

전력계 (Wattmeter)



■ 주요사항 (Specification)

■ 1P 2W (단상 2선식)

Type	Size (mm)	Scale Form	Input			Oper. Prin.	Accu. Class(%)	Burden		Weight(g)	Dimension	Remarks		
			V	A	Hz			Volt.	Curr.			Structure	Volt.	Curr.
SC – W1	80 × 80	Square (각형)	110V or 220V	5A or 1A	50/60		1.5	0.5	0.5	≒ 680	280~281page 참조	Ext.T/D	—	—
SB – W1	100 × 84									≒ 700				
SA – W1	120 × 100									≒ 750				
WB – W1	80 × 80	≒ 800												
WA – W1	110 × 110	≒ 920												
WA – TW1		≒ 740								Int.T/D				

※ 상기의 표준 전압 · 전류 이외의 제품은 고객의 요구에 따라 제작이 가능합니다.

■ 1P 3W (단상 3선식)

Type	Size (mm)	Scale Form	Input			Oper. Prin.	Accu. Class(%)	Burden		Weight(g)	Dimension	Remarks		
			V	A	Hz			Volt.	Curr.			Structure	Volt.	Curr.
SC - W2	80 × 80	Square (각형)	110V	5A or 1A	50/60		1.5	0.5	0.5	≒ 800	280~281page 참조	Ext.T/D	—	—
SB - W2	100 × 84									≒ 800				
SA - W2	120 × 100									≒ 850				
WB - W2	80 × 80	≒ 970												
WA - W2	110 × 110	≒ 930												
WA - TW2		≒ 800								Int.T/D				

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■ 3P 3W (3상 3선식)

Type	Size (mm)	Scale Form	Input			Oper. Prin.	Accu. Class(%)	Burden		Weight(g)	Dimension	Remarks		
			V	A	Hz			Volt.	Curr.			Structure	Volt.	Curr.
SC - W3	80 × 80	Square (각형)	110V or 220V	5A or 1A	50/60		1.5	0.5	0.5	≒ 850	280~281page 참조	Ext.T/D	Un	Un
SB - W3	100 × 84									≒ 850				
SA - W3	120 × 100									≒ 900				
WB - W3	80 × 80	≒ 970												
WA - W3	110 × 110	≒ 1090												
WA - TW3		≒ 800								Int.T/D				

Un : Unbalance

※ 상기의 표준 전압 · 전류 이외의 제품은 고객의 요구에 따라 제작이 가능합니다.

■ 3P 4W (3상 4선식)

Type	Size (mm)	Scale Form	Input			Oper. Prin.	Accu. Class(%)	Burden		Weight(g)	Dimension	Remarks			
			V	A	Hz			Volt.	Curr.			Structure	Volt.	Curr.	
SC – W4	80 × 80	Square (각형)	$190/\sqrt{3}$ or $380/\sqrt{3}$	5A or 1A	50/60		1.5	0.5	0.5	≒ 850	280~281page 참조	Ext.T/D	B	Un	
SC – UW4										≒ 900			Un		
SB – W4	100 × 84									≒ 850			B		
SB – UW4										≒ 930			Un		
SA – W4	120 × 100									≒ 900			B		
SA – UW4										≒ 900			Un		
WB – W4	80 × 80	Wide Angle (광각형)								≒ 970			B		
WB – UW4										≒ 1020			Un		
WA – W4	110 × 110									≒ 1090		B			
WA – UW4										≒ 1170		Un			
WA – TW4										≒ 870		B			
WA – UTW4										≒ 890		Un			

B : Balance, Un : Unbalance

※ 상기의 표준 전압 · 전류 이외의 제품은 고객의 요구에 따라 제작이 가능합니다.

■ 주요특징 (Overview)

본 계기는 유효전력을 측정하는 Transducer형 계기로 변환기(Transducer)를 계기 내부(Int.) 또는 외부(Ext.)에 부착하여 사용합니다.

The types of operating principle of the meter is the transducer type, this meter measure active power.

Watt-meter transducer is internal type and/or external type.

동작전압의 범위는 정격전압의 ±15% 이내 입니다.

Operating voltage range is ±15% of rated voltage.

정격을 초과하여 사용할 경우에는 AC110V / 5A의 VT와 CT를 연결하여 사용하십시오.

