



**Watt- and varmeters  
MW96 / MV96**

**96x96  
DIN 43700  
moving coil instrument with  
electronic circuit  
class 1.5**

## Wattmeters and Varmeters

**MW96 1/2/3/4/5 - ERV96 1/2/3/4/5 ( 90° scale)  
MWL96 1/2/3/4/5 - MVL96 1/2/3/4/5 ( 240° scale)**

single-phase	( MW96/1 – MV96/1 )
3 phase – 3-wire balanced load	( MW96/2 – MV96/2 )
3 phase – 3 wire unbalanced load	( MW96/3 – MV96/3 )
3 phase – 4 wire balanced load	( MW96/4 – MV96/4 )
3-phase – 4-wire unbalanced load	( MW96/5 – MV96/5 )



burden: current circuit: ca. 0,5VA  
voltage circuit: ca. 1,5VA  
input voltage: 100V, 230V, oder 400V +/- 20%  
input current: 5A

overload: 1,2 In = continuously ; 1,5 In = <2 hours ; 2 In = < 5 seconds

input resistance voltage circuit: ca. 16 kΩ / V  
current circuit: less as 50 mΩ

When ordering please indicate:

- 1) type of current: single or 3-phase, with or without neutral, balanced or unbalanced load between phases, between phase-neutral. If voltage transformers is used please indicate primary and secondary voltage
- 2) voltage: please indicate primary and secondary voltage
- 3) current: max.5A direct. If current transformers are used please indicate primary and secondary current
- 4) scale value: if not indicated, it is calculated by us according to the following table.

In order to achieve the above, the various converters have been calibrated as follows:



Example when ordering

ERW96/14 400V 100/5A 80kW wattmeter, single phase 400V  
ERW96/21 100V 500/5A 100kW wattmeter, 3-phase, 3 wire unbalanced load

Scale plates are linear, with values expressed in:

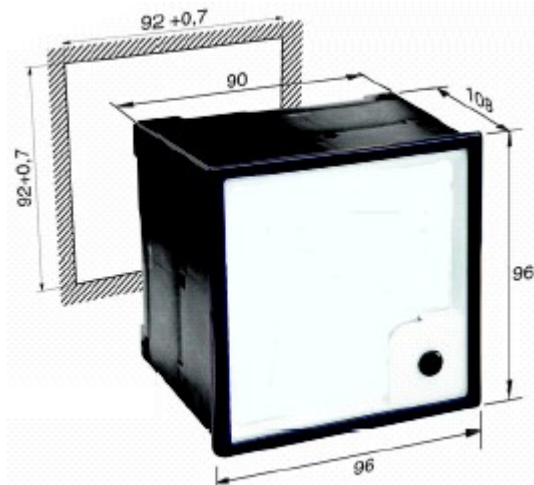
for wattmeters: Watt(W) Kilowatt (kW) Megawatt (MW)  
for varmeters : VA (Var) KiloVar (kVar) Megavar (Mvar)

weight ERW96 (0,58kg) ERV96 (0,58kg)  
ERWL96(0,65kg) ERVL96(0,65kg)

