

# CW/CQ AC WATT / VAR Transducer

## FEATURE

- Measuring Watt, Var or Watt & Var
- 1P2W, 1P3W, 3P3W, 3P4W Balanced or Unbalanced systems
- Precision measurement even for distorted wave
- Output range programmable by dip-switch
- Low output ripple
- High impulse & Surge protection
- High stability & low cost



## SPECIFICATION

### INPUT: Watt / Var

Connection	AC Input		Basic Ref. Value Watt or Var	Input Burden
	Voltage	Current		
1P2W	110V or 120V	5A (1A) <b>10A**</b>	± 0.5 K (± 0.1K)	≤ 0.10VA or ≤ 0.15VA
	220V or 240V		± 1.0 K (± 0.2K)	
1P3W	220V-110V		± 1.0 K (± 0.2K)	
	110V or 120V		± 1.0 K (± 0.2K)	
3P3W	220V or 240V		± 2.0 K (± 0.4K)	
	380V or 416V		± 3.0 K (± 0.6K)	
3P4W	190V <sub>LL</sub> -110V <sub>LN</sub> or 208V <sub>LL</sub> -120V <sub>LN</sub>		± 1.5 K (± 0.3K)	
	380V <sub>LL</sub> -220V <sub>LN</sub> or 416V <sub>LL</sub> -240V <sub>LN</sub>		± 3.0 K (± 0.6K)	

\* The maximum input is 450V and 5A in standard (**10Amax input available in option**), If the input over the level please connects with CT or PT to the transducer.  
 \*  $V_{ll}$  means Voltage of line to line;  $V_{ln}$  means Voltage of line to neutral.  
 \* The basic ref. value is base on second of PT & CT, and versus the high range of output.

### OUTPUT: Watt or Var O/P Programming by Dip Switch inside

Output Range	Load Resistance	Output Resistance	Output Ripple	
0 ~ 1 V / 0 ~ 0.5 ~ 1 V	≥ 500 ohm	≤ 0.001 ohm	≤ 0.2% of F.S.	
0 ~ 5 V / 0 ~ 2.5 ~ 5 V	≥ 500 ohm			
0 ~ 10 V / 0 ~ 5 ~ 10 V	≥ 1000 ohm			
1 ~ 5 V / 1 ~ 3 ~ 5 V	≥ 500 ohm			
-1 ~ 0 ~ +1 V	≥ 500 ohm			
-5 ~ 0 ~ +5 V	≥ 1000 ohm			
-10 ~ 0 ~ +10 V	≥ 1000 ohm			
0 ~ 1 mA / 0 ~ 0.5 ~ 1 mA	0 ~ 12K ohm			≥ 20M ohm
0 ~ 5 mA	0 ~ 2400 ohm			≥ 6M ohm
0 ~ 10 mA / 0 ~ 5 ~ 10 mA	0 ~ 1200 ohm			
0 ~ 20 mA / 0 ~ 10 ~ 20	0 ~ 600 ohm			
4 ~ 20 mA / 4 ~ 12 ~ 20	0 ~ 600 ohm			
-1 ~ 0 ~ +1 mA	0 ~ 8500 ohm	≥ 20M ohm		
-5 ~ 0 ~ +5 mA	0 ~ 17000 ohm	≥ 6M ohm		
-10 ~ 0 ~ +10 mA	0 ~ 600 ohm			
-20 ~ 0 ~ +20 mA	0 ~ 400 ohm			

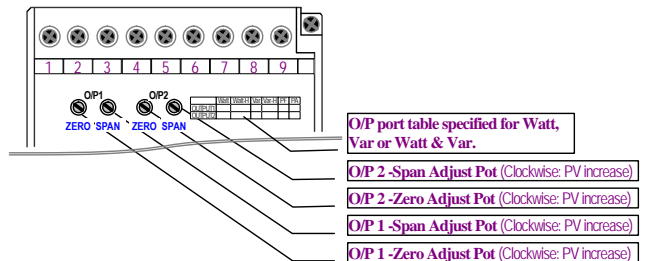
※When Aux Powered is DC, The Load Resistance is about 70%

