

DESCRIPTION

Model Wxx 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 and are suitable for all single-phase and three-phase power systems.

Analog output signals are available in industry standard formats: i.e. $\pm 1\text{mA}$, $\pm 10\text{V}$, $4\text{-}20\text{mA}$, etc. Forward (consumed) power is indicated with a positive polarity and reverse (generated) power with a negative polarity. Unidirectional outputs ($4\text{-}20\text{mA}$) 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.

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



**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.
- Optional MODBUS RTU serial communications using RS232, RS422, or RS485 replaces analog and pulse outputs.

APPLICATIONS

- Process control.
- Variable frequency drives
- 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.. Wx3,5,6 48 - 62Hz
Wx7 10 - 500Hz
WT9..48-62Hz, 40th Har.

Burden

Voltage All models $\leq 0.5\text{mA}/\text{phase}$
Current All models $\leq 0.25\text{VA}/\text{phase}$

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)

Wx3,5 models $\pm 0.5\%$ F.S.
Wx6 models Watts $\pm 0.2\%$ Rdg./PF, $\pm 0.04\%$ F.S.
VARs $\pm 0.2\%$ Rdg./ $\sin\theta$, $\pm 0.04\%$ F.S.
Wx7 models $\pm 0.25\%$ F.S.
WT9 models $\pm 0.2\%$ Rdg./PF, $\pm 0.04\%$ F.S.

TEMPERATURE

Range Operating -10 to 50°C
Storage -25 to 75°C
Effect $\pm 0.005\%/^{\circ}\text{C}$, $\pm 0.05\%$ F.S.

PHYSICAL

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

OUTPUT**Analog**

Note: WTx models = 1 output for watts.

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

Type Select from table
Scaling 1... ($1\emptyset$ 2W) F.S. = $V_{L-N(NOM)} \times I_{NOM}$
2... ($3\emptyset$ 3W) F.S. = $V_{L-L(NOM)}/1.2 \times I_{NOM} \times 2$
3... ($3\emptyset$ 4W) F.S. = $V_{L-N(NOM)} \times I_{NOM} \times 3$
4... ($1\emptyset$ 3W) F.S. = $V_{L-N(NOM)} \times I_{NOM} \times 2$
Loading B ($\pm 1\text{mA}$ dc) $\leq 10\text{k}\Omega$
D, X5... ($\pm 10\text{V}$ dc, $\pm 5\text{V}$ dc) $\geq 2\text{k}\Omega$
E, EM.. (4-20mA dc, 4-12-20mA dc) $\leq 500\Omega$
Response... Standard (typical, to 90% F.S.) 50mS
1 (for zero-crossing SCRs) 5S
Polarity ... Watt .. Pos(+) = Forward .. Neg(-) = Reverse
VAR... Pos(+) = Lagging .. Neg(-) = Leading
Ripple..... Input frequency $\geq 48\text{Hz}$ $\leq \pm 0.5\%$ F.S.

Pulse

WT5,6,7,9 2 Wh outputs, 1ea forward/reverse
WV5,6,7 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
rate between 1000 and 10,000 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, $\leq 10\text{VA}$
115-300Vdc, $\leq 10\text{VA}$

MODEL SELECTION

TRANSDUCER TYPE		SYSTEM CONFIGURATION		INPUT VOLTAGE - NOMINAL				
AA	Measured Parameter(s) and Features	B	Phase (no. of elements)	C	1Ø 2W (Vac)	3Ø 3W (Vac)	3Ø 4W (Vac)	1Ø 3W (Vac)
T3	Watt	1	1Ø2W (1 ele.)	1	120VL-N	120VL-L	69VL-N/120VL-L	120VL-N/240VL-L
T5	Watt and Wh	2	3Ø3W (2 ele.)	2	240VL-N	240VL-L	120VL-N/208VL-L	
T6	Watt and Wh, High accuracy	3	3Ø4W (3 ele.)	3	480VL-N	480VL-L	277VL-N/480VL-L	
T7	Watt and Wh, Variable Frequency	4	1Ø3W (2 ele.)	4			**346VL-N/600VL-L	
T9	Watt and Wh, 40th Harmonic of 60Hz						**Suitable for 400VL-N/693L-L	
V3	Watt and VAR							
V5	Watt, VAR, Wh, VARh							
V6	Watt, VAR, Wh, VARh, High accuracy							
V7	Watt, VAR, Wh, VARh, Variable frequency							

W **AA** - **B** **C** - **DDD** (**D***) - **E** - **F** **G** (Replace letters in boxes with selected options.)

