

INCLUDES PHASE-FIRED & ZERO-CROSSING MEASUREMENTS

DESCRIPTION

Model W transducers are available in many models covering 0-600 Volts and 0-1000 Amperes. One-, two- & three-element transducers are available for all single-phase and three-phase power systems.

All models provide an isolated analog output signal related to the average power consumed in the load and/or relay closure (or pulse output) related to the Watthours of energy consumed in the load.

Computers or auxiliary equipment can be used to calculate demand, monitor or control processes, and to accumulate energy consumption for billing purposes.

FEATURES

- Analog output for instantaneous Watts and relay closure or pulse output for Watthour consumption.
- Maintains accuracy with chopped or distorted waveforms through use of real-time multiplier.
- Accuracy maintained when factory-calibrated with external current sensors.
- Rugged metal enclosures for harsh environments.

APPLICATIONS

- Building energy management systems
- Manufacturing process control
- Pump motor power consumption.
- Welding and soldering process monitoring.
- Battery charger monitoring.



5 YEAR WARRANTY

ORDERING INFORMATION

Example: Self-Powered, Three-Phase, Four-Wire, 120V, 5A Input with 0-5Vdc Output Proportional to 0-1500 Watts, TTL Pulse Output for Watthours, each Pulse Proportional to 1.0 Watthour

W-007CX5-T

400Hz Models: To order for use on 400Hz applications, substitute "W4-" for "W-" in model number.

MODEL SELECTION

SINGLE-PHASE, TWO-WIRE (ONE-ELEMENT) MODELS WITH INTERNAL CURRENT SENSOR



INPUTS		F.S. WATTS	F.S. COUNTS PER HOUR	WH PER COUNT	STANDARD OUTPUT MODEL W- OR W4-						
AC VOLTS	AC AMPS				0-±1mA*	0-±1mA	0-±10V*	0-±10V	0-±5V*	0-±5V	4-20mA
0-150	0 - 1	100	100	1	103A	103B	103C	103D	103CX5	103X5	103E
	0 - 2.5	250	250	1	106A	106B	106C	106D	106CX5	106X5	106E
	0 - 5	500	500	1	001A	001B	001C	001D	001CX5	001X5	001E
	0 - 10	1000	1000	1	010A	010B	010C	010D	010CX5	010X5	010E
	0 - 15	1500	1500	1	019A	019B	019C	019D	019CX5	019X5	019E
	0 - 20	2000	2000	1	117A	117B	117C	117D	117CX5	117X5	117E
0-300	0 - 2.5	200	200	1	104A	104B	104C	104D	104CX5	104X5	104E
	0 - 5	500	500	1	107A	107B	107C	107D	107CX5	107X5	107E
	0 - 10	1000	1000	1	002A	002B	002C	002D	002CX5	002X5	002E
	0 - 15	1500	1500	1	011A	011B	011C	011D	011CX5	011X5	011E
	0 - 20	2000	2000	1	020A	020B	020C	020D	020CX5	020X5	020E
	0 - 25	2500	2500	1	110A	110B	110C	110D	110CX5	110X5	110E
0-600	0 - 1	500	500	1	105A	105B	105C	105D	105CX5	105X5	105E
	0 - 2.5	1000	1000	1	108A	108B	108C	108D	108CX5	108X5	108E
	0 - 5	2000	2000	1	003A	003B	003C	003D	003CX5	003X5	003E
	0 - 10	4000	4000	1	012A	012B	012C	012D	012CX5	012X5	012E
	0 - 15	6000	6000	1	021A	021B	021C	021D	021CX5	021X5	021E
	0 - 20	8000	8000	1	111A	111B	111C	111D	111CX5	111X5	111E

* "A", "C" and "CX5" models are self-powered. Input voltage range is limited to:

- 103-135V for 150V models
- 215-280V for 300V models
- 395-550V for 600V models

All others require 103-135Vac instrument power, 50-400Hz.

Add suffix "-22" for optional 230Vac instrument power.

For custom Wh count rates, order desired model with added suffix "/xxxx", where "xxxx" = F.S. counts/hr.