WA - TW□type의 전력계는 Transducer box를 내장하고 있으며, □□ - W□type의 전력계는 외부에 Transducer box를 연결하여 사용하십시오.

Combine AC 110V VT and AC 5A CT in case of over rating value.

In case of the WA - TW□ type of Watt-meters, transducer box is self-contained and the □□ - W□ type of Watt-meters are provided with on external transducer box.

3상4선식 전력계의 정격전압은 상 전압으로 표시됩니다. ($1/\sqrt{3}$ V)

Rating voltage of 3P 4W is indicated the phase to earth voltage. ($1/\sqrt{3}$ V)

VT와 CT를 사용한 전력계의 교정전력은

$$\text{교정전력} = \frac{\text{최대눈금치}}{VT\text{비} \times CT\text{비}}$$

When using VT and CT calibrating Watts will be as follows.

$$\text{Calibrating Watt} = \frac{\text{Full scale value}}{VT \text{ Ratio} \times CT \text{ Ratio}}$$

ex 1) 3P 3W

Full scale Wattmeter : 600kW

VT Ratio : 6600 / 110V

CT Ratio : 50 / 5A

$$\begin{aligned} \text{Calibration Watts} &= \frac{600\text{kW}}{(6600 / 110\text{V}) \times (50 / 5\text{A})} \\ &= 1.0\text{kW} \end{aligned}$$

ex 2) 3P 4W

Full scale Wattmeter : 2000kW

VT Ratio : $22900/\sqrt{3} / 190/\sqrt{3}$ V

CT Ratio : 50 / 5A

$$\begin{aligned} \text{Calibration Watts} &= \frac{2000\text{kW}}{(22900/\sqrt{3} / 190/\sqrt{3} \text{ V}) \times (50 / 5\text{A})} \\ &= 1.666\text{kW} \end{aligned}$$

최대눈금 및 교정전력은 Standard Full Scale Watts Table을 참조하시기 바랍니다.

Max. scale and calibration watt refer to the Standard Full Scale Watts Table.

전류의 방향을 확인하려고 할 경우에는 ±전력계를 사용하십시오.

When shall be catch the flow of current, be use the ±Watt meter.



■ Wattmeter 표준 최대 눈금표 (Standard Full Scale Watts Table)

CT 2차 전류가 5A일 경우의 Full Scale Watts Table

(Unit : kW)

Phase × Wire V.T ratio Calibrating C.T ratio Watts	1×2	1×3	3×3								3×4				
	110	110	220	$\frac{380}{110}$	$\frac{440}{110}$	$\frac{3300}{110}$	$\frac{6600}{110}$	$\frac{22000}{110}$	$\frac{22900}{110}$	$\frac{154kV}{110}$	$208/\sqrt{3}$	$\frac{380/\sqrt{3}}{190/\sqrt{3}}$	$380/\sqrt{3}$	$\frac{11400/\sqrt{3}}{190/\sqrt{3}}$	$\frac{22900/\sqrt{3}}{190/\sqrt{3}}$
	0.6kW	1.0kW	2.0kW	1.158kW	1.0kW	1.0kW	1.0kW	1.0kW	0.961kW	1.0kW	2.0kW	2.0kW	4.0kW	1.666kW	1.666kW
5/5	0.6	1	2	4	4	30	60	200	200	1400	2	4	4	100	200
10/5	1.2	2	4	8	8	60	120	400	400	2800	4	8	8	200	400
15/5	1.8	3	6	12	12	90	180	600	600	4200	6	12	12	300	600
20/5	2.4	4	8	16	16	120	240	800	800	5600	8	16	16	400	800
25/5	3.0	5	10	20	20	150	300	1000	1000	7000	10	20	20	500	1000
30/5	3.6	6	12	24	24	180	360	1200	1200	8400	12	24	24	600	1200
40/5	4.8	8	16	32	32	240	480	1600	1600	11.2MW	16	32	32	800	1600
50/5	6.0	10	20	40	40	300	600	2000	2000	14.0	20	40	40	1000	2000
60/5	7.2	12	24	48	48	360	720	2400	2400	16.8	24	48	48	1200	2400
75/5	9.0	15	30	60	60	450	900	3000	3000	21.0	30	60	60	1500	3000
80/5	9.6	16	32	64	64	480	960	3200	3200	22.4	32	64	64	1600	3200
100/5	12.0	20	40	80	80	600	1200	4000	4000	28.0	40	80	80	2000	4000
120/5	14.4	24	48	96	96	720	1440	4800	4800	33.6	48	96	96	2400	4800
150/5	18.0	30	60	120	120	900	1800	6000	6000	42.0	60	120	120	3000	6000
200/5	24.0	40	80	160	160	1200	2400	8000	8000	56.0	80	160	160	4000	8000
250/5	30.0	50	100	200	200	1500	3000	10MW	10MW	70.0	100	200	200	5000	10MW
300/5	36.0	60	120	240	240	1800	3600	12	12	84.0	120	240	240	6000	12
400/5	48.0	80	160	320	320	2400	4800	16	16	112.0	160	320	320	8000	16
500/5	60.0	100	200	400	400	3000	6000	20	20	140	200	400	400	10MW	20
600/5	72.0	120	240	480	480	3600	7200	24	24	168	240	480	480	12	24
750/5	90.0	150	300	600	600	4500	9000	30	30	210	300	600	600	15	30
800/5	96.0	160	320	640	640	4800	9600	32	32	224	320	640	640	16	32
1000/5	120.0	200	400	800	800	6000	12MW	40	40	280	400	800	800	20	40
1200/5	144.0	240	480	960	960	7200	14.4	48	48	336	480	960	960	24	48
1500/5	180.0	300	600	1200	1200	9000	18.0	60	60	420	600	1200	1200	30	60
2000/5	240.0	400	800	1600	1600	12MW	24.0	80	80	560	800	1600	1600	40	80
2500/5	300.0	500	1000	2000	2000	15	30.0	100	100	700	1000	2000	2000	50	100