**Changeable scales for wattmeters and varmeters**

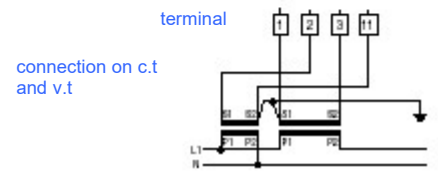
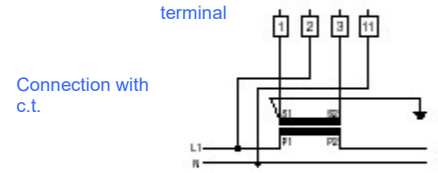
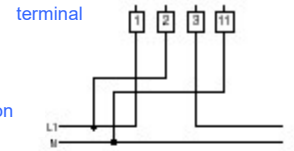
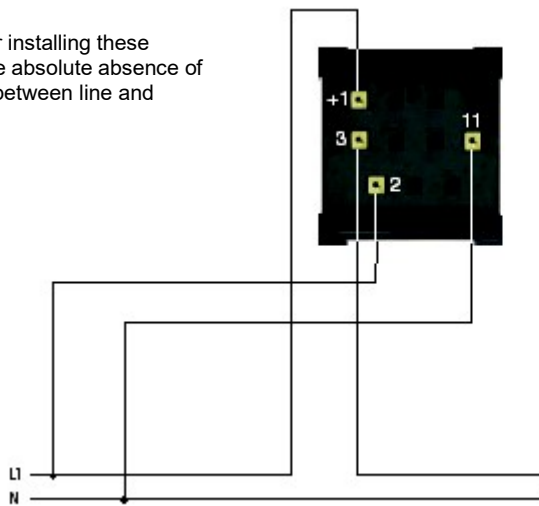
By adopting a single instrument with an interchangeable scale and multi-voltage converter it is possible to obtain all the capacities shown on the table below. It is sufficient to select the input voltage on the accessory and to insert the scale corresponding to the current-transformer used. If for example there is a need for a mono-phase 380V wattmeter (varmeter) with a c.t. ratio of 300/5A; the corresponding scale to insert into the instrument has a 120kW (kVar) scale. This function only applies if the input voltage is direct and not by means of v.t. in which case calibration in the factory is preferable. If instead it is necessary to take advantage of the multiscale function, even if the entry voltage derives from a v.t. eg. 1500/100V, always bearing in mind a mono-phase wattmeter, it is necessary to seek the voltage constant and therefore  $1500/100=15$ . In order to obtain the scale value introduce into the indicating instrument it is necessary to multiply the number found (here 15) by the value of the scale on the table corresponding to c.t.300/5A which is 30kW (kVar)Therefore  $15 \times 30kW(kVar) = 450kW(kVar)$

Current-transformer	singel phase Wattmeters /varmeters			3-phase wattmeters / varmeters		
	100V	230V	400V	100V	230V	400V
5/5A	500W(Var)	1000W(Var)	2000W(Var)	1000W(Var)	2000W(Var)	4000W(Var)
10/5A	1000W(Var)	2000W(Var)	4000W(Var)	2000W(Var)	4000W(Var)	8000W(Var)
15/5A	1500W(Var)	3000W(Var)	6000W(Var)	3000W(Var)	6000W(Var)	12KW(KVar)
20/5A	2000W(Var)	4000W(Var)	8000W(Var)	4000W(Var)	8000W(Var)	16KW(KVar)
25/5A	2500W(Var)	5000W(Var)	10KW(KVar)	5000W(Var)	10KW(KVar)	20KW(KVar)
30/5A	3000W(Var)	6000W(Var)	12KW(KVar)	6000W(Var)	12KW(KVar)	24KW(KVar)
40/5A	4000W(Var)	8000W(Var)	16KW(KVar)	8000W(Var)	16KW(KVar)	32KW(KVar)
50/5A	5000W(Var)	10KW(KVar)	20KW(KVar)	10KW(KVar)	20KW(KVar)	40KW(KVar)
60/5A	6000W(Var)	12KW(KVar)	24KW(KVar)	12KW(KVar)	24KW(KVar)	48KW(KVar)
80/5A	8000W(Var)	16KW(KVar)	32KW(KVar)	16KW(KVar)	32KW(KVar)	64KW(KVar)
100/A	10KW(KVar)	20KW(KVar)	40KW(KVar)	20KW(KVar)	40KW(KVar)	80KW(KVar)
150/5A	15KW(KVar)	30KW(KVar)	60KW(KVar)	30KW(KVar)	60KW(KVar)	120KW(KVar)
200/5A	20KW(KVar)	40KW(KVar)	80KW(KVar)	40KW(KVar)	80KW(KVar)	160KW(KVar)
250/5A	25KW(KVar)	50KW(KVar)	100KW(KVar)	50KW(KVar)	100KW(KVar)	200KW(KVar)
300/5A	30KW(KVar)	60KW(KVar)	120KW(KVar)	60KW(KVar)	120KW(KVar)	240KW(KVar)
400/5A	40KW(KVar)	80KW(KVar)	160KW(KVar)	80KW(KVar)	160KW(KVar)	320KW(KVar)
500/5A	50KW(KVar)	100KW(KVar)	200KW(KVar)	100KW(KVar)	200KW(KVar)	400KW(KVar)
600/5A	60KW(KVar)	120KW(KVar)	240KW(KVar)	120KW(KVar)	240KW(KVar)	480KW(KVar)
800/5A	80KW(KVar)	160KW(KVar)	320KW(KVar)	160KW(KVar)	320KW(KVar)	640KW(KVar)
1000/5A	100KW(KVar)	200KW(KVar)	400KW(KVar)	200KW(KVar)	400KW(KVar)	800KW(KVar)
1500/5A	150KW(KVar)	300KW(KVar)	600KW(KVar)	300KW(KVar)	600KW(KVar)	1200KW(KVar)
2000/5A	200KW(KVar)	400KW(KVar)	800KW(KVar)	400KW(KVar)	800KW(KVar)	1600KW(KVar)
2500/5A	250KW(KVar)	500KW(KVar)	1000KW(KVar)	500KW(KVar)	1000KW(KVar)	2000KW(KVar)



