



WATT HOUR AND VAR HOUR TRANSDUCER

- TWH** system Watt-Hour
- TWWH** system Watt-Hour + Watt
- TQH** system Var-Hour
- TQQH** system Var-Hour + Var

These transducers convert the active power or reactive power of a single-phase or three-phase system with balanced or unbalanced loads.

The output signals are a digital signal and DC analog signal.

FEATURES

- High accuracy $\pm 0.2\% \text{ RD} + 0.1\% \text{ RO (WH)}$
 $\pm 0.25\% \text{ RD} + 0.1\% \text{ RO (VARH)}$
- Precision measurement even for distorted waves
- Uses time division multiplier for Watt and Var
- High immunity to external noise
- Wide selection of input and output range
- Quick and easy mounting

SPECIFICATION

- Accuracy:** $\pm 0.2\% \text{ RD} + 0.1\% \text{ RO (WH)}$
 $\pm 0.25\% \text{ RD} + 0.1\% \text{ RO (VARH)}$
- Temp. coefficient:** 100ppm at 23°C $\pm 3^\circ\text{C}$
(Option 60ppm at 23°C $\pm 3^\circ\text{C}$)
- Temp. range:** -20 to 60 °C
Operating 0~50°C
- Humidity range:** Up to 95% RH
- Isolation:** Input/output/power/case
- Dielectric test:** DIN-IEC 688. 2K Vrms 50/60 Hz,
1 min. Between terminal to terminal.
2.8K Vrms/1min. Between terminal
to case.
- Surge test:** DIN-IEC 255-4, ANSI C37.
90a/1974. 5KV (1.2 x 50µs)
- Insulation resistance:** 100MΩ or more, DC 500V
- Housing material:** Steel sheet
- Mounting:** Wall mounting
- Power supply:** AC 115/230V $\pm 15\%$, 50/60 Hz, 3VA

INPUT

- Frequency:** 50Hz or 60Hz $\pm 3\text{Hz}$
- Burden:** $\leq 0.1\text{VA}$ per voltage circuit
 $\leq 0.2\text{VA}$ per current circuit
- Sensitivity:** $\leq 0.5\%$ of end range value
- Overload capacity:** Voltage ... 600Vrms continuous
1.25 x rated continuous
2 x rated for 10 sec
4 x rated for 5 sec
Current ... 3 x rated continuous
10 x rated for 10 sec
50 x rated for 1 sec
80 x rated for 0.5 sec



- Operational range:** Voltage ... 0~120%
Current... 0~120%

Circuit	Voltage	Current	W/Var
1 phase 2 wires	120V	1A	± 100
		5A	± 500
	240V	1A	± 200
		5A	± 1000
1 phase 3 wires	120V	1A	± 200
		5A	± 1000
	240V	1A	± 400
		5A	± 2000
3 phase 3 wires	120V	1A	± 200
		5A	± 1000
	240V	1A	± 400
		5A	± 2000
3 phase 4 wires	$120\text{V}/\sqrt{3} \cdot 120\text{V}$	1A	± 300
		5A	± 1500
	$240\text{V}/\sqrt{3} \cdot 240\text{V}$	1A	± 600
		5A	± 3000

- The 3 phase 4 wires $120\text{V}/\sqrt{3} \cdot 120\text{V}$, $240\text{V}/\sqrt{3} \cdot 240\text{V}$
120V or 240V ... phase voltage
 $\sqrt{3} \cdot 120\text{V}$ or $\sqrt{3} \cdot 240\text{V}$...line voltage
- To determine the primary measuring ranges
Measuring range end value = CT ratio x PT ratio x input (W)

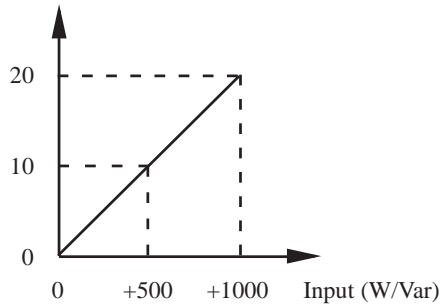
Example:

CT: 200/5A PT: 3300/110V Input: 1000W
 $(X_A=40)$ $(X_V=30)$
 Measuring range end value = 40 x 30 x 1000W = 1200 KW

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DC output characteristic

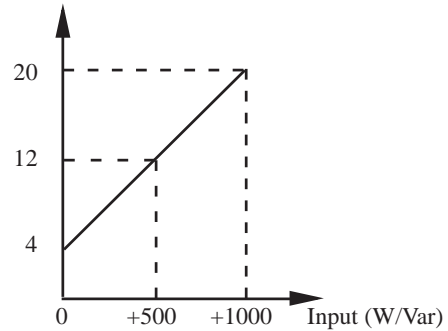
A: Output (mA)



Example:

Measuring range 0 ~ 1000W (Var)
Output 0 ~ 20mA

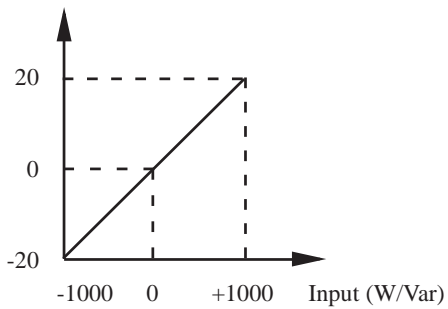
B: Output (mA)



Example:

Measuring range 0 ~ 1000W (Var)
Output 4 ~ 20mA

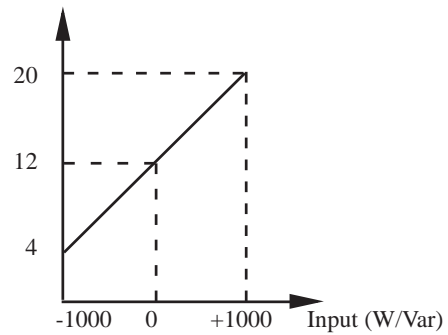
C: Output (mA)



Example:

Measuring range -1000 ~ 0 ~ +1000W (Var)
Output -20 ~ 0 ~ +20mA

D: Output (mA)



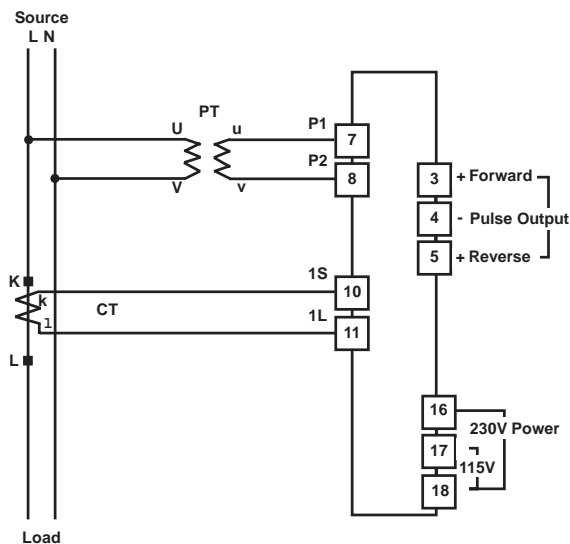
Example:

Measuring range -1000 ~ 0 ~ +1000W (Var)
Output 4 ~ 12 ~ 20mA

CONNECTION DIAGRAMS

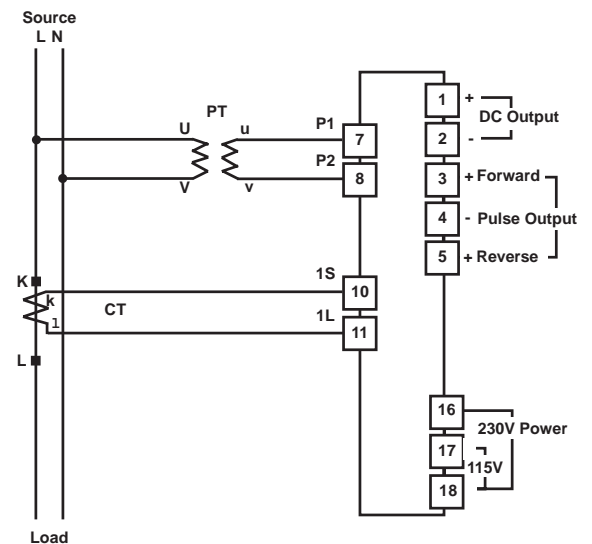
■ TW-12, TQ-12 (CASE B)

1 phase 2 wires



■ TWQ-12 (CASE B)

