Ziegler

Redefine Innovative Metering

Technical Datasheet

POWER METER WQ/WL

ANALOG PANEL METERS

www.ziegler-instrument.com

POWER METER WQ/WL

ANALOG PANEL METERS

WQ/WL

Analog power (Watt / Var) Meters are designed to measure active and reactive power in both balanced and unbalanced, single phase, 3 phase 3 wire, 3 phase 4 wire systems. The instruments are suitable to indicate forward (export / outgoing) and reverse (import / incoming) power flow. Scale is linear and non-interchangeable.

Product Features

- Linear scale
- Glass filled polycarbonate housing
- Higher Proof Voltage 2kV AC for 1 minute
- Knife edge pointer
- Easily replaceable glass and bezel
- Center zero and offset zero models are also available
- Easy installation with swivel screws

Specifications:

Scale & Pointer	
Pointer	Knife - edge Pointer
Pointer Deflection(WQ)	0…90°
Pointer Deflection(WL)	0…240°
Scale characteristics	Linear *1
Scale division	Coarse – Fine
Scale length(WQ)	WQ96 : 97mm, VQ144 : 146mm
Scale length(WL)	WL96 : 142mm, WL144 : 230mm
Over range	
Scale Interchangeability	Interchangeable*
Mechanical Data	
Case details	Moulded square case suitable for mounting in Control / Switchgear panels, Machinery consoles
Case material	Glass filled Polycarbonate – Flame retardant and drip proof as per UL94 V-0.
Front facia	Glass
Colour of bezel	Black
Position of use	Vertical
Panel fixing	Swivel screws
Mounting	Stack-able in a single cutout
Panel thickness(WQ)	≤25mm
Terminals for Voltage & Current < 6A(WQ)	Hexagon studs, M4 screws & wire clamps E3 (DIN 46282)
Terminals for Voltage & Current < 6A/10A(WL)	Hexagon studs, M4 screws & wire clamps E3 (DIN 46282)

Electrical Data	
Measured quantity	Active or Reactive Power
Overload capacity (acc to IEC 60051)	Continuously 1.2 times rated voltage or current
	Short duration for voltage : 2 times for 5 sec

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	Short duration for Current : 10 times for 5 sec
	Response Time 4 sec
Power consumption approx. Current path(WQ)	≤0.2VA
Power consumption approx. Current path(WL)	≤0.25VA
Power Consumption approx. Voltage path types E1W,D1W,D1B,V1W,V1B E1B D2W,D2B V3W V3B	 ≤3.0VA ≤3.5VA ≤3.4VA ≤3.9VA ≤4.3VA
Enclosure code (IEC 529)	IP52 for case IP 00 for terminals without back cover
Insulation class	Group A according to VDE 0110
Rated Insulation Voltage	660V
Proof voltage	2KV
Installation category IEC 61010	300V CAT III
Insulation resistance	>50 MΩ at 500V DC
Reference Conditions	
Accuracy Class	1.5 according to IEC 60051 / DIN EN 60051
Ambient temperature	23°C ± 2°C
Position of use	Nominal position ± 1°
Input	Full scale power value PW or Pb
Feasibility factor	“Lambda” = PW / PS or Pb/ PS
Power factor	Cos ϕ = 1 ± 0.01 for Watt meters Sin ϕ = 1 ± 0.01 for Var meters
Voltage	Rated voltage ± 2%
Frequency	45…65 Hz (50Hz ± 0.1 % for E1B)
Current	20% ……120% of rated current
Other Conditions	IEC 60051 / DIN EN 60051
Nominal range of use Ambient Temperature	0……50°C
Position of use	Vertical ± 5°
External Magnetic Field	0.5 mT
Environmental conditions	
Climatic suitability	Climate category II as per IEC 60051 (climatic class 3 acc to VDE/VDI 3540)
Operating temperature	0 … +50°C
Storage temperature	-25 … +65°C
Relative Humidity	≤ 75% annual average, non-condensing
Shock resistance	15g, 11ms
Vibration resistance	10-55-10 Hz/0.15mm, 1.5 g at about 50 Hz

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STANDARD MEASURING RANGES FOR WQ/WL

Type	Active Power	Reactive Power
Single Phase System	E1W	E1B
3 phase 3 wire system balanced load	D1W	D1B
3 phase 4 wire system balanced load	V1W	V1B
3 phase 3 wire system unbalanced load	D2W	D2B
3 phase 4 wire system unbalanced load	V3W	V3B

Selection of measuring ranges

Apparent power PS is calculated from primary ratings of current transformer and voltage transformer.