CT 2차 전류가 1A일 경우의 Full Scale Watts Table

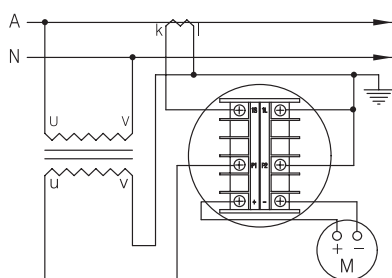
(Unit : kW)

Phase × Wire V.T ratio Calibrating C.T ratio Watts	1×2	1×3	3×3								3×4				
	110	110	220	$\frac{380}{110}$	$\frac{440}{110}$	$\frac{3300}{110}$	$\frac{6600}{110}$	$\frac{22000}{110}$	$\frac{22900}{110}$	$\frac{154kV}{110}$	$208/\sqrt{3}$	$\frac{380/\sqrt{3}}{190/\sqrt{3}}$	$380/\sqrt{3}$	$\frac{11400/\sqrt{3}}{190/\sqrt{3}}$	$\frac{22900/\sqrt{3}}{190/\sqrt{3}}$
	120W	200W	400W	232W	200W	200W	200W	200W	192W	200W	400W	400W	800W	333W	333W
5/1	0.6	1	2	4	4	30	60	200	200	1400	2	4	4	100	200
10/1	1.2	2	4	8	8	60	120	400	400	2800	4	8	8	200	400

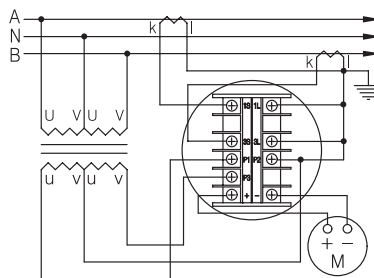
※ CT의 2차 전류가 1A일 경우의 '예'이며, 5A의 Calibrating Watts의 1/5값입니다.

