



Single Phase Digital Panel Meter

Instrument
Division

True RMS Ammeter & Voltmeter 96 X 96 mm sizes.

Data sheet No. : AE-1 Ph-DPM /10/11



Brief Information:

"Highly Adaptable DPMs suitable for a wide range of measuring applications". The measurable input current/voltage is user programmable. Aux. Supply is galvanically isolated from Measuring circuit.

Measuring range is from 0.5 % to 120 % of the full scale indication. CT Ratio / PT Ratio are fully programmable through front Two switches provided on the Front side. User can enjoy the freedom to set primary value as well secondary values suitable for his application.(for Voltmeter (KVAC) Primary - upto 99 kV & for Ammeter Primary - upto 6999A)

Auxilliary Power Supply:

AC – 220V AC, 50HZ, L-N (Range 180-270V).
AC – 110V AC, 50HZ, L-N (Range 85-130V).
Universal – 85.....265 V AC / DC.

Features:

True RMS measurement.
State of Art Microcontroller Based Design.
3PH. AC Current and Voltage ranges.
Onsite Programmable CT/PT ratio.
4 digit ultra bright LED Display.

Application:

The digital panel meters AE DPM 96 have been designed for Industrial applications, i.e. electrical Panels required for Generation, Distribution & Commercial purpose.

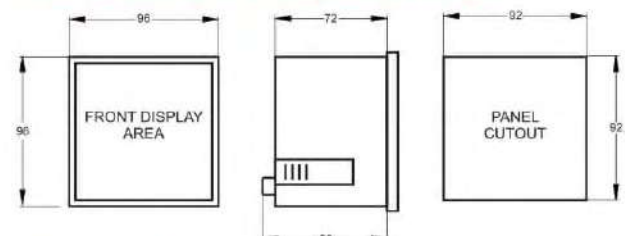
Ordering information

- 1) Meter type : Ammeter / Voltmeter
- 2) Measuring range
- 3) Auxilliary Supply
- 4) Display size (0.5"/0.8")

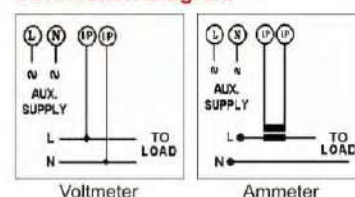
Specifications :

Parameters	Type	
	Voltmeter (VAC)	Ammeter (AAC)
Display Range	9999	
Display	4-Digit ultra Bright LED display (0.5"/0.8" 7 segment LED Display)	
Overload indication	"OL" indication on display (Ammeter only)	
Accuracy	±1% F.S. Indication (± 2 Digits)	
Computation	True RMS	
Temperature coefficient	100 ppm/°C	
Frequency	45HZ to 55 HZ	
CT/PT Primary	Programmable Through Front switches.	
CT/PT Secondary	Selectable Through Front Switch.	
Range adjustment span	From 0.5% to 100% of range.	
Overload	120% of nominal value.	
Auxilliary supply	110 V AC / 220 V AC / Universal (85...265)	
Input range	0-600(0.5 to 120%)	1/5 Amp: (0.5 % -120%)
Input impedance for voltage		
Burden	≤ 2 VA MAX on Aux. supply	
Insulation Resistance	500 DC .	
Dielectric Strength	2KV RMS for one minute.	
Operating temperature	0 to +60 °C	
Storage temperature	-20 to +70 °C	
Humidity	≤ 95% RH Non-condensing	
Front protection rating	IP 52	
Case protection rating	IP 30	
Material	ABS	
Mounting	Flush Mounting with side clamps	
Dimension	96 X 96 X 80 mm	
Weight	340 gm	

Meter Dimensions & Installation cut out



Connection Diagram





Three Phase Digital Panel Meter

Instrument
Division

True RMS Ammeter & Voltmeter 96 X 96 mm sizes.

Data sheet No. : AE-3 Ph-DPM /10/11



Brief Information:

"Highly Adaptable DPMs suitable for a wide range of measuring applications". The measurable input current/voltage is user programmable. Aux. Supply is galvanically isolated from Measuring circuit.

Measuring range is from 0.5 % to 120 % of the full scale indication. CT Ratio / PT Ratio are fully programmable through front Two switches provided on the Front side. User can enjoy the freedom to set primary value as well secondary values suitable for his application.(for Voltmeter (KVAC) Primary - upto 99 kV & for Ammeter Primary - upto 6999A)

Auxilliary Power Supply:

AC – 220V AC, 50HZ, L-N (Range 180-270V).
AC – 110V AC, 50HZ, L-N (Range 85-130V).
Universal – 85.....265 V AC / DC.

Features:

True RMS measurement.
State of Art Microcontroller Based Design.
3PH. AC Current and Voltage ranges.
Onsite Programmable CT/PT ratio.
4 digit ultra bright LED Display.

Application:

The digital panel meters AE DPM 96 have been designed for Industrial applications, i.e. electrical Panels required for Generation, Distribution & Commercial purpose.

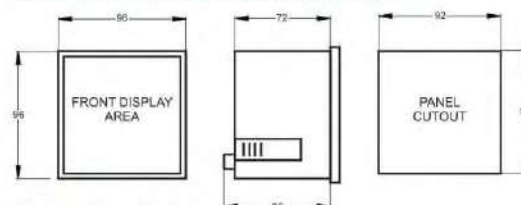
Ordering information

- 1) Meter type : Ammeter / Voltmeter
- 2) Measuring range
- 3) Auxilliary Supply
- 4) Display size (0.5"/0.8")

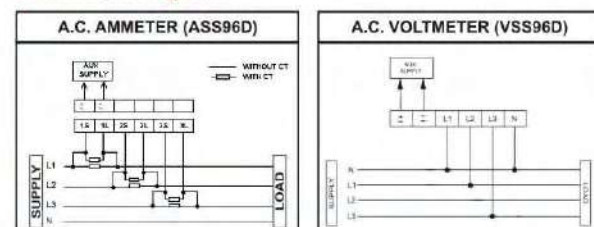
Specifications :

Parameters	Type	
	Voltmeter (VAC)	Ammeter (AAC)
Display Range	9999	
Display	4-Digit ultra Bright LED display (0.5"/0.8" 7 segment LED Display)	
Overload indication	"OL" indication on display (Ammeter only)	
Accuracy	±1% F.S. Indication (± 2 Digits)	
Computation	True RMS	
Temperature coefficient	100 ppm/°C	
Frequency	45HZ to 55 HZ	
CT/PT Primary	Programmable Through Front switches.	
CT/PT Secondary	Selectable Through Front Switch.	
Range adjustment span	From 0.5% to 100% of range.	
Overload	120% of nominal value.	
Auxilliary supply	110 V AC / 220 V AC / Universal (85...265)	
Input range	0-600(0.5 to 120%)	1/5 Amp: (0.5 % -120%)
Input impedance for voltage	0-600/99KV(1MΩ)	
Burden	≤ 2 VA MAX on Aux. supply	
Insulation Resistance	> 20MΩ @ 500 DC .	
Dielectric Strength	2KV RMS for one minute.	
Operating temperature	0 to +60 °C	
Storage temperature	-20 to +70 °C	
Humidity	≤ 95% RH Non-condensing	
Front protection rating	IP 52	
Case protection rating	IP 30	
Material	ABS	
Mounting	Flush Mounting with side clamps	
Dimension	96 X 96 X 80 mm	
Weight	395 gm	

Meter Dimension & Installation cut out



Connection Diagram





DESCRIPTION

It incorporates solid state circuitry with micro-controller to measure Power Factor of Single Phase and Three Phase system.

FEATURES

- ◆ The Meter does not require external transducer. Hence panel wiring is reduced.
- ◆ "—" sign indicates lagging PF (only for model PFD 65101 & 66301).
- ◆ Glowing of "Reverse LED" for reversal of current (only for model PFD 65102, 66302, 67302, 68302).

ELECTRICAL SPECIFICATIONS

- ◆ TYPE : 1 Ph / 3 Ph – 1 EL / 3 Ph – 2 EL – 3 W / 3 Ph – 3 EL – 4 W
- ◆ INPUT VOLTAGE : 63.5V/110V/240V/440V
- ◆ INPUT CURRENT : 1A/5A
- ◆ ACCURACY : $\pm 2^{\circ}$
- ◆ AUXILIARY SUPPLY : 110V./240V. $\pm 10\%$ 50/60 Hz
- ◆ VA BURDEN : Voltage : 2 VA
Current : 0.5 VA
Aux. Supply : 3 VA
- ◆ DISPLAY COLOUR : Red , (Green On request.)
- ◆ DISPLAY TYPE : 4 Digit, Seven Segment, 12.5mm LED Display
- ◆ RESOLUTION : 0.001
- ◆ RANGE : 0.1Lag-1-0.1Lead
- ◆ INSULATION RESISTANCE : Greater than 20M. Ω at 500V. DC
- ◆ DIELECTRIC TEST : 2kV RMS for 1 minute.
- ◆ OPERATING TEMP. : 0°C to 55° C.
- ◆ STORAGE TEMP. : -20°C to 70°C.
- ◆ HUMIDITY : Up to 95% RH.
- ◆ PROTECTION : IP 30