**- wattmeter / varmeter  
single phase**

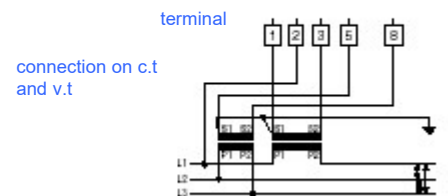
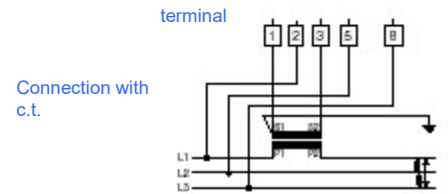
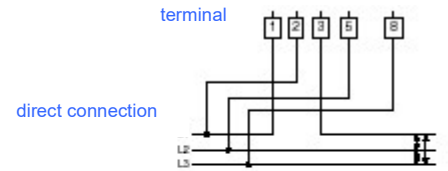
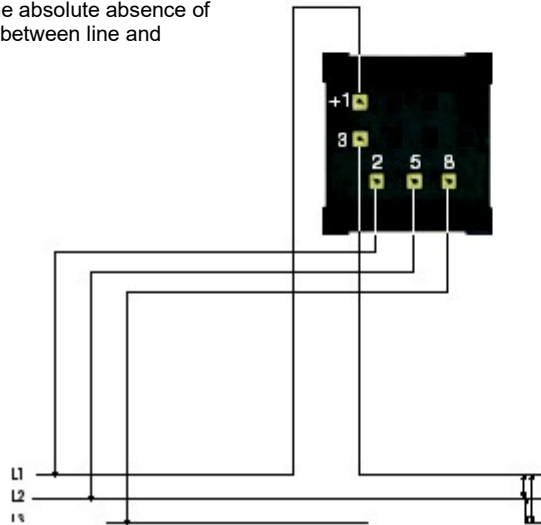
Note: any operation necessary for installing these instruments must take place in the absolute absence of voltage, as there is no insulation between line and instrument!



