



## TECHNICAL SPECIFICATION

### PARAMETER SPECIFICATION

|                     |                                   |
|---------------------|-----------------------------------|
| Input Signal        | 3Ø 3 Wire / 3Ø 4Wire / 1Ø 2Wire   |
| CT Primary          | up to 9999A (Programmable)        |
| CT Secondary        | 5 Amp/1 Amp selectable            |
| Current Input       | 10mA To 5 Amp AC                  |
| PT Primary          | 100V to 520kV (Programmable)      |
| PT Secondary        | 100V to 520V (L-L) (Programmable) |
| PF Avg. & Per Phase | 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 - 99999999 kWh   |
| kVAh Total  | 000.000 - 99999999 kVAh  |
| kVArh Total | 000.000 - 99999999 kVArh |

### DISPLAY & KEY :

|         |                             |
|---------|-----------------------------|
| Display | 8 Digit, 7 Segment 0.5" RED |
| Key     | PRG, VAF, P, E              |

### DIMENSION :

|      |                               |
|------|-------------------------------|
| Size | 90.5 (H) x 88 (W) x 62 (D) mm |
|------|-------------------------------|

### AUXILIARY SUPPLY :

|                               |                            |
|-------------------------------|----------------------------|
| Supply voltage                | 100 to 270V AC/DC, 50/60Hz |
| Power consumption (VA RATING) | Approx 3 VA @ 230V AC MAX  |

### COMMUNICATION:

RS-485 MODBUS

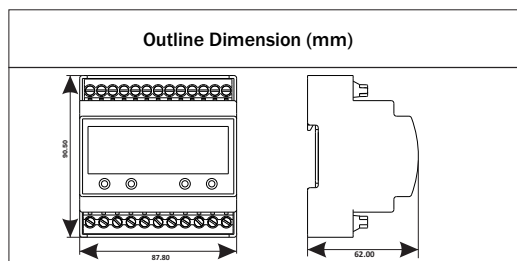
### ACCURACY:

Class : 0.5

### 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 DIMENSION



## TERMINAL CONNECTION



## KEY OPERATION

### PARAMETER SETTING MODE

|                        |                                    |
|------------------------|------------------------------------|
| To Set Parameter Value | Press <b>PRG</b> For 5 Sec         |
| To view VAF Pages      | <b>VAF</b>                         |
| To View Power Pages    | <b>P</b>                           |
| To View Energy         | <b>E</b>                           |
| To scroll & hold pages | Press <b>P</b> + <b>E</b> For 5Sec |

### PARAMETER SETTING MODE

|                                |            |
|--------------------------------|------------|
| To Set Parameter Value         | <b>PRG</b> |
| To Increment parameter value   | <b>P</b>   |
| To Decrement parameter value   | <b>E</b>   |
| To Exit from parameter setting | <b>PRG</b> |

## 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:

Press **PRG** key For 5 Sec

**PASS 10**

(Enter Password)

(10) Change by **(P)&(E)** Key

Press **ENT** key

**ntu 3P4W**

Network Selection

3Ø 4Wire / 3Ø 3Wire / 1Ø 2Wire

Change by **(P)&(E)** Key

Press **ENT** key

**P.Ct 5**

(Primary CT Ratio)

(5 to 9999Amp Selectable)

Change by **(P)&(E)** Key

Press **ENT** key

**S.Ct 5**

(Secondary CT )

5A / 1Amp Selectable

Change by **(P)&(E)** Key

Press **ENT** key

**P.Pt 240**

(PT Primary )

100V To 520 KV ( Selectable)

Change by **(P)&(E)** Key

Press **ENT** key

**S.Pt 240**

(PT Secondary )

100V To 520 V ( Selectable)

Change by **(P)&(E)** Key

Press **PRG** key For Save & Exit

## Load Hour , No Load Hour & RPM SETTINGS

Press **PRG** key For 5 Sec

**PASS 25**

(Enter Password)

(25) Change by **(P)&(E)** Key

Press **ENT** key

**Lhr5 Enb**

Load Hour Enable / Disable

Change by **(P)&(E)** Key

Press **ENT** key

**PERC 25**

Load Hour Percentage

5 To 50%

Change by **(P)&(E)** Key

Press **ENT** key

**rPn Enb**

RPM Enable / Disable

Change by **(P)&(E)** Key

Press **ENT** key

**PoLE 2**

Pole

2 To 128 Change by **(P)&(E)** Key

Press **ENT** key

**PLtN 100**

Pulse On Time

10 To 500mS Change by **(P)&(E)** Key

Press **ENT** key

**PLnd AUT**

Pulse Mode

Auto / Manual Change by **(P)&(E)** Key

Press **ENT** key

**P.out 001**

Pulse Out

0.01, 0.1, 1, 10, 100, 1000

Press **PRG** key For Save & Exit

## LOAD HOUR & RPM

Press **PRG** key For 5 Sec

**PASS 15**

(Enter Password)