MECHANICAL SPECIFICATIONS

Data Sheet	Model	System	Acc.	Indication incase of absence of current / voltage signal	Size (mm)	Weight (@ gms)	Panel Cutout (mm)
PFD	AE 65101	Single Phase	$\pm 2^{\circ}$	Err	48 X 96 X 150	550	45 ^{+0.6} X 92 ^{+0.8}
	AE 65102	Single Phase		Err	96 X 96 X 115	800	92 X 92 ^{+0.8}
	AE 66301	3 Ph-1 EL	$\pm 2^{\circ}$	Err	48 X 96 X 150	550	45 ^{+0.6} X 92 ^{+0.8}
	AE 66302	3 Ph-1 EL		Err	96 X 96 X 115	800	92 X 92 ^{+0.8}
	AE 67301	3 Ph-2 EL-3 W	$\pm 2^{\circ}$	Blinking of reverse LED	96 X 96 X 150	550	45 ^{+0.6} X 92 ^{+0.8}
	AE 67302	3 Ph-2 EL-3 W		Blinking of reverse LED	96 X 96 X 115	800	92 X 92 ^{+0.8}
	AE 68302	3 Ph-3 EL-4 W	$\pm 2^{\circ}$	Blinking of reverse LED	96 X 96 X 115	800	92 X 92 ^{+0.8}



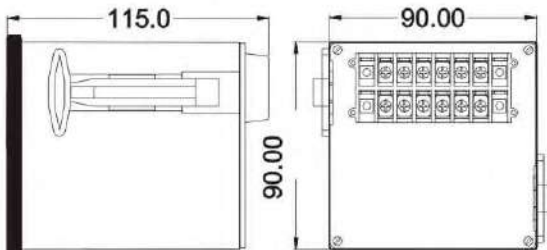
Built in Transducer

Instrument
Division

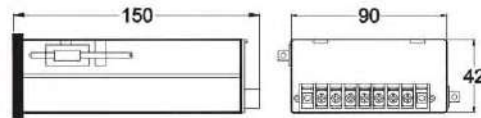
Digital Power Factor Meter

DIMENSIONS

For 96 x 96



For 48 x 96



TERMINAL CONNECTIONS

For 96 x 96

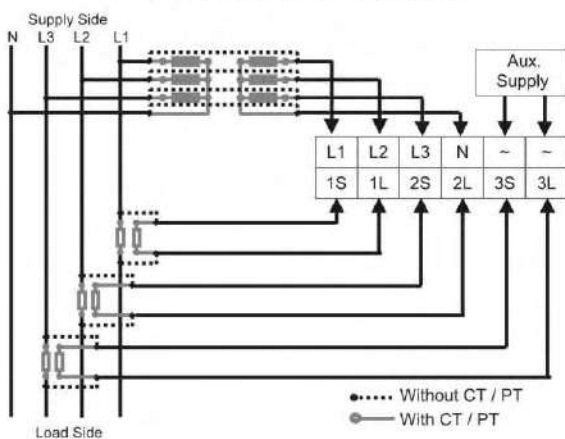
Type	Voltage	Current	Aux. Supply
1Ph	L1, N	1S, 1L	~ , ~
3Ph – 1EL	L2, L3	1S, 1L	
3Ph – 2EL – 3W	L1, L2, L3	1S, 1L 3S, 3L	
3Ph – 3EL – 4W	L1, L2, L3, N	1S, 1L 2S, 2L 3S, 3L	

For 48 x 96

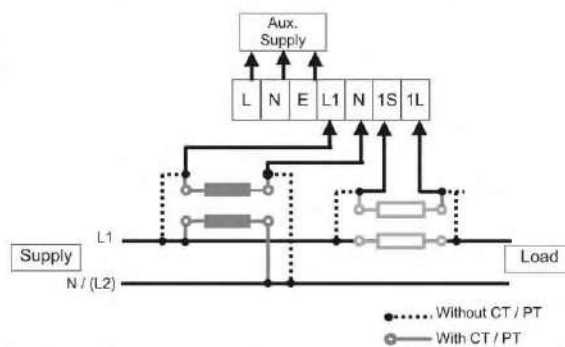
Type	Voltage	Current	Aux. Supply
1Phase	L1, N	1S, 1L	~ , ~
	L2, L3	1S, 1L	
	L3, L1	2S, 2L	
3 Ph 1 EL	L1, L2	3S, 3L	

TYPICAL WIRING DIAGRAM

For Three Phase System



For Single Phase System



⚠ **Note :-** For 3 Ph – 1EL type, connect current of 1 phase (CT secondary) & Voltage across other two phases (PT secondary).

Ordering information

- 1) Model
- 2) Input Voltage
- 3) Input Current
- 4) Auxiliary supply
- 5) Power Factor Range

**DESCRIPTION**

'AE' Built in Transducer type Digital Power Meter is equipped with a measuring transducer & Digital indicator. It measures Active, Reactive & Apparent power in Single Phase & Three Phase system.

FEATURE

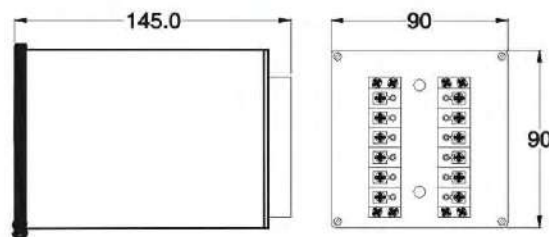
- ◆ The meter doesn't require external transducer, hence panel wiring is reduced.

ELECTRICAL SPECIFICATIONS

- ◆ TYPE : Active, Reactive & Apparent Power.
1 Ph / 3 Ph – 2 EL – 3 W / 3 Ph – 3 EL – 4 W
- ◆ INPUT VOLTAGE : 110V / 240V / 415V / 440V.
- ◆ INPUT CURRENT : 1A / 5A
- ◆ OPERATING FREQUENCY : 50Hz or 60Hz
- ◆ MEASURING UNIT : Active Power : W, kW, MW.
Reactive Power : Var, kVar, MVar.
Apparent Power : VA, kVA, MVA
- ◆ ACCURACY : $\pm 0.5\%$ of full scale deflection ± 2 Digits
- ◆ AUX. SUPPLY : 110 V / 240 V AC, 50 Hz
- ◆ VA BURDEN : Voltage : 3 VA
Current : 1 VA
Aux. Supply : 4 VA
- ◆ DISPLAY COLOUR : Red.(Green On request.)
- ◆ INSULATION RESISTANCE : Greater than $20M \Omega$ at 500V DC
- ◆ DIELECTRIC TEST : 2kV RMS for 1 minute.
- ◆ OPERATING TEMP. : 0°C to 55°C
- ◆ STORAGE TEMP. : -20°C to 70°C
- ◆ HUMIDITY : Up to 95% RH

MECHANICAL SPECIFICATIONS

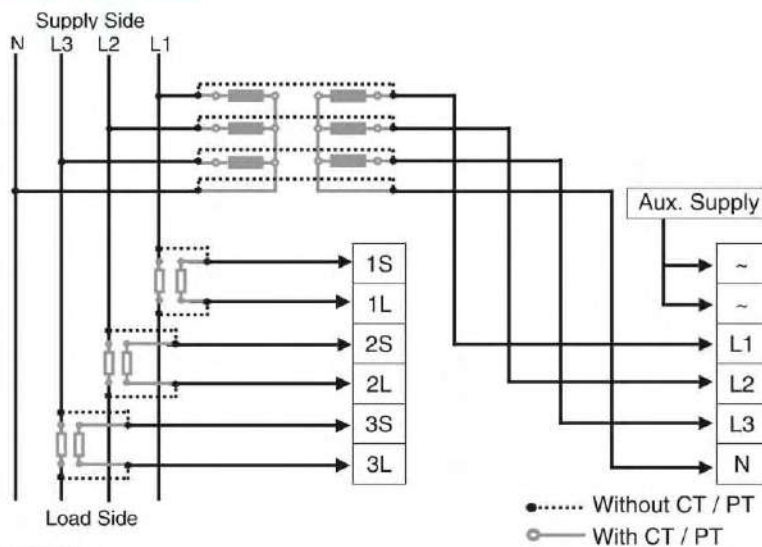
Data sheet	Model	System	Acc. Class	Size (mm)	Weight (@ gms)	Panel Cutout (mm)
BIDPM	AE 73132	Single Phase	0.5	96 x 96 x 145	800	92 x 92 ^{+0.8}
	AE 73332	3 Ph – 2 EL – 3W	0.5	96 x 96 x 145	800	92 x 92 ^{+0.8}
	AE 74332	3Ph – 3EL – 4W	0.5	96 x 96 x 145	800	92 x 92 ^{+0.8}
	AE 74334	3 Ph – 2 EL – 3W	0.5	144 x 144	800	138 x 138 ^{+1.0}
	AE 74334	3 Ph – 3 EL – 4W	0.5	144 x 144	800	138 x 138 ^{+1.0}



TERMINAL CONNECTION

TYPE	VOLTAGE	CURRENT	Aux. Supply
Single Phase	L1, N	1S, 1L	~ , ~
Three Phase, Two Element, Three Wire	L1, L2, L3	1S, 1L 3S, 3L	
Three Phase, Three Element, Four Wire	L1, L2, L3, N	1S, 1L 2S, 2L 3S, 3L	

TYPICAL WIRING DIAGRAM



Ordering information

- 1) Model
- 2) Active, Reactive & Apparent Power
- 3) Resolution
- 4) PTR (if any)
- 5) CTR (if any)
- 6) Full Scale Indication.



