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: ±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.

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

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

Frequency
Range ..........With accuracy ..........48 - 62Hz
Wx7 .............. 10 - 500Hz
WT9 .......... 48-62Hz, 40th Har.

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

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

Wx3,5 models .......... ±0.5% F.S.
Wx6 models .......... ±0.2% Rdg./PF, ±0.04% F.S.
VARs .......... ±0.2% Rdg./sinθ, ±0.04% F.S.
Wx7 models .......... ±0.25% F.S.
WT9 models .......... ±0.2% Rdg./PF, ±0.04% F.S.

TEMPERATURE

Range ..........Operating .............. -10 to 50°C
Storage .............. -25 to 75°C

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

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.

OUTPUT

Analog

Type ..........(3Ø 3W)...........F.S. = VL-N(NOM) x INOM x 2
..........(1Ø 3W)...........F.S. = VL-N(NOM) x INOM x 2
..........(1Ø 2W)...........F.S. = VL-N(NOM) x INOM x 2

Loading ..........B .............. (±1mA) .............. ≤10kΩ
..........D, X5 .......... (±10Vdc, ±5Vdc) .............. ≥2kΩ
..........E, EM .......... (4-20mAdc, 4-12-20mAdc) .............. ≤500Ω

Polarity ..........Watt ............ Pos(+) = Forward ..Neg(-) = Reverse
..........VAR .......... Pos(+) = Lagging ..Neg(-) = Leading

Ripple ..........Input frequency .............. ≥48Hz .............. ≤0.5% F.S.

Pulse

WT5,6,7,9 ..........2 Wh outputs, 1ea forward/reverse
WTV,6,7 ..........2 Wh outputs, 1ea forward/reverse

Type ..........Wh ..........Form C, solid-state relay
VARH ..........Open collector transistor

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

INSTRUMENT POWER

Standard universal ..........85-265V, 47-63Hz, ≤10VA
115-300Vdc, ≤10VA
WATT / Wh / VAR / VARh TRANSUDER

MODEL Wxx-

MODEL SELECTION

<table>
<thead>
<tr>
<th>TRANSUDER TYPE</th>
<th>Measured Parameter(s) and Features</th>
<th>B</th>
<th>Phase (no. of elements)</th>
<th>C</th>
<th>INPUT VOLTAGE - NOMINAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>T3</td>
<td>Watt</td>
<td>1</td>
<td>1Ø2W (1 ele.)</td>
<td>1</td>
<td>120VL-N 120VL-L 69VL-N/120VL-L 120VL-N/240VL-L</td>
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<tr>
<td>T5</td>
<td>Watt and Wh</td>
<td>2</td>
<td>3Ø3W (2 ele.)</td>
<td>2</td>
<td>240VL-N 240VL-L 120VL-N/208VL-L</td>
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<tr>
<td>T6</td>
<td>Watt and Wh, High accuracy</td>
<td>3</td>
<td>3Ø4W (3 ele.)</td>
<td>3</td>
<td>480VL-N 480VL-L 277VL-N/480VL-L</td>
</tr>
<tr>
<td>T7</td>
<td>Watt and Wh, Variable Frequency</td>
<td>4</td>
<td>1Ø3W (2 ele.)</td>
<td>4</td>
<td>**346VL-N/600VL-L</td>
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<tr>
<td>T9</td>
<td>Watt and Wh, 40th Harmonic of 60Hz</td>
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<tr>
<td>V3</td>
<td>Watt and VAR</td>
<td></td>
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<tr>
<td>V5</td>
<td>Watt, VAR, Wh, VARh</td>
<td></td>
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</tr>
<tr>
<td>V6</td>
<td>Watt, VAR, Wh, VARh, High accuracy</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>V7</td>
<td>Watt, VAR, Wh, VARh, Variable frequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

INPUT CURRENT - NOMINAL

<table>
<thead>
<tr>
<th>DDD</th>
<th>Aac</th>
<th>DDD(D*)</th>
<th>Aac</th>
<th>E</th>
<th>Type</th>
<th>F</th>
<th>Response</th>
<th>G</th>
<th>Type</th>
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<tbody>
<tr>
<td>001</td>
<td>1A</td>
<td>100(S)</td>
<td>100A</td>
<td>B</td>
<td>±1mA</td>
<td>(blank)</td>
<td>50mA</td>
<td>Form C, solid-state relay (std.)</td>
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<tr>
<td>005</td>
<td>5A</td>
<td>200(S)</td>
<td>200A</td>
<td>D</td>
<td>±10V</td>
<td>(blank)</td>
<td>1S</td>
<td>5S</td>
<td></td>
</tr>
<tr>
<td>010</td>
<td>10A</td>
<td>300(S)</td>
<td>300A</td>
<td>E</td>
<td>4-20mA</td>
<td>(blank)</td>
<td>5V, TTL compatible pulse</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>400(S)</td>
<td>400A</td>
<td>EM</td>
<td>4-12-20mA</td>
<td>(blank)</td>
<td>Form C, solid-state relay, KYZ operation</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>500(S)</td>
<td>500A</td>
<td>X5</td>
<td>±5V</td>
<td>(blank)</td>
<td>K</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>600(S)</td>
<td>600A</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>800(S)</td>
<td>800A</td>
<td></td>
<td></td>
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<td></td>
<td>1000(S)</td>
<td>1000A</td>
<td></td>
<td></td>
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</table>

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

ANALOG OUTPUT(S) (Watt and/or VAR) | PULSE OUTPUT (WH only)

SERIAL COMMUNICATION (replaces analog outputs)

<table>
<thead>
<tr>
<th>COMMUNICATION CONNECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
</tr>
<tr>
<td>B</td>
</tr>
</tbody>
</table>