Example: 0-300V, 0-100A input, 0-10Vdc output (for Watts) and TTL output (for Wh) with 5000 counts/hr at F.S.:

order model: **W-059D-T/5000**

Add suffix "Y27" for use on zero-crossing SCR controllers.

NOTE: This option is not available for self-powered models.

NOTE: Watt outputs for "A", "B", "C", "CX5", "D" and "X5" models operate bi-directionally. Positive (+) output at terminal 2a indicates forward/consumed power; negative (-) output indicates reverse/generated power. "E" models and all Wh relay outputs are unidirectional and operate in the forward/consumed direction only. For "E" models, reverse power conditions may cause the Watt output to drop below 4mA but not below 0mA.

SINGLE-PHASE, TWO-WIRE (ONE-ELEMENT) MODELS SUPPLIED WITH EXTERNAL SENSOR



INPUTS		F.S. WATTS	F.S. CTS PER HR	WH PER COUNT	SENSOR SIZE	STANDARD OUTPUT MODEL W- OR W4-						
AC VOLTS	AC AMPS					0-±1mA*	0-±1mA	0-±10V*	0-±10V	0-±5V*	0-±5V	4-20mA
0-150	0 - 100	10k	10000	1	W	058A	058B	058C	058D	058CX5	058X5	058E
	0 - 200	20k	2000	10	W	067A	067B	067C	067D	067CX5	067X5	067E
	0 - 400	40k	4000	10	X	076A	076B	076C	076D	076CX5	076X5	076E
	0 - 600	60k	6000	10	X	085A	085B	085C	085D	085CX5	085X5	085E
	0 - 1000	100k	1000	100	Y	094A	094B	094C	094D	094CX5	094X5	094E
0-300	0 - 100	20k	2000	10	W	059A	059B	059C	059D	059CX5	059X5	059E
	0 - 200	40k	4000	10	W	068A	068B	068C	068D	068CX5	068X5	068E
	0 - 400	80k	8000	10	X	077A	077B	077C	077D	077CX5	077X5	077E
	0 - 600	120k	1200	100	X	086A	086B	086C	086D	086CX5	086X5	086E
	0 - 1000	200k	2000	100	Y	095A	095B	095C	095D	095CX5	095X5	095E
0-600	0 - 100	40k	4000	10	W	060A	060B	060C	060D	060CX5	060X5	060E
	0 - 200	80k	8000	10	W	069A	069B	069C	069D	069CX5	069X5	069E
	0 - 400	160k	1600	100	X	078A	078B	078C	078D	078CX5	078X5	078E
	0 - 600	240k	2400	100	X	087A	087B	087C	087D	087CX5	087X5	087E
	0 - 1000	400k	4000	100	Y	096A	096B	096C	096D	096CX5	096X5	096E

Note: Current Transformer is supplied as part of the model. Refer also to notes below table on page first page.