DESCRIPTION

Digital Panel Meter operates on the principle of dual slope integration. It is available in two types i.e. 3½ digit & 4½ digit. Digital frequency meter incorporates microcontroller with crystal oscillator to display the frequency. It is available in 4 digit type.

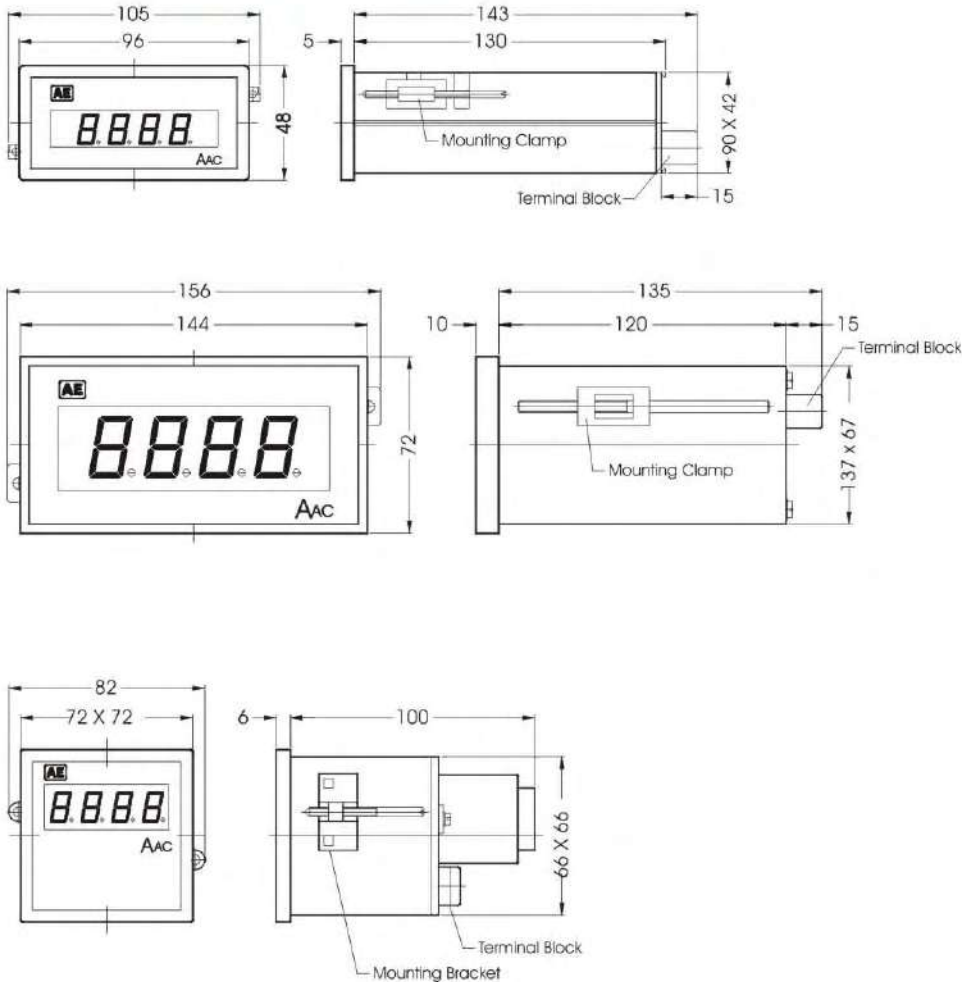
FEATURES

- ◆ Low cost.
- ◆ Seven segment red & green colour LED display with 0.5" & 1" size.
- ◆ AC current input is incorporated with built-in CT of 1Amp or 5Amp for isolation.
- ◆ High accuracy.
- ◆ AC / DC signal measurement

ELECTRICAL SPECIFICATIONS

Parameters	Type		
	Digital panel meter		Digital frequency meter
	3½ digit	4½ digit	4 digit
Mounting	Panel	Panel	Panel
Operating voltage	650V AC	650 V AC	600 V AC
	700V DC	700V DC	—
Operating current AC (with internal CT) DC (with internal Shunt)	1A / 5A	1A / 5A	—
	5A	5A	—
Frequency	40 – 400Hz.	40 – 400Hz.	40Hz–400Hz
Resolution	0.001 to 1 count depending upon measuring range	0.0001 to 1 count depending upon measuring range	Depending upon measuring range
Accuracy	0.5% of f.s.d. ± 2 Digits		0.2% of reading ± 2 Digits.
Auxiliary Supply	63.5V / 110V / 240V AC ±10%		63.5V / 110V / 240V AC ±10%
VA Burden for Aux. supply	Less than 4VA		Less than 4VA
Input impedance for voltage	1MΩ		1MΩ
VA Burden Current Voltage	0.5VA 1VA		— 1VA
Insulation resistance	Greater than 20M ohms at 500V DC		Greater than 20M ohms at 500V DC
Dielectric test	2kV RMS for 1 minute.		2kV RMS for 1 minute.
Operating temperature	0°C to 55°C		0°C to 55°C
Storage temperature	-20° to 70°C		-20° to 70°C
Humidity	Upto 95% RH		Upto 95% RH
Sampling rate	3 samples/sec.		3 samples/sec.
Over range indication	MSD indication 1" & all other digits blank. Polarity sign is preserved.	All digits blinking with "0" indication & polarity sign is preserved.	—
Protection	IP20		IP20
Maximum indication	1999	19999	—

MECHANICAL SPECIFICATIONS



MODEL	A1	A2	A3	A4	A5
SIZE (mm)	48 x 96 x 115	96 x 96 x 70	72 X 72 X 100	72 x 144 x 130	144 x 144 x 91
PANEL CUTOUT (mm)	45 ^{+0.6} x 92 ^{+0.7}	92 x 92 ^{+0.8}	68 X 68 ^{+0.7}	68 ^{+0.7} x 138 ^{+1.0}	138 x 138 ^{+1.0}
WEIGHT (Approx. gms)	520	500	400	1100	600

Note:

- ◆ Active, reactive & apparent power indicators are to be used with external transducer.
- ◆ For AC current measurement above 5Amp, external CT is to be used.
- ◆ For DC current measurement above 5Amp external shunt is to be used.

Ordering information

- 1) Type
- 2) Model
- 3) Measuring Range
- 4) Display height & colour
- 5) Auxilliary supply
- 6) Resolution

DESCRIPTION

The shunts are designed & manufactured to comply with the requirements of IS1248 / DIN43703 & DIN43780. The shunt provides an accurate d.c. millivolt signal, exactly proportional to the measuring current.

FEATURES

- Rating 1A to 15000A
- Riveted and soldered construction
- In-line bus bar mounting
- Very low temperature coefficient
- High overload withstand
- Shock and vibration tested
- Long term stability



ELECTRICAL SPECIFICATIONS

- TYPE : Ranges ↓
 - 1) Insulated mounting : 1, 1.5, 2, 2.5, 3, 4, 5, 6, 10, 15, 20, 25, 30Amp.
 - 2) "I" Section : 30, 40, 50, 60, 75, 80, 100, 120, 150Amp.
 - 3) "L" Section : 200, 250, 300, 400, 500, 600, 750, 800, 1000, 1200, 1500, 2000, 2500, 3000Amp.
 - 4) "T" Section : 4000, 5000, 6000, 7500, 8000, 10000, 12000, 15000Amp.
- ACCURACY : ±0.5%
- CONTINUOUS OVER LOAD : 120 % of rated current.
- 5 SECONDS WITHSTAND : 10 times for 1A to 500Amp.
: 5 times for 600A to 2000Amp.
: 2 times for 2500A to 15000Amp.
- TEMP. COEFFICIENT : 0.002% per °C.
- AMBIENT TEMP. : Calibration at 23°C.
- OPERATING TEMP. : -10°C to 55°C.
- STORAGE TEMP. : -20°C to 70°C
- MAXIMUM LOAD : The load should not exceed 0.1% of the nominal current rating for specified accuracy.
- MILLIVOLT : 50mV, 60mV, 75mV, 100mV, 150mV, 300mV (standard)
Other mV drop on request.

