

POWER QUALITY METER

MULTISPAN

PQM 14-M1



TECHNICAL SPECIFICATION

PARAMETER SPECIFICATION

Input Signal	1Ø 2Wire /3Ø 4Wire
CT Primary	up to 9999A (Programmable)
CT Secondary	5 Amp/1 Amp selectable
PT Primary	100V to 520kV (Programmable)
PT Secondary	100V to 520V (L-L) (Programmable)
PF Avg. & Per Phase	0.100 - 1.000
System PF	0.100 - 1.000
Frequency (Hz)	45.00 - 60.00 Hz
Load hours	9999.59 Hrs/Min.
No load hours	9999.59 Hrs/Min.
RPM	3600 RPM @ 60 Hz & 2 pole
POWER	
kW Total	0.000 - 9999 MW
kW Per Phase	0.000 - 9999 MW
kVA Total	0.000 - 9999 MVA
kVA Per Phase	0.000 - 9999 MVA
kVAr Total	0.000 - 9999 MVar
kVAr Per Phase	0.000 - 9999 MVar
ENERGY	
kWh Total	000.000 - 999999999.999 kWh
kVAh Total	000.000 - 999999999.999 kVAh
kVArh Total	000.000 - 999999999.999 kVArh

DISPLAY & KEY :

LCD Display	4 Digit,3 Line 0.57"
Key	PROGRAM, VAF, PF, POWER , ENERGY

DIMENSION :

Size	98 (H) x 98 (W) x 46 (D) mm
Panel Cutout	92 (H) x 92 (W) mm

AUXILIARY SUPPLY :

Supply voltage	100 to 300V AC/DC, 50/60Hz
Power consumption (VA RATING)	Approx 3 VA @ 230V AC MAX

ACCURACY:

Class 0.5 (Standard)

COMMUNICATION:

RS 485 MODBUS

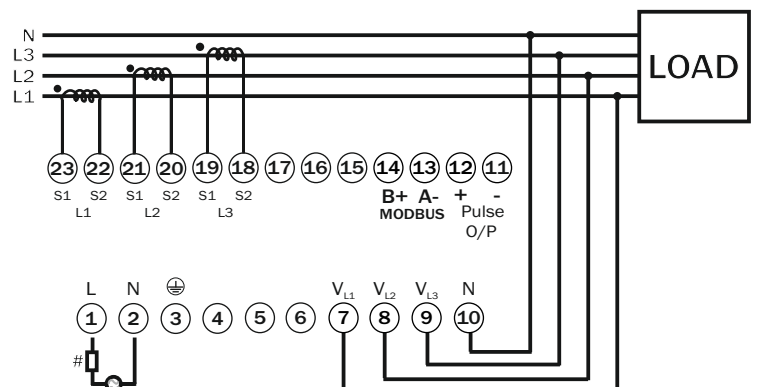
ENVIRONMENT CONDITION:

Operating Temp.	0 °C to 55 °C
Relative Humidity	UP to 95% RH (non-condensing)
Protection Level (AS Per Request)	IP-65 (Front side) As per IS/IEC 60529 : 2001

MECHANICAL INSTALLATION

Outline Dimension (mm)	Panel Cutout Dimension (mm)

TERMINAL CONNECTION



KEY OPERATION

FUNCTION	PRESS KEY
OPERATOR MODE	
To view VAF Pages	
To view Power Factor Pages	
To view Power Pages	
To scroll & hold pages	Press + For 5Sec
PARAMETER SETTING MODE	
To Set Parameter Value	Press For 5 Sec
To Increment parameter value	
To Decrement parameter value	
To Exit from parameter setting	

Resolution	
PT Ratio x CT Ratio	Pulse/kWh
<15	0.01kWh
<150	0.1kWh
<1500	1kWh
<15000	10kWh
<150000	100kWh
≥150000	1000kWh

INSTALLATION GUIDELINES

1. This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and internal wiring.
2. Do not allow pieces of metal, wire clippings, or fine metallic fillings from installation to enter the product or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
3. Circuit breaker or mains switch must be installed between power source and supply terminal to facilitate power 'ON' or 'OFF' function. However this mains switch or circuit breaker must be installed at convenient place normally accessible to the operator.
4. Use and store the instrument within the specified ambient temperature and humidity ranges as mentioned in this manual.