THREE-PHASE, THREE-WIRE (TWO-ELEMENT) MODELS WITH INTERNAL CURRENT SENSORS



INPUTS		F.S. WATTS	F.S. COUNTS PER HOUR	WH PER COUNT	STANDARD OUTPUT MODEL W- OR W4-						
AC VOLTS	AC AMPS				0-±1mA*	0-±1mA	0-±10V*	0-±10V	0-±5V*	0-±5V	4-20mA
0-150	0 - 1	200	200	1	120A	120B	120C	120D	120CX5	120X5	120E
	0 - 2.5	500	500	1	129A	129B	129C	129D	129CX5	129X5	129E
	0 - 5	1k	1000	1	004A	004B	004C	004D	004CX5	004X5	004E
	0 - 10	2k	2000	1	013A	013B	013C	013D	013CX5	013X5	013E
	0 - 15	3k	3000	1	022A	022B	022C	022D	022CX5	022X5	022E
	0 - 20	4k	4000	1	112A	112B	112C	112D	112CX5	112X5	112E
	0 - 25	5k	5000	1	123A	123B	123C	123D	123CX5	123X5	123E
0-300	0 - 1	400	400	1	121A	121B	121C	121D	121CX5	121X5	121E
	0 - 2.5	1k	1000	1	130A	130B	130C	130D	130CX5	130X5	130E
	0 - 5	2k	2000	1	005A	005B	005C	005D	005CX5	005X5	005E
	0 - 10	4k	4000	1	014A	014B	014C	014D	014CX5	014X5	014E
	0 - 15	6k	6000	1	023A	023B	023C	023D	023CX5	023X5	023E
	0 - 20	8k	8000	1	113A	113B	113C	113D	113CX5	113X5	113E
	0 - 25	10k	10000	1	124A	124B	124C	124D	124CX5	124X5	124E
0-600	0 - 1	800	800	1	122A	122B	122C	122D	122CX5	122X5	122E
	0 - 2.5	2k	2000	1	131A	131B	131C	131D	131CX5	131X5	131E
	0 - 5	4k	4000	1	006A	006B	006C	006D	006CX5	006X5	006E
	0 - 10	8k	8000	1	015A	015B	015C	015D	015CX5	015X5	015E
	0 - 15	12k	12000	1	024A	024B	024C	024D	024CX5	024X5	024E
	0 - 20	16k	1600	10	114A	114B	114C	114D	114CX5	114X5	114E

Note: Refer to notes below table on page first page.

THREE-PHASE, THREE-WIRE (TWO-ELEMENT) MODELS SUPPLIED WITH EXTERNAL SENSORS



INPUTS		F.S. WATTS	F.S. CTS PER HOUR	WH PER COUNT	SENSOR SIZE	STANDARD OUTPUT MODEL W- OR W4-						
AC VOLTS	AC AMPS					0-±1mA*	0-±1mA	0-±10V*	0-±10V	0-±5V*	0-±5V	4-20mA
0-150	0 - 100	20k	2000	10	W	061A	061B	061C	061D	061CX5	061X5	061E
	0 - 200	40k	4000	10	W	070A	070B	070C	070D	070CX5	070X5	070E
	0 - 400	80k	8000	10	X	079A	079B	079C	079D	079CX5	079X5	079E
	0 - 600	120k	12000	10	X	088A	088B	088C	088D	088CX5	088X5	088E
	0 - 1000	200k	2000	100	Y	097A	097B	097C	097D	097CX5	097X5	097E
0-300	0 - 100	40k	4000	10	W	062A	062B	062C	062D	062CX5	062X5	062E
	0 - 200	80k	8000	10	W	071A	071B	071C	071D	071CX5	071X5	071E
	0 - 400	160k	1600	100	X	080A	080B	080C	080D	080CX5	080X5	080E
	0 - 600	240k	2400	100	X	089A	089B	089C	089D	089CX5	089X5	089E
	0 - 1000	400k	4000	100	Y	098A	098B	098C	098D	098CX5	098X5	098E
0-600	0 - 100	80k	8000	10	W	063A	063B	063C	063D	063CX5	063X5	063E
	0 - 200	160k	1600	100	W	072A	072B	072C	072D	072CX5	072X5	072E
	0 - 400	320k	3200	100	X	081A	081B	081C	081D	081CX5	081X5	081E
	0 - 600	480k	4800	100	X	090A	090B	090C	090D	090CX5	090X5	090E
	0 - 1000	800k	8000	100	Y	099A	099B	099C	099D	099CX5	099X5	099E

Note: Current Transformers are supplied as part of the model. Refer also to notes below table on first page.