NOTE : Two cables of 1metre length with 1.5mm cross sectional area are provided. This corresponds to a total resistance of 0.026 ohms. The instruments are calibrated with this resistance and consequently the cable length must not be changed. **If different length or resistances are required, please indicate while ordering.**

INSTALLATION

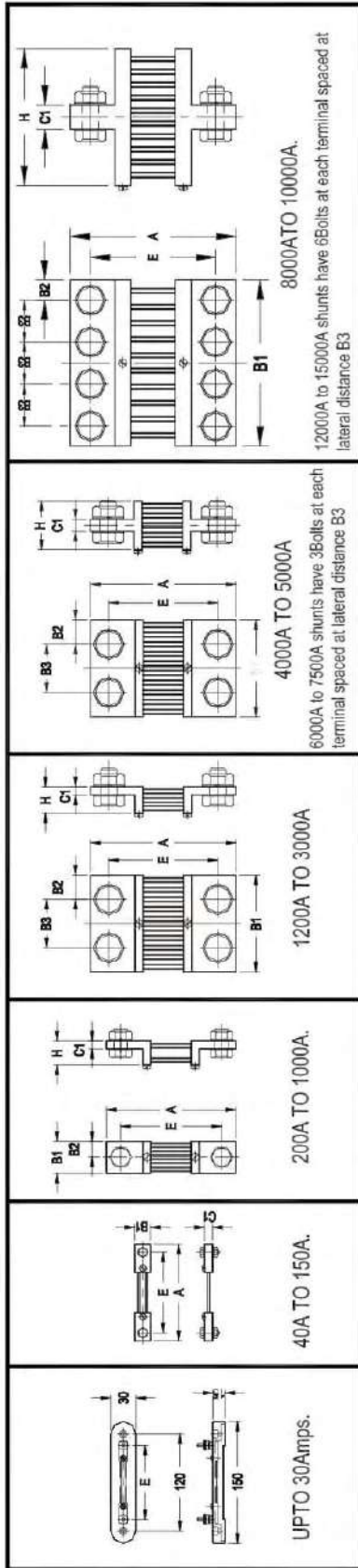
The best performance is guaranteed if the following points are observed.

- 1) Shunts may be mounted horizontally or vertically. Horizontal mounting gives the best heat dissipation.
- 2) Utilize the full end block surface area. 3) Ample ventilation should be provided. 4) Busbar should be adequately rated, cleaned & coated with a thin layer of silicon grease between the contact surfaces.
- 5) Bolts and nuts must be carefully tightened.

CAUTION : Shunts are not insulated & protection against accidental contact may be necessary in order to comply with Health & Safety regulations.

Ordering information

- 1) Current rating 2) Millivolt 3) Length of the cable.



Rated Current Amps.	Dim 'A' Max. (mV)						Dim 'B1'	Dim 'B2'	Dim 'B3'	Dim 'C1'	Dim 'E' (mV)						Dim 'H' (mV)	Current Terminal Dim.	No. of Current Terminals	Minimum length of contacting part with Busbar
	60	75	100	150	300	300					60	75	100	150	300	60 / 75				
1 ~ 30	90	90	90	90	90	20	—	8	80	80	80	8	8	M5 x 12	2 x 1	—				
40 ~ 150	100	120	145	225	285	* 20	—	8	80	100	125	205	365	M8 x 12	2 x 1	15				
200 ~ 300	145	165	190	270	430	30	15	10	105	125	150	230	390	M12 x 40	2 x 1	20				
400 ~ 750	145	165	190	270	430	40	20	10	105	125	150	230	390	M16 x 45	2 x 1	25				
800 ~ 1000	165	185	210	290	450	* 60	30	10	115	135	160	240	400	M20 x 50	2 x 1	40				
1200 ~ 1500	165	185	210	290	450	90	21	48	115	135	160	240	400	M16 x 45	2 x 2	40				
1600 ~ 3000	165	185	210	290	450	120	30	60	115	135	160	240	400	M20 x 50	2 x 2	40				
4000 ~ 5000	165	185	220	300	460	120	30	60	115	135	170	250	410	M20 x 50	2 x 2	40				
6000 ~ 7500	175	195	220	300	460	154	25	52	125	145	170	250	410	M20 x 75	2 x 3	40				
8000 ~ 10000	185	205	-	-	-	206	25	52	135	155	180	260	420	M20 x 85	2 x 4	40				
12000 ~ 15000	185	205	-	-	-	310	25	52	135	155	180	260	420	M20 x 85	2 x 6	40				

Note : 1) Dimensions A, E, H are the same for 50mV shunt & 60mV shunt. 2) Unless specified, tolerance for mounting dimensions (Dim 'E') shall be ± 1.5 mm upto 1500A rating & ± 2.0 mm for the ratings above 1500A. 3) Maximum value of 'H' is specified, Minimum value is equal to corresponding value of 'C1'. 4) * Dimension 20 & 60mm is for 60/75mV and 25 & 70mm respectively for 100~300mV. 5) The power consumption of measuring instruments should not exceed 500microwatts for interchangeable shunts.(All dimensions are in mm)



Introduction

The 3 Phase VIF meter measures the true RMS voltage, currents and frequency of three phase electrical system. These parameters are displayed on three rows of four digit seven segment LED displays. The first row displays the voltage (both phase to neutral & phase to phase) of the selected phase. The second row displays the current in the selected phase and the third row displays the frequency. The channel selection is done by the push buttons 'V' and 'I' for voltage & current respectively.

Features:

- ✓ Voltage , Current, Frequency measurement
- ✓ True RMS measurement
- ✓ State of Art Microcontroller Based Design.
- ✓ Ultra bright 4 –Digit,3 -Row LED Display
- ✓ Site programmable CT ratio.
- ✓ Site programmable PT ratio.
- ✓ MODBUS RS 485 Communication (optional)
- ✓ 3 Row of 4 Digit LED Display

Optional features

- MOD BUS communication.
- Baud Rate programmable.
- Device ID programmable

Applications

- Generation Control Panels
- Distribution Control Panels
- Commercial Panels

Specifications

Nominal Input Voltage Range	0-300 V AC L-N (520 V L-L)
Nominal Input Current Range	0 - 5 A or 0 - 1A AC / Phase
Nominal Input Frequency	20 HZ to 99.9HZ
Computation	True RMS
Max. continuous input overload Voltage	120% of nominal
Max. continuous input overload current	120% of nominal
Frequency	45-65 HZ
Auxiliary Supply	110 V AC, 50 HZ (90 – 130 V) / 240 V AC, 50 HZ (180 – 270 V)

Accuracy Class

Voltage (V)	0.5 % of Full Scale Indication
Current (A)	0.5 % of Full Scale Indication
Frequency (HZ)	0.2 % of C.F.
Nominal input Voltage burden Per Phase	0.2 VA (Max)
Nominal Input Current burden Per Phase	0.2 VA (Max)
Auxilliary Supply Burden	2 VA Maximum.
Display	3 Row of 4 Digit (14 mm / 7 Segment) LED Display

Optional Feature

Communication	With RS 485 Modbus
Type	2-wire half duplex
Baud Rate	4800,9600,19200

Mechanical Specification

Enclosure style	Flush mounting with side clamps.
Dimensions	96x96x80
Panel Cut-out	92x92mm
Panel thickness	1-5mm
Front protection rating	IP 52
Case protection rating	IP 30
Material	ABS
Weight	350gm
Terminals	Shrouded screw -clamp

Environment

Operating Temperature	0°C to +60°C
Storage temperature	-20° to +70° C
Temperature coefficient	100 ppm / C
Dielectric Strength	2KV RMS for 1 minute
Insulation resistance	> 20M Ω @ 500V DC.



3 Phase VIF Meter *True RMS*

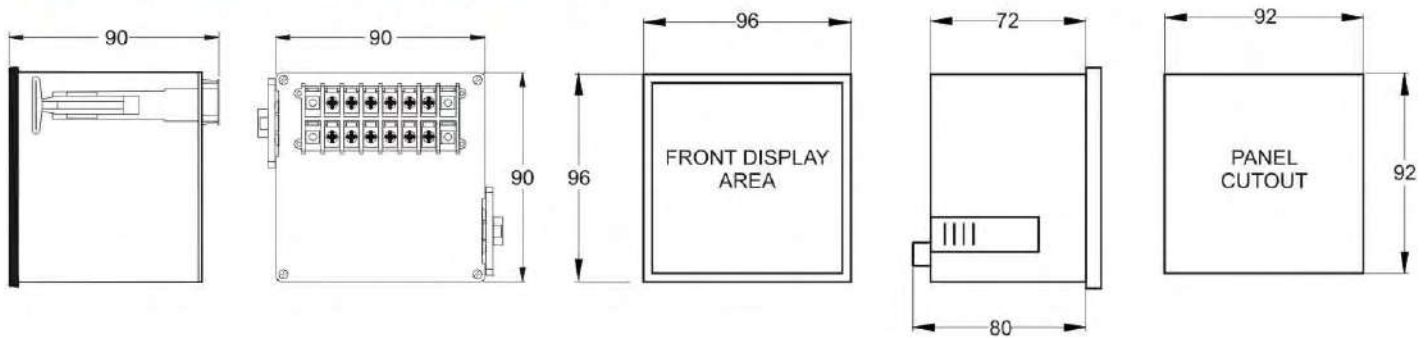
Instrument
Division

Digital Panel meter-3Phase True RMS, Voltage,
Current and Frequency

Monitoring the Parameters

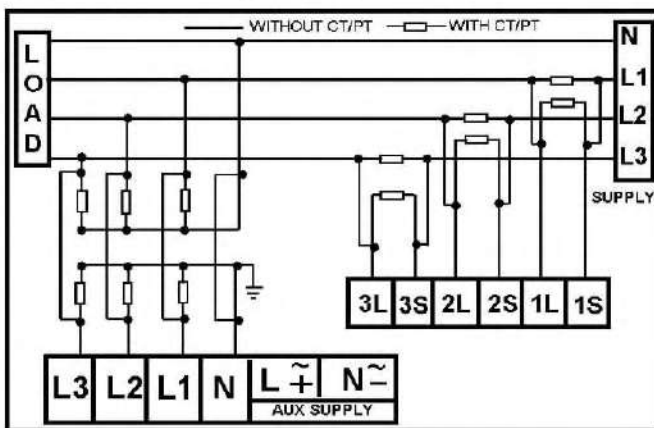
When the Auxiliary supply of the meter is switched ON, the display shows the voltage, current and frequency of the L1 phase. The sequential voltage phases are selected by pressing 'V' button provided on the front panel. The selected phase is indicated by the respective LED. The sequence of phase selection is L1- L2-L3-L1L2-L2L3-L3L1-L1. Similarly current phases are selected by pressing 'I' button provided on the front panel. The selected phase is indicated by the respective LED. The sequence of current phase selection is L1 - L2 - L3 - L1.

