WATT / WH / VAR / VARh TRANSDUCER MODEL WVx-

DESCRIPTION

Model WVx transducers utilize a microprocessor based design with high speed analog-to-digital converters to provide accurate measurement of real power, reactive power and energy delivered to a load. Bi-directional capability allows indication of forward (consumed) as well as reverse (generated) power and energy conditions.

Models are available in a variety of configurations with current ranges up to 1000A and nominal voltage ratings up to 600V (suitable for 693VL-L applications). Models are available in 1, 2 and 3 element versions for all single-phase and three-phase power systems.

Analog output signals are available in industry standard formats: i.e. ±1mA, ±10V, 4-20mA, etc. Forward (consumed) power is indicated with a positive polarity and reverse (generated) power with a negative polarity. Unidirectional outputs (4-20mA) only indicate forward (consumed) power.

Solid-state relays provide pulse/relay closure outputs indicating predetermined amounts of energy usage: i.e. scaling of 1kWH per closure.

Optional 5 second response output for active power measurement of SCR zero-crossing controllers.

All outputs are galvanically isolated from the measured inputs and instrument power.

RoHS compliant

5 YEAR WARRANTY

FEATURES

- DIN rail mountable package - small, lightweight.
- Wide variety of input and output configurations.
- Measures instantaneous power (real and reactive) as well as energy.
- Indication of forward/reverse power and leading/lagging VARs.
- Universal power supply.
- Models with direct current and with optional CT's provided in the calibration.

APPLICATIONS

- Process control.
- High accuracy CT's feature a 0.1A secondary output.
- Variable frequency drives.
- SCR controlled heater waveforms
- Energy management systems.
- Sub-metering.
- 40th harmonic measurement per DOE requirement.

SPECIFICATIONS

INPUT

Voltage ..... Nominal ..... Select from table
Range ..... With accuracy ..... 10% to 125% of Nominal
Overrange ..... Without damage ..... 150% of Nominal

Current ..... Nominal ..... Select from table
Range ..... With accuracy ..... 5% to 110% of Nominal
Overrange ... Without damage ..... 200% Nominal

Power Factor . With accuracy ..... 0.5Lead - 1 - 0.5Lag

Frequency
Range ..... With accuracy ... WV6 ..... 48 - 62Hz
WV7 ..... 10 - 500Hz

40th harmonic measurement only available with WV6 solid-core models.

Burden
Voltage ..... All models ..... ≤0.5mA/phase
Current ..... All models ..... ≤0.25VA/phase

DIELECTRIC TEST

Input to Output/Inst. Pwr./Case ..... 3000V, 60Hz, 1min.
Inst. Pwr. to Output/Case ..... 3000V, 60Hz, 1min.
Output to Case ..... 500V, 60Hz, 1min.

ACCURACY (setpoint/linearity/repeatability at 25°C)

WV6 models Watts ..... ±0.2% Rdg./PF, ±0.04% F.S.
VARs ..... ±0.2% Rdg./sinθ, ±0.04% F.S.
WV7 models ..... ±0.25% F.S.

TEMPERATURE

Range ..... Operating ..... -10 to 50ºC
Storage ..... -25 to 75ºC
Effect ..... ±0.005%/°C, ±0.05% F.S.

PHYSICAL

Humidity ..... Operating ..... Any non-condensing
Weight ..... ≤1lb.
Enclosure .... Mounting ..... DIN rail, 35mm
(may be panel mounted using 19754 adaptors)
Material ..... ABS, UL94HB
Connections ..... Screw terminals

OUTPUT

Analog

Note: WVx models = 2 outputs, 1ea for watts and VARs

Type ..... Select from table
Scaling ... **1** ..... (1Ø 2W) ..... F.S. = V_{L-N}(NOM) x INOM
2 ..... (3Ø 3W) .... F.S. = V_{L-L}(NOM)/1.2 x I_{NOM} x 2
3 ..... (3Ø 4W) ..... F.S. = V_{L-N}(NOM) x I_{NOM} x 3
4 ..... (1Ø 3W) ..... F.S. = V_{L-N}(NOM) x I_{NOM} x 2
Loading **B** ..... (±1mAdc) ..... ≤10kΩ
D, X5 . (±10Vdc, ±5Vdc) ..... ≥2kΩ
E, EM. (4-20mAdc, 4-12-20mAdc) ..... ≤500Ω

Response ..... Standard (typical, to 90% F.S) 50mS
Watt output only ... **1** (for zero-crossing SCRs) 5S

Polarity ... Watt ... Pos(+) = Forward ..... Neg(-)= Reverse
VAR Pos(+) = Lagging ..... Neg(-) = Leading
Ripple .... Input frequency ≥48Hz ..... ≤±0.5% F.S.

