

**Power Transducer Series L-UNIT**

**MULTI POWER TRANSDUCER**

MODEL **LSMT**

**MODEL & SUFFIX CODE SELECTION**

LSMT-□□-□□□□-□

MODEL

CONFIGURATION

- 1 : 3-phase / 3-wire
  - 2 : Single-phase / 2-wire\*
  - 3 : Single-phase / 3-wire\*
- \*Specify input frequency.

INPUT (unbalanced load)

- 1 : 110V / 5AAC
- 2 : 110V / 1AAC
- 3 : 220V / 1AAC
- 4 : 220V / 5AAC
- A : 100V / 200V / 1AAC\*\*
- B : 100V / 200V / 5AAC\*\*

\*Selectable with single-phase / 3-wire system

MEASURING ITEM

- 1 : V<sub>1</sub>, I<sub>1</sub>, W, var, PF, Hz
- 2 : V<sub>1</sub>, I<sub>1</sub>, I<sub>2</sub>, I<sub>3</sub>, W, PF\*\*\*
- 3 : V<sub>1</sub>, I<sub>1</sub>, I<sub>2</sub>, I<sub>3</sub>, W, var\*\*\*
- 4 : V<sub>1</sub>, I<sub>1</sub>, I<sub>2</sub>, I<sub>3</sub>, W, Hz\*\*\*
- 5 : V<sub>1</sub>, V<sub>2</sub>, V<sub>3</sub>, I<sub>1</sub>, I<sub>2</sub>, I<sub>3</sub>\*\*\*
- 6 : V<sub>1</sub>, I<sub>1</sub>, W, var
- 7 : V<sub>1</sub>, I<sub>1</sub>, W
- 8 : V<sub>1</sub>, I<sub>1</sub>, Hz

\*Selectable with 3-phase / 3-wire system

OUTPUT SIGNAL POLARITY (var & PF)

- Z : No var or PF measuring
- P : Negative in lag, positive in lead
- M : Negative in lead, positive in lag

FREQUENCY (V<sub>1</sub>)

- 0 : No frequency measuring
- 1 : 45 – 55 Hz
- 2 : 55 – 65 Hz
- 3 : 45 – 65 Hz

OUTPUT

Current

- A : 4 – 20mA DC
- G : 0 – 1mA DC
- J : 0 – 5mA DC
- Z : Specify current

Voltage

- 1 : 0 – 10mV DC
- 2 : 0 – 100mV DC
- 3 : 0 – 1V DC
- 4 : 0 – 10V DC
- 5 : 0 – 5V DC
- 6 : 1 – 5V DC
- 0 : Specify voltage

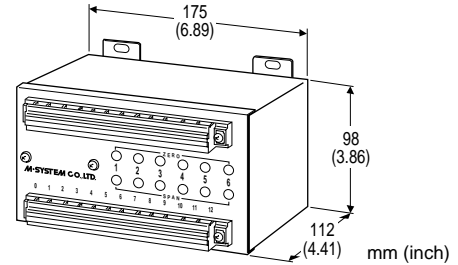
AUXILIARY POWER SUPPLY

AC Power

- B : 100V AC
- C : 110V AC
- F : 120V AC
- H : 220V AC
- J : 240V AC

DC Power

- R : 24V DC
- V : 48V DC
- P : 110V DC



**Functions & Features**

- Converting all major factors required for power management into DC outputs
- Compact design for 6 measuring items
- Saving installation work and space
- DC output containing little ripple is ideal for computer input
- Isolation up to 2000V AC

**Typical Applications**

- Monitoring panels

Remark 1: Both voltage and current loads must be balanced for measuring power factor.

Remark 2: V<sub>1</sub>, V<sub>2</sub> and V<sub>3</sub> = voltage between each line; I<sub>1</sub>, I<sub>2</sub> and I<sub>3</sub> = each line current; W = active power; var = reactive power; PF = power factor; Hz = frequency

**ORDERING INFORMATION**

Specify code number and variables. Use Ordering Informations Sheet (No. ESU-1992) for single-phase system.