In single phase network, PS = V . I where V = voltage between phase and neutral & I = line current.

In three phase network, PS = v3. V. I where V = Voltage between two phases & I = line current.

Full scale value i.e range of the instrument (PW = active power,Pb = reactive power) must be selected in such a way that the same remain between 0.5 times and 1.5 times the value of apparent power PS.

Thus feasibility factor "Lambda" should be between 0.3 and 1.5 where "Lambda" = PW/PS or Pb/PS Full scale values shall preferably be selected from standard series according to DIN 43701, 1-1.2-1.5-2-2.5-3-4-5-6-7.5-8 and their decadic / decimal multiples.

Rated voltage :- **For Single phase**(E1W,E1B):- 57.7,63.5,100,110,127,220,289,380.

For Three phase (D1W,D1B,D2W,D2B,V1W,V1B,V3W,V3B):-100, 110,220,240,380,415,440,500. The voltage will be considered as a phase voltage (between phase an neutral) in case of single phase meters and as a line voltage (between two phases) in case of multiphase (2 wire, 3 wire and 4 wire) meters.

Rated current :- 1 A or 5 A If used on current transformer, please state transformer ratio on the order.

Options	
Front facia	Anti glare glass
Colour of bezel	Red, Yellow, Blue, White
Red Index pointer	Front adjustable on site
Position of use	On request 0°...180°
Accuracy class	1
Blank dial	With initial and end values marked
Special markings	Numbering / Lettering
Division dials	Basic divisions without numbering
Colour marking / band	Red or green

Applicable standards	
Nominal case & cutout dimensions for indicating electrical instruments	DIN 43700
Scale & Pointer for electrical measuring instruments	IEC 60051, DIN 43802
Connections and terminal markings for panel meters	IEC 60051, DIN 43807
Terminal bolts / leads	DIN 46200/46282
Clamp straps for connections	DIN 46282

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Safety requirements and protective measures for Electrical indicating instruments and their accessories	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529, IEC 1010
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories Environmental conditions	IEC 60051 / DIN EN 60051, DIN 43701, IEC 60051, VDE / VDI 3540
Front frames for indicating measuring instruments principle dimensions	DIN 43718
UL Combustibility class	UL94 V-0
Technical conditions of delivery for electrical instruments	DIN 43701
Mechanical strength (Free fall test, vibration test)	IEC 60051, VDE 0411,part 1, Sec. 43/44, IEC 1010
Environmental Conditions	VDE/VDI 3540
Electromagnetic Compatibility (EMC) Compliance as per following standards	EN 50081-2,EN 50082-2, EN 55011/CISPR 11, EN 60555 -2,IEC 555-2, EN 61000-4-4 / IEC 1000-4-4, EN 61000-4-2 / IEC 1000-4-2, EN 61000-4-5 / IEC 1000-4-5, ENV 50140
Comply with following European directives	89/336/EEC (EMC directive), 73/23/EEC (low voltage directive), & amendment 93/68/EEC for CE marking

Accessories

Safety Terminal Protection

Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc to VDE 0410.

Safety Precautions

1) Instruments with damaged bezels or window glasses must be disconnected from the mains.
2) Adequate safety clearance must be maintained to control panel fasteners and to sheet metal housing. If non-insulated connector wires are used.
3) The back cover must be snapped into place after connector wires have been clamped for protection against accidental contact.
4) Scales should be replaced under voltage-free conditions.
5) Bezels and window glasses may only be replaced under voltage-free conditions.