MW96/2 - MWL96/2

**- wattmeter  
3-phase, 3-wire unbalanced load**

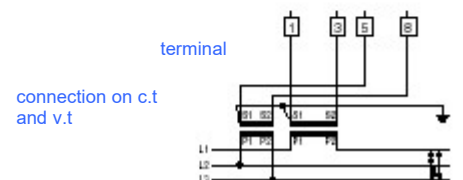
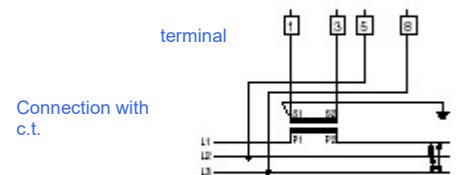
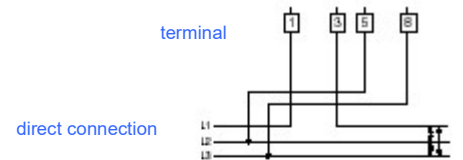
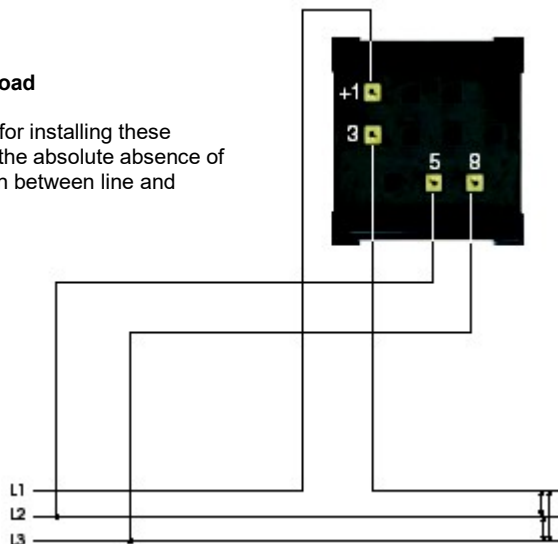
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MV96/2 - MVL96/2

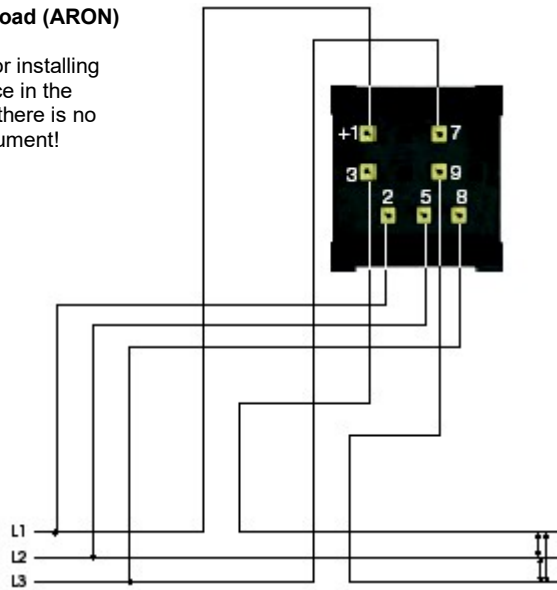
**- varmeter  
3-phase, 3-wire, balanced load**

Note: any operation necessary for installing these instruments must take place in the absolute absence of voltage, as there is no insulation between line and instrument!



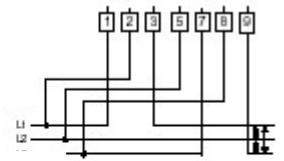
**- wattmeter / varmeter**  
**3-phase, 3-wire unbalanced load (ARON)**

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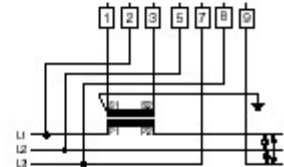
terminal

direct connection



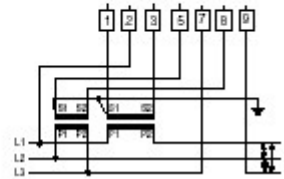
terminal

Connection with c.t.