- **Code number** (e.g. LSMT-11-1P1A-C)
- **Watt range** (e.g. 0 – 1000W)
- **Var range** (e.g. lag 1000 – 0 – lead 1000 var)
- **Frequency range**  
(for single phase input only; e.g. 50 Hz)
- **Special DC output range** (For codes Z & 0)

**GENERAL SPECIFICATIONS**

**Construction:** stand-alone; terminal access at the front

**Connection:** M4 screw terminals (torque ≤1.2 N·m)

**Coating:** melamine resin fired (black)

**Isolation:** voltage input to current input to output to to power; negatives common to all outputs

**Computation**

**Voltage & current:** RMS sensing

**Active/reactive power:** time division multiplication

**Power factor:** phase angle detection

**Frequency:** one-shot

**Overrange output:** approx. -10 – +120% at 1 – 5V

**Front adjustments:** zero and span; ±5% independently adjustable for each measuring item

**Overrange output limit:** approx. 120%

**INPUT & OUTPUT**

**INPUT**

**•Voltage Input**

Input burden: 0.22VA/phase for 110V AC  
0.44VA/phase for 220V AC

**Operational range**

Voltage & active/reactive power: 0 – 120% of rating

Power factor & frequency: 85 – 120% of rating

Overload capacity: 150% of rating for 10 sec.,  
120% continuous

**•Current Input**

Input burden: 0.5VA/phase

**Operational range**

Current & active/reactive power: 0 – 120% of rating

Power factor: 20 – 120% of rating

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

**INPUT RANGE**

**•Voltage**

VOLTAGE RATING	INPUT RANGE
110V	0 – 150V
220V	0 – 300V

**•Current**

CURRENT RATING	INPUT RANGE
1A	0 – 1A
5A	0 – 5A

Voltage input for single-phase/3-wire system is 0 – 150V.

**•Active power, single-phase / 2-wire**

INPUT		AVAILABLE RANGE
	STD. RANGE	
110V / 1A	100W	50 – 120W
110V / 5A	500W	250 – 600W
220V / 1A	200W	100 – 240W
220V / 5A	1000W	500 – 1200W

**single-phase / 3-wire**

INPUT		AVAILABLE RANGE
	STD. RANGE	
100V / 200V / 1A	200W	100 – 240W
100V / 200V / 5A	1000W	500 – 1200W

**3-phase / 3-wire**

INPUT		AVAILABLE RANGE
	STD. RANGE	
110V / 1A	200W	100 – 240W
110V / 5A	1000W	500 – 1200W
220V / 1A	400W	200 – 480W
220V / 5A	2000W	1000 – 2400W

**•Reactive power, single-phase / 2-wire**

INPUT		AVAILABLE RANGE
	STD. RANGE	
110V / 1A	100 var	50 – 120 var
110V / 5A	500 var	250 – 600 var
220V / 1A	200 var	100 – 240 var
220V / 5A	1000 var	500 – 1200 var

**single-phase / 3-wire**

INPUT		AVAILABLE RANGE
	STD. RANGE	
100V / 200V / 1A	200 var	100 – 240 var
100V / 200V / 5A	1000 var	500 – 1200 var

**3-phase / 3-wire**

INPUT		AVAILABLE RANGE
	STD. RANGE	
110V / 1A	200 var	100 – 240 var
110V / 5A	1000 var	500 – 1200 var
220V / 1A	400 var	200 – 480 var
220V / 5A	2000 var	1000 – 2400 var

Power factor: lag 0.5 – 1 – lead 0.5

lead 0.5 – 1 – lag 0.5

Frequency: 45 – 55 Hz, 55 – 65 Hz or 45 – 65 Hz

**OUTPUT**

•DC Current: -5 – +20mA DC

Span: min. 1mA, max. 20mA

Zero suppression/elevation: max. 1.5 times span

Load resistance: output drive 6V maximum

Output	Load Resistance
4 – 20mA	: 300 (Ω maximum)
0 – 1mA [±1mA]	: 6000
0 – 5mA [±5mA]	: 1200

Reactive power and power factor output ranges in brackets. 4 – 20mA is centered at 12mA.

•DC Voltage: -10 – +10V DC

Minimum span: 5mV

Zero suppression/elevation: max. 1.5 times span

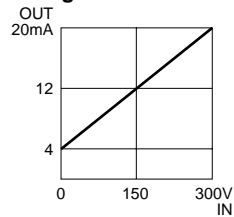
Load resistance: output drive 1mA maximum

Output	Load Resistance
0 – 10mV [±10mV]	: 10k (Ω minimum)
0 – 100mV [±100mV]	: 100k
0 – 1V [±1V]	: 1000
0 – 10V [±10V]	: 10k
0 – 5V [±5V]	: 5000
1 – 5V	: 5000

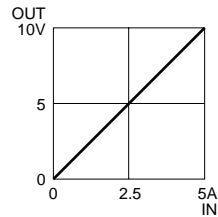
Reactive power and power factor output ranges in brackets. 1 – 5V is centered at 3V.

