

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 | 5000 | 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 | 500 | 500 | 1 | 104A | 104B | 104C | 104D | 104CX5 | 104X5 | 104E |
| | 0 - 5 | 1000 | 1000 | 1 | 002A | 002B | 002C | 002D | 002CX5 | 002X5 | 002E |
| | 0 - 10 | 2000 | 2000 | 1 | 011A | 011B | 011C | 011D | 011CX5 | 011X5 | 011E |
| | 0 - 15 | 3000 | 3000 | 1 | 020A | 020B | 020C | 020D | 020CX5 | 020X5 | 020E |
| | 0 - 20 | 4000 | 4000 | 1 | 110A | 110B | 110C | 110D | 110CX5 | 110X5 | 110E |
| | 0 - 25 | 5000 | 5000 | 1 | 119A | 119B | 119C | 119D | 119CX5 | 119X5 | 119E |
| 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)

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-±1mA) 0-10kΩ
“C” & “D” models..... (0-±10Vdc) 2kΩ min.
“CX5” & “X5” models (0-±5Vdc) 2kΩ min.
“E” models (4-20mA) 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%

DIELECTRIC TEST

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

ACCURACY..... ±0.5% F.S.

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

INSTRUMENT POWER

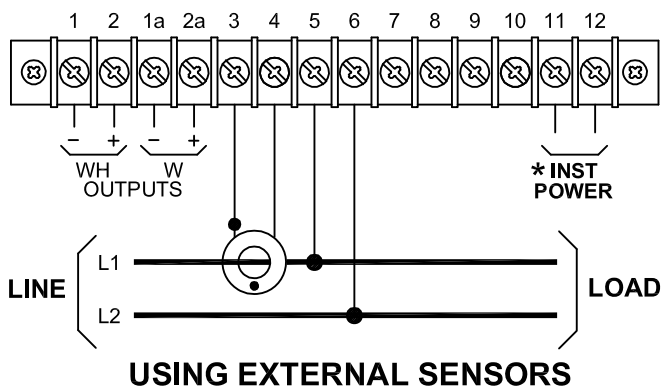
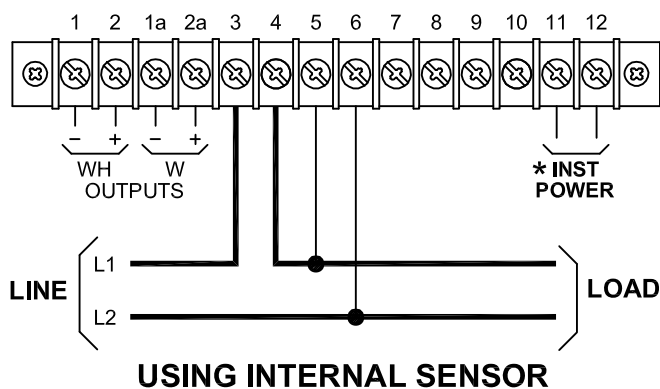
- “A”, “C”, “CX5” models not required
- “B”, “D”, “X5” & “E” models 103-135Vac, 50-400Hz, 5VA
- “-22” Option..... 230Vac ±10%, 50/60Hz, ±10%