INPUT CURRENT - NOMINAL				ANALOG OUTPUT(S) (Watt and/or VAR)				PULSE OUTPUT (WH only)	
Direct Input (no CTs)		With External CTs		E		F		G	
DDD	Aac	DDD(D*)	Aac	Type	Response	Type	Type	Type	
001	1A	100(S)	100A	B	±1mAdc	(blank)	50mS (std.)	(blank)	Form C, solid-state relay (std.)
005	5A	200(S)	200A	D	±10Vdc	1	5S	T	5V, TTL compatible pulse
010	10A	300(S)	300A	E	4-20mAdc			K	Form C, solid-state relay, KYZ operation
		400(S)	400A	EM	4-12-20mAdc				
		500(S)	500A	X5	±5Vdc				
		600(S)	600A						
		800(S)	800A						
		1000(S)	1000A						
* S indicates split-core CTs.				SERIAL COMMUNICATION (replaces analog outputs)				COMMUNICATION CONNECTOR	
				M2	MODBUS RS422 (4-wire)			R	RJ-45 connector (std.)
				M3	MODBUS RS232			B	Screw terminals
				M5	MODBUS RS485 (2-wire)				

NOTES:

Models Wx7/WT9-xx are not available with direct input or with split-core CTs. Solid-core external CTs only.

Refer to the WMx series for expanded Modbus capabilities.

ORDERING INFORMATION

EXAMPLE: Watt/Wh transducer, 3Ø 4W, 277VL-N/480VL-L, 200A with solid-core CTs, ±0.5%F.S. accuracy analog output is ±10V with 50mS response, pulse output is form C solid-state relay.

Analog output scaling: 0-166.2kW Input = 0-10V Output

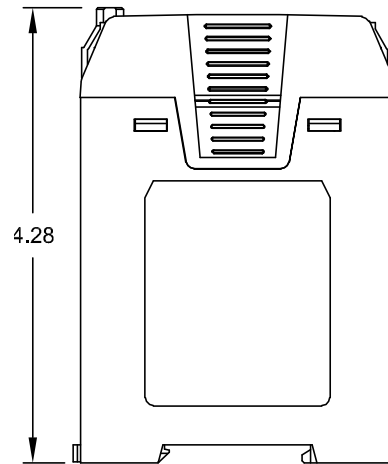
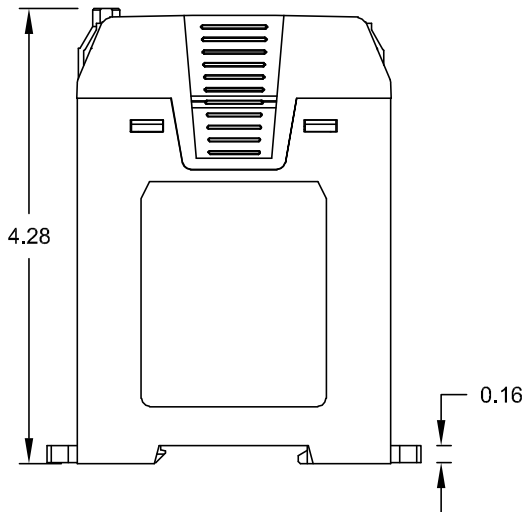
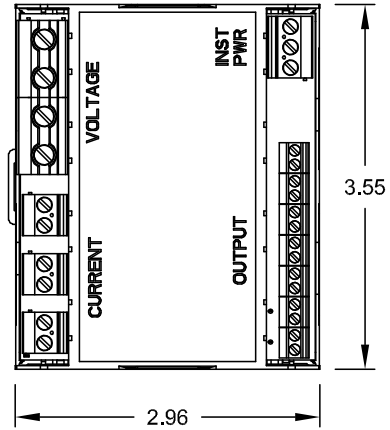
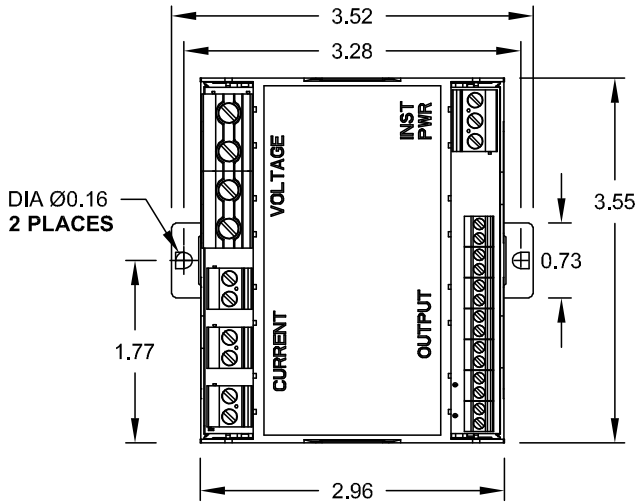
Pulse output scaling: 0.1kWh per pulse

