



W A T T A N D V A R T R A N S D U C E R

TWQ system Active + Reactive power (Watt + Var)

TW system Active power (Watt)

TQ system Reactive power (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 isolated, load-independent DC current or DC voltage, representing the measured value of the active and reactive power.

FEATURES

- High accuracy $\pm 0.2\%$ RD $\pm 0.1\%$ RO
- 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: $\pm 0.2\%$ RD $\pm 0.1\%$ RO

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 50 μs)

Insulation resistance: 100M Ω 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 = $40 \times 30 \times 1000\text{W} = 1200 \text{KW}$

W A T T A N D V A R T R A N S D U C E R

OUTPUT

Output variables: DC voltage or current
Ripple: <0.5% p-p max.
Response time: < 0.4 sec. or less
Zero adjustment: ±5% minimum
Span adjustment: ±10% minimum
DC current: 0~20mA (max.)

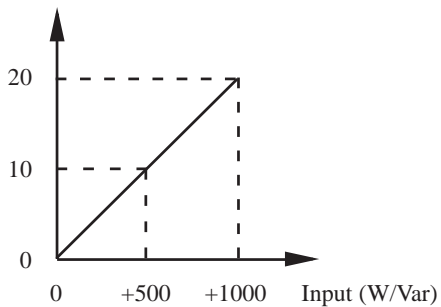
Output	Load resistance	Load voltage 12V $R = \frac{12V}{\text{Output current}}$ (R = load resistance)
4~20mA	≤ 600Ω	
0~20mA	≤ 600Ω	
0~10mA	≤ 1200Ω	
0~1mA	≤ 12KΩ	
-1~0~+1mA	≤ 12KΩ	
-10~0~+10mA	≤ 1200Ω	

DC voltage: 0~12V (max.)

Output	Load resistance	Load voltage 10mA $R = \frac{\text{Output voltage}}{10mA}$ (R = load resistance)
0~10V	≥ 1000Ω	
0~5V	≥ 500Ω	
1~5V	≥ 500Ω	
0~1V	≥ 100Ω	
-1~0~+1V	≥ 100Ω	
-10~0~+10V	≥ 1000Ω	

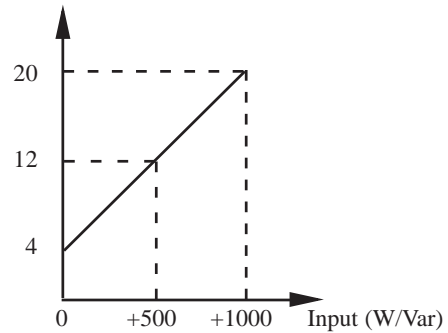
DC output characteristic

A: Output (mA)



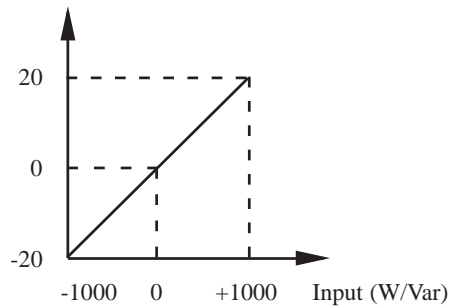
Example:
 Measuring range 0~1000W (Var)
 Output 0~20mA

B: Output (mA)



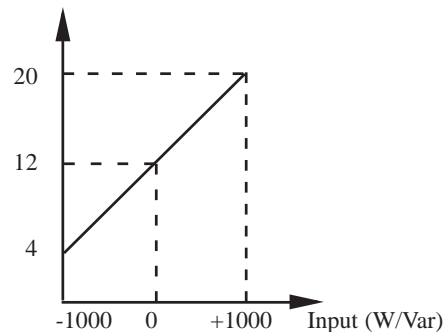
Example:
 Measuring range 0~1000W (Var)
 Output 4~20mA

C: Output (mA)