THREE-PHASE, FOUR-WIRE (THREE-ELEMENT) MODELS WITH INTERNAL CURRENT SENSORS

INPUTS		F.S. WATTS	F.S. COUNTS PER HOUR	WH PER COUNT	STANDARD OUTPUT MODEL W- OR W4-						
AC VOLTS	AC AMPS				0-±1mA*	0-±1mA	0-±10V*	0-±10V	0-±5V*	0-±5V	4-20mA
0-150 L-N	0 - 1	300	300	1	125A	125B	125C	125D	125CX5	125X5	125E
	0 - 2.5	750	750	1	132A	132B	132C	132D	132CX5	132X5	132E
	0 - 5	1.5k	1500	1	007A	007B	007C	007D	007CX5	007X5	007E
	0 - 5	1.5k	1500	1	7.5A	7.5B	7.5C	7.5D	7.5CX5	7.5X5	7.5E
	0 - 10	3k	3000	1	016A	016B	016C	016D	016CX5	016X5	016E
	0 - 15	4.5k	4500	1	025A	025B	025C	025D	025CX5	025X5	025E
	0 - 20	6k	6000	1	115A	115B	115C	115D	115CX5	115X5	115E
	0 - 25	7.5k	7500	1	127A	127B	127C	127D	127CX5	127X5	127E
0-300 L-N	0 - 1	600	600	1	126A	126B	126C	126D	126CX5	126X5	126E
	0 - 2.5	1.5k	1500	1	133A	133B	133C	133D	133CX5	133X5	133E
	0 - 5	3k	3000	1	008A	008B	008C	008D	008CX5	008X5	008E
	0 - 5	3k	3000	1	8.5A	8.5B	8.5C	8.5D	8.5CX5	8.5X5	8.5E
	0 - 10	6k	6000	1	017A	017B	017C	017D	017CX5	017X5	017E
	0 - 15	9k	9000	1	026A	026B	026C	026D	026CX5	026X5	026E
	0 - 20	12k	12000	1	116A	116B	116C	116D	116CX5	116X5	116E
	0 - 25	15k	15000	10	128A	128B	128C	128D	128CX5	128X5	128E

Note: Part Numbers 7.5 and 8.5 denote 2½-element units. Refer also to notes below table on first page.

THREE-PHASE, FOUR-WIRE (THREE-ELEMENT) MODELS SUPPLIED WITH EXTERNAL SENSORS



INPUTS		F.S. WATTS	F.S. CTS PER HOUR	WH PER COUNT	SENSOR SIZE	STANDARD OUTPUT MODEL W- OR W4-						
AC VOLTS	AC AMPS					0-±1mA*	0-±1mA	0-±10V*	0-±10V	0-±5V*	0-±5V	4-20mA
0-150 L-N	0 - 100	30k	3000	10	W	064A	064B	064C	064D	064CX5	064X5	064E
	0 - 200	60k	6000	10	W	073A	073B	073C	073D	073CX5	073X5	073E
	0 - 400	120k	1200	100	X	082A	082B	082C	082D	082CX5	082X5	082E
	0 - 600	180k	1800	100	X	091A	091B	091C	091D	091CX5	091X5	091E
0 - 1000	300k	3000	100	Y	100A	100B	100C	100D	100CX5	100X5	100E	
0-300 L-N	0 - 100	60k	6000	10	W	065A	065B	065C	065D	065CX5	065X5	065E
	0 - 200	120k	12000	10	W	074A	074B	074C	074D	074CX5	074X5	074E
	0 - 400	240k	2400	100	X	083A	083B	083C	083D	083CX5	083X5	083E
	0 - 600	360k	3600	100	X	092A	092B	092C	092D	092CX5	092X5	092E
0 - 1000	600k	6000	100	Y	101A	101B	101C	101D	101CX5	101X5	101E	

Note: Current Transformers are supplied as part of the model. Refer also to notes under table on first page.

SPECIFICATIONS

INPUT

Voltage..... (See Tables)
 Current..... (See Tables)
 Frequency Range W- models..... 48-70Hz
 W4- models..... 400Hz
 Power Factor..... Any
 Response (Transient, to 90% F.S.)
 With Internal Sensors <100µs
 With Current Transformers 1ms
 Burden
 Voltage and Current..... 1.25VA/phase
 Output Amplifier..... 2W
 Current Overload (Continuous) ... 1-10A models..... 2 X F.S.
 15A, 20A, 25A models..... F.S.
 Transient (all models)..... 6 X F.S. (10 seconds)