MECHANICAL INSTALLATION GUIDELINES

1. Prepare the panel cutout with proper dimensions as shown above.
2. Fit the unit into the panel with the help of clamp given.
3. The equipment in its installed state must not come in close proximity to any heating source, caustic vapors, oils steam, or other unwanted process byproducts.
4. Use the specified size of crimp terminal (M3.5 screws) to wire the terminal block. Tightening the screws on the terminal block using the tightening torque of the range of 1.2 N.m.
5. Do not connect anything to unused terminals.

MAINTENANCE

1. The equipment should be cleaned regularly to avoid blockage of ventilating parts.
2. Clean the equipment with a clean soft cloth. Do not use isopropyl alcohol or any other cleaning agent.
3. Fusible resistor must not be replaced by operator.



SAFETY PRECAUTION

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.

If all the equipment is not handled in a manner specified by the manufacturer, it might impair the protection provided by the equipment.



Read complete instructions prior to installation and operation of the unit.



WARNING : Risk of electric shock.

WARNING GUIDELINES



WARNING : Risk of electric shock.

1. To prevent the risk of electric shock, power supply to the equipment must be kept OFF while doing the wiring arrangement. Do not touch the terminals while power is being supplied.
2. To reduce electro magnetic interference, use wire with adequate rating and twists of the same of equal size shall be made with shortest connection.
3. Cable used for connection to power source, must have a cross section of 1mm or greater. These wires should have insulations capacity made of at least 1.5kV.
4. A better anti-noise effect can be expected by using standard power supply cable for the instrument.

PARAMETER SETTING

Long Press  key

Enter Password 10

PRSS

10

Change by  &  key

nEtū

Network Selection

3P4

1Ø2W / 3Ø4W

Change by  &  key

CT

CT Primary

Pr Iñ

(5 Amp to 9999 Amp selectable)

0005

Change by  &  key

CT

CT Secondary

SECD

(5 Amp/1 Amp selectable)

1 A

/ 5 A

Change by  &  key

PT

PT Primary

Pr Iñ

(100V to 520kV selectable)

240

Change by  &  key

PT

PT Secondary

SECD

(100V to 520V selectable)

240

Change by  &  key

Press  key to save & exit from parameter setting

LOAD HOUR & RPM

PRSS

Enter Password 25

25

Change by  &  key

LHr5

Load Hour

Enb

Enable / Disable

Change by  &  key

LOAD

Load Hour Percentage

PERC

(5 to 50%)

40

Change by  &  key

rPñ

RPM

Enb

Enable / Disable

Change by  &  key

POLE

Pole

4

(1 to 128)

Change by  &  key

PLSE

Pulse ON Time

On

(10 to 500ms)

100

Change by  &  key

PLSE

Pulse Mode

ñODE

Auto / Manual

AUTO

IF Auto

Change by  &  key

PLSE

Pulse Out

OUT

0.01, 0.1, 1, 10, 100, 1000

0001

Change by  &  key

Press  key to save & exit from parameter setting

RESET SETTINGS

PASS

Enter Password 15

15

Change by [P] & [E] key

rESt
ALL
YES

Reset
All Parameter
(Yes/No)

Change by [P] & [E] key

rESt
EnGy
YES

Reset
Energy
(Yes/No)

Change by [P] & [E] key

rESt
LHrS
YES

Reset
Load Hour
(Yes/No)

Change by [P] & [E] key

rESt
nHrS
YES

Reset
No Load Hour
(Yes/No)

Change by [P] & [E] key

Press [Enter] key to save & exit from
parameter setting

MODBUS SETTINGS

PASS

Enter Password 35

35

Change by [P] & [E] key

Addr

Address

1

1 to 125

Change by [P] & [E] key

bAud

Baudrate

9600

4800,9600,19200

Change by [P] & [E] key

PARt

Parity

nOnE

None, Even, Odd

Change by [P] & [E] key

data

Data type

FLot

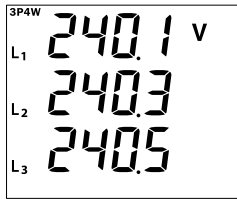
Float

Press [Enter] key to save & exit from
parameter setting

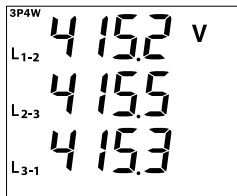
VAF Pages :