- Accuracy :** ≤ ±0.2% of F.S.  
**Waveform effect:** ≤ 0.2% of F.S. at 30% distortion  
**Max. input over capability:** Voltage: 1.5 x rated continuous  
 2 x rated for 10 seconds  
 4 x rated for 2 seconds  
 Current: 3 x rated continuous  
 10 x rated for 10 seconds  
 50 x rated for 1 second  
 50 Hz ±3 Hz, 60 Hz ±3 Hz  
**Input frequency:** ≤ 250 m-sec.  
**Response time:** ≤ ±5% of F.S. (or ±20% of F.S. specify)  
**Span adjustment:** ≤ ±2% of F.S. (or ±20% of F.S. specify)  
**Zero adjustment:** Current output ≤ 0.1% of F.S.  
 Voltage output ≤ 0.05% of F.S.  
**Output load effect:** AC 115/230V ±15%, 50/60 Hz  
 AC 380 or 415V ±15%, 50/60 Hz  
 Option: DC 24V, 48V, 110V, 220V ±10%  
 Self Powered: Interior connection from input volt  
 Working volt: ±15% rated of input voltage  
 ADH: AC 85~265V; DC 100~300V  
 ADL: AC/DC 20~56V  
**Power supply:**

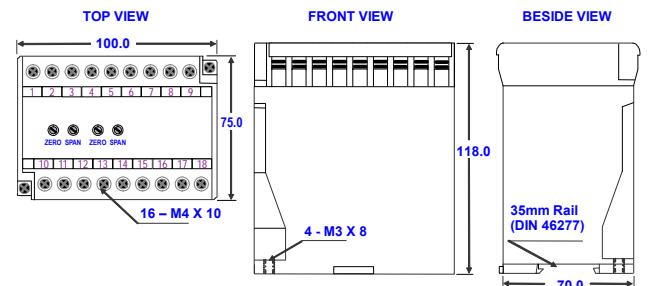
- Power effect:** ≤ 0.05% of F.S.  
**Power consumption:** ≤ 4VA  
**Mutual interference effect:** ≤ 0.1% of F.S. between each element  
**Magnetic field strength:** 400ATM ≤ 0.2% of F.S.  
**Operating temperature:** 0~60 °C  
**Operating relative humidity:** 20~95 %RH, non-condensing  
**Temperature coefficient:** ≤ 100 PPM/°C  
**Storage temperature:** -10~70 °C  
**Dielectric Strength:** IEC 414, IEC 688:1992, ANSI C37.90a  
 Between Input / Output / Power / Case  
 AC 4KV, 50/60Hz, 1 min.  
 IEC 255-4, ANSI C37.90a  
 6KV, 1.2 x 50 μsec.  
 Common mode & differential mode  
 IEC 414, BS 5458  
 IEC 529 (IP50)  
 Input / Output / Power / Case  
 ≥ 100M ohm, DC 500V  
**Performance:** Designed it comply with IEC 688  
**Mounting:** Wall or DIN rail (EN 50022)  
**Weight:** Under 650g

## ADJUSTMENT

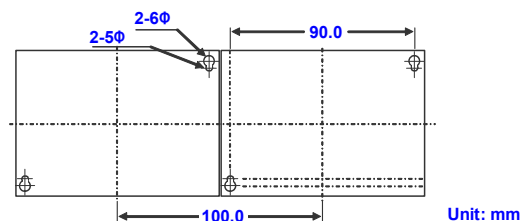
Watt / Var / Watt & Var:



## DIMENSIONS



## PANEL MOUNTING HOLES



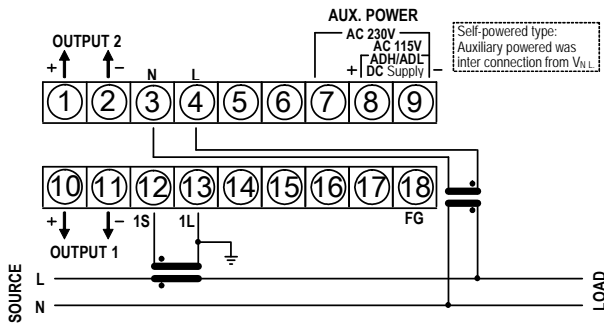
# OUTPUT RANGE PROGRAMMING

OUTPUT	pcb no. WQHP2-2										JUMPER	
	1	2	3	4	5	6	7	8	9	10	CN10	CN11
0 ~ 1 mA					on							—
0 ~ 5 mA					on	on				on		—
0 ~ 10 mA					on	on						—
0 ~ 20 mA					on		on					—
4 ~ 20 mA	on				on		on					—
0 ~ 0.5 ~ 1 mA					on				on	on		—
0 ~ 5 ~ 10 mA					on	on						—
0 ~ 10 ~ 20 mA					on		on		on	on		—
4 ~ 12 ~ 20 mA	on				on		on		on	on		—
-1 ~ 0 ~ +1 mA					on							—
-5 ~ 0 ~ +5 mA					on	on						—
-10 ~ 0 ~ +10 mA					on	on						—
-20 ~ 0 ~ +20 mA					on		on					—
0 ~ 1 V		on	on	on				on				—
0 ~ 5 V			on	on				on				—
0 ~ 10 V				on				on				—
1 ~ 5 V	on		on	on				on				—
2 ~ 10 V	on			on				on				—
0 ~ 0.5 ~ 1 V		on	on	on				on	on	on		—
0 ~ 2.5 ~ 5 V			on	on				on	on	on		—
0 ~ 5 ~ 10 V				on				on	on	on		—
1 ~ 3 ~ 5 V	on		on	on				on	on	on		—
2 ~ 6 ~ 10 V	on			on				on	on	on		—
-1 ~ 0 ~ +1 V		on	on	on				on				—
-5 ~ 0 ~ +5 V			on	on				on				—
-10 ~ 0 ~ +10 V				on				on				—

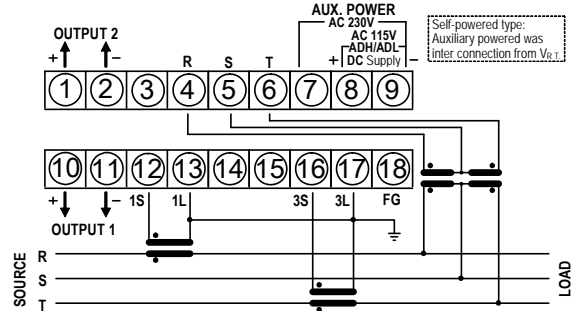
\* JUMPER: (1) "—" closed by jumper; (2) blank field mean open.  
ADH / ADL version; It's no CN10 and CN11 options

## CONNECTION DIAGRAM

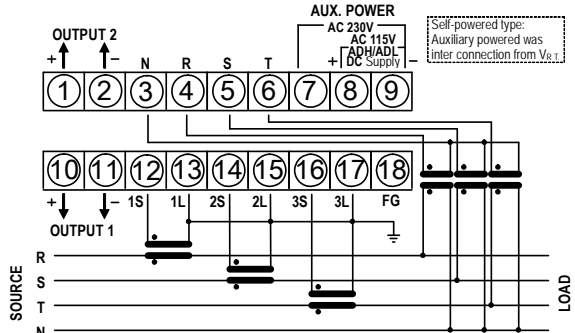
### Watt / Var / Watt & Var - 1Φ2W (Unbalanced Load)



