MULTI FUNCTION METER

MULTISPAN **AVH-14-M1**

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
kVAr Total	0.000 - 9999 kVAr
kVAr Per Phase	0.000 - 9999 kVAr
ENERGY	
WH Total	000.000 - 99999999 MWh
Vah Total	000.000 - 99999999 MVAh
Varh Total	000.000 - 99999999 MVArh

DISPLAY & KEY :

Display	Upper	6 Digit, 7 Seg 0.40",RED LED
	Lower	4 Digit, 3 Line 7 Seg 0.39",RED
Key		SET/ENT, INC, DEC, RESET

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:

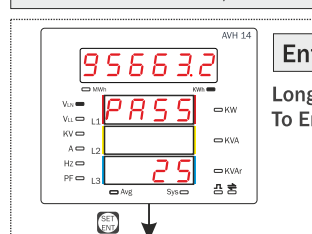
Class 0.5 (Standard)

ENVIRONMENT CONDITION:

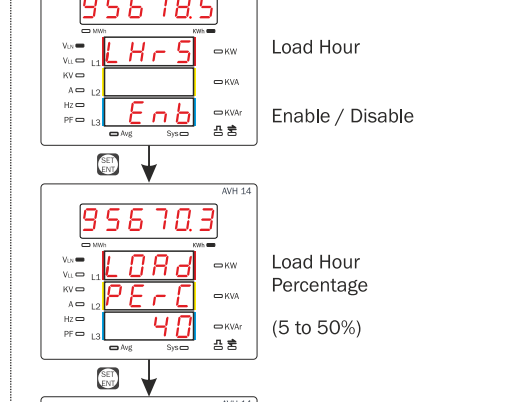
Operating Temp.	0°C to 55°C
Relative Humidity	UP to 95% RH (non-condensing)
Protection Level (AS Per Request)	IP-65 (Front side) As per IS/IEC 60529 : 2001

MECHANICAL INSTALLATION

Outline Dimension (mm)	Panel Cutout Dimension (mm)



TERMINAL CONNECTION



KEY OPERATION

FUNCTION	PRESS KEY
OPERATOR MODE	
To view different pages	∧ OR ∨
To Enter into enter setting	SET ENT Long Press
To Reset parameter	RESET Long Press
To Scroll or Hold	∧ + ∨ Long Press
PARAMETER SETTING MODE	
To Set Parameter Value	SET ENT
To Increment parameter value	∧
To Decrement parameter value	∨
To Exit from parameter setting	SET ENT

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.

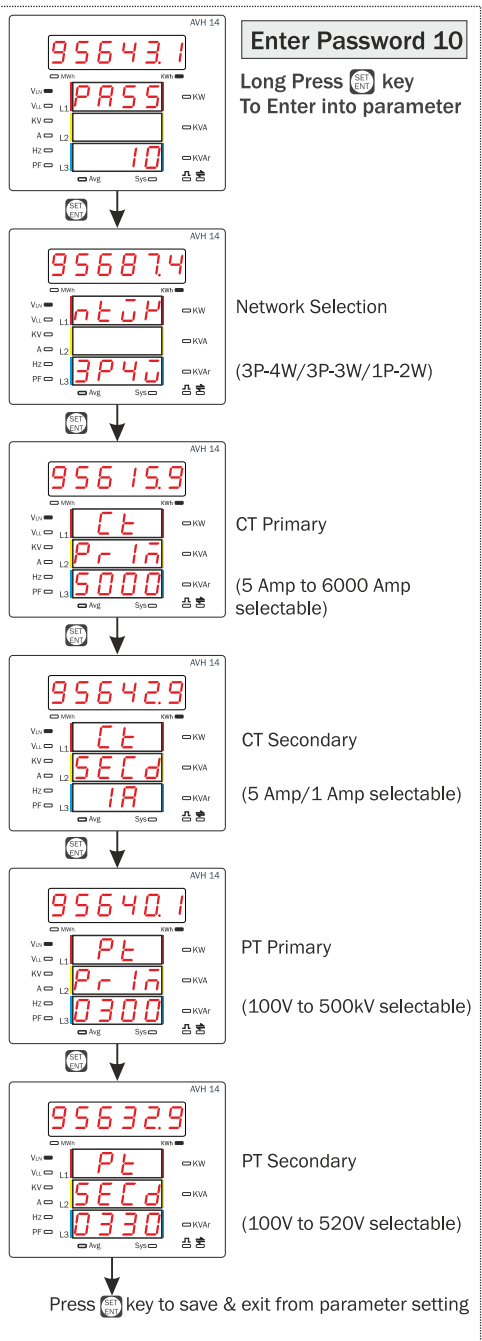
WARNING GUIDELINES

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.