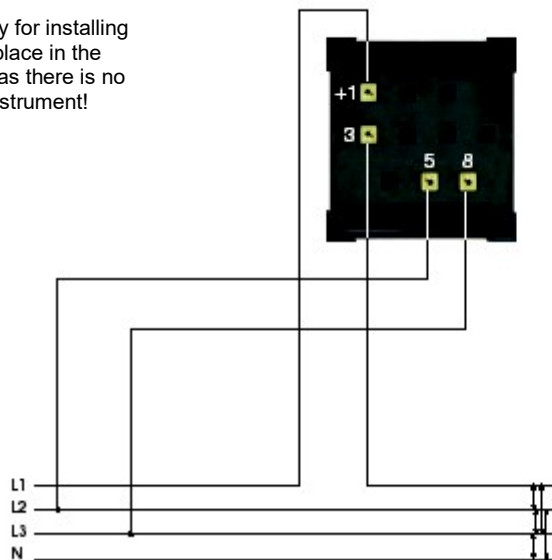
terminal

connection on c.t and v.t



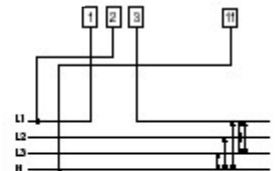
**- wattmeter**  
**3-phase, 4-wire, balanced load**

Note: any operation necessary for installing these instruments must take place in the absolute absence of voltage, as there is no insulation between line and instrument!



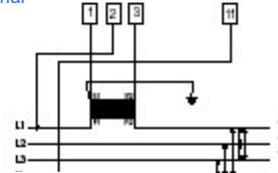
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direct connection



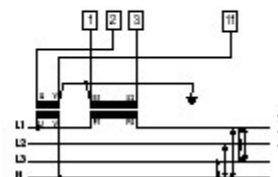
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Connection with c.t.



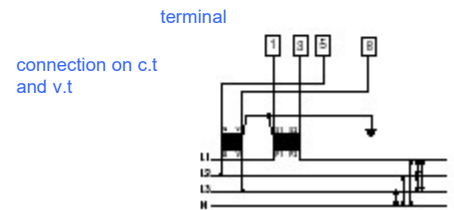
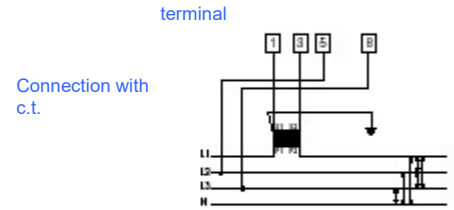
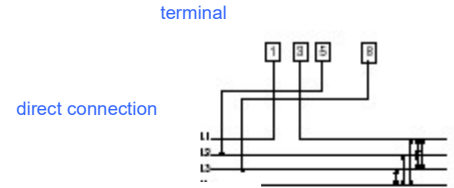
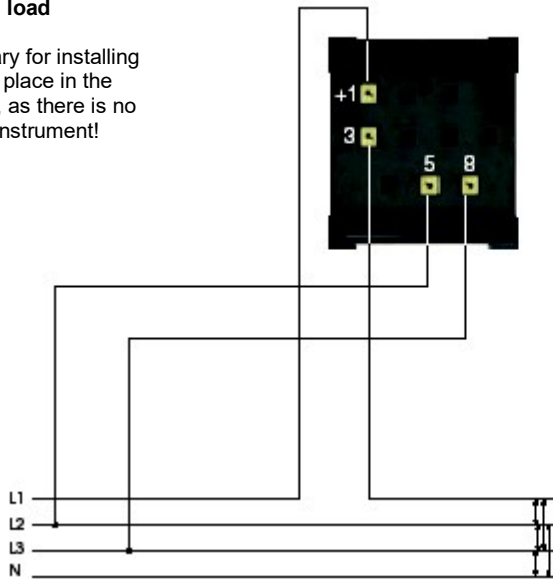
terminal

connection on c.t and v.t



**- varmeter**  
**3-phase, 4-wire, balanced load**

Note: any operation necessary for installing these instruments must take place in the absolute absence of voltage, as there is no insulation between line and instrument!



**- wattmeter/ varmeter**  
**3-phase, 4-wire, unbalanced load**

Note: any operation necessary for installing these instruments must take place in the absolute absence of voltage, as there is no insulation between line and instrument!