Meter Dimensions & Installation cut out

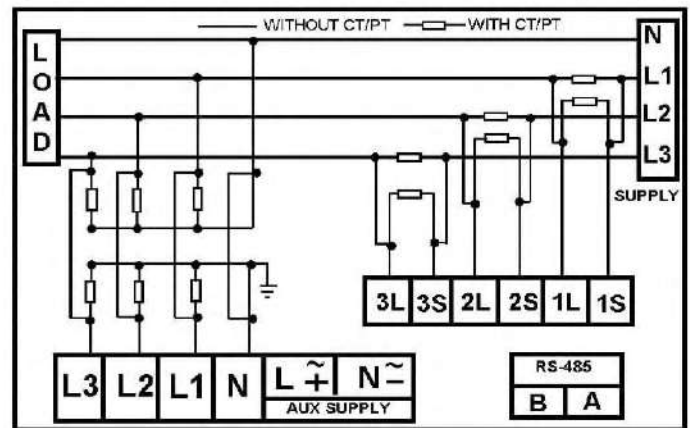


Connection Diagram :

1) 3 Phase VIF Meter (standard)



2) 3 Phase VIF Meter with RS 485 Communication port (optional)





Static Watthour Meter with

Instrument
Division

Electro-Mechanical Display

Data sheet No.: KWHM/10/11



DESCRIPTION

It measures energy (Watthour) consumed by SINGLE PHASE / THREE PHASE, balanced / unbalanced load in power industry. The meter comprises of microcontroller with **DIP switch** provision to accommodate different CT Ratios.

FEATURES

- ◆ True RMS measurement.
- ◆ Current direction reversal indication.
- ◆ Tamper-proof.
- ◆ No need of external power supply (Self – Powered).
- ◆ Indication of energy by six digit electro – mechanical, non-resettable, impulse counter.
- ◆ Isolated solid state pulse output.

OPTIONAL FEATURES

- ◆ MODBUS RTU with / without software package.

ELECTRICAL SPECIFICATIONS

- ◆ TYPE : 1 Ph / 3 Ph - 2 EL - 3 W / 3 Ph - 3 EI - 4 W
- ◆ INPUT VOLTAGE : 63.5V / 110V / 240V / 415V AC, $\pm 20\%$
- ◆ INPUT CURRENT : 1A / 5A (5% to 120%)
- ◆ OPERATING FREQUENCY : 50Hz. $\pm 5\text{Hz}$.
- ◆ OPERATING POWER FACTOR : 0.5 (Lag) – Unity – 0.8(Lead)
- ◆ ACCURACY : $\pm 1.0\%$ of reading
- ◆ VA BURDEN : Voltage : 8 VA / Phase
- ◆ Current : 0.5 VA / Phase
- ◆ DISPLAY TYPE : 6 Digit Impulse Counter, Non-resettable
- ◆ PULSE OUTPUT : $100 \pm 10\text{msec}$. (ON period)
- ◆ CONTACT RATING : 24V DC, 100mA DC
- ◆ INSULATION RESISTANCE : Greater than $20 \text{ M}\Omega$ at 500V DC
- ◆ DIELECTRIC TEST : 2kV RMS for 1 minute
- ◆ OPERATING TEMP. : 0°C to 55°C
- ◆ STORAGE TEMP. : -10°C to 70°C
- ◆ HUMIDITY : Upto 95% RH
- ◆ CONFORMS TO : I.S. 13779 / I.E.C :1036

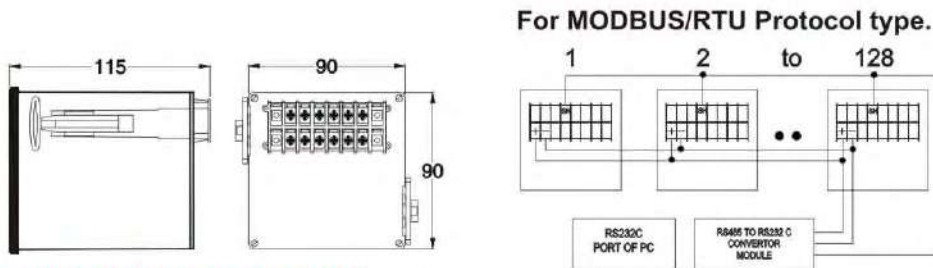
MECHANICAL SPECIFICATIONS

Data Sheet	Model	System	Acc. Class	Size (mm)	Weight (@ gms)	Panel Cutout (mm)
KWHM	KWHM 30132	Single Phase	0.5	96 x 96 x 115	450	92 x 92 ^{+0.8}
	KWHM 30142	Single Phase	1.0			
	KWHM 31332	3Ph – 2EL– 3W	0.5			
	KWHM 31342	3Ph – 2EL– 3W	1.0			
	KWHM 32332	3Ph – 3EL– 4W	0.5			
	KWHM 32342	3Ph – 3EL– 4W	1.0			

* 72 x72 mm on request

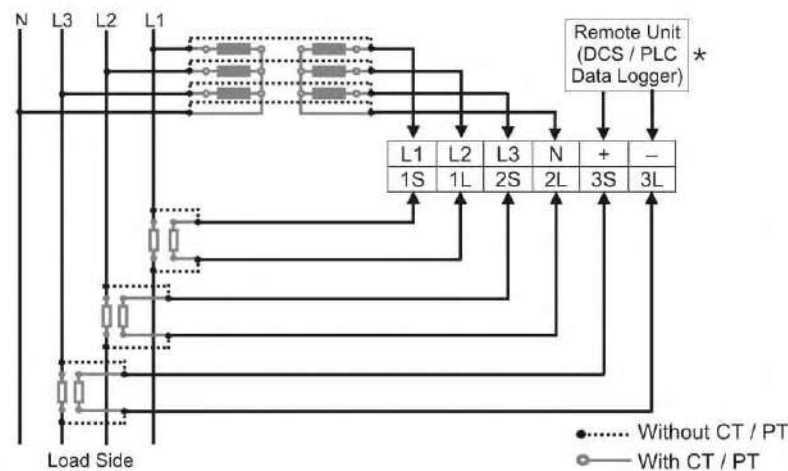
TERMINAL CONNECTIONS

TYPE	VOLTAGE	CURRENT	Pulse Output
Single Phase	L1, N	1S, 1L	+ , -
Three Phase, Two Element, Three Wire	L1, L2, L3	1S, 1L 3S, 3L	
Three Phase, Three Element, Four Wire	L1, L2, L3, N	1S, 1L 2S, 2L 3S, 3L	



TYPICAL WIRING DIAGRAM

For Self Powered type.
Supply Side



CTR SELECTION	RESOLUTION kWh	SWITCH ON DIP
5 / 5A	0.1	■ ■ ■ ■
50 / 5A	1	■ ■ ■ ■
60 / 5A	1	■ ■ □ ■
75 / 5A	1	□ ■ ■ ■
100 / 5A	1	□ ■ □ ■
125 / 5A	1	■ ■ □ ■
150 / 5A	1	■ ■ ■ □
160 / 5A	1	□ ■ □ ■
200 / 5A	1	■ ■ □ ■
250 / 5A	1	□ ■ □ ■
300 / 5A	1	■ ■ □ ■
400 / 5A	1	□ ■ □ ■
500 / 5A	10	■ ■ ■ ■
600 / 5A	10	■ ■ □ ■
800 / 5A	10	■ ■ □ ■
1000 / 5A	10	□ ■ ■ ■
1200 / 5A	10	□ ■ □ ■
1500 / 5A	10	■ ■ ■ ■
1600 / 5A	10	□ ■ □ ■
2000 / 5A	10	■ ■ ■ ■

NOTE : Above selection is applicable for Single Phase & Three Phase 110V & 440V direct operating Meter.

ON DIP

 1 2 3 4

Example : Switch setting for CTR 100/5A

* For self excited DCS / PLC / Data logger system, external 24V D. C. supply is not required.

Ordering information

1) Model 2) Input Voltage 3) input Current 4) PTR (if any) 5) CTR (if any)



DESCRIPTION

It measures energy (Watthour) consumed by Single Phase / Three Phase, balanced / unbalanced load in power industry. The meter comprises of microcontroller with **DIP switch** provision to accommodate different CT Ratios.

FEATURES

- ◆ True RMS measurement.
- ◆ Current direction reversal indication.
- ◆ Tamper-proof.
- ◆ No need of external auxiliary supply (Self –Powered).
- ◆ Indication of energy by six digit, seven segment LED display.
- ◆ Isolated solid-state pulse output.
- ◆ E² Prom memory backup for storage of energy reading during power failure.