Model number is: **WT5-33-200-D**

DIMENSIONS

With Panel Mount Adapters (OSI P/N 19754)

DIN Rail Mounting (35mm)

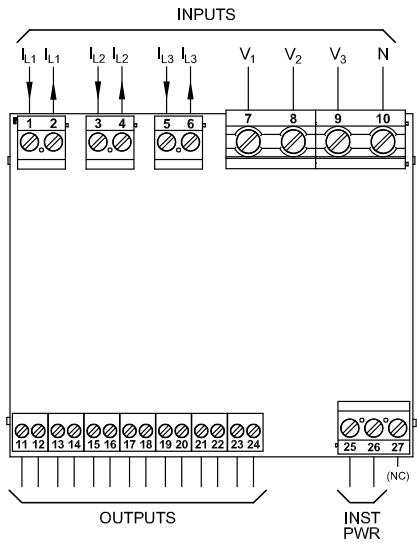


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DIMENSIONS FOR ALL MODELS
 All dimensions in inches. Tolerance - 0.00±0.03
 (unless otherwise specified)

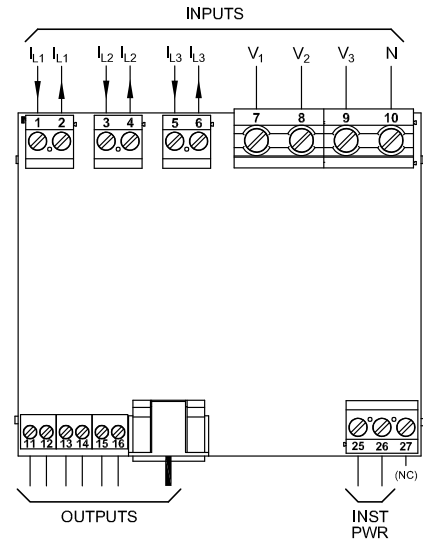
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TERMINAL IDENTIFICATION



(FIGURE 1)

Outputs based on table below.