## OPERATION DIAGRAM (example)

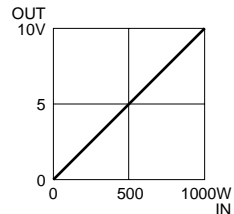
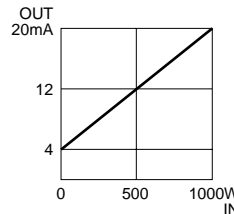
### •Voltage



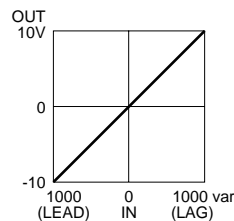
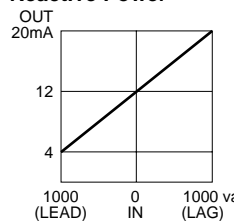
### •Current



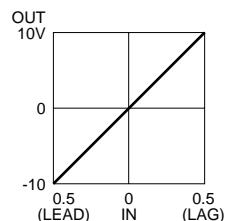
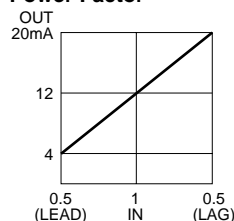
### •Active Power



### •Reactive Power

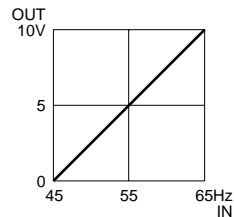
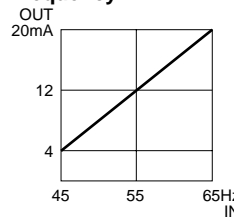


### •Power Factor



When there is no voltage input or when input current is 1/20 or less of rating, output may become unsteady (hunting).

### •Frequency



When there is no voltage input, the transducer will produce a downscale output.

## INSTALLATION

### Auxiliary power supply

- AC:** rating -15/+10%, 50/60 Hz, approx. 12VA
- DC:** rating  $\pm 10\%$ , or 85 – 150V for 110V rating (ripple 10% p-p max.)  
approx. 10W (90mA at 110V)

**Operating temperature:** -10 to +55°C (14 to 131°F)

**Operating humidity:** 30 to 85% RH (non-condensing)

**Mounting:** surface

**Dimensions:** W175×H120×D134 mm (6.89"×4.72"×5.28")

**Weight:** 2 kg (4.41 lbs)

## PERFORMANCE in percentage of span

### Accuracy

(at 23°C  $\pm 10^\circ\text{C}$  or 73.4°F  $\pm 18^\circ\text{F}$ , 45 – 65 Hz for 3-phase system, 50/60  $\pm 2$  Hz for single-phase system)

**Voltage, current, active/reactive power:**  $\pm 0.5\%$

**Power factor:**  $\pm 2\%$  with input 1 – 0.866, balanced load  
 $\pm 4\%$  with input 0.866 – 0.5, balanced load

**Frequency:**  $\pm 1\%$

**Response time (0 – 100%  $\pm 1\%$ )**

**Voltage, current & frequency:**  $\leq 1$  second

**Active/reactive power & power factor:**  $\leq 2$  seconds

**Ripple:** 0.5% p-p max.

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

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

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

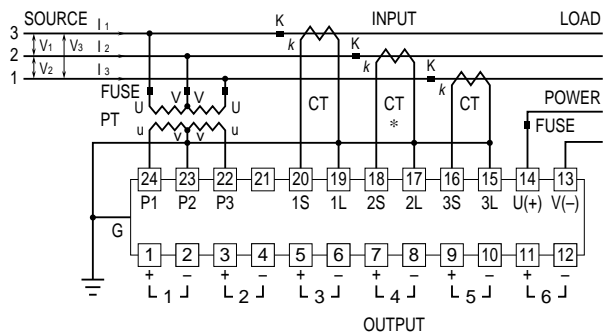
(voltage input to current input to output to power to ground)

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

(input to output or ground)

**CONNECTION DIAGRAM**

**■3-PHASE/3-WIRE**

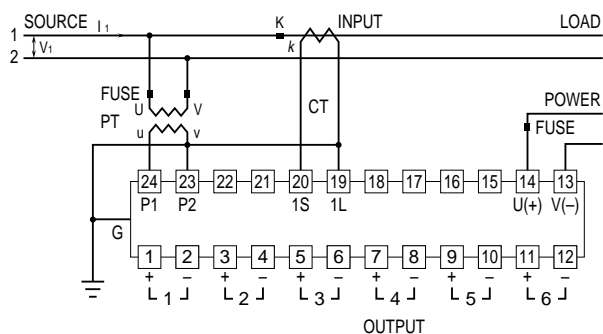


\*Connected only when measuring item I2.