OPTIONAL FEATURES

- ◆ MODBUS RTU with / without software package.

ELECTRICAL SPECIFICATIONS

◆ TYPE	: 1 Ph / 3 Ph - 2 EL - 3W / 3 Ph - 3 EL - 4 W
◆ INPUT VOLTAGE	: 63.5V / 110V / 240V / 415 V AC, ±20%
◆ INPUT CURRENT	: 1A / 5A (5% to 120%)
◆ OPERATING FREQUENCY	: 50Hz ±5Hz
◆ OPERATING POWER FACTOR	: 0.5 (Lag) – Unity – 0.8(Lead)
◆ ACCURACY	: ± 1.0% of reading
◆ AUX. SUPPLY	: Self- Powered
◆ VA BURDEN	: Voltage : 12VA / Phase Current : 0.5VA / Phase
◆ DISPLAY COLOUR	: Red , (Green on request.)
◆ DISPLAY TYPE	: 6 Digit, 7 Segment, 0.3" LED Display
◆ PULSE OUTPUT	: 100 ± 10msec. (ON period)
◆ CONTACT RATING	: 24V DC, 100mA DC
◆ INSULATION RESISTANCE	: Greater than 20 M Ω at 500V DC
◆ DIELECTRIC TEST	: 2kV RMS for 1 minute
◆ OPERATING TEMP.	: 0°C to 55°C
◆ STORAGE TEMP.	: -10°C to 70°C
◆ HUMIDITY	: Upto 95% RH
◆ CONFORMS TO	: I.S. 13779 / I.E.C:1036



Static Watthour Meter

Instrument
Division

With LED Display

MECHANICAL SPECIFICATIONS

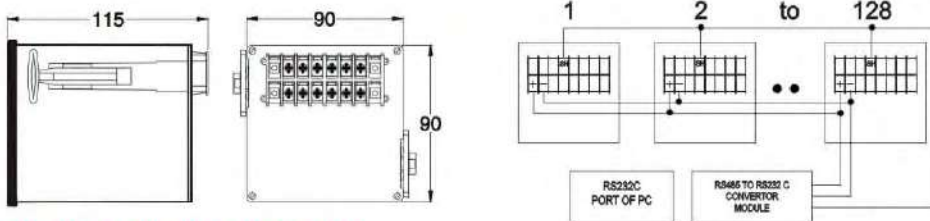
Data sheet	Model	System	Acc. Class	Size (mm)	Weight (Approx. gms)	Panel Cutout (mm)
KWHD	KWHD 33132	Single Phase	0.5	96 x 96 x 115	450	92 x 92 ^{+0.8}
	KWHD 33142	Single Phase	1.0			
	KWHD 34332	3Ph – 2EL– 3W	0.5			
	KWHD 34342	3Ph – 2EL– 3W	1.0			
	KWHD 35332	3Ph – 3EL– 4W	0.5			
	KWHD 35342	3Ph – 3EL– 4W	1.0			

* 72 x72 mm on request

TERMINAL CONNECTIONS

TYPE	VOLTAGE	CURRENT	Pulse Output
Single Phase	L1, N	1S, 1L	+ , -
Three Phase, Two Element, Three Wire	L1, L2, L3	1S, 1L 3S, 3L	
Three Phase, Three Element, Four Wire	L1, L2, L3, N	1S, 1L 2S, 2L 3S, 3L	

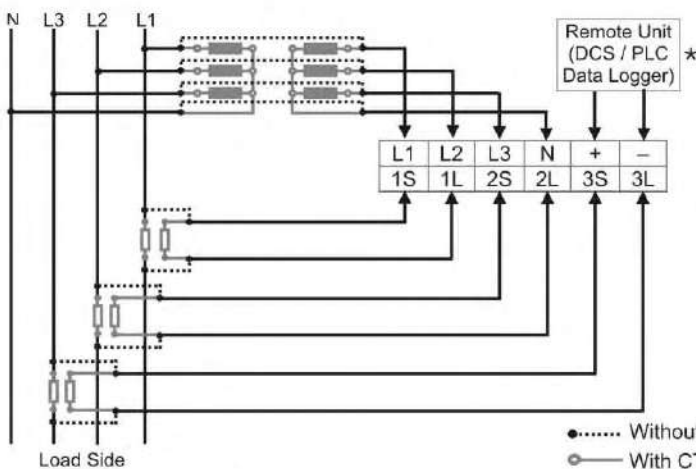
For MODBUS/RTU Protocol type.



TYPICAL WIRING DIAGRAM

For Self Powered type.

Supply Side



CTR SELECTION	RESOLUTION kWh	SWITCH ON DIP
5 / 5A	0.1	■ ■ ■ ■
50 / 5A	1	■ ■ ■ □
60 / 5A	1	■ □ ■ ■
75 / 5A	1	□ ■ ■ ■
100 / 5A	1	□ ■ ■ □
125 / 5A	1	■ ■ ■ □
150 / 5A	1	■ ■ ■ □
160 / 5A	1	□ ■ ■ □
200 / 5A	1	■ □ ■ ■
250 / 5A	1	□ ■ ■ ■
300 / 5A	1	■ ■ ■ ■
400 / 5A	1	□ ■ ■ ■
500 / 5A	10	■ ■ ■ ■
600 / 5A	10	■ □ ■ ■
800 / 5A	10	■ ■ ■ □
1000 / 5A	10	□ ■ ■ ■
1200 / 5A	10	□ ■ ■ □
1500 / 5A	10	■ ■ ■ □
1600 / 5A	10	□ ■ ■ □
2000 / 5A	10	■ ■ ■ ■

NOTE : Above selection is applicable for Single Phase & Three Phase 110V & 440V direct operating Meter.

ON DIP
 ■ ■ ■ ■
 □ ■ ■ □
 1 2 3 4

Example : Switch setting for CTR 100/5A

* For self excited DCS / PLC / Data logger system, external 24V D. C. supply is not required.

Ordering information

1) Model 2) Input Voltage 3) input Current 4) PTR (if any) 5) CTR (if any)



Dual KWh Energy Meter

Instrument
Division

Dual Source KWh meter 96 x 96 mm size,
measures energy (Watt hour) of both 'MAINS' as well as 'GENSET'.

Data sheet No.: DKWH/10/11



Features:

Available in Size 96mm x 96mm.
 True RMS measurement of energy.
 Phase sequence and Current direction reversal indication.
 Self Powered Auxilliary supply.
 Single meter records both mains / DG energy consumption.
 Individual phase missing indication.
 Automatic source (MAINS/GENSET) detection.
 ONSite selectable CT ratio.
 Isolated solid state separate pulse outputs for both DG & MAINS.
 Display Total Energy (MAINS+GENSET).
 In built RS 485 communication port
 Password protection.

Brief Information:

AE Dual Source KWH meter measures energy (Watt hour) Of both MAINS as well as GENSET, consumed in, Three phase 2 / 3 element, 3 / 4 Wire, balanced / unbalanced load circuits. The meter comprises of advanced microcontroller technology for reliability & accuracy. The user-friendly operation is the unique feature of this meter.

Model available in this range

6-digit LED display With MODBUS (RS-485) communication
 6-digit LED display Without MODBUS (RS-485) communication

Application:

- Industrial & Commercial Generator sets.
- Building management System.
- Energy Management System.
- Control & Monitoring Systems.
- Process Control.
- Switch Gears.

Technical Specifications:

Parameters	Description
Type	3P2E3W / 3P3E4W
Input Voltage	110V / 240V / 415V AC ($\pm 20\%$).
Nominal Input Current	1A / 5A AC (5% TO 120% of rated value)
Operating Frequency	45 Hz TO 55 Hz
Operating P.F.	0.5(LAG) – UNITY – 0.8(LEAD)
Accuracy	Class 1
Auxilliary Supply	Self Powered (Auxilliary supply needed for RS-485 only.)
VA Burden	Voltage : ≤ 10 VA / Phase Current : ≤ 0.5 VA / Phase
Genset Sensing voltage	5.....24 V DC
Pulse output	2400 imp. /KWh
Open collector output	24V, 100mA DC.
Insulation Resistance	≥ 20 M Ω @ 500V DC
Dielectric Strength	2kV RMS for 1 min.
Operating temperature	0°C to +60°C
Storage temperature	-20°C to +70°C
Humidity	≤ 95 % RH Non- condensing.
Conforms to	I.S. 13779 / IEC 62052-11 & 62053-21, IS 1248 –(Part1)
Size	96 X 96 X 85 mm
Display color	RED
Display type	6 digit,7 segment Ultra bright LED display.