(15) Change by **(P)&(E)** Key

Press **ENT** key

**ALL no**

Reset All

Change by **(P)&(E)** Key

Press **ENT** key

**puh no**

Reset kWh (Yes / No)

Change by **(P)&(E)** Key

Press **ENT** key

**puAh no**

Reset kVAh (Yes / No)

Change by **(P)&(E)** Key

Press **ENT** key

**puRh no**

Reset kVArh (Yes / No)

Change by **(P)&(E)** Key

Press **ENT** key

**Lhr5 no**

Reset Load Hour (Yes / No)

Change by **(P)&(E)** Key

Press **ENT** key

**nhr5 no**

Reset No Load Hour (Yes / No)

Press **PRG** key For Save & Exit

## VAF **(VAF)** PAGES

1)  $V_{LN}$  (L1)

**2308**  
 $V_{L1}$

2)  $V_{LN}$  (L2)

**235.7**  
 $V_{L2}$

3)  $V_{LN}$  (L3)

**245.7**  
 $V_{L3}$

4)  $V_{LN}$  (AVG)

**237.2**  
 $V_{L1L2L3}$

5)  $V_{LL}$  (L1-L2)

**415.7**  
 $V_{L1L2}$

6)  $V_{LL}$  (L2-L3)

**388.9**  
 $V_{L2L3}$

7)  $V_{LL}$  (L1-L3)

**510.4**  
 $V_{L1L2L3}$

8)  $V_{LL}$  (AVG)

**438.6**  
 $V_{L1L2L3}$

9) Current (L1)

**487.5**  
 $A_{L1}$

10) Current (L2)

**312.0**  
 $A_{L2}$

11) Current (L3)

**500.0**  
 $A_{L3}$

12) Current (AVG)

**433.1**  
 $A_{L1L2L3}$

13) Frequency

**FrEQ 50.1**

14) PF (L1)

**PF 0.987**  
 $L1$

15) PF (L2)

**PF 0.521**  
 $L2$

16) PF (L3)

**PF 0.861**  
 $L3$

17) PF (AVG)

**PF 0.789**  
 $L1L2L3$

18) Load hour

**LHr 0.12**

19) No Load hour

**nHr 0.07**

20) RPM

**rPn 1500**

## POWER **(P)** PAGES

1) kW (L1)

**1.184**  
 $kW_{L1}$

2) kW (L2)

**1.104**  
 $kW_{L2}$

3) kW (L3)

**180.8**  
 $kW_{L3}$

4) kW (Total)

**120.9**  
 $kW_{L1L2L3}$

5) kVA (L1)

**120.9**  
 $kVA_{L1}$

6) kVA (L2)

**128.7**  
 $kVA_{L2}$

7) kVA (L3)

**120.8**  
 $kVA_{L3}$

8) kVA (Total)

**370.4**  
 $kVA_{L1L2L3}$

9) kVA (L1)

**0.296**  
 $kvar_{L1}$

10) kVA (L2)

**0.394**  
 $kvar_{L2}$

11) kVA (L3)

**0.594**  
 $kvar_{L3}$

12) kVA (Total)

**1.284**  
 $kvar_{L1L2L3}$

## ENERGY **(E)** PAGES

1) kWh

**59.221**  
 $kWh$

2) kVAh

**21.10**  
 $kVAh$

3) kVArh

**21.10**  
 $kvarh$

## MODBUS SETTING:

**PASS 35**

(Enter Password)

(35) Change by **(P)&(E)** Key

**Addr 1**

(Address)

(1 To 125)  
Change by **(P)&(E)** Key

**bAud9600**

(Baudrate)

(4800,9600,19200,  
38400)

Change by **(P)&(E)** Key

**Prty non**

(Parity)