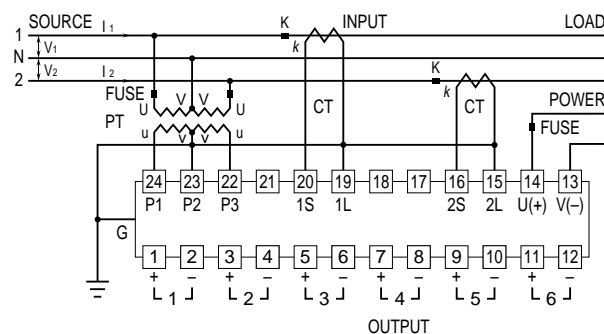
OUTPUT CH.	1	2	3	4	5	6
ITEM CODE	V <sub>1</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>
1	V <sub>1</sub>	I <sub>1</sub>	W	var	PF	Hz
2	V <sub>1</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	W	PF
3	V <sub>1</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	W	var
4	V <sub>1</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	W	Hz
5	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>
6	V <sub>1</sub>	I <sub>1</sub>	W	var	---	---
7	V <sub>1</sub>	I <sub>1</sub>	W	---	---	---
8	V <sub>1</sub>	I <sub>1</sub>	Hz	---	---	---

Input Codes 2, 3, 4 and 5 are selectable with 3-phase/3-wire system.

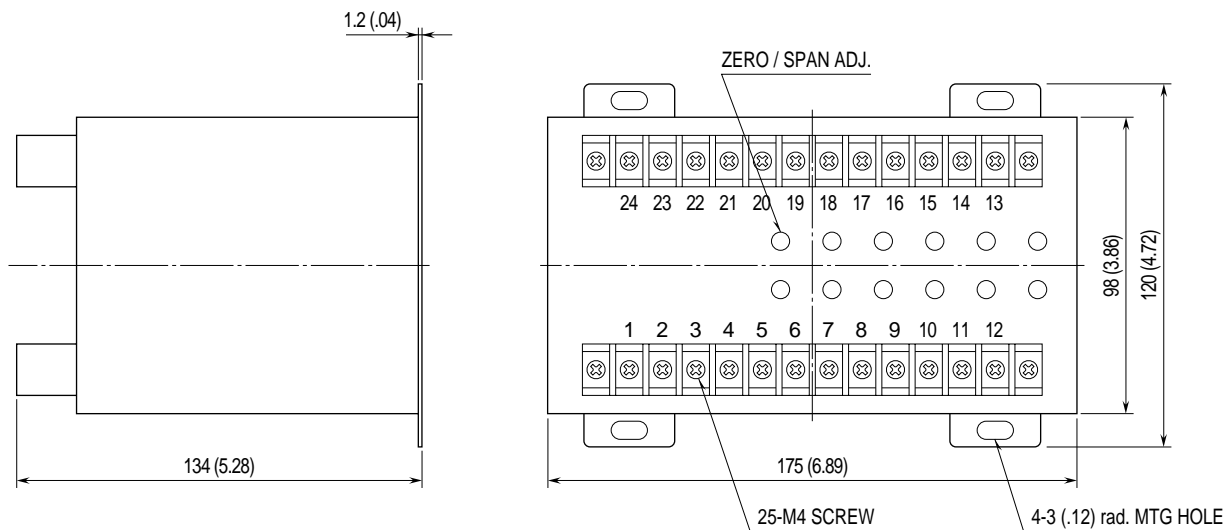
**■SINGLE-PHASE/2-WIRE**



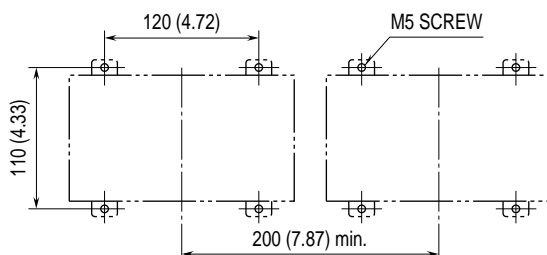
**■SINGLE-PHASE/3-WIRE**



**EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENT mm (inch)**



**MOUNTING REQUIREMENTS mm (inch)**



Specifications subject to change without notice.