



TECHNICAL SPECIFICATION

PARAMETER SPECIFICATION

Input Signal	3Ø 3 Wire / 3Ø 4Wire / 1Ø 2Wire
CT Primary	up to 6000A (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
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 kW
kW Per Phase	0.000 - 9999 kW
kVA Total	0.000 - 9999 kVA
kVA Per Phase	0.000 - 9999 kVA
kVA Total	0.000 - 9999 kVA
kVA Per Phase	0.000 - 9999 kVA
kVA Total	0.000 - 9999 kVA
kVA Per Phase	0.000 - 9999 kVA
ENERGY	
kWh Total	000.000 - 999999999.999 kWh
kVAh Total	000.000 - 999999999.999 kVAh
kVAh Total	000.000 - 999999999.999 kVAh

DISPLAY & KEY :

Display	4 Digit,3 Line 0.57" RED
Key	SET/ENT,VAF,P/E, INC, DEC

DIMENSION :

Size	96 (H) x 96 (W) x 54 (D) mm
Panel Cutout	92 (H) x 92 (W) mm

AUXILIARY SUPPLY :

Supply voltage	100 to 270V AC, 50/60Hz
Power consumption (VA RATING)	Approx 4 VA @ 230V AC MAX

COMMUNICATION:-

RS-485 MODBUS

ACCURACY:

Class 0.5 (Standard)

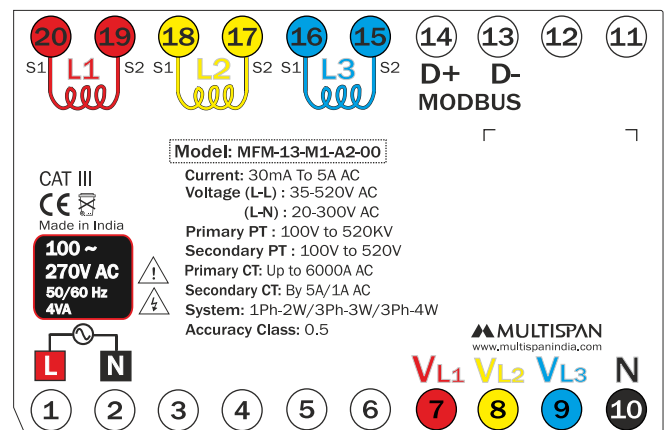
ENVIRONMENT CONDITION:

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 & Energy 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	

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

PRG

ntūP

Network Selection

3P3ū / 3P4ū / 1P2ū

PRG

ct

CT Primary

Prīā

(5 Amp to 6000 Amp selectable)

5000

PRG

ct

CT Secondary

SEcd

1 A / 5 A

(5 Amp/1 Amp selectable)

PRG

Pt

PT Primary

Prīā

(100V to 500kV selectable)

300

PRG

Pt

PT Secondary

SEcd

(100V to 520V selectable)

330

PRG

mode

Mode selection

base / Advn

(Basic / Advance)

Press  key to save & exit from parameter setting

BASIC MODE PAGES

VAF Pages :

Press  key to change page

1) Voltage L-N

L₁ 2419 V_{LN}
L₂ 2384
L₃ 2405

2) Voltage L-L

L₁₂ 4185 V_{LL}
L₂₃ 4126
L₃₁ 4162

3) Current

L₁ 4999 I
L₂ 5001
L₃ 4890

4) System Frequency

FrE9
5000 Hz

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

AVG 2402 V_{LN}
4963 I
5000 Hz

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

AVG 4202 V_{LL}
4965 I
5000 Hz

7) PF L1L2L3

L₁ 0982
L₂ 0983 PF
L₃ 0981

8) System PF

54tā
PF
Σ 0982

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

AVG 2402 V_{LN}
4963 I
0982 PF

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

AVG 4202 V_{LL}
4963 I
0982 PF

Note : In 3P-3W Page 2,3,4,6,8,10 will display

POWER & ENERGY Pages :

Press  key to change page

1) kW PER PHASE

L₁ 1184
L₂ 1168
L₃ 1152 kW

5) kWh Total

1549
0935 kWh

2) kVA PER PHASE

L₁ 1209 kVA
L₂ 1192
L₃ 1176

6) kvah Total

1908
2034 kVAh

3) kvar PER PHASE

L₁ 0296
L₂ 0239 kvar
L₃ 0236

7) kvah Total

8452
0176 kvarh

4) TOTAL kVA,kvar,kW

Σ 3577 kVA
0257 kvar
3504 kW

Note : In 3P-3W
Page 4,5,6,7 will display

1Phase 2 wire Pages

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

L₁ 2306 V_{LN}
506 I
5006 Hz

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

L₁ 2306 V_{LN}
506 I
098 PF

3) TOTAL kVA,kvar,kW

Σ 3577 kVA
0257 kvar
3504 kW

4) kWh Total

1549
0935 kWh

5) kvah Total

1908
2034 kVAh

6) kvarh Total

8452
0176 kvarh

ADVANCE MODE PAGES

VAF Pages :