Pulse

WV6, WV7 ..... 2 Wh outputs, 1ea forward/reverse
2 VARh outputs, 1ea lagging/leading
Type ..... Wh ..... Form C, solid-state relay
VARh ..... Open collector transistor
T(Wh) ..... 5Vdc, TTL compatible pulse
K(Wh) ..... KYZ operation, solid-state relay

Scaling .... Pulse weight is 0.0001, 0.001, 0.01, 0.1 or 1kWh/kVARh as required to provide best resolution while maintaining pulse rates up to 2000 pulses per hour at F.S. input.

Solid-state relay rating 125Vac/dc, 0.1A
Open collector transistor rating 28Vdc, 50mA
Closure / pulse duration ..... Nominal 200mS

INSTRUMENT POWER

Standard universal ..... 85-265V, 47-63Hz, ≤10VA
115-300Vdc, ≤10VA

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WATT / WH / VAR / VARh TRANSDUCER MODEL WVx-

MODEL SELECTION

TYPE	SYSTEM	VOLTAGE	CURRENT	ANALOG	RESPONSE	PULSE
WV [ ] - [ ]	[ ] -	[ ]	[ ]	* - [ ]	* - *	*

Skip or leave [*] blank if not applicable

MODEL

Type:

- [6] Watt and Wh, VAR and VARh..... (Frequency Range)..... 48-62Hz
- [7] Watt and Wh, VAR and VARh..... (Frequency Range)..... 10-500Hz

INPUT

System:

- [1] 1Φ 2W (1 element)
- [2] 3Φ 3W (2 element)
- [3] 3Φ 4W (3 element)
- [4] 1Φ 3W (2 elements)

Voltage:

1Φ 2W

- [1] 120VL-N
- [2] 240VL-N
- [3] 480VL-N

3Φ 3W

- [1] 120VL-L
- [2] 240VL-L
- [3] 480VL-L

3Φ 4W

- [1] 69VL-N/120VL-L
- [2] 120VL-N/208VL-L
- [3] 277VL-N/480VL-L
- [4] 346VL-N/600VL-L

1Φ 3W

- [1] 120VL-N/240VL-L

Current:

Direct:

WV6 only

- [001] 1A
- [005] 5A
- [010] 10A

External CT's:

Solid-Core WV6 & WV7

- [101] 100A
- [201] 200A
- [301] 300A
- [401] 400A
- [501] 500A
- [601] 600A
- [801] 800A
- [102] 1000A

Split-Core - WV6 Only

- [101] [S] 100A
- [201] [S] 200A
- [301] [S] 300A
- [401] [S] 400A
- [501] [S] 500A
- [601] [S] 600A
- [801] [S] 800A
- [102] [S] 1000A

OUTPUT

Analog:

- [B] ±1mAdc
- [D] ±10Vdc
- [E] 4-20mAdc
- [EM] 4/12/20mAdc
- [X5] ±5Vdc

Response Time:

(Standard) 50mS

- [1] 5S

Pulse:

(Standard) Form C solid-state relay

- [T] 5V, TTL pulse
- [K] Form C, solid-state relay, KYZ operation.

ORDERING INFORMATION

EXAMPLE: 10-500Hz, 3ph 3W, 240V, 300A CT's, 4/12/20mAdc output, 50ms, TTL
Model number: WV7-22-301-EM-T

EXAMPLE: 60Hz, 1ph 2W, 120V, 10A direct, 0-10Vdc output
Model number: WV6-11-010-D