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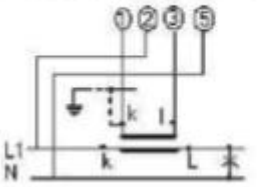
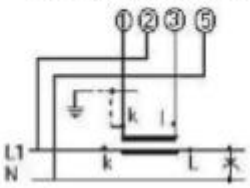
Connection Diagram :

FOR WQ

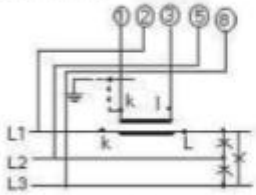
Active Power
E1W-single phase(one element)



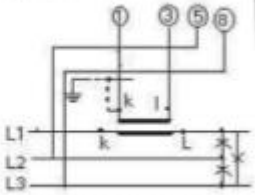
Reactive Power
E1B-single phase (one element)



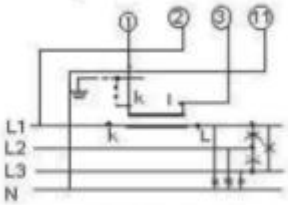
D1W-Three phase,three-wire AC supply with balanced load (one element)



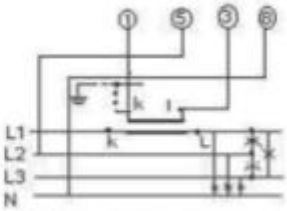
D1B -Three phase,three-wire AC supply with balanced load (one element)



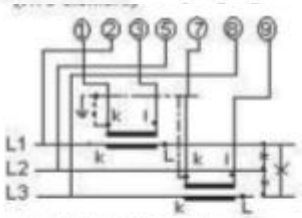
V1W-Three phase,four-wire AC supply with balanced load(one element)



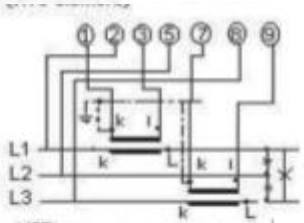
V1B -Three phase,four-wire AC supply with balanced load(one element)



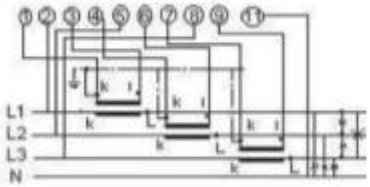
D2W-Three phase,three- wire AC supply with unbalanced load (two element)



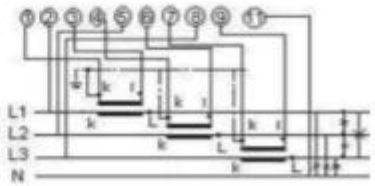
D2B -Three phase,three- wire AC supply with unbalanced load (two element)



V3W-Three phase,four-wire AC supply with unbalanced load(three element)

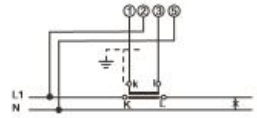


V3B-Three phase,four-wire AC supply with unbalanced load(three element)

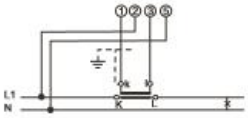


FOR WL

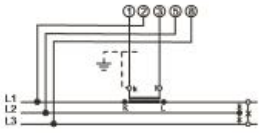
Active power
E1W-Single phase
(One element)



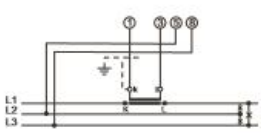
Reactive power
E1B-Single phase
(One element)



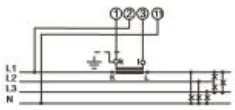
D1W -Three phase, three-wire AC Supply with balanced load (One element)



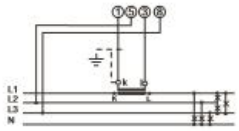
D1B -Three phase, three-wire AC Supply with balanced load (One element)



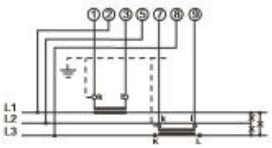
V1W -Three phase, four-wire AC Supply with balanced load (One element)