DIELECTRIC TEST

Input/Output/Case..... 1500Vac (RMS)
 Surge Withstands IEEE SWC test

INSTRUMENT POWER

“A”, “C”, “CX5” models..... not required
 “B”, “D”, “X5” & “E” models 103-135Vac, 50-400Hz, 5VA
 “-22” Option..... 230Vac ±10%, 50/60Hz, ±10%

OUTPUT

Wh Relay (Wh output is forward/consumed direction only)
 Standard.... N/O SPST relay contact; 150Vac, 0.5A Rated
 Contact Closure Period..... 200ms
 “-T” Option TTL output for Watthours, 5Vdc pulse
 Watt Output, Loading
 “A” & “B” models..... (0-±1mAdc)..... 0-10kΩ
 “C” & “D” models..... (0-±10Vdc)..... 2kΩ min.
 “CX5” & “X5” models (0-±5Vdc)..... 2kΩ min.
 “E” models (4-20mAdc)..... 0-500Ω
 (±1mA, ±5V and ±10V unit Watt output are bidirectional)
 Response Time (to 90% F.S.) ... standard..... 250ms
 Suffix “Y27” (for use on zero-crossing SCR controllers)..... 5s
 NOTE: This option is not available for self-powered models.
 Field Adjustable Calibration ±10%

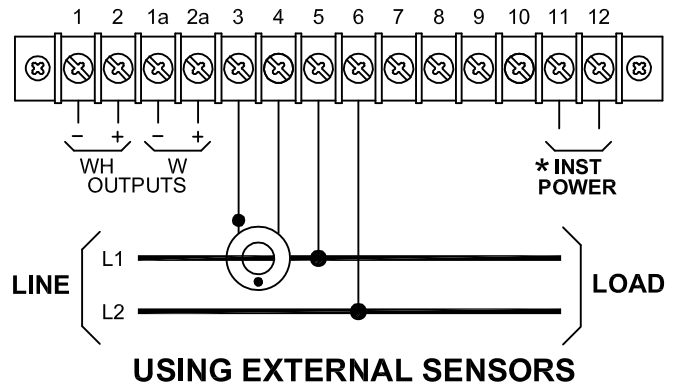
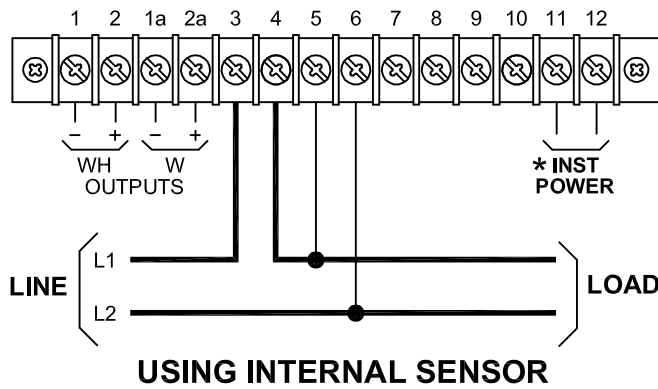
ACCURACY..... ±0.5% F.S.

Includes combined effects of power factor, repeatability, linearity, and current sensor.
 Analog Output Ripple..... <1% F.S.