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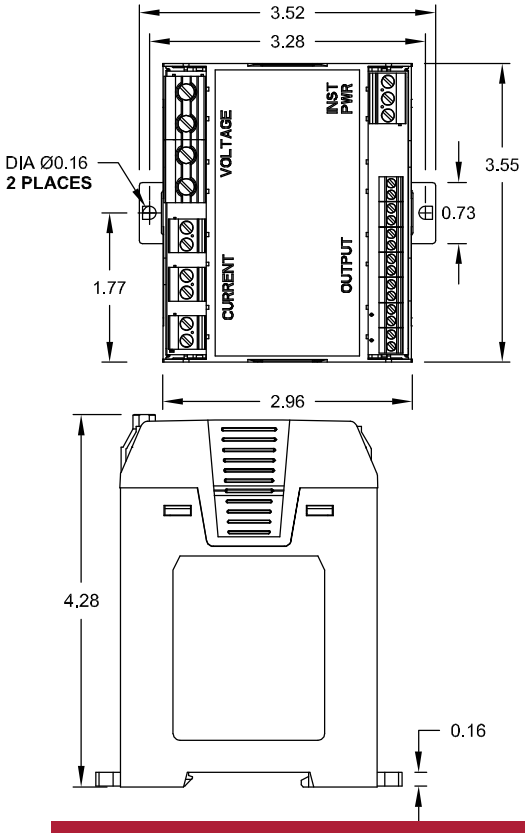
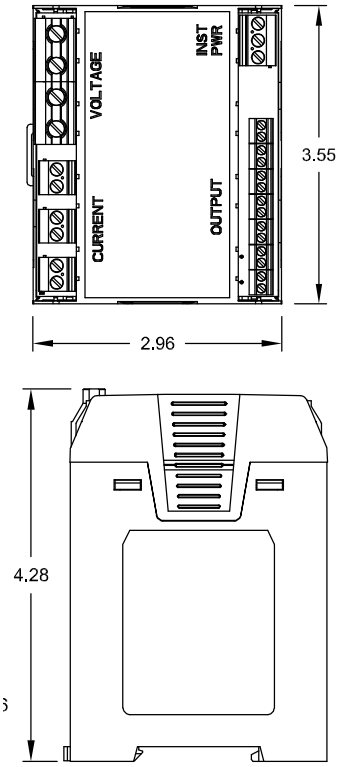
TERMINAL IDENTIFICATION

With Panel Mount Adapters (OSI P/N 19754)

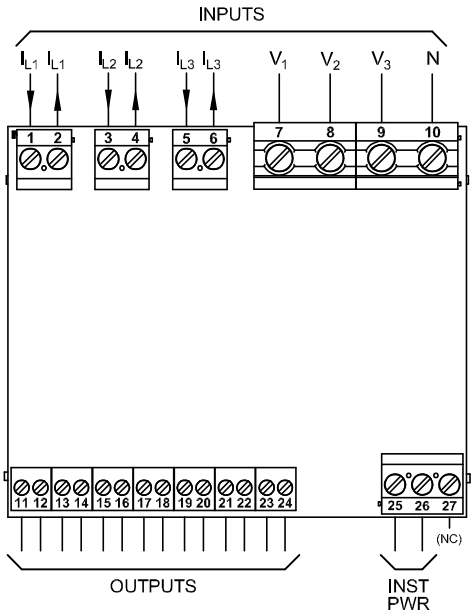


DIN Rail Mounting (35mm)



Dwg# 0902-01016-B Rev-G

DIMENSIONS FOR ALL MODELS
All dimensions in inches. Tolerance - 0.00±0.03
(unless otherwise specified)



Outputs based on table below.
Note: terminal 12 & 14 are internally common (non-isolated).

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	TB11	TB12	TB13	TB14	TB15	TB16	TB17	TB18	TB19	TB20	TB21	TB22	TB23	TB24
Mode	Analog				Wh-FWD			Wh-REV			Vh-LEAD		Vh-LAG	
STD/KYZ	Watts	COM	VARs	COM	C	N.C.	N.O.	C	N.C.	N.O.	N.O.	C	N.O.	C
TTL	Watts	COM	VARs	COM	COM	Wh-FWD	Wh-REV	(N/C)	(N/C)	(N/C)	N.O.	C	N.O.	C

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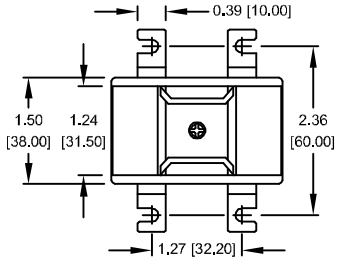
DIMENSIONS