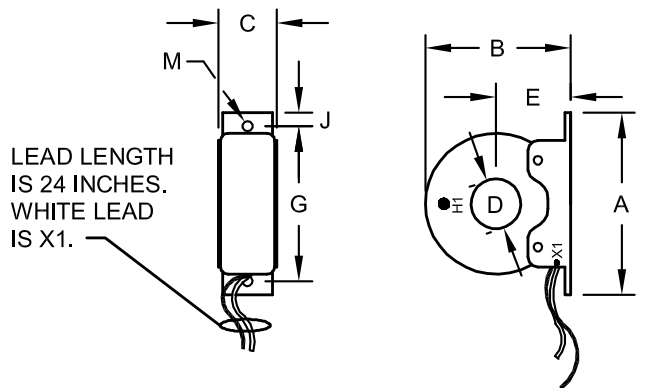
(FIGURE 2)

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Parameter "G" = Blank/K/T (FIGURE 1)														
	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
Parameter "G" = B (MODBus RTU w/Term. Blocks) (FIGURE 1)														
Mode	TB11	TB12	TB13	TB14	TB15	TB16	TB17	TB18	TB19	TB20	TB21	TB22	TB23	TB24
RS422	(N/C)	COM	(N/C)	(N/C)	(N/C)	Tx+	Tx-	Rx+	Rx-	(N/C)	(N/C)	5V	(N/C)	(N/C)
RS485	(N/C)	COM	(N/C)	(N/C)	(N/C)	Tx+/Rx+	Tx-/Rx-	Tx+/Rx+	Tx-/Rx-	(N/C)	(N/C)	5V	(N/C)	(N/C)
RS232	(N/C)	COM	(N/C)	(N/C)	(N/C)	(N/C)	(N/C)	Rx	Tx	(N/C)	(N/C)	5V	(N/C)	(N/C)
Parameter "G" = R (MODBus RTU w /RJ45) (FIGURE 2)														
	RJ45								Term. Blocks					
Mode	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	TB 11	TB 12	TB 13	TB 14-16		
RS422	Rx-	Rx+	(N/C)	Tx+	Tx-	(N/C)	5V	COM	(N/C)	COM	5V	(N/C)		
RS485	Tx-/Rx-	Tx+/Rx+	(N/C)	Tx+/Rx+	Tx-/Rx-	(N/C)	5V	COM	(N/C)	COM	5V	(N/C)		
RS232	Tx	Rx	(N/C)	(N/C)	(N/C)	(N/C)	(N/C)	COM	(N/C)	COM	5V	(N/C)		

DIMENSIONS

Wx3,5-xx Solid-Core CTs

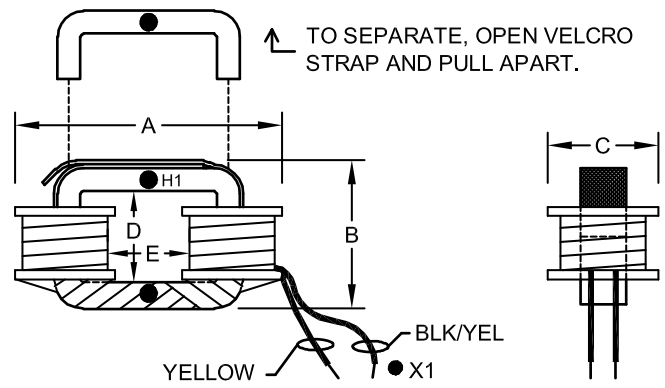


Dwg# 0902-00872-B Rev--

SENSOR SIZE	DIMENSIONS (inches)								WT. (lbs.)
	A	B	C	D	E	G	J	M	
100A-300A	4.50	3.70	1.25	1.25	1.94	3.88	0.34	0.27 X 0.44	1.43
400A-800A	6.50	4.70	1.25	2.50	2.46	5.75	0.39	0.28	1.61
1000A	6.50	4.70	1.25	3.00	2.46	5.75	0.39	0.28	1.10