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

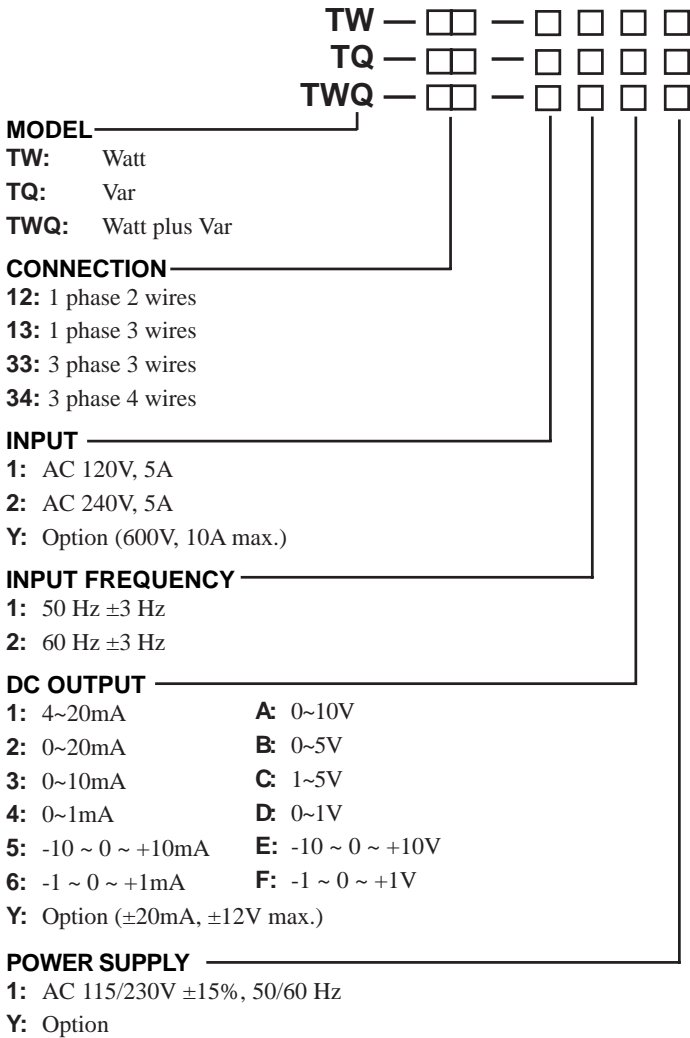
D: Output (mA)



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

W A T T A N D V A R T R A N S D U C E R

ORDERING INFORMATION



CODE NUMBER

Model-Connection - Input/Frequency/Output/Power

Example: TW-33-2261

Connection: 3 phase 3 wires

Input: AC 240V, 5A

Frequency: 60Hz ±3Hz

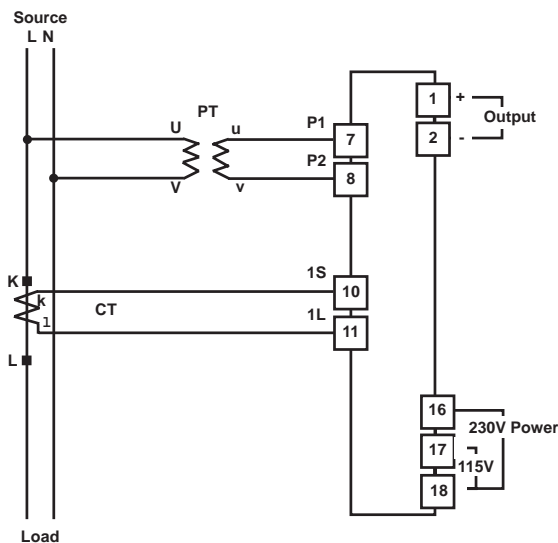
Output: -1 ~ 0 ~ +1 mA

Power: AC 115/230V

CONNECTION DIAGRAMS

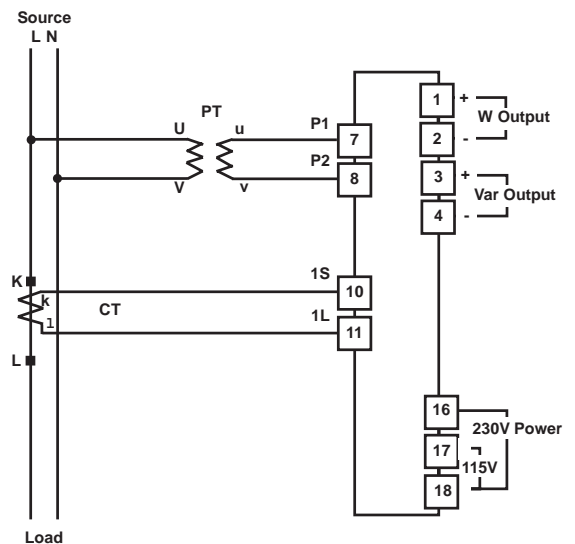
■ TW-12, TQ-12 (CASE B)

1 phase 2 wires



■ TWQ-12 (CASE B)