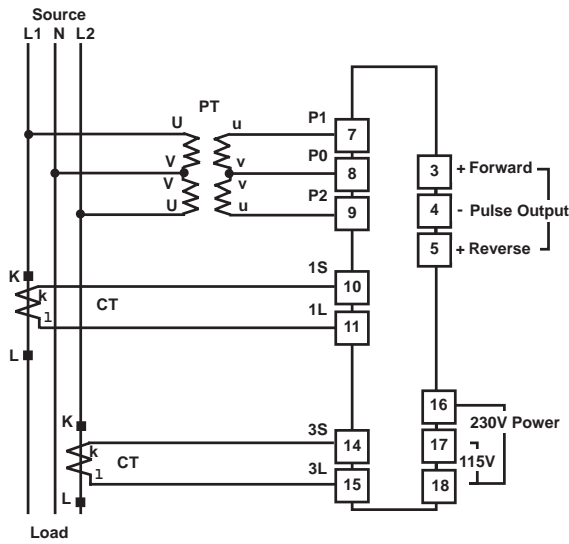
1 phase 2 wires



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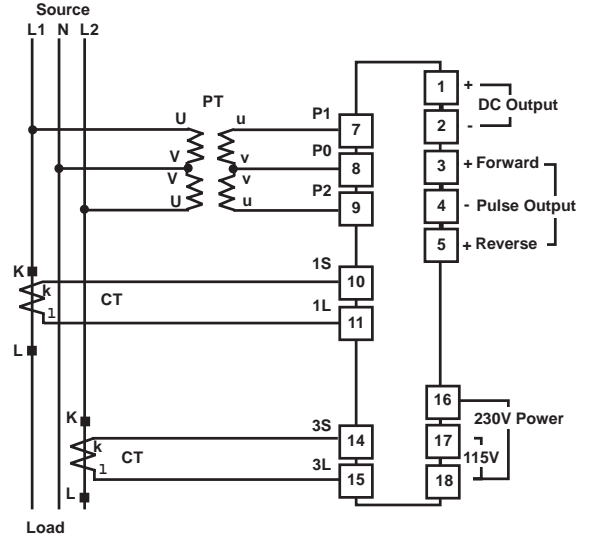
■ TW-13, TQ-13 (CASE B)

1 phase 3 wires



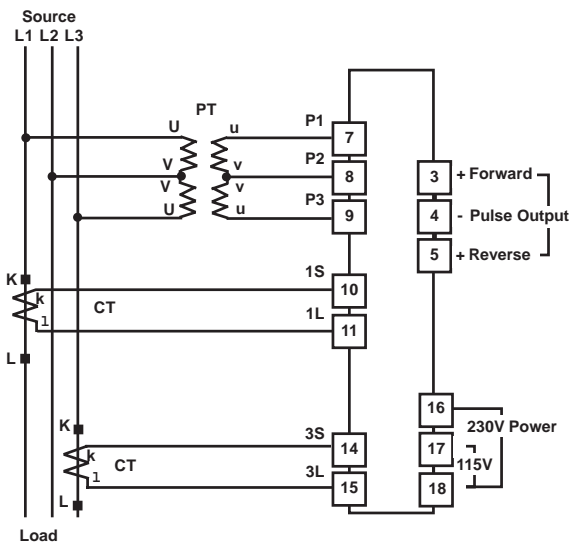
■ TWQ-13 (CASE B)

1 phase 3 wires



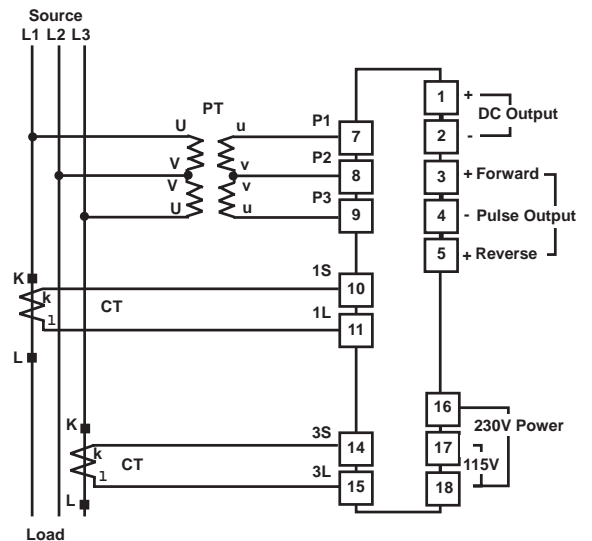
■ TW-33, TQ-33 (CASE B)

3 phase 3 wires



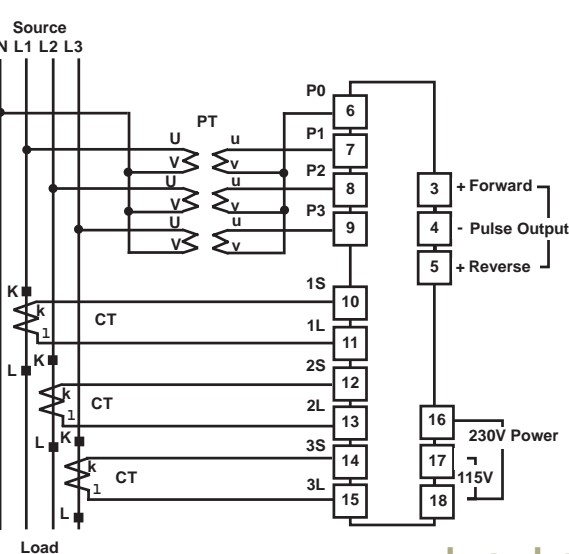
■ TWQ-33 (CASE B)

3 phase 3 wires



■ TW-34, TQ-34 (CASE B)

3 phase 4 wires



■ TWQ-34 (CASE B)

3 phase 4 wires