Press **VAF** key to change page

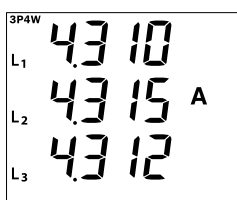
1) Voltage L-N



2) Voltage L-L



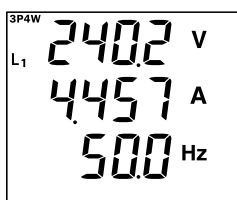
3) Current



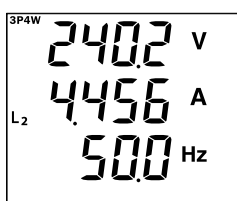
4) System Frequency



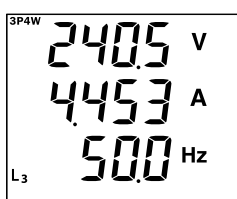
5) Line 1 V(L-N)-A-F



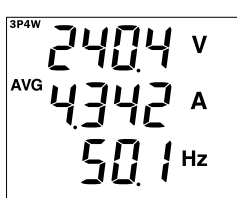
6) Line 2 V(L-N)-A-F



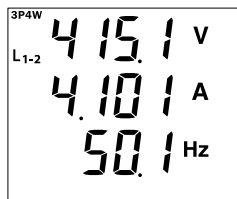
7) Line 3 V(L-N)-A-F



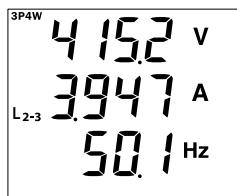
8) AVG V(L-N)-A-F



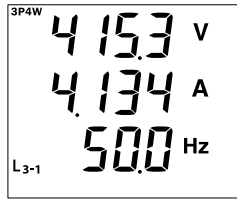
9) Line 12 V(L-L)-A-F



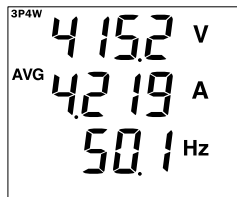
10) Line 23 V(L-L)-A-F



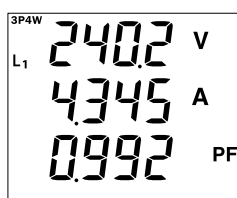
11) Line 31 V(L-L)-A-F



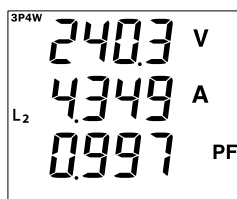
12) AVG V(L-L)-A-F



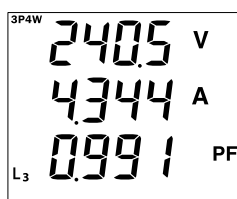
13) Line 1 V(L-N) A-PF



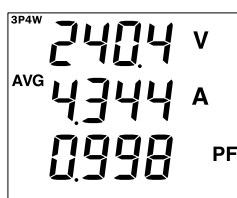
14) Line 2 V(L-N) A-PF



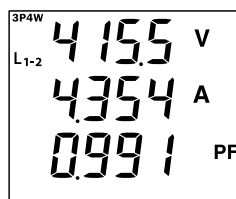
15) Line 3 V(L-N) A-PF



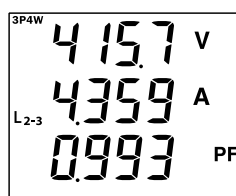
16) AVG V(L-N) A-PF



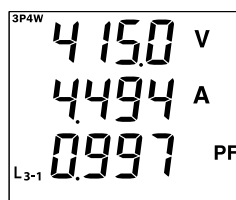
17) Line 12V(L-L) A-PF



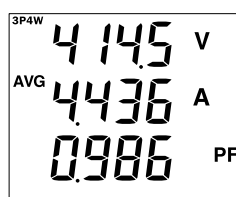
18) Line 23V(L-L) A-PF



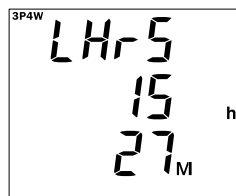
19) Line 31V(L-L) A-PF



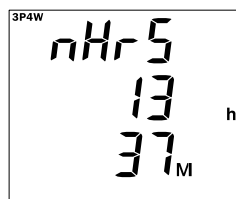
20) AVG V(L-L) A-PF



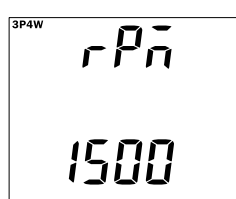
21) Load Hour



22) No Load Hour



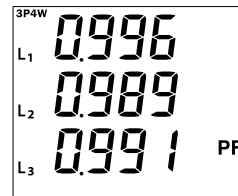
23) RPM



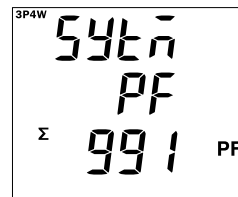
PF Pages :