LEAD LENGTHS24in.,14AWG, White (X1) and Black

Wx3,5,6-xx Split-Core CTs



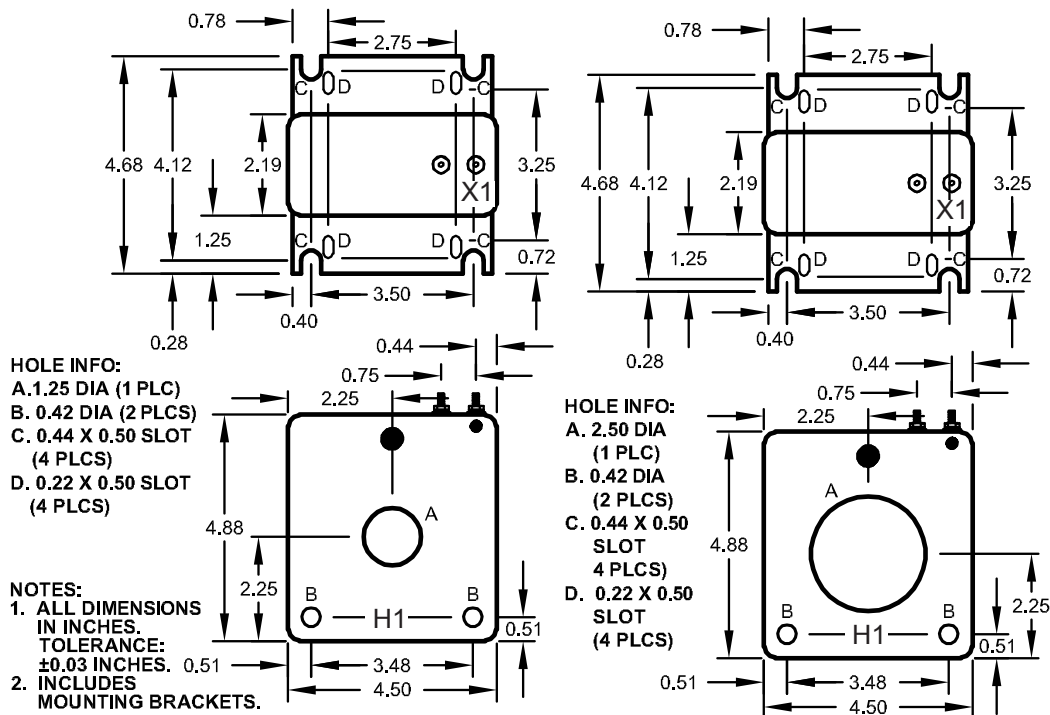
Dwg# 0902-00878-B Rev--

SENSOR SIZE	DIMENSIONS (inches)					WT. (lbs.)
	A	B	C	D	E	
100A-800A	3.85	3.80	1.30	2.40	1.25	0.8
1000A	5.50	4.90	1.60	3.15	3.20	1.5