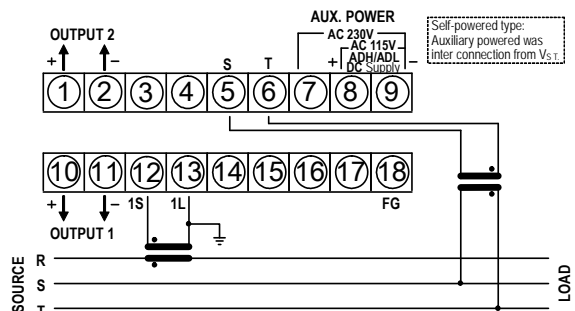
### Watt / Var / Watt & Var - 3Φ3W (Unbalanced)



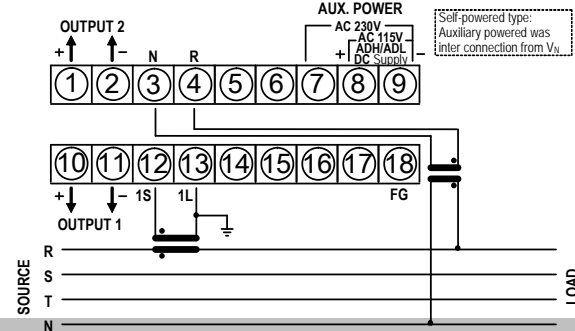
### Watt / Var / Watt & Var - 3Φ4W (Unbalanced Load)



### Watt / Var / Watt & Var - 3Φ3W (balanced Load)



### Watt / Var / Watt & Var - 3Φ4W (balanced Load)



## ORDERING INFORMATION

CODE	INPUT TYPE	CODE	INPUT RANGE	CODE	INPUT FREQ.	CODE	OUTPUT	CODE	OUTPUT	CODE	AUX. POWER
W	Watt	A1	0 ~ 1 A	5	50Hz ±3Hz	A1	0 ~ 1 mA	V1	0 ~ 1 V	A1	AC 115/230 V
Q	Var	A5	0 ~ 5 A	6	60Hz ±3Hz	A2	0 ~ 5 mA	V2	0 ~ 5 V	A2	AC 380 V
WQ	Watt & Var	AA	0 ~ 10A(Option)	F	Specify	A3	0 ~ 10 mA	V3	0 ~ 10 V	A3	AC 416 V
		V1	110V or 120 V			A4	0 ~ 20 mA	V4	1 ~ 5 V	D2	DC 24 V
		V2	220V or 240V			A5	4 ~ 20 mA	V5	0 ~ 0.5 ~ 1V	D4	DC 48 V
		V3	380V or 416V			A6	0 ~ 0.5 ~ 1mA	V6	0 ~ 2.5 ~ 5V	D1	DC 110 V
		V4	110V <sub>eff</sub> - 63.5V <sub>eff</sub> or 120V <sub>eff</sub> - 69.3V <sub>eff</sub>			A7	0 ~ 5 ~ 10mA	V7	0 ~ 5 ~ 10V	D3	DC 220 V
		V5	190V <sub>eff</sub> - 110V <sub>eff</sub> or 208V <sub>eff</sub> - 120V <sub>eff</sub>			A8	0 ~ 10 ~ 20mA	V8	1 ~ 3 ~ 5V	AS	Self Powered
		V6	380V <sub>eff</sub> - 220V <sub>eff</sub> or 416V <sub>eff</sub> - 240V <sub>eff</sub>			A9	4 ~ 12 ~ 20mA	V9	-1 ~ 0 ~ +1V	DO	Specify DC
		V7	220V-110V(1P3W)			AA	-1 ~ 0 ~ +1mA	VA	-5 ~ 0 ~ +5V	AO	Specify AC
		AO VO	Specify(A or V o/p)			AB	-5 ~ 0 ~ +5mA	VB	-10 ~ 0 ~ +10V	ADH	AC85~265V; DC100~300V
			*V4, V5, V6 will be selected in 3P4W connection.			AC	-10 ~ 0 ~ 10mA	VC	2~10 V	ADL	AC/DC 20~56V
						AD	-20 ~ 0 ~ 20mA	VO	Specify(V o/p)		
						AO	Specify(mA o/p)				

\*If the output range above have a middle point., (EX. A9: 4~12~20mA), it means bi-polar output.