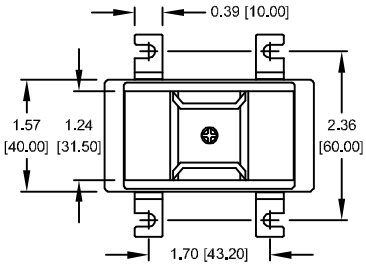
Solid-Core CTs

100A - 300A



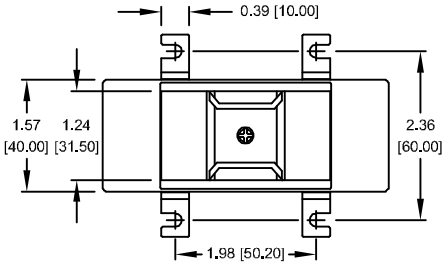
SIZE 1

400A - 600A

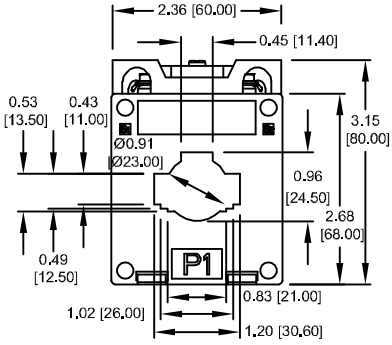


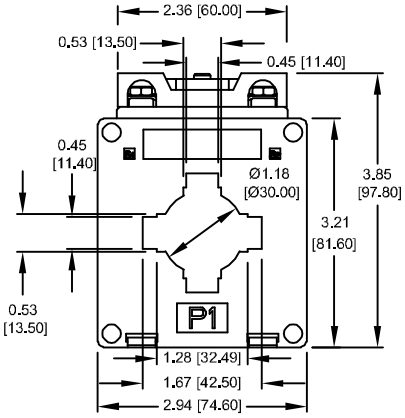
SIZE 2

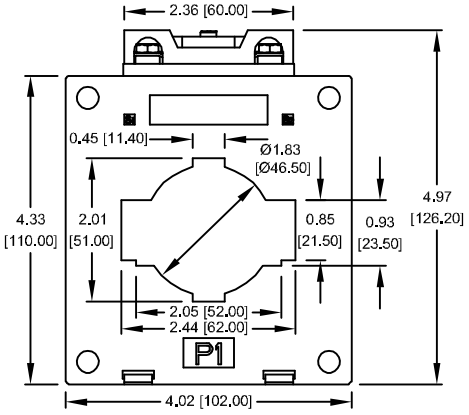
800A - 1000A



SIZE 3

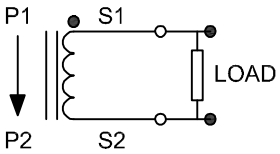






Dwg# 0902-01025-B Rev-A

Polarity Markings



Recommended Lead Lengths
72in., 16AWG, Twisted Pair

High accuracy CT's feature a 0.1A secondary output

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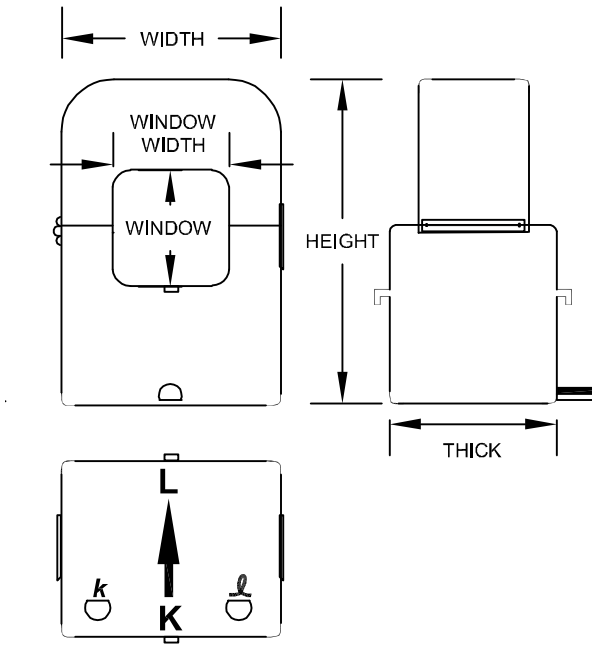
Split-Core CTs for WV6 ONLY.