Dual KWh Energy Meter

Instrument Division

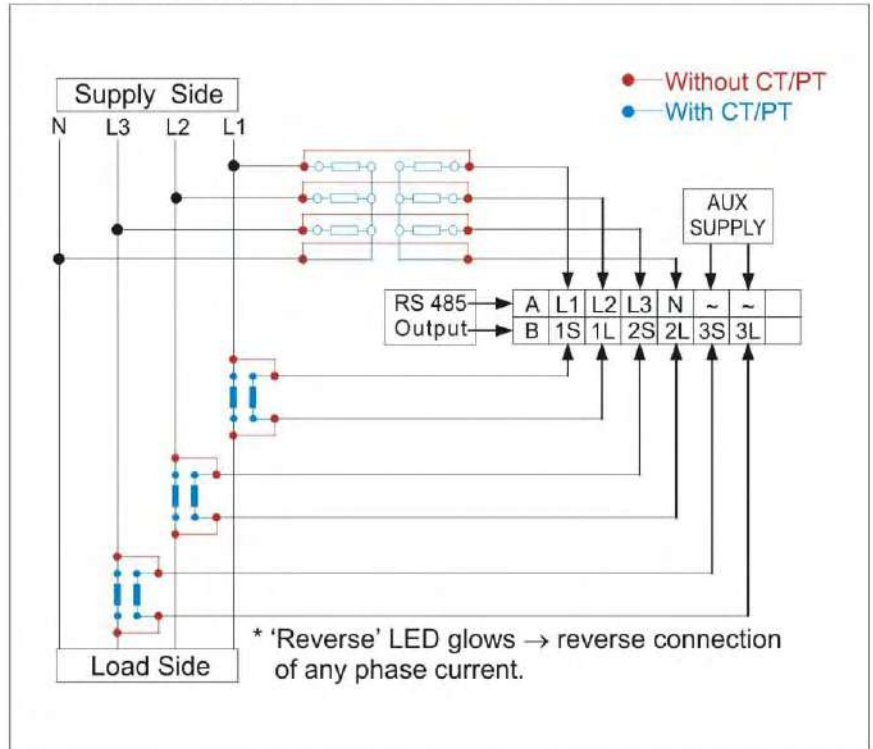
Dual Source KWh meter 96 x 96 mm size, measures energy (Watt hour) of both 'MAINS' as well as 'GENSET'.

CTR Selection Chart

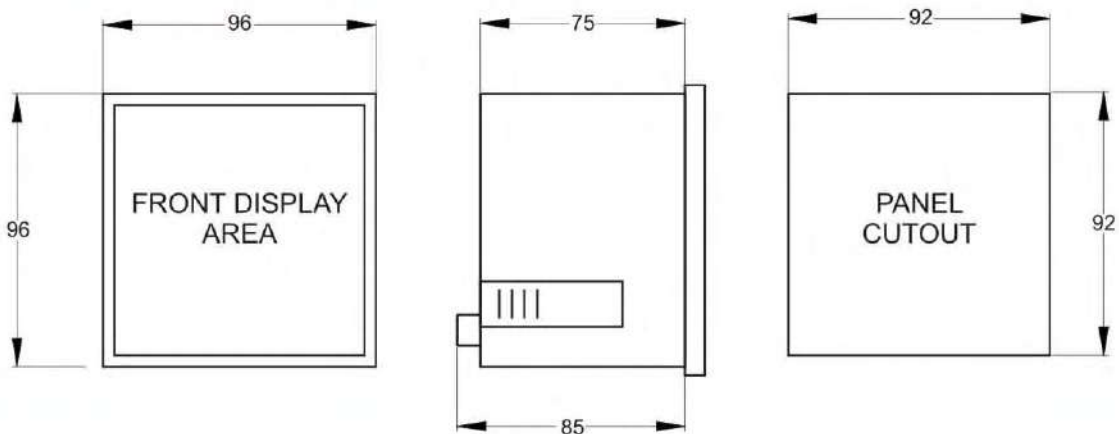
Displayed CT Ratio	CTR Value	Resolution
1	5/5A	0.1
2	10/5A	0.1
3	15/5A	0.1
4	20/5A	0.1
5	25/5A	0.1
6	30/5A	0.1
8	40/5A	0.1
10	50/5A	1
12	60/5A	1
15	75/5A	1
16	80/5A	1
20	100/5A	1
24	120/5A	1
25	125/5A	1
30	130/5A	1
32	150/5A	1
40	160/5A	1
50	200/5A	1
50	250/5A	1
60	300/5A	1
80	400/5A	1
100	500/5A	10
120	600/5A	10
150	750/5A	10
160	800/5A	10
200	1000/5A	10
240	1200/5A	10
250	1250/5A	10
300	1500/5A	10
320	1600/5A	10
400	2000/5A	10
500	2500/5A	10
600	3000/5A	10
640	3200/5A	10
800	4000/5A	10
1000	5000/5A	10

Connection Diagram

For Self Powered type.



Meter Dimensions & Installation cut out



Ordering Information:

- 1) Model Type: Dual KWh Meter with / without RS 485 Communication port.
- 2) Input Voltage
- 3) Input Current



DC Energy Meter

Instrument
Division

DC Energy meter 96 x 96 mm size is suitable to measure the DC energy of 4 individuals channels with suitable enable/disable facility.

Data sheet No. : DC KWH /10/11



Principle

DC energy Measurement is based on the principle of integration of DC power with time incorporating State of art microprocessor based design

Features:

- 1 Programmable & password protected for the tampering protection. To widen the usage, different shunt ratio can be programmed directly through switch
- 2 Programmable shunt ratio
- 3 Programmable device ID and selectable baudrate.
- 4 EEPROM based memory for Energy data retention.
- 5 RS 485 Modbus communication.
- 6 Measure DC energy of four channels simultaneously.
- 7 Energy displayed on 16 X 2 Alphanumeric character LCD display with backlit.

Auxiliary Power Supply:

Self Powered

Application:

The DC energy meter have been designed for industrial & Telecom applications purpose.

Specifications :

Electrical

Input Voltage	40V to 220 V DC
Input Current	4 channels through external Shunt (75 mV).
Accuracy	±1.0% of the reading for DC energy & power. ±1.0% of full scale for DC current & voltage..
Resolution	0.001KWH for DC energy. 0.1V for Voltage 0.1A for Current 0.1KW for power
Insulation resistance	> 20M ohms at 500V DC.
Dielectric Test	2KV RMS for 1 minute.
Power consumption	2 VA at 48V DC
LCD Display	16 * 2 LCD Black characters with yellow backlit.

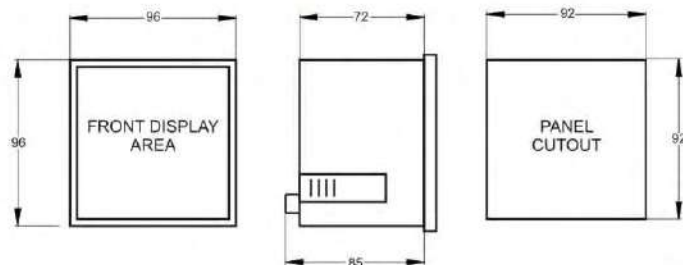
Environmental

Humidity	≤ 95 % RH Non condensing.
Operating temperature	0°C to +60°C
Storage temperature	20°C to +70°C

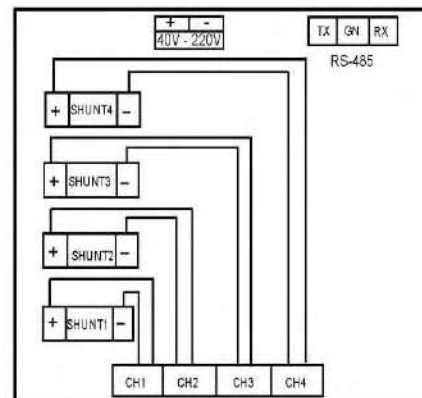
Mechanical

Mounting	Flush mounting with side clamps.
Dimension	96 X 96 X 75 mm
Weight	
Termination	8 pin VH connector for current input. 2 pin VH connector for V input. 3 pin VH connector for RS-485 communication.

Meter Dimension & Installation cut out



Connection Diagram



1. Product Perspective

AE -9xxx is used in variety of industrial and commercial applications. AE - 9xxx computes -Display, Monitor, stores, and communicate up to maximum 63 major electrical parameters, including true RMS Voltage, Current, PF, Frequency, Active power, Reactive power, Apparent power, Active energy, Reactive energy, Apparent energy, Total harmonic distortion (THD) and Maximum demand. The meter offers simple user-friendly Programming of Voltage, current, and power Measurement parameters using a menu driven interface. Status of all parameters can be viewed through main Screens on the 3 line, 4 digits LED display (Maximum nos. of screens - 30). The AE-9xxx has option for digital RS485 Communication. The protocol used is a standard MODBUS and is ideal for Energy Management System.

2. Operation

AE - 9xxx offers high functionality and uncomplicated operation. AE- 9xxx measures all the values needed to monitor power and Energy. A five-button interface on the front panel gives simple access to the measuring, display and configuration screens. With the help of "▲" (navigation key) buttons, can access total 63 (AE-9000) major electrical parameters. The parameters to be viewed through display screens.