LEAD LENGTHS 72in.,16AWG, Blk/Yel (X1) and Yellow

Wx6-xx Solid-Core CTs

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



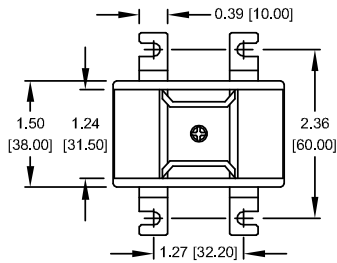
100A - 400A

500A - 1000A

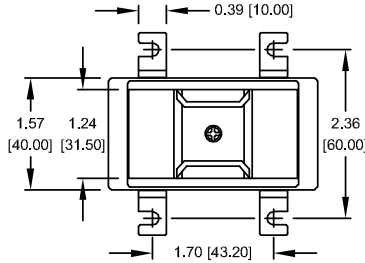
Dwg# 0902-00920-B Rev--

DIMENSIONS

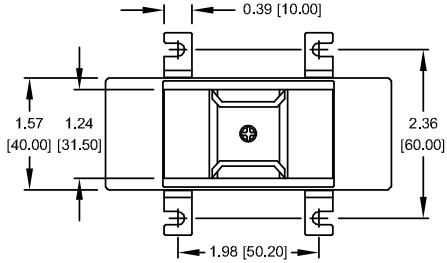
Wx7-xx, WT9-xx Solid-Core CTs



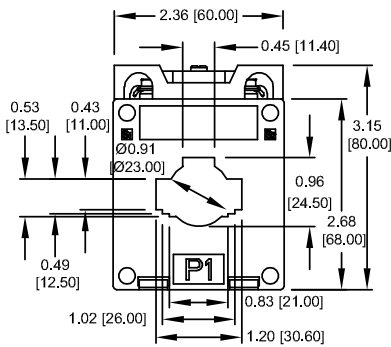
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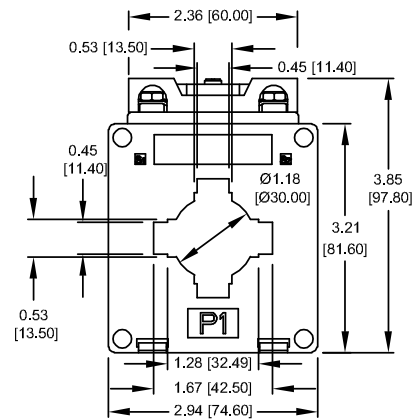
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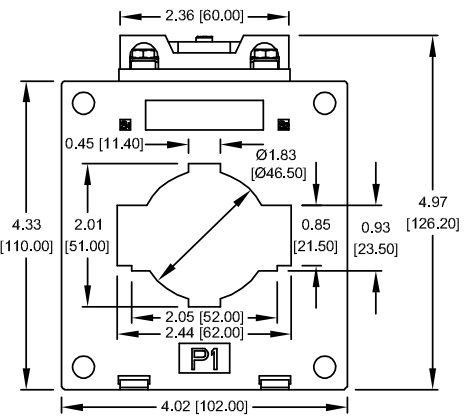
SIZE 3



100A - 300A

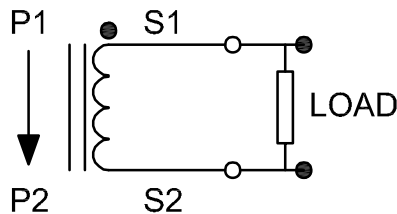


400A - 600A



800A - 1000A

Polarity Markings



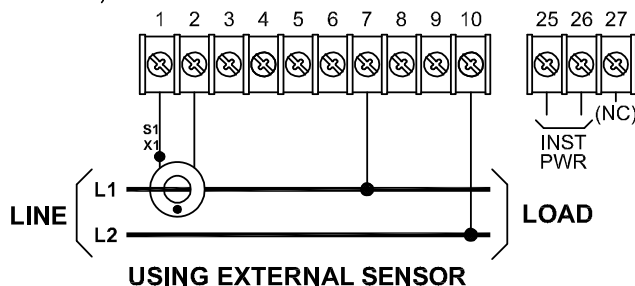
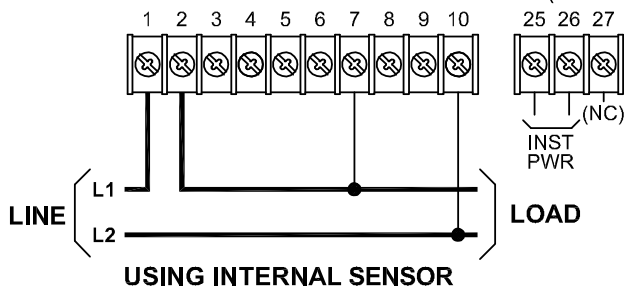
Recommended Lead Lengths