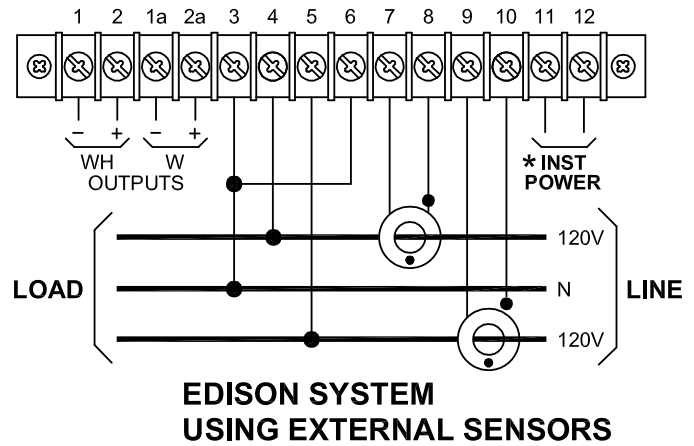
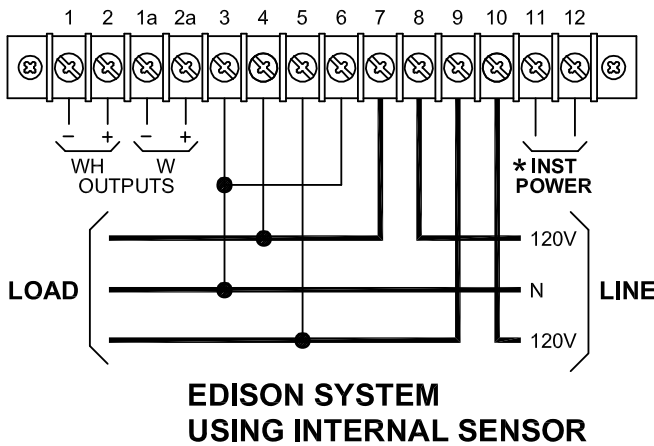
TEMPERATURE

Operating Range..... -10°C to +60°C
 Effect..... ±1.0% of Rdg., ±0.1% F.S. Output

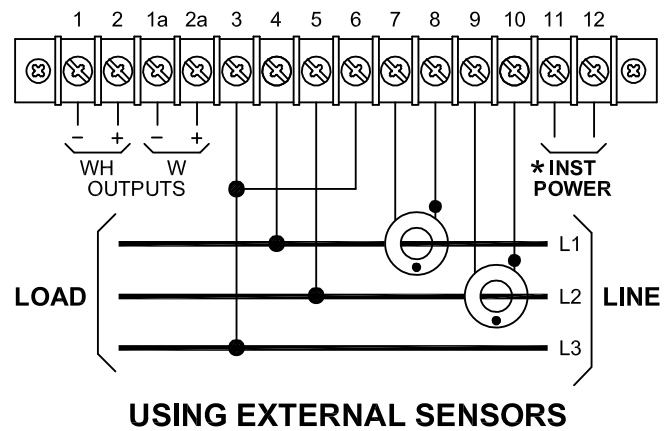
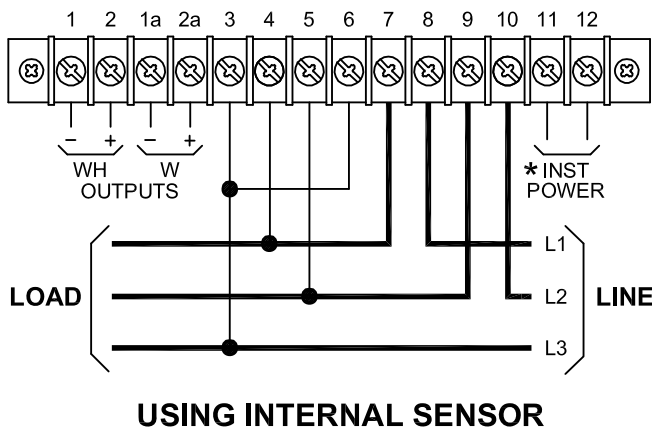
SINGLE-PHASE CONNECTIONS