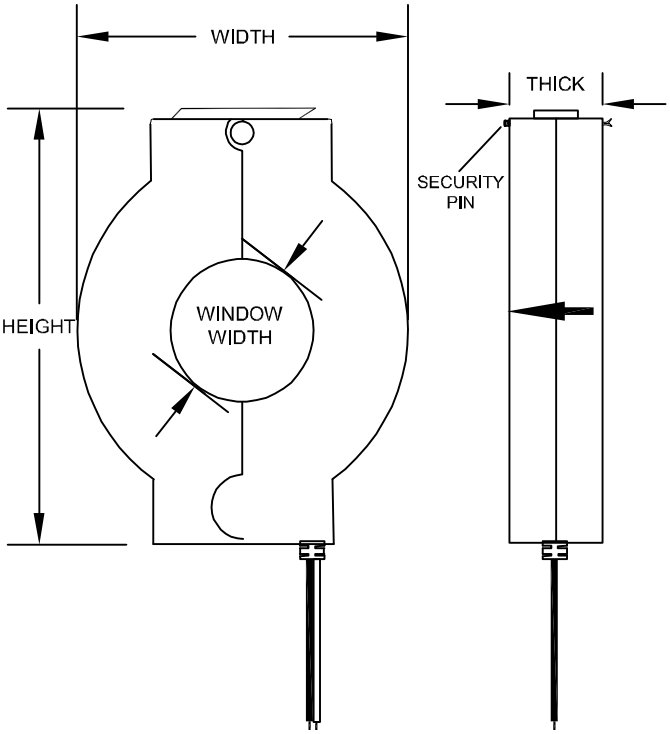
High accuracy CT's feature a 0.1A secondary output

SENSOR SIZE 100A - 600A



Lead Length..... 72"
Wire ..... WHITE = S1/k, 22AWG

SENSOR SIZE 800A -1000A



Lead Length..... 72"
Wire ..... WHITE = S1, 18AWG

SENSOR Size	Dimensions in Inches (mm)					Weight
	Height	Width	Thick	Window		
				High	Wide	lbs. (grams)
100A-300A	2.62 (66.5)	1.77 (45)	1.35 (34.4)	0.94 (23.8)	0.94 (23.8)	0.40 (180)
400A-600A	3.21 (81.5)	2.24 (57)	1.51 (38.4)	1.41 (35.7)	1.41 (35.7)	0.77 (350)
800A-1000A	5.72 (145.2)	4.25 (108)	1.1 (28)	2.16 (55)	2.16 (55)	0.97 (440)

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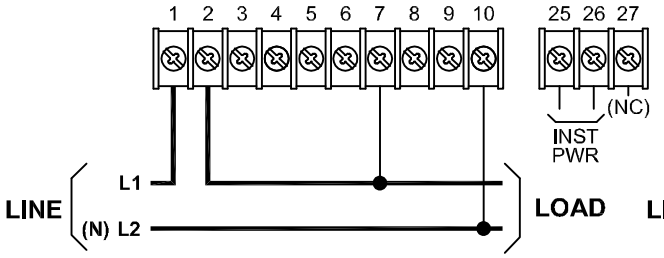
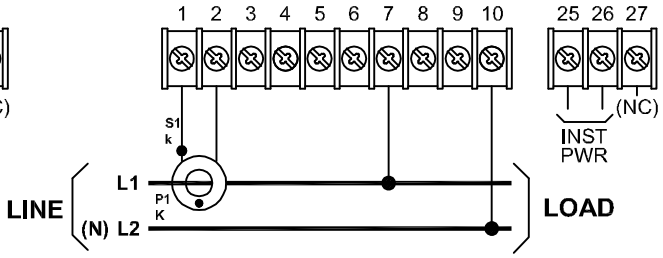
CONNECTIONS

SINGLE-PHASE, TWO-WIRE CONNECTIONS
(ONE ELEMENT)