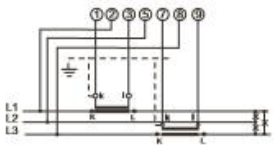
V1B -Three phase, four-wire AC Supply with balanced load (One element)



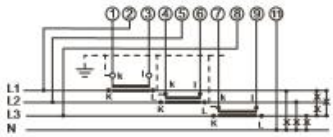
D2W -Three phase, three-wire AC Supply with unbalanced load (Two element)



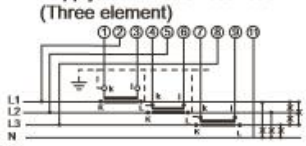
D2B -Three phase, three-wire AC Supply with unbalanced load (Two element)



V3W -Three phase, four-wire AC Supply with unbalanced load (Three element)



V3B -Three phase, four-wire AC Supply with unbalanced load (Three element)



POWER METER WQ/WL

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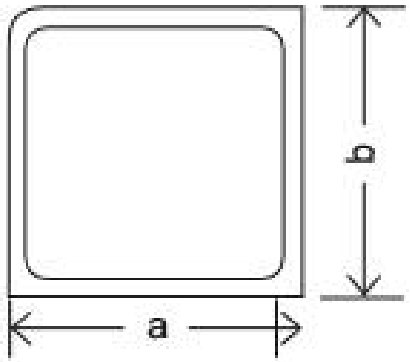
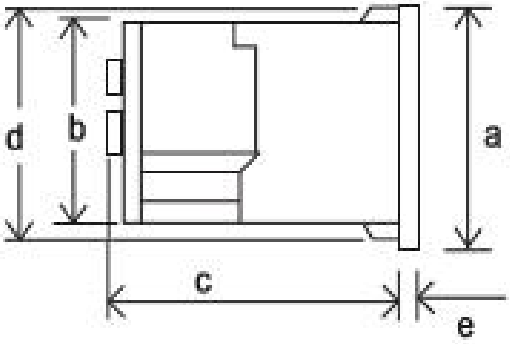
Dimensions:





Dimensions (in mm)		WQ 96	WQ 144
Bezel	a	96	144
Case	b	90	136
Depth	c *	106	106
	d	91.5	137.5
	e	5.5	5.5
Cotout Size		$92^{+0.8}$	138^{+1}
Depth with Back cover	f **	64	64
Weight (approx.)		0.65-0.9 kg.	0.9-1.1 kg.

Dimensions (in mm)		WL 96	WL 144
Bezel	a	96	144
Case	b	90	136
Depth	c	106	106
	d	91.5	137.5
	e	5.5	5.5
Cutout Size		$92^{+0.8}$	138^{+1}
Weight (approx.)		0.73 to 0.85 Kg	0.9 to 1.2 Kg

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Ordering Information

WQ/WL	
Front dimension	96X96mm, 144X144mm
Type E1W,E1B D1W,D1B V1W,V1B D2W,D2B V3W,V3B	Single Phase System 3 phase 3 wire system balanced load 3 phase 4 wire system balanced load 3 phase 3 wire system unbalanced load 3 phase 4 wire system unbalanced load
Measuring ranges	Refer to table inside
Terminal Protection	Full sized polycarbonate back cover
Front facia	Normal glass *1, PC glass *3, Anti glare glass *3
Colour of bezel	Black *1 Red, Blue, Yellow, White *3
Position of use	Vertical *1 On request 0°…180° *3
Dial	Standard scale same as measuring range*1 Blank dial with division*3 Additional lettering on request*3 Additional numbering on request*3 Coloured marking red or green*3 Coloured sector red or green*3
Logo	Ziegler*1, Others*3

*1 Standard
*3 Please clearly add the desired specifications while ordering

Example – WQ/WL96, for Active Power 3 phase 4 wire system unbalanced load, Measuring range 0.....480 kW, Voltage AC 440Vfor use on current transformer 600/5A
Specifications are subjects to change without notice (11/11)

Ziegler

Redefine Innovative Metering

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