Press **PF** key to change page

1) PF L1,L2,L3



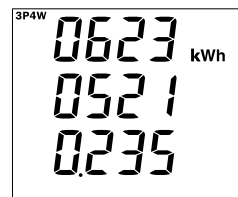
2) System PF



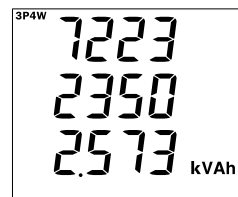
Energy Pages :

Press **E** key to change page

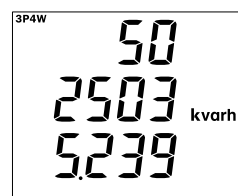
1) kWh Total



2) kVAh Total



3) kVArh Total



POWER Pages :

Press **P** key to change page

1) kW Per Phase

3P4W
L₁ 1027 kW
L₂ 1039
L₃ 1032

2) kVA Per Phase

3P4W
L₁ 1043
L₂ 1041
L₃ 1042 kVA

3) kVAr Per Phase

3P4W
L₁ 0.182
L₂ 0089 kvar
L₃ 0.101

4) Line 1 kW, kVAr, kVA

3P4W
L₁ 1027 kW
0.182 kvar
1043 kVA

5) Line 2 kW, kVAr, kVA

3P4W
L₂ 1039 kW
0089 kvar
1042 kVA

6) Line 3 kW, kVAr, kVA

3P4W
L₃ 1032 kW
0.142 kvar
1042 kVA

7) Total kW, kVAr, kVA

3P4W
Σ 3098 kW
0.361 kvar
3.129 kVA

1Phase 2 wire Pages

PF Pages :

Press **PF** key to change page

1) PF L1

L₁
0.996 PF

POWER Pages :

Press **P** key to change page

1) Line 1 kW, kVAr, kVA

L₁ 1027 kW
0.182 kvar
1043 kVA

VAF Pages :

Press **VAF** key to change page

1) Line 1 V(L-N)-A-F

L₁ 240.2 V
4457 A
50.0 Hz

2) Line 1 V(L-N) A-PF

L₁ 240.2 V
4345 A
0.992 PF

3) Load Hour

LHr5
15 h
27 M

4) No Load Hour

nHr5
13 h
37 M

5) RPM

rPñ
1500

ENERGY Pages :

Press **E** key to change page

1) kWh Total

623 kWh
0521
0235

2) kVAh Total

7223
2350
2573 kVAh

3) kVAh Total

50
2503
5239 kvarh

MODBUS (PQM 14-M1)

Slave Address :	1 to 125
Baudrate :	4800,9600,19200bps
Parity :	None,Even,Odd
Datatype :	Float (32 Bit Little Endian Byte Swap)
Read Function Register :	0x03 and 0x04
Write Function Register :	0x06 and 0x10

Sr.No	Access Type	Parameter	Register
			Data Type
			Float
1	R	kWh Value *N1	0
			2
2	R	kVArh Value *N1	4
			6
3	R	kVAh Value * N1	8
			10

*Note 1 :- In Above Energy Parameter, Energy Value Representation shown as per below.

Example :- Actual Value = 320126789.321
 Above Register Address 1 = 320126789
 Below Register Address 2 = 0.321

4	R	Voltage L1-N Value	12
5	R	V L1-N Unit	14
		Selection	Value
		Volt	0
		Kilo Volt	1
6	R	Voltage L2-N Value	16
7	R	V L2-N Unit	18
		Selection	Value
		Volt	0
		Kilo Volt	1
8	R	Voltage L3-N Value	20
9	R	V L3-N Unit	22
		Selection	Value
		Volt	0
		Kilo Volt	1
10	R	AVG VLN Value	24
11	R	AVG VLN Unit	26
		Selection	Value
		Volt	0
		Kilo Volt	1
12	R	Voltage L12 Value	28
13	R	V L12 Unit	30
		Selection	Value
		Volt	0
		Kilo Volt	1
14	R	Voltage L23 Value	32
15	R	V L23 Unit	34
		Selection	Value
		Volt	0
		Kilo Volt	1