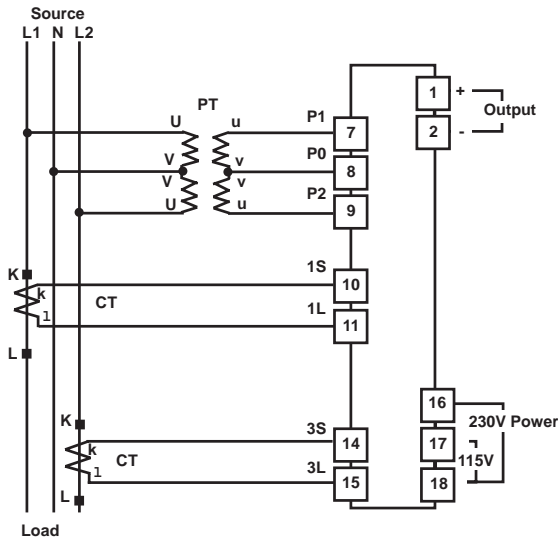
1 phase 2 wires



W A T T A N D V A R T R A N S D U C E R

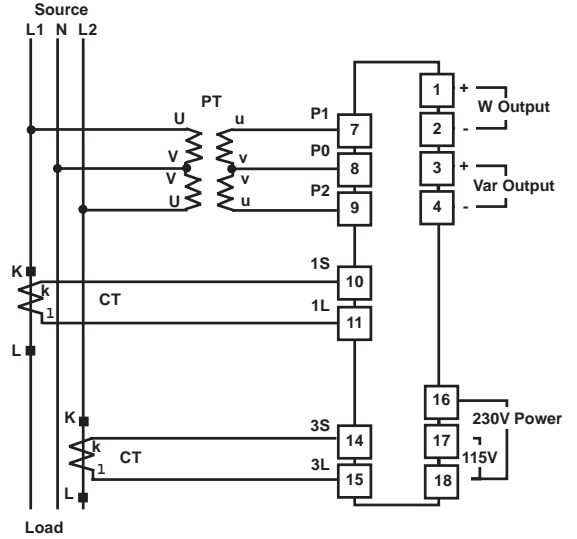
■ TW-13, TQ-13 (CASE B)

1 phase 3 wires



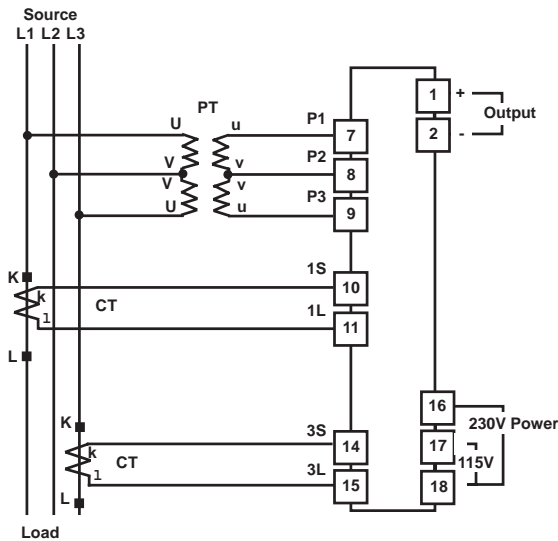
■ TWQ-13 (CASE B)

1 phase 3 wires



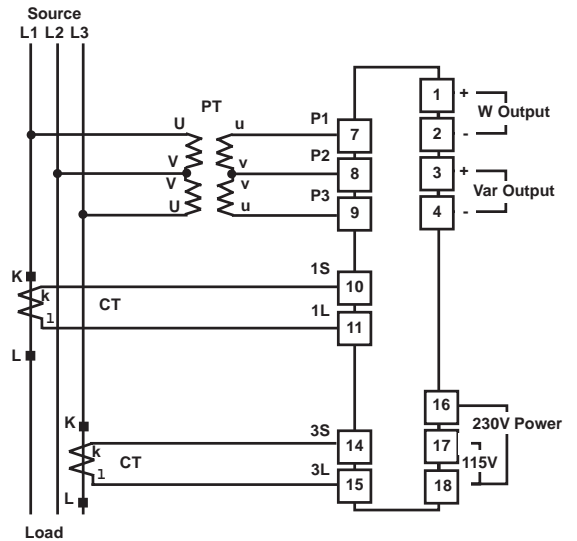
■ TW-33, TQ-33 (CASE B)

3 phase 3 wires



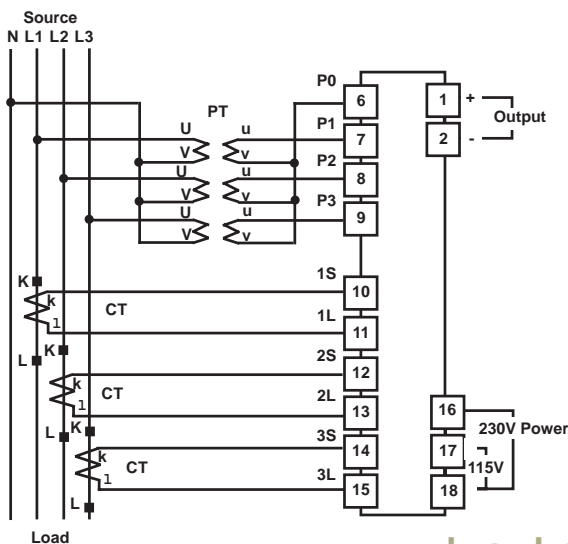
■ TWQ-33 (CASE B)

3 phase 3 wires



■ TW-34, TQ-34 (CASE B)

3 phase 4 wires



■ TWQ-34 (CASE B)

3 phase 4 wires