TEMPERATURE

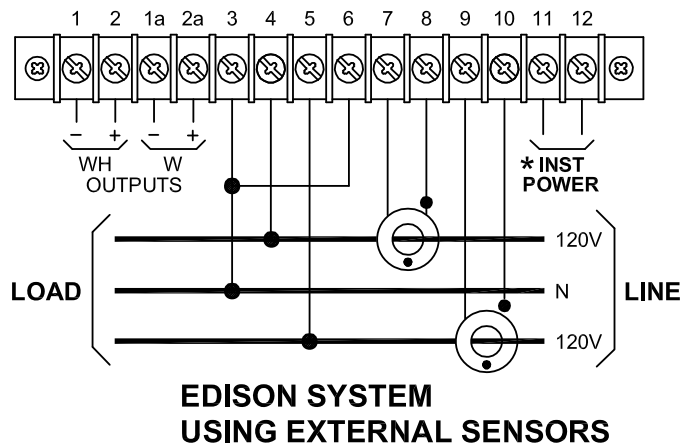
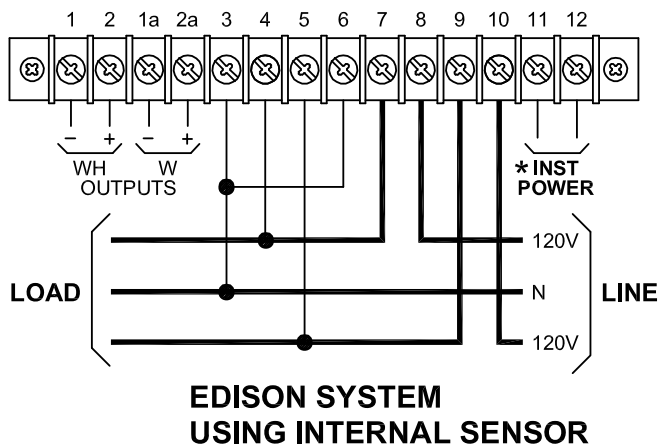
- Operating Range..... -10°C to +60°C
- Effect..... ±1.0% of Rdg., ±0.1% F.S. Output

OHIO SEMITRONICS, INC. 4242 REYNOLDS DRIVE * HILLIARD, OHIO * 43026-1264
PHONE: (614) 777-1005 * FAX: (614) 777-4511
WWW.OHIOSEMITRONICS.COM * 1-800-537-6732

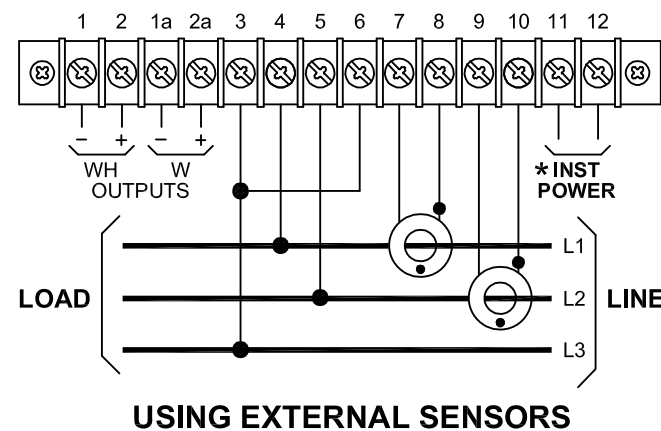
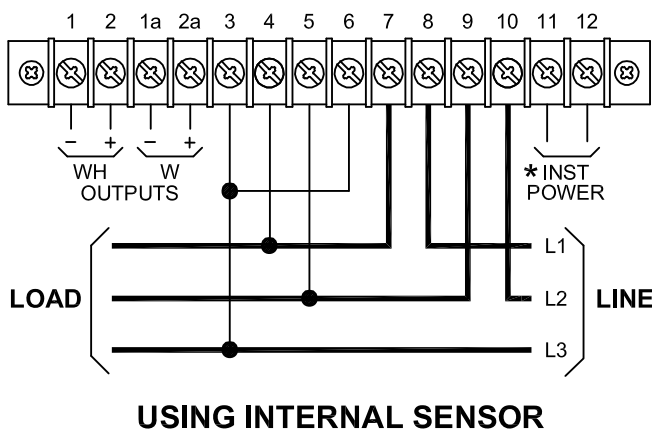
SINGLE-PHASE CONNECTIONS