Sr.No	Access Type	Parameter	Register
			Data Type
			Float
16	R	Voltage L31 Value	36
17	R	V L31 Unit	38
		Selection	Value
		Volt	0
		Kilo Volt	1
18	R	AVG VLL Value	40
19	R	AVG VLL Unit	42
		Selection	Value
		Volt	0
		Kilo Volt	1
20	R	Current L1 Value	44
21	R	Current L1 Unit	46
		Selection	Value
		Ampere	0
22	R	Current L2 Value	48
23	R	Current L2 Unit	50
		Selection	Value
		Ampere	0
24	R	Current L3 Value	52
25	R	Current L3 Unit	54
		Selection	Value
		Ampere	0
26	R	AVG Current Value	56
27	R	AVG Current Unit	58
		Selection	Value
		Ampere	0
28	R	Line 1 Power Factor	60
29	R	Line 2 Power Factor	62
30	R	Line 3 Power Factor	64
31	R	Average Power Factor	66
32	R	System Power Factor	68
33	R	System Frequency	70
34	R	Line 1 kW value	72
35	R	Line 1 kW Unit	74
		Selection	Value
		kW	1
		MW	2
36	R	Line 2 kW value	76
37	R	Line 2 kW Unit	78
		Selection	Value
		kW	1
		MW	2
38	R	Line 3 kW value	80
39	R	Line 3 kW Unit	82
		Selection	Value
		kW	1
		MW	2

Sr.No	Access Type	Parameter	Register
			Data Type
			Float
40	R	Total kW	84
41	R	Total kW Unit	86
		Selection	Value
		kW	1
		MW	2
42	R	Line 1 kVA value	88
43	R	Line 1 kVA Unit	90
		Selection	Value
		kVA	1
		MVA	2
44	R	Line 2 kVA value	92
45	R	Line 2 kVA Unit	94
		Selection	Value
		kVA	1
		MVA	2
46	R	Line 3 kVA value	96
47	R	Line 3 kVA Unit	98
		Selection	Value
		kVA	1
		MVA	2
48	R	Total kVA value	100
49	R	Total kVA Unit	102
		Selection	Value
		kVA	1
		MVA	2
50	R	Line 1 kVAr value	104
51	R	Line 1 kVAr Unit	106
		Selection	Value
		kVAr	1
		MVAr	2
52	R	Line 2 kVAr value	108
53	R	Line 2 kVAr Unit	110
		Selection	Value
		kVAr	1
		MVAr	2
54	R	Line 3 kVAr value	112
55	R	Line 3 kVAr Unit	114
		Selection	Value
		kVAr	1
		MVAr	2
56	R	Total kVAr value	116
57	R	Total kVAr Unit	118
		Selection	Value
		kVAr	1
		kVAr	2
58	R	Load Hour Value (In Hour)	120
59	R	Load Hour Minute (In Min.)	122
60	R	No Load Hour Value (In Hour)	124
61	R	No Load Hour Minute (In Min.)	126
62	R	RPM	128

Sr.No	Access Type	Parameter	Register
			Data Type
			Float
63	R	Network Selection	130
		Selection	Value
		3P-4W	0
		1P-2W	1
64	R/W	CT Primary Value	132
65	R/W	CT Secondary Value	134
66	R/W	PT Primary Value	136
67	R/W	PT Secondary Value	138
68	R/W	Load Hour	140
		Selection	Value
		Disable	0
		Enable	1
69	R/W	Load Hour Percentage	142
70	R/W	RPM	144
		Selection	Value
		Disable	0
		Enable	1
71	R/W	Pole	146
72	R/W	Pulse ON Time	148
73	R/W	Pulse Mode	150
		Selection	Value
		Auto	0
		Manual	1
74	R/W	Pulse Output	152
		Selection	Value
		0.01	0
		0.1	1
		1	2
		10	3
		100	4
		1000	5

Note :- To Reset Below Parameter Enter 15 Value

75	R/W	Reset All Parameter	154
76	R/W	Reset Energy	156
77	R/W	Reset Load Hour	158
78	R/W	Reset No Load Hour	160
79	R/W	Address	162
80	R/W	Baudrate	164
		Selection	Value
		4800	0
		9600	1
		19200	2
81	R/W	Parity	166
		Selection	Value
		None	0
		Even	1
		Odd	2
82	R	Data type	168
83	R/W	Scroll & Hold	170
		Selection	Value
		Hold	0
		Scroll	1