 - 150 V, ripple 10 %p-p max.) (CE not available)

[7] OPTIONS

- Terminal Cover**
- blank: Without
 - /T: With

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 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: 200 % of rating for 10 sec., 120 % continuous

• Current input

Operational range: 0 - 120 % of rating

Overload capacity: 4000 % of rating for 1 sec., 2000 % for 4 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

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

• 3-phase / 3-wire

INPUT		USABLE RANGE	BURDEN (VA)	
VT / CT CODE	STD.RANGE		VT	CT
1 / 1	200 var	100 - 240 var	0.2 /phase	0.1/ph
1 / 2	400 var	200 - 480 var		0.2/ph
1 / 5	1000 var	500 - 1200 var		0.5/ph
2 / 1	400 var	200 - 480 var	0.4 /phase	0.1/ph
2 / 2	800 var	400 - 960 var		0.2/ph
2 / 5	2000 var	1000 - 2400 var		0.5/ph
4 / 1	800 var	400 - 960 var	0.6 /phase	0.1/ph
4 / 2	1600 var	800 - 1920 var		0.2/ph
4 / 5	4000 var	2000 - 4800 var		0.5/ph

• 3-phase / 4-wire

INPUT		USABLE RANGE	BURDEN (VA)	
VT / CT CODE	STD.RANGE		VT	CT
1 / 1	200 var	100 - 240 var	0.1 /phase	0.1/ph
1 / 2	400 var	200 - 480 var		0.2/ph
1 / 5	1000 var	500 - 1200 var		0.5/ph
2 / 1	400 var	200 - 480 var	0.3 /phase	0.1/ph
2 / 2	800 var	400 - 960 var		0.2/ph
2 / 5	2000 var	1000 - 2400 var		0.5/ph
4 / 1	800 var	400 - 960 var	0.4 /phase	0.1/ph
4 / 2	1600 var	800 - 1920 var		0.2/ph
4 / 5	4000 var	2000 - 4800 var		0.5/ph

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

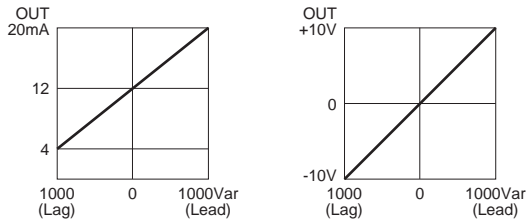
Minimum span: 5 mV

Offset: Max. 1.5 times span

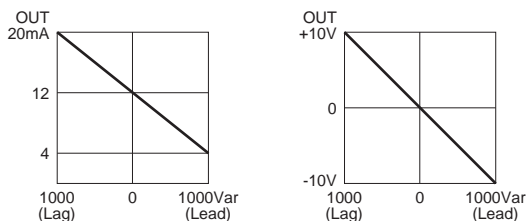
Load resistance: Output drive 1 mA max. at $\geq 0.5 \text{ V}$

■ **OPERATION DIAGRAM (example)**

• Negative in lag, positive in lead



• Negative in lead, positive in lag



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

Magnetic field (ext. origin) effect: $\pm 0.5 \%$ (400 A/m)

Response time: $\leq 2 \text{ sec.}$ (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: $\pm 0.25 \%$ 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 power to ground)

Impulse withstand voltage: 1.2 / 50 $\mu\text{sec.}$, $\pm 5 \text{ kV}$

(input to output or ground)



STANDARDS & APPROVALS

CE conformity:

EMC Directive (2004/108/EC)

EMI EN 61000-6-4: 2007

EMS EN 61000-6-2: 2005

Low Voltage Directive (2006/95/EC)

EN 61010-1: 2001

Measurement Category II (input, output)

Installation Category II (power)