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 FOR ALL MODELS
All dimensions in inches. Tolerance - 0.00±0.03
(unless otherwise specified)
Parameter “G” = Blank/K/T

<table>
<thead>
<tr>
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<td>Analog</td>
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<td></td>
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</tr>
<tr>
<td>STD/KYZ Watts</td>
<td>COM</td>
<td>VARs</td>
<td>COM</td>
<td>C</td>
<td>N.C.</td>
<td>N.O.</td>
<td>C</td>
<td>N.C.</td>
<td>N.O.</td>
<td>N.O.</td>
<td>C</td>
<td>N.O.</td>
<td>C</td>
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<tr>
<td>TTL Watts</td>
<td>COM</td>
<td>VARs</td>
<td>COM</td>
<td>COM</td>
<td>Wh-FWD</td>
<td>Wh-REV</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>(N/C)</td>
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</table>

Parameter “G” = B (MODBus RTU w/Term. Blocks)

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>RS422</td>
<td>(N/C)</td>
<td>COM</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>Tx+</td>
<td>Tx-</td>
<td>Rx+</td>
<td>Rx-</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>5V</td>
<td>(N/C)</td>
<td>(N/C)</td>
</tr>
<tr>
<td>RS485</td>
<td>(N/C)</td>
<td>COM</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>Tx+Rx+</td>
<td>Tx-/Rx-</td>
<td>Tx+Rx+</td>
<td>Tx-/Rx-</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>5V</td>
<td>(N/C)</td>
<td>(N/C)</td>
</tr>
<tr>
<td>RS232</td>
<td>(N/C)</td>
<td>COM</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>Rx</td>
<td>Tx</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>5V</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td></td>
</tr>
</tbody>
</table>

Parameter “G” = R (MODBus RTU w/RJ45)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Pin 1</th>
<th>Pin 2</th>
<th>Pin 3</th>
<th>Pin 4</th>
<th>Pin 5</th>
<th>Pin 6</th>
<th>Pin 7</th>
<th>Pin 8</th>
<th>RJ45</th>
<th>Pin 11</th>
<th>Pin 12</th>
<th>Pin 13</th>
<th>Pin 14-16</th>
<th>Term. Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS422</td>
<td>Rx-</td>
<td>Rx+</td>
<td>(N/C)</td>
<td>Tx-</td>
<td>(N/C)</td>
<td>5V</td>
<td>COM</td>
<td>(N/C)</td>
<td>COM</td>
<td>5V</td>
<td>(N/C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS485</td>
<td>Tx-/Rx-</td>
<td>Tx+Rx+</td>
<td>(N/C)</td>
<td>Tx+Rx+</td>
<td>(N/C)</td>
<td>5V</td>
<td>COM</td>
<td>(N/C)</td>
<td>COM</td>
<td>5V</td>
<td>(N/C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS232</td>
<td>Tx</td>
<td>Rx</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>(N/C)</td>
<td>COM</td>
<td>(N/C)</td>
<td>COM</td>
<td>5V</td>
<td>(N/C)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Outputs based on table below.

Dwg# 0902-01016-B Rev-D

(FIGURE 1) (FIGURE 2)
**DIMENSIONS**

### Wx3,5-xx Solid-Core CTs

**SENSOR SIZE**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>G</th>
<th>J</th>
<th>M</th>
<th>WT. (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100A-300A</td>
<td>4.50</td>
<td>3.70</td>
<td>1.25</td>
<td>1.25</td>
<td>1.94</td>
<td>3.88</td>
<td>0.34</td>
<td>0.27 X 0.44</td>
<td>1.43</td>
</tr>
<tr>
<td>400A-800A</td>
<td>6.50</td>
<td>4.70</td>
<td>1.25</td>
<td>2.50</td>
<td>2.46</td>
<td>5.75</td>
<td>0.39</td>
<td>0.28</td>
<td>1.61</td>
</tr>
<tr>
<td>1000A</td>
<td>6.50</td>
<td>4.70</td>
<td>1.25</td>
<td>3.00</td>
<td>2.46</td>
<td>5.75</td>
<td>0.39</td>
<td>0.28</td>
<td>1.10</td>
</tr>
</tbody>
</table>

**LEAD LENGTHS** ....... 24 in., 14 AWG, White (X1) and Black

### Wx3,5,6-xx Split-Core CTs

**SENSOR SIZE**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>WT. (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100A-800A</td>
<td>3.85</td>
<td>3.80</td>
<td>1.30</td>
<td>2.40</td>
<td>1.25</td>
<td>0.8</td>
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<tr>
<td>1000A</td>
<td>5.50</td>
<td>4.90</td>
<td>1.60</td>
<td>3.15</td>
<td>3.20</td>
<td>1.5</td>
</tr>
</tbody>
</table>

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

### Wx6-xx Solid-Core CTs

**Recommended Lead Lengths**

72 in., 16 AWG, Twisted Pair

**HOLE INFO:**

1. 2.50 DIA (1 PLC)
2. 0.42 DIA (2 PLCs)
3. 0.44 X 0.50 SLOT (4 PLCs)
4. 0.22 X 0.50 SLOT (4 PLCs)

**NOTES:**

1. All dimensions in inches. Tolerance: ±0.03 inches.
2. Includes mounting brackets.
**DIMENSIONS**

**Wx7-xx, WT9-xx Solid-Core**

---

**100A - 300A**

1.28 [32.80] x 1.20 [30.60]

**400A - 600A**

2.68 [68.00] x 2.94 [74.60]

**800A - 1000A**

2.36 [60.00] x 3.45 [88.00]

---

**Polarity Markings**

**Recommended Lead Lengths**

72in., 16AWG, Twisted Pair
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)