(None,Even,Odd)  
Change by **(P)&(E)** Key

Press **PRG** key For Save & Exit

Specifications are subject to change, since development is a continuous process.  
So for more updated operating information and Support,  
Please contact our Helpline: +91-9081078683/81 or  
Email at [service@multispanindia.com](mailto:service@multispanindia.com) Ver:191201

| MODBUS (MFM 5M)           |                                        |
|---------------------------|----------------------------------------|
| Slave Address :           | 1 to 125                               |
| Baudrate :                | 4800,9600,19200,38400bps               |
| 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           | kVAh Value * N1 | 4         |
|       |             |                 | 6         |
| 3     | R           | kVArh 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    | —           | NA                   | 66        |
| 32    | R           | Average 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           | Max kW Value       | 130       |
| 64    | R           | Max kW Unit        | 132       |
|       |             | Selection          | Value     |
|       |             | kW                 | 1         |
|       |             | MW                 | 2         |
| 65    | R           | Max kVA Value      | 134       |
| 66    | R           | Max kVA Unit       | 136       |
|       |             | Selection          | Value     |
|       |             | kVA                | 1         |
|       |             | MVA                | 2         |
| 67    | R           | Max kVAr Value     | 138       |
| 68    | R           | Max kVAr Unit      | 140       |
|       |             | Selection          | Value     |
|       |             | kVAr               | 1         |
|       |             | MVAr               | 2         |
| 69    | R           | Max V-LN Value     | 142       |
| 70    | R           | Max V-LN Unit      | 144       |
|       |             | Selection          | Value     |
|       |             | Volt               | 0         |
|       |             | Kilo Volt          | 1         |
| 71    | R           | Max V-LL Value     | 146       |
| 72    | R           | Max V-LL Unit      | 148       |
|       |             | Selection          | Value     |
|       |             | Volt               | 0         |
|       |             | Kilo Volt          | 1         |
| 73    | R           | Min V-LN Value     | 150       |
| 74    | R           | Min V-LN Unit      | 152       |
|       |             | Selection          | Value     |
|       |             | Volt               | 0         |
|       |             | Kilo Volt          | 1         |
| 75    | R           | Min V-LL Value     | 154       |
| 76    | R           | Min V-LL Unit      | 156       |
|       |             | Selection          | Value     |
|       |             | Volt               | 0         |
|       |             | Kilo Volt          | 1         |
| 77    | R/W         | Network Selection  | 158       |
|       |             | Selection          | Value     |
|       |             | 3P-3W              | 0         |
|       |             | 3P-4W              | 1         |
|       |             | 1P-2W              | 2         |
| 78    | R/W         | CT Primary Value   | 160       |
| 79    | R/W         | CT Secondary Value | 162       |
| 80    | R/W         | PT Primary Value   | 164       |
| 81    | R/W         | PT Secondary Value | 166       |
| 82    | —           | NA                 | 168       |

Note :- To Reset Below Parameter Enter 15 Value

|    |     |                     |     |
|----|-----|---------------------|-----|
| 83 | R/W | Reset All Parameter | 170 |
| 84 | R/W | Reset kWh           | 172 |
| 85 | R/W | Reset kVAh          | 174 |
| 86 | R/W | Reset kVArh         | 176 |
| 87 | R/W | Reset Max kW        | 178 |
| 88 | R/W | Reset Max kVA       | 180 |
| 89 | R/W | Reset Max kVAr      | 182 |
| 90 | R/W | Reset Max Volt      | 184 |
| 91 | R/W | Reset Min Volt      | 186 |
| 92 | R/W | Reset Load Hour     | 188 |
| 93 | R/W | Reset No Load Hour  | 190 |

|        |     |                      |     |       |
|--------|-----|----------------------|-----|-------|
| 94     | R/W | Address              | 192 |       |
| 95     | R/W | Baudrate             | 194 |       |
|        |     | Selection            |     | Value |
|        |     | 4800                 |     | 0     |
|        |     | 9600                 |     | 1     |
|        |     | 19200                |     | 2     |
| 38400  | 3   |                      |     |       |
| 96     | R/W | Parity               | 196 |       |
|        |     | Selection            |     | Value |
|        |     | None                 |     | 0     |
|        |     | Even                 |     | 1     |
| Odd    | 2   |                      |     |       |
| 97     | —   | NA                   | 198 |       |
| 98     | R/W | Load Hour            | 200 |       |
|        |     | Selection            |     | Value |
|        |     | Disable              |     | 0     |
| Enable | 1   |                      |     |       |
| 99     | R/W | Load Hour Percentage | 202 |       |
| 100    | R/W | RPM                  | 204 |       |
|        |     | Selection            |     | Value |
|        |     | Disable              |     | 0     |
| Enable | 1   |                      |     |       |
| 101    | R/W | Pole                 | 206 |       |