Pollution Degree 2

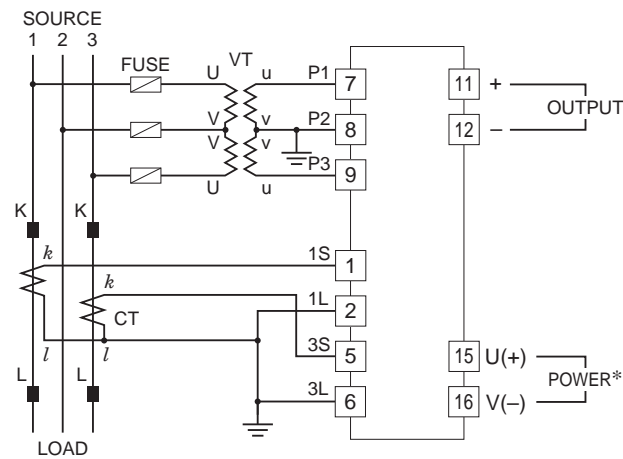
Input to output or power: Reinforced insulation (550 V)

Output to power: Reinforced insulation (300 V)

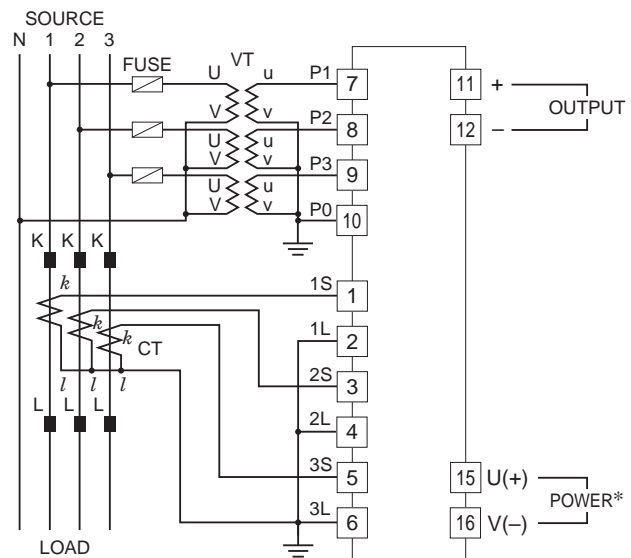
IEC Standard: IEC 60688

CONNECTION DIAGRAM

■ 3-PHASE/3-WIRE

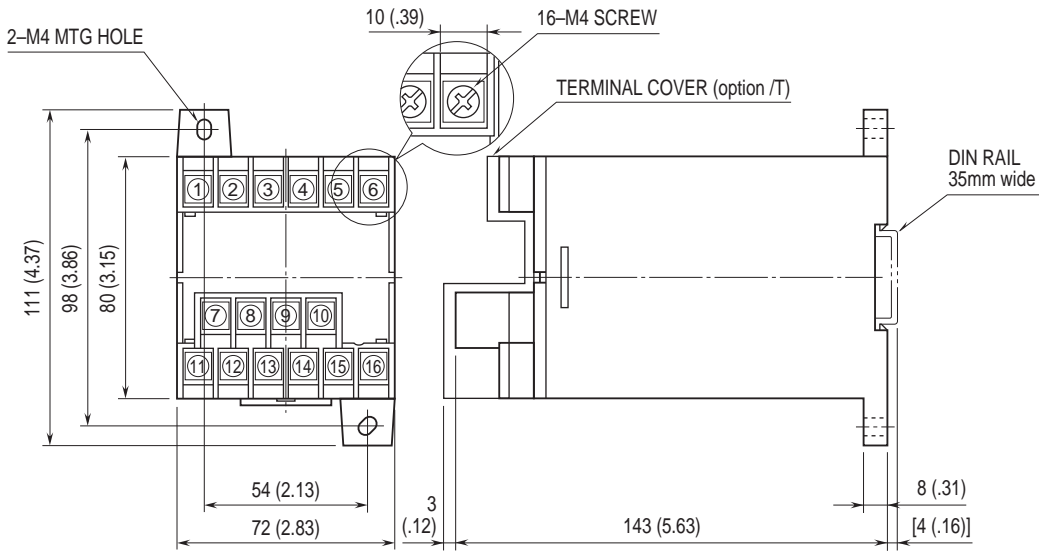


■ 3-PHASE/4-WIRE



*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.