Press **VAF** key to change page

1) Voltage L-N

L₁ 2419 V_{LN}
L₂ 2384
L₃ 2405

2) Voltage L-L

L₁₂ 4185 V_{LL}
L₂₃ 4126
L₃₁ 4162

3) Current

L₁ 4999 I
L₂ 5001
L₃ 4890

4) System Frequency

F_{REQ}
50.00 Hz

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

L₁ 2306 V_{LN}
5963 I
50.65 Hz

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

L₂ 2346 V_{LN}
4967 I
50.35 Hz

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

L₃ 2406 V_{LN}
4732 I
49.64 Hz

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

AVG 2402 V_{LN}
4963 I
50.05 Hz

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

L₁₂ 4325 V_{LL}
5746 I
50.45 Hz

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

L₂₃ 4356 V_{LL}
4962 I
50.45 Hz

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

L₃₁ 4299 V_{LL}
3657 I
50.45 Hz

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

AVG 4202 V_{LL}
4965 I
50.45 Hz

13) PF L1 L2 L3

L₁ 0982
L₂ 0983
L₃ 0981 PF

14) System PF

54.67
PF
Σ 0982 PF

15) Line 1 V(LN)-A-PF

L₁ 2306 V_{LN}
5963 I
0951 PF

16) Line 2 V(LN)-A-PF

L₂ 2346 V_{LN}
4967 I
0982 PF

17) Line 3 V(LN)-A-PF

L₃ 2406 V_{LN}
4732 I
0964 PF

18) AVG V(LN)-A-PF

AVG 2402 V_{LN}
4963 I
0983 PF

19) Line12 V(LL)-A-PF

L₁₂ 4325 V_{LL}
5746 I
0987 PF

20) Line23 V(LL)-A-PF

L₂₃ 4356 V_{LL}
4962 I
0952 PF

21) Line31 V(LL)-A-PF

L₃₁ 4299 V_{LL}
3657 I
0961 PF

22) AVG V(LL)-A-PF

AVG 4202 V_{LL}
4963 I
0983 PF

Note : In 3P-3W Page 2,3,4,9,10,11,12,14,
22 will display

POWER & ENERGY Pages :

Press **P/E** key to change page

1) kW PER PHASE

L₁ 1.184
L₂ 1.168
L₃ 1.152 KW

2) kVA PER PHASE

L₁ 1.209 KVA
L₂ 1.192
L₃ 1.176

3) kvar PER PHASE

L₁ 0.296
L₂ 0.239 KVAR
L₃ 0.236

4) Line 1 kVA,kvar,kW

L₁ 1.209 KVA
0.296 KVAR
1.184 KW

5) Line 2 kVA,kvar,kW

L₂ 1.192 KVA
0.239 KVAR
1.168 KW

6) Line 3 kVA,kvar,kW

L₃ 1.176 KVA
0.236 KVAR
1.152 KW

7) TOTAL kVA,kvar,kW

Σ 3.577 KVA
0.257 KVAR
3.504 KW

8) kWh Total

1549
0.935 KWh

9) kvah Total

1908
2.034 KVAh

10) kvarh Total

8452 KVarh
0.176

11) Load Hour

LHr5
213 h
53 M

12) No Load Hour

nLHr5
150 h
01 M

13) RPM

rPn
3000

Note :

In 3P-3W
Page 7,8,9,10,11,12,
13 will display

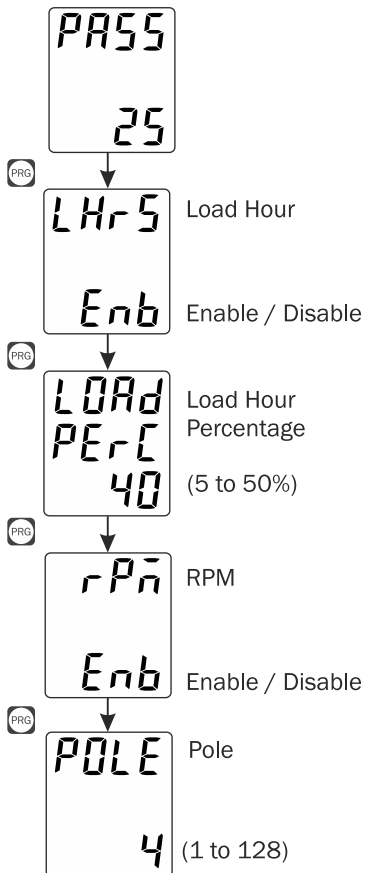
ADVANCE MODE PAGES

1Phase 2 wire Pages

1) V(L-N)-A-F 2306 V _{L-N} 506 I 50.06 Hz	2) V(L-N)-A-PF 2306 V _{L-N} 506 I 0.982 PF	3) TOTAL kVA,kvar,kW 3577 KVA 0257 KVar Σ 3504 KW
4) kWh Total 1549 0935 kWh	5) kvah Total 1908 2034 KVAh	6) kvarh Total 8452 KVarh
7) Load Hour LHr5 213 h 53 m	8) No Load Hour nLHr5 150 01	9) RPM rPn 3000