SINGLE-PHASE, THREE-WIRE CONNECTIONS



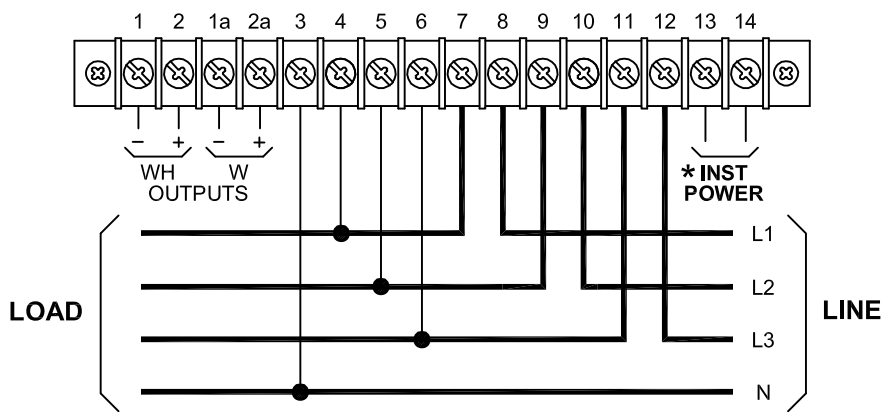
THREE-PHASE, THREE-WIRE CONNECTIONS



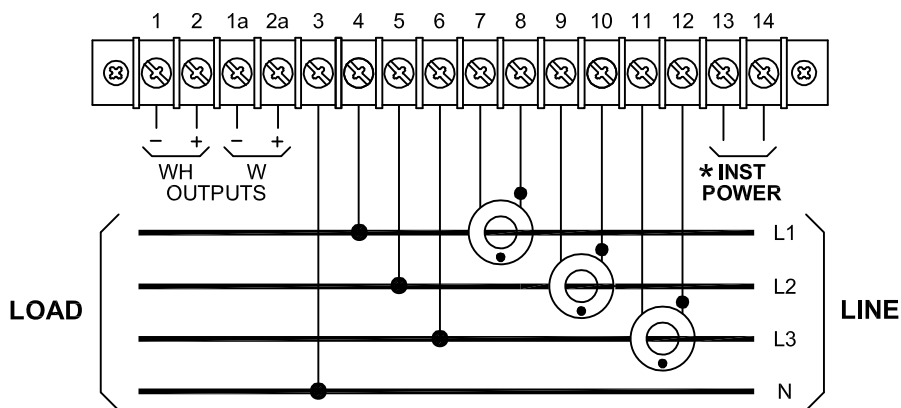
* 115Vac on models with B, D, E or X5 suffix.
 * 230Vac on models with -22 suffix.
 * Not required on models with A, C or CX5 suffix.

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THREE-PHASE, FOUR-WIRE CONNECTIONS



USING INTERNAL SENSORS

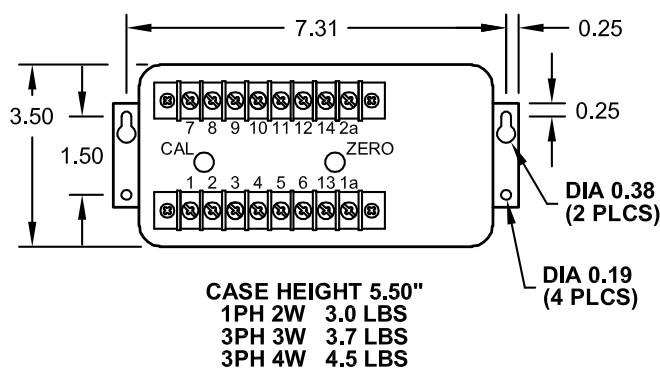


USING EXTERNAL SENSORS

- * 115Vac on models with B, D, E or X5 suffix.
- * 230Vac on models with -22 suffix.
- * Not required on models with A, C or CX5 suffix.

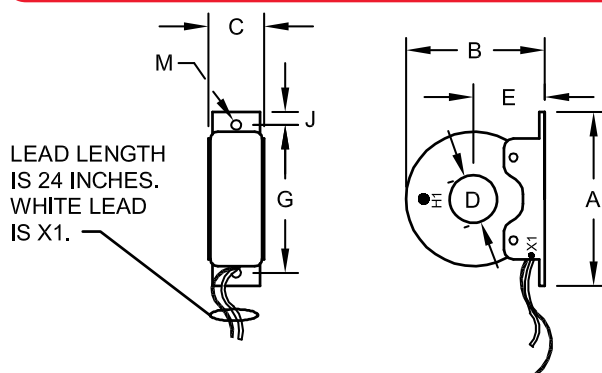
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CASE DIMENSIONS



ALL DIMENSIONS IN INCHES.

SENSOR DIMENSIONS



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

Lead Length: 24 inches White Lead is X1