■ 외부결선 (External Connection)

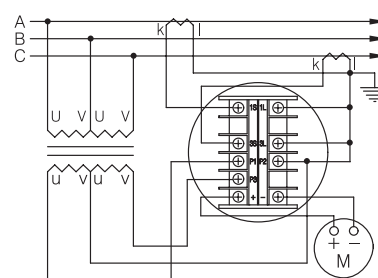
■ Ext. T/D Type



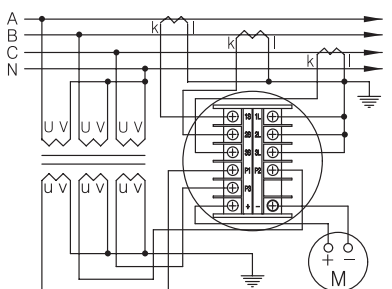
1P 2W



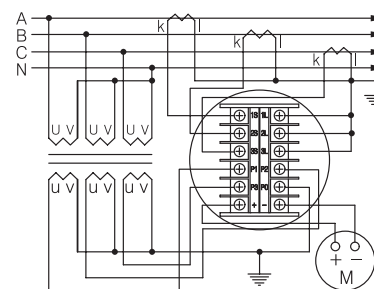
1P 3W



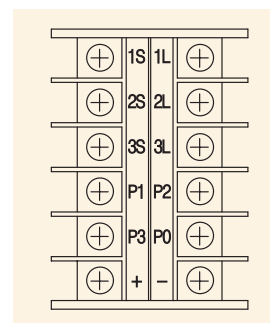
3P 3W



3P 4W Balance

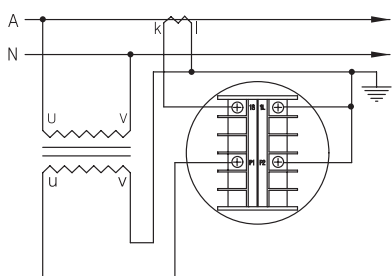


3P 4W Unbalance

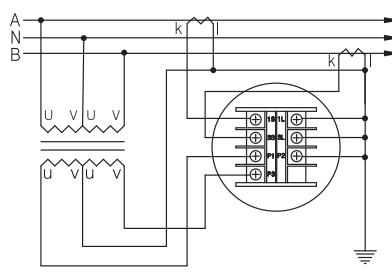


단자구조도

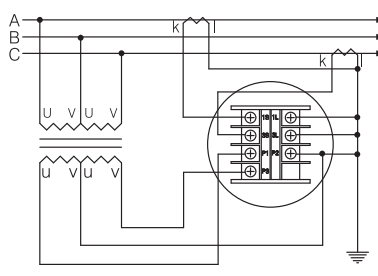
■ Int. T/D Type



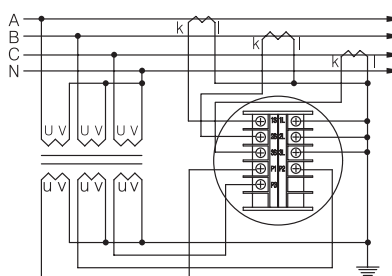
1P 2W



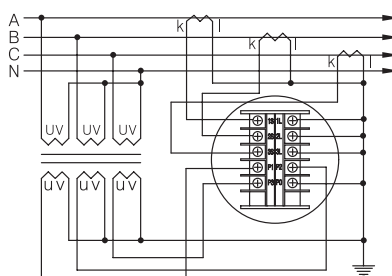
1P 3W



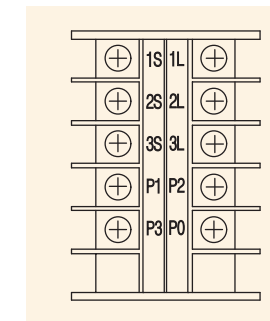
3P 3W



3P 4W Balance



3P 4W Unbalance

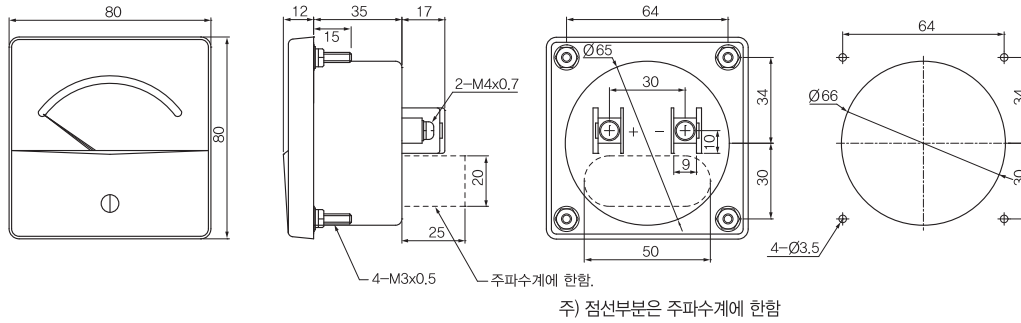


단자구조도

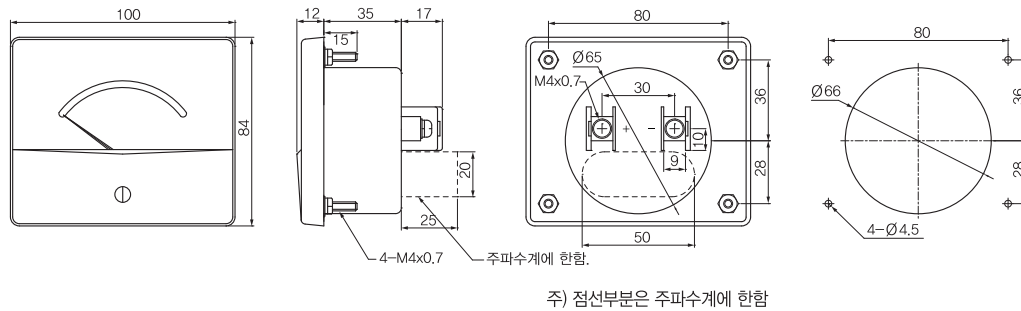
■ 외형치수 (Dimension)