LOAD HOUR & RPM

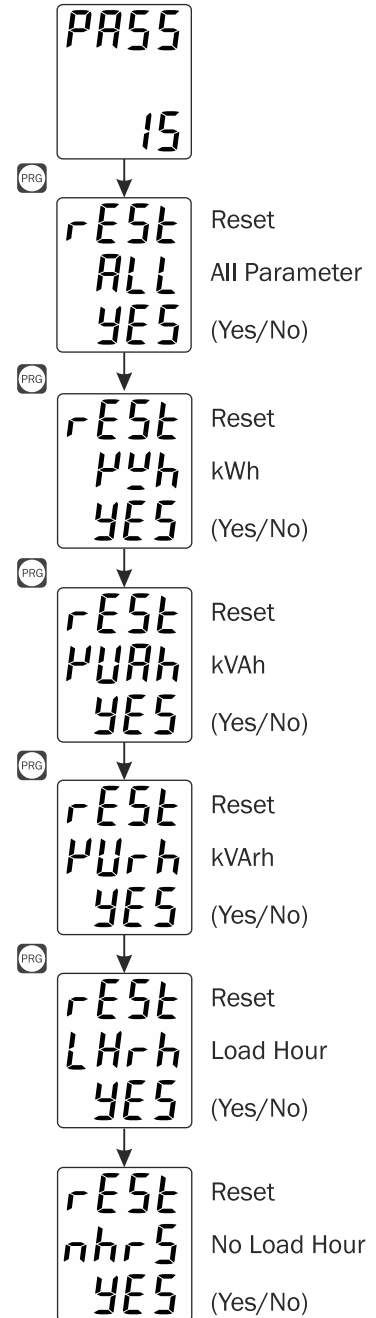
Enter Password 25



Press **PRG** key to save & exit from parameter setting

RESET SETTINGS

Enter Password 15



Press **PRG** key to save & exit from parameter setting

MODBUS

PASS
69

Enter Password 69



Addr
0001

Address



baud
9600

(4800/9600/19200/38400)



PrtY
none

(None/Even/Odd)



data
float

(Float/Long)

Press  key to save & exit from menu

MODBUS (MFM 13-M1)

Slave Address :	1 to 125
Baudrate :	9600,4800,19200,38400bps
Parity :	None,Even,Odd
Datatype :	Float,Long
Read Function Register :	0x03 and 0x04
Write Function Register :	0x06 and 0x10

Sr.No	Access Type	Parameter	Register	
			Data Type	
			Float/Long	
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/Long
16	R	Voltage L31 Value	36
17	R	V L31 Unit	38
		Selection	
		Volt	
		Kilo Volt	
18	R	AVG VLL Value	40
19	R	AVG VLL Unit	42
		Selection	
		Volt	
		Kilo Volt	
20	R	Current L1 Value	44
21	R	Current L1 Unit	46
		Selection	
		Ampere	
22	R	Current L2 Value	48
23	R	Current L2 Unit	50
		Selection	
		Ampere	
24	R	Current L3 Value	52
25	R	Current L3 Unit	54
		Selection	
		Ampere	
26	R	AVG Current Value	56
27	R	AVG Current Unit	58
		Selection	
		Ampere	
28	R	Line 1 Power Factor	60
29	R	Line 2 Power Factor	62
30	R	Line 3 Power Factor	64
31	R	System Power Factor	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	
		kW	
		MW	
36	R	Line 2 kW value	76
37	R	Line 2 kW Unit	78
		Selection	
		kW	
		MW	
38	R	Line 3 kW value	80
39	R	Line 3 kW Unit	82
		Selection	
		kW	
		MW	
40	R	Total kW	84
41	R	Total kW Unit	86
		Selection	
		kW	
		MW	

Sr.No	Access Type	Parameter	Register
			Data Type
			Float/Long
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
63	R/W	Network Selection	130
		Selection	Value
		3P-3W	0
		3P-4W	1
		1P-2W	2

Sr.No	Access Type	Parameter	Register
			Data Type
			Float/Long
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	Mode Selection	140
		Selection	Value
		Basic Mode	0
		Advance Mode	1

Note :- To Reset Below Parameter Enter 15 Value

69	R/W	Reset All Parameter	142
70	R/W	Reset kWh	144
71	R/W	Reset kVAh	146
72	R/W	Reset kvarh	148
73	R/W	Reset Load Hour	150
74	R/W	Reset No Load Hour	152

75	R/W	Address	154
76	R/W	Baudrate	156
		Selection	Value
		4800	0
		9600	1
		19200	2
77	R/W	Parity	158
		Selection	Value
		None	0
		Even	1
78	R/W	Data Type	160
		Selection	Value
		Float	0
		Long	1
79	R/W	Load Hour	162
		Selection	Value
		Disable	0
		Enable	1
80	R/W	Load Hour Percentage	164
81	R/W	RPM	166
		Selection	Value
		Disable	0
		Enable	1
82	R/W	Pole	168