3. Product Features

- ▶ Fully programmable CT and PT ratio (Primary / Secondary).
- ▶ Fully programmable selection of three phase 3 wire or 4 wire configuration.
- ▶ Programmable Single & Three phase system configuration.
- ▶ The true RMS measurement.
- ▶ Display and communication of up to 63 parameters through 30 screens / pages.
- ▶ KVA & KW Demand Measurements. Demand interval can be set from 5 to 30 minutes.
- ▶ Password protection.
- ▶ Simultaneously three parameters can be view
- ▶ Total Voltage or Current % THD measurement.
- ▶ Phase angle & Phasor angle measurement.
- ▶ Separate registers for Import and Export energy measurement.
- ▶ Energy summation (Import + Export) for Active, Reactive & Apparent Energy.
- ▶ Display Previous Energies (before the energies were reset).
- ▶ Neutral Current Measurement.
- ▶ RS 485 interface for configuration, communication and downloading purpose.
- ▶ Confirm to IP54 (front face)
- ▶ Run Hr. & ON Hr display.
- ▶ LED and Memory test facility.
- ▶ High quality LED display.
- ▶ Simple menu driven.
- ▶ EMS Software available (optional).
- ▶ Real Time clock
- ▶ Universal Auxiliary Power Supply.
- ▶ Recording & display of Minimum Voltage & Current values.
- ▶ Recording & display of Maximum Voltage & Current values

4. Monitors

- ▶ Voltage- Line – Line , Line - Neutral & System voltage.
- ▶ Current- Individual Phase, Average & Neutral
- ▶ Frequency
- ▶ Power (Active, Reactive and Apparent)
- ▶ Energy (Active, Reactive and Apparent)
- ▶ Power Factor(per phase & average along with phase & Phasor angle)
- ▶ Maximum demand – (Active & Apparent)
- ▶ Minimum / Maximum Voltage & Current Values

6. System Input

Designed for all low, medium and high voltage switchgear and distribution systems, the AE-9xxx Has customer programmable PT and CT ratio capability. Both primary & secondary are configurable. The standard nominal inputs Voltage are 415 or 110 VAC (L-L) & Current – 1A or 5AAC.

7. Typical Applications

- ▶ Energy Generation & Distribution Systems
- ▶ Industrial & Commercial Generator sets.
- ▶ Building management System.
- ▶ Energy Management System.
- ▶ Control & Monitoring Systems.
- ▶ Process Control.
- ▶ Switch Gear.





Multifunction Meter

Instrument
Division

AE 9000 ▶ AE 9001 ▶ AE 9002 ▶ AE 9003

7. Display Parameters of AE 9000, AE 9001, AE 9002, AE 9003

AE 9000 (With THD% Measurement) – Premium Class

- ▶ Volts R-N
- ▶ Volts Y-N
- ▶ Volts B-N
- ▶ Volts RY
- ▶ Volts YB
- ▶ Volts BR
- ▶ Avg. Voltage
- ▶ Current R
- ▶ Current Y
- ▶ Current B
- ▶ Avg. Current
- ▶ IN
- ▶ Frequency
- ▶ pf R
- ▶ pf Y
- ▶ pf B
- ▶ System PF
- ▶ Phase Angle R
- ▶ Phase Angle Y
- ▶ Phase Angle B
- ▶ Phasor Angle R-Y
- ▶ Phasor Angle Y-B
- ▶ Phasor Angle B-R
- ▶ kWh Total
- ▶ kWh Import
- ▶ kWh Export
- ▶ kVAh Total
- ▶ kVAh Import
- ▶ kVAh Export
- ▶ kVAh Total
- ▶ kVAh Import
- ▶ kVAh Export
- ▶ Prev. energies kWh Total
- ▶ Prev. energies kVAh Total
- ▶ Prev. energies kWh Import
- ▶ Prev. energies kVAh Import
- ▶ Prev. energies kWh Export
- ▶ Prev. energies kVAh Export
- ▶ Prev. energies kWh Total
- ▶ Prev. energies kVAh Total
- ▶ Prev. energies kWh Import
- ▶ Prev. energies kVAh Import
- ▶ Prev. energies kWh Export
- ▶ Prev. energies kVAh Export
- ▶ Prev. energies kWh Total
- ▶ Prev. energies kVAh Total
- ▶ Prev. energies kWh Import
- ▶ Prev. energies kVAh Import
- ▶ Prev. energies kWh Export
- ▶ Prev. energies kVAh Export

AE- 9002 (Power Class series)

- ▶ Volts R-N
- ▶ Volts Y-N
- ▶ Volts B-N
- ▶ Volts RY
- ▶ Volts YB
- ▶ Volts BR
- ▶ Avg. Voltage
- ▶ Current R
- ▶ Current Y
- ▶ Current B
- ▶ Avg. Current
- ▶ Frequency
- ▶ pf R
- ▶ pf Y
- ▶ pf B
- ▶ System PF
- ▶ kW R
- ▶ kW Y
- ▶ kW B
- ▶ System kW
- ▶ kVA R
- ▶ kVA Y
- ▶ kVA B
- ▶ System kVA
- ▶ MD KW
- ▶ MD KVA
- ▶ 3P4W3E
- ▶ 3P3W3E
- ▶ CTR / PTR Programming
- ▶ DISPLAY : LED
- ▶ RS 485
- ▶ EMS/ BMS Software comply *
- ▶ Accuracy class 1 (0.5 *)
- ▶ Bezel size : 96 x 96

AE 9001 (Energy Class)

- ▶ Volts R-N
- ▶ Volts Y-N
- ▶ Volts B-N
- ▶ Volts RY
- ▶ Volts YB
- ▶ Volts BR
- ▶ Avg. Voltage
- ▶ Current R
- ▶ Current Y
- ▶ Current B
- ▶ Avg. Current
- ▶ Frequency
- ▶ System PF
- ▶ kWh Total
- ▶ kWh Import **
- ▶ kWh Export **
- ▶ kVAh Total
- ▶ kVAh Import **
- ▶ kVAh Export **
- ▶ kVAh Total
- ▶ kVAh Import **
- ▶ kVAh Export **
- ▶ MD KW *
- ▶ MD KVA *
- ▶ Run Hrs. Total
- ▶ Total On Hrs.
- ▶ RTC - Date & Time *
- ▶ 3P4W3E
- ▶ 3P3W3E
- ▶ 3P3W2E
- ▶ 1P1E
- ▶ CTR / PTR Programming
- ▶ DISPLAY : LED
- ▶ RS 485 *
- ▶ Memory Test
- ▶ EMS/ BMS Software comply *
- ▶ Accuracy class 1 (0.5 *)
- ▶ Bezel size : 96 x 96

AE 9003 (Economy Class)

- ▶ Volts R-N
- ▶ Volts Y-N
- ▶ Volts B-N
- ▶ Volts RY
- ▶ Volts YB
- ▶ Volts BR
- ▶ Avg. Voltage
- ▶ Avg. Current
- ▶ Frequency
- ▶ System PF
- ▶ kWh Total
- ▶ System kW
- ▶ System kVA
- ▶ MD KW
- ▶ Run Hrs. Total
- ▶ Total On Hrs.
- ▶ 3P4W3E
- ▶ 3P3W3E
- ▶ 3P3W2E
- ▶ CTR / PTR Programming
- ▶ DISPLAY : LED
- ▶ LED Test
- ▶ Accuracy class :1
- ▶ Bezel Size : 96 x 96

Note :Parameter marked by** will be optional.
Accuracy class is not same for all measured parameters



Multifunction Meter

Instrument
Division

AE 9000 ▶ AE 9001 ▶ AE 9002 ▶ AE 9003

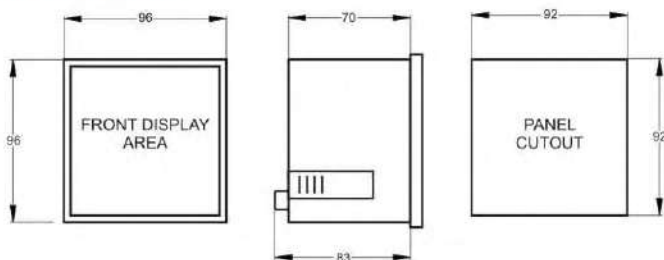
8. Specifications

Type	1 / 3-Phase-3-wire/ 4wire (Programmable through front panel).
Input voltage V AC	110V or 415 V (L-L)
Voltage Overload	1.5 time for 10 sec
Input Current A AC	1A or 5A
Current Overload	50A max for 3 sec
Auxiliary supply	AC / DC: 85 V - 300 V.
Burden	For Voltage / Current - 0.2 VA max per Volt/Amp input, Auxiliary - 3VA max.
Frequency	45 Hz - 55Hz
Resolution	RMS 4 digit, Integral 8 digit
Accuracy Class	1.0 (optional: 0.5S).
RS485 communication	Two wire half duplex Baud rates - 4800, 9600, 19200, 38400.
Isolation	2k VAC isolation for 1min. Between communication and other circuit.
Demand Interval	Programmable from 5 to 30 Minutes.(In steps of 1 Minute)
Environmental	Operating Temp. -10 to +70 °C. Storage temp.-20 to +85°C, Humidity [95% RH non condensing.
Mechanical Size	Bezel : 96 x 96 mm Depth : 83mm behind Bezel
Protection	IP54 for front Display.
Conform to	IS 1248 - Part1, for Class 1 - IS13779 / IEC 62052-11 & 62053-21. (for Class 0.5S- IS14697 / IEC 62052-11 & 62053-22).
Casing	ABS
Keypad	5 Functional keys
LED Indication	Individual LED's for parameter information

9. Digital Communication (Optional)

An RS485 communication Port is available for direct connection to SCADA systems (EMS / BMS) using the Modbus RTU protocol. Remote monitoring enables the user to record the systems parameters in real time basis.

10. Dimensions:



11. Wiring Diagram :