■ SC Type

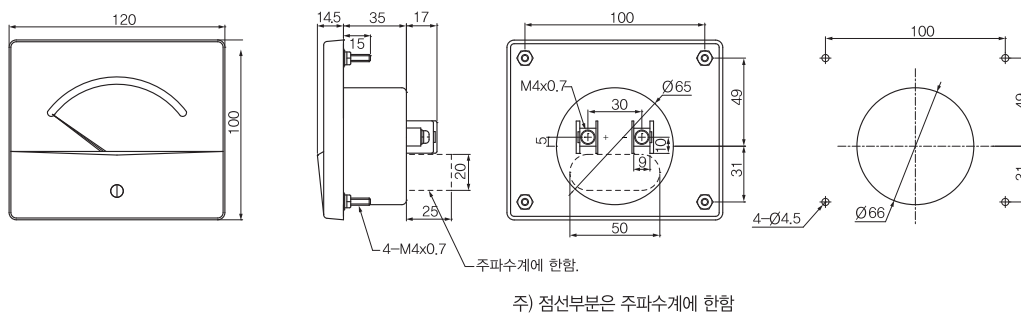
Unit : mm



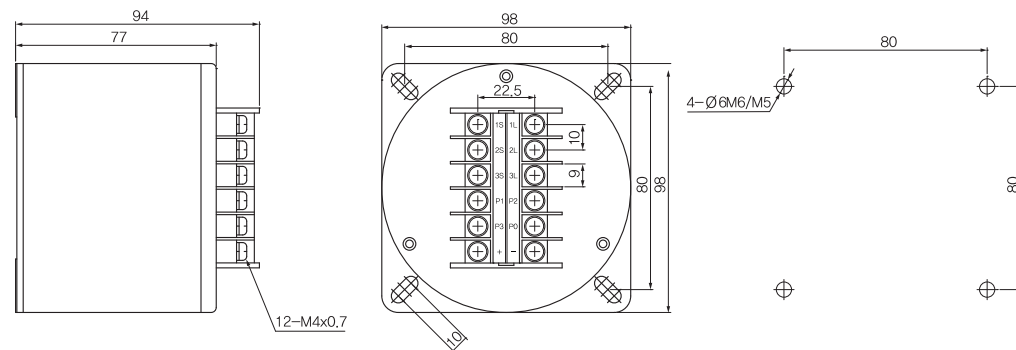
■ SB Type



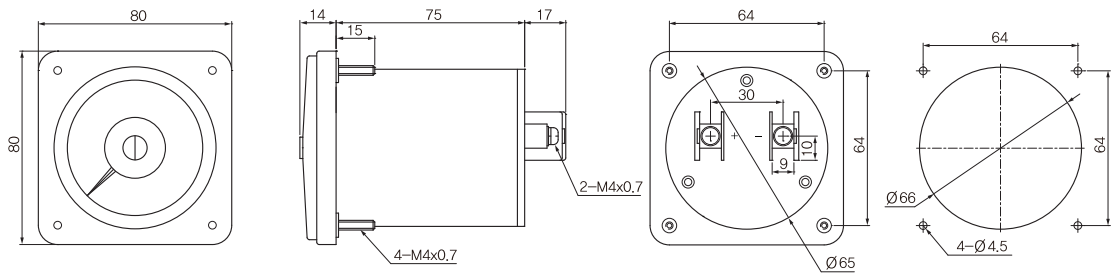
■ SA Type



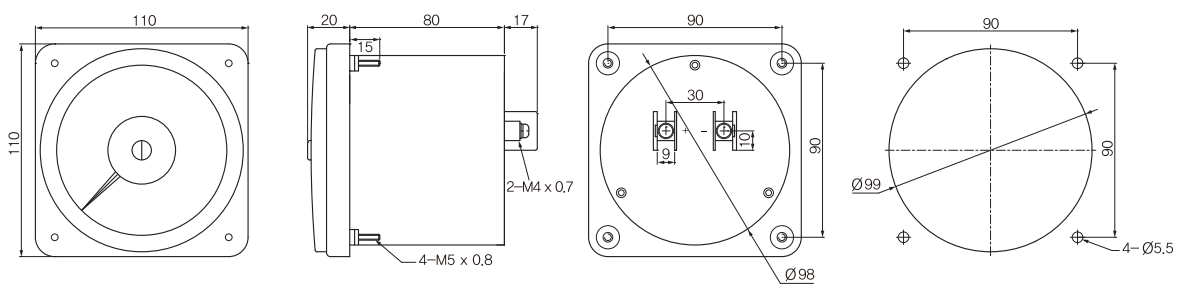
■ EXTERNAL TRANSDUCER(For meter)