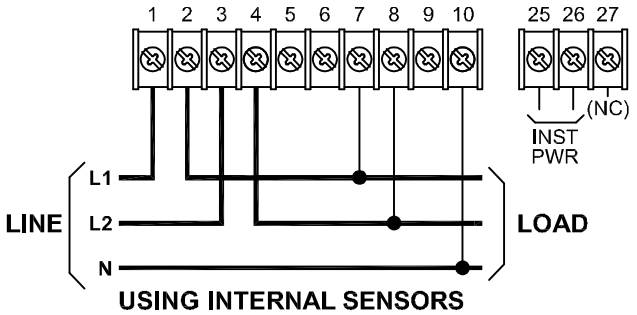


USING INTERNAL SENSOR

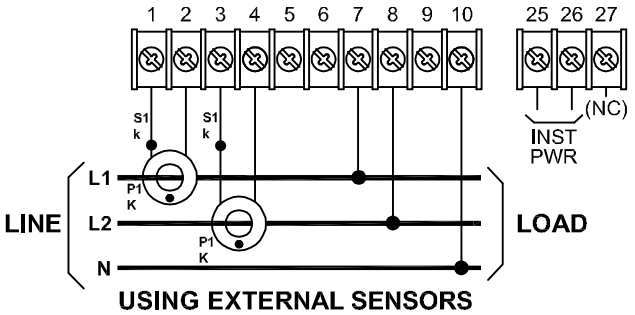


USING EXTERNAL SENSOR

SINGLE-PHASE, THREE-WIRE EDISON CONNECTIONS
(TWO ELEMENT)

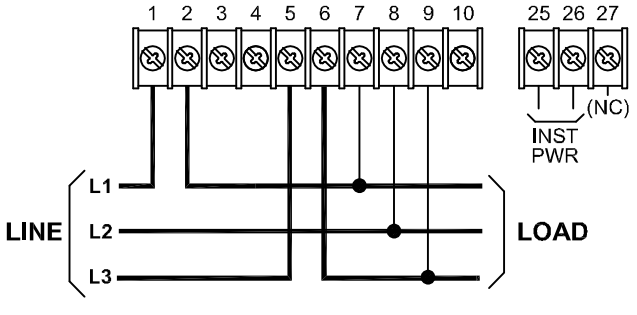


USING INTERNAL SENSORS

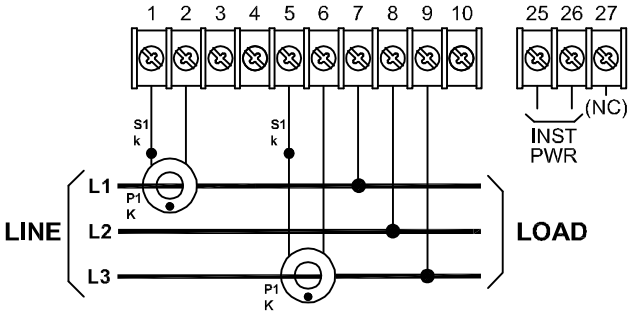


USING EXTERNAL SENSORS

THREE-PHASE, THREE-WIRE CONNECTIONS
(TWO ELEMENT)

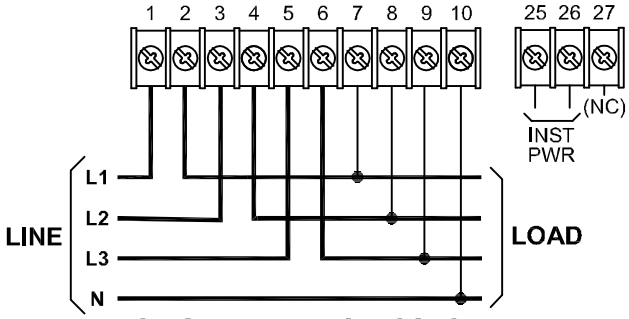


USING INTERNAL SENSORS

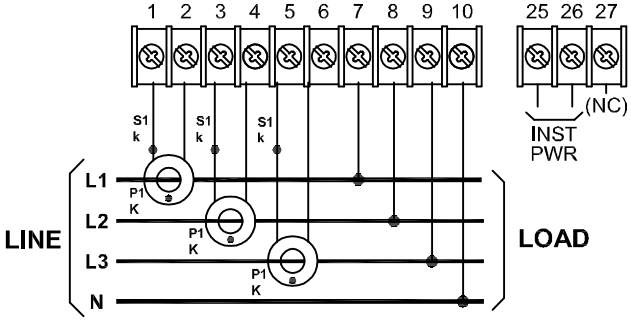


USING EXTERNAL SENSORS

THREE-PHASE, FOUR-WIRE CONNECTIONS
(THREE ELEMENT)



USING INTERNAL SENSORS



USING EXTERNAL SENSORS

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