SINGLE-PHASE, THREE-WIRE CONNECTIONS



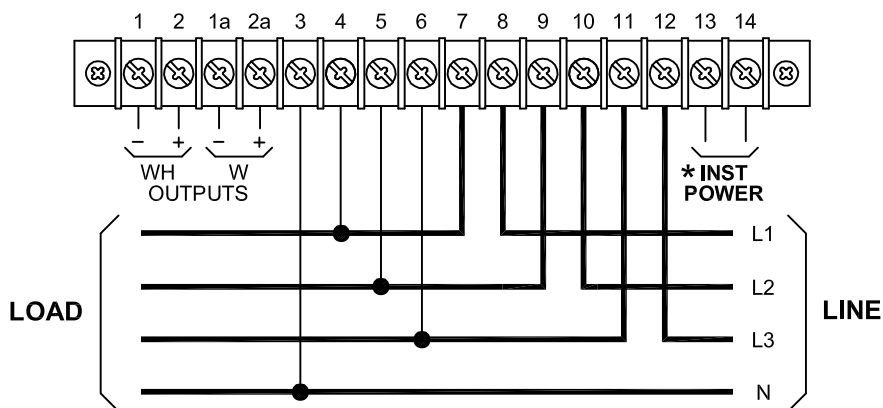
THREE-PHASE, THREE-WIRE CONNECTIONS



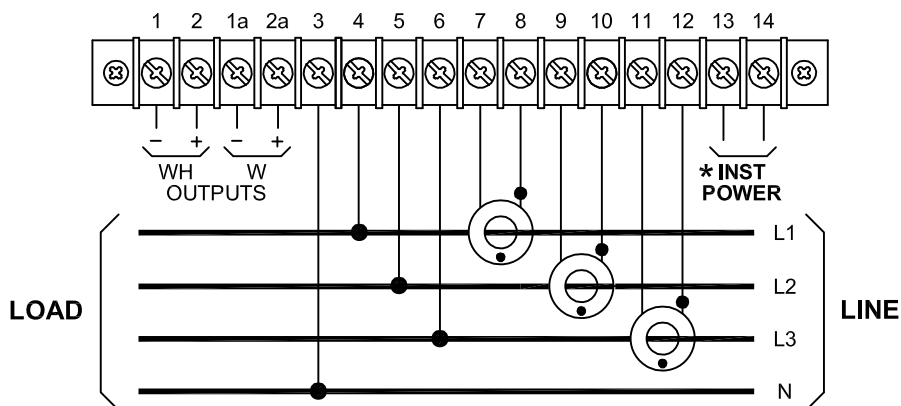
* 115Vac on models with B, D, E or X5 suffix.
 * 230Vac on models with -22 suffix.
 * Not required on models with A, C or CX5 suffix.

Dwg# 0902-00872-B

THREE-PHASE, FOUR-WIRE CONNECTIONS



USING INTERNAL SENSORS

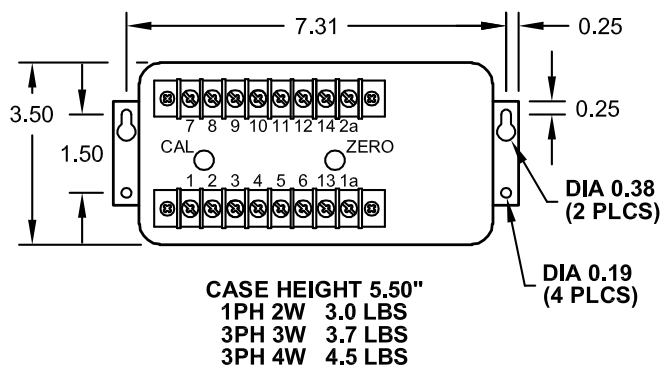


USING EXTERNAL SENSORS

- * 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.

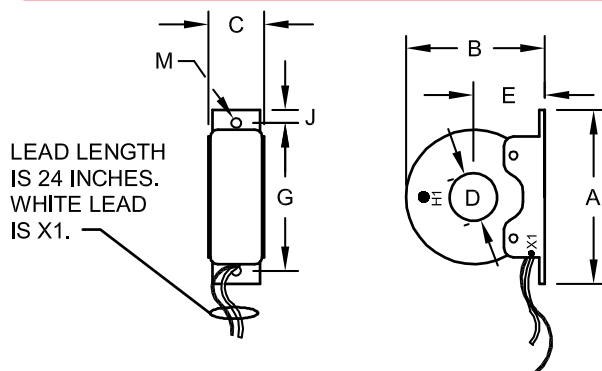
Dwg# 0902-00872-B

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