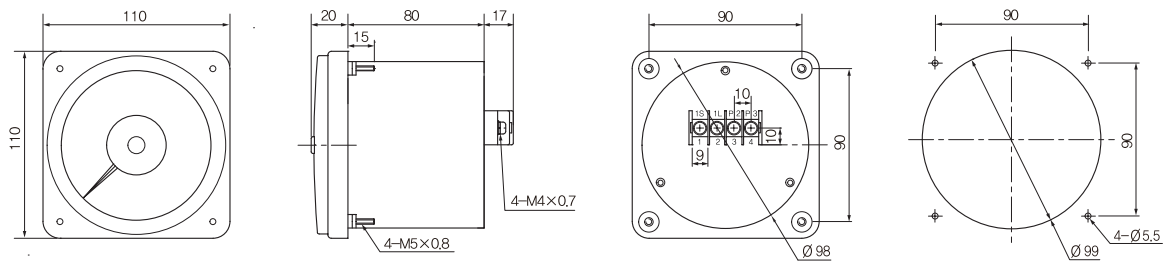
■ WB Type(WB – A1, A2, V1, V2, H1)



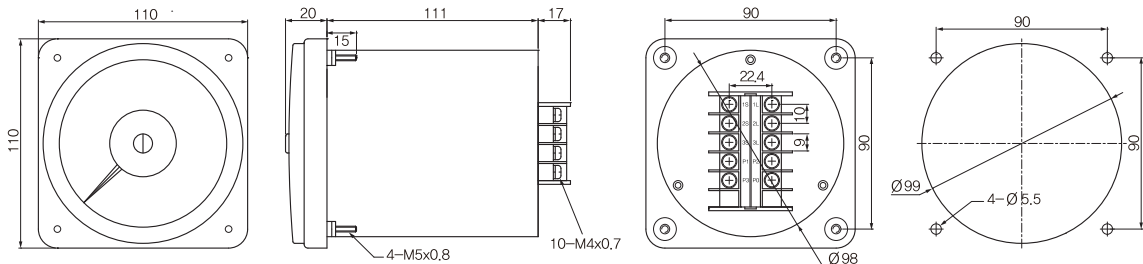
■ WA Type



■ WA – TP Type



■ WA – TW4, TR4, UTR4, UTP4, TP1, TW1 Type



주) 단 TW4, TR4는 PO단자가 없음

■ WA – TW2, TR2, TP2, TW3, TR3, UTP3 Type