72in., 16AWG, Twisted Pair

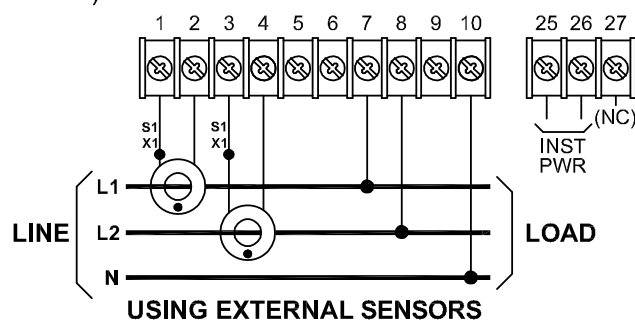
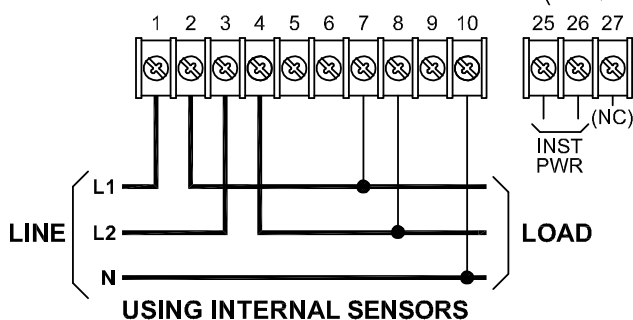
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CONNECTIONS

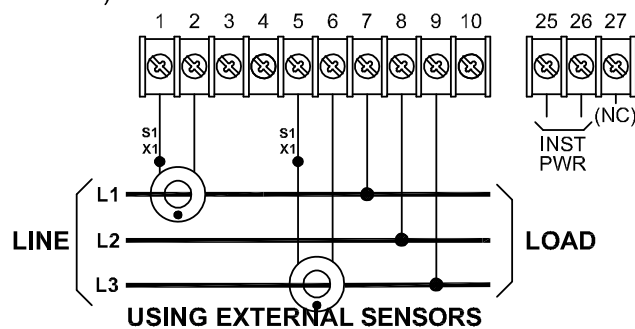
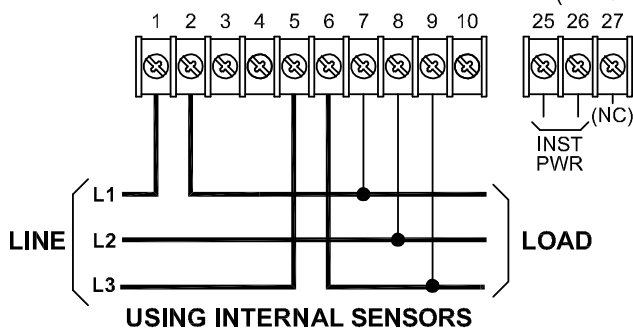
**SINGLE-PHASE, TWO-WIRE CONNECTIONS
(ONE ELEMENT)**



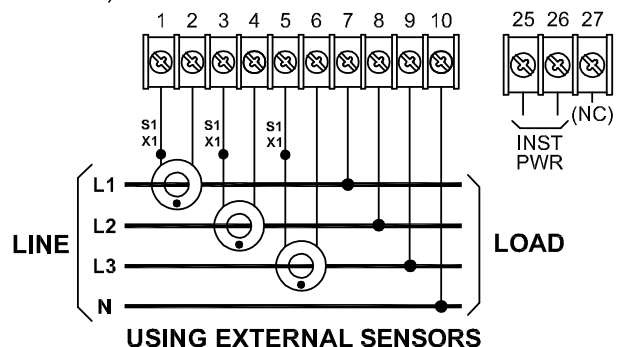
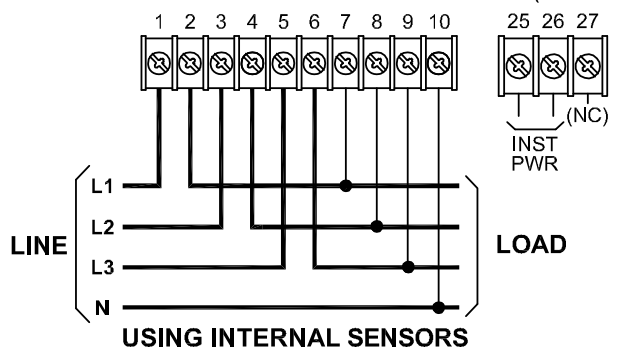
**SINGLE-PHASE, THREE-WIRE EDISON CONNECTIONS
(TWO ELEMENT)**



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



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



Dwg# 0902-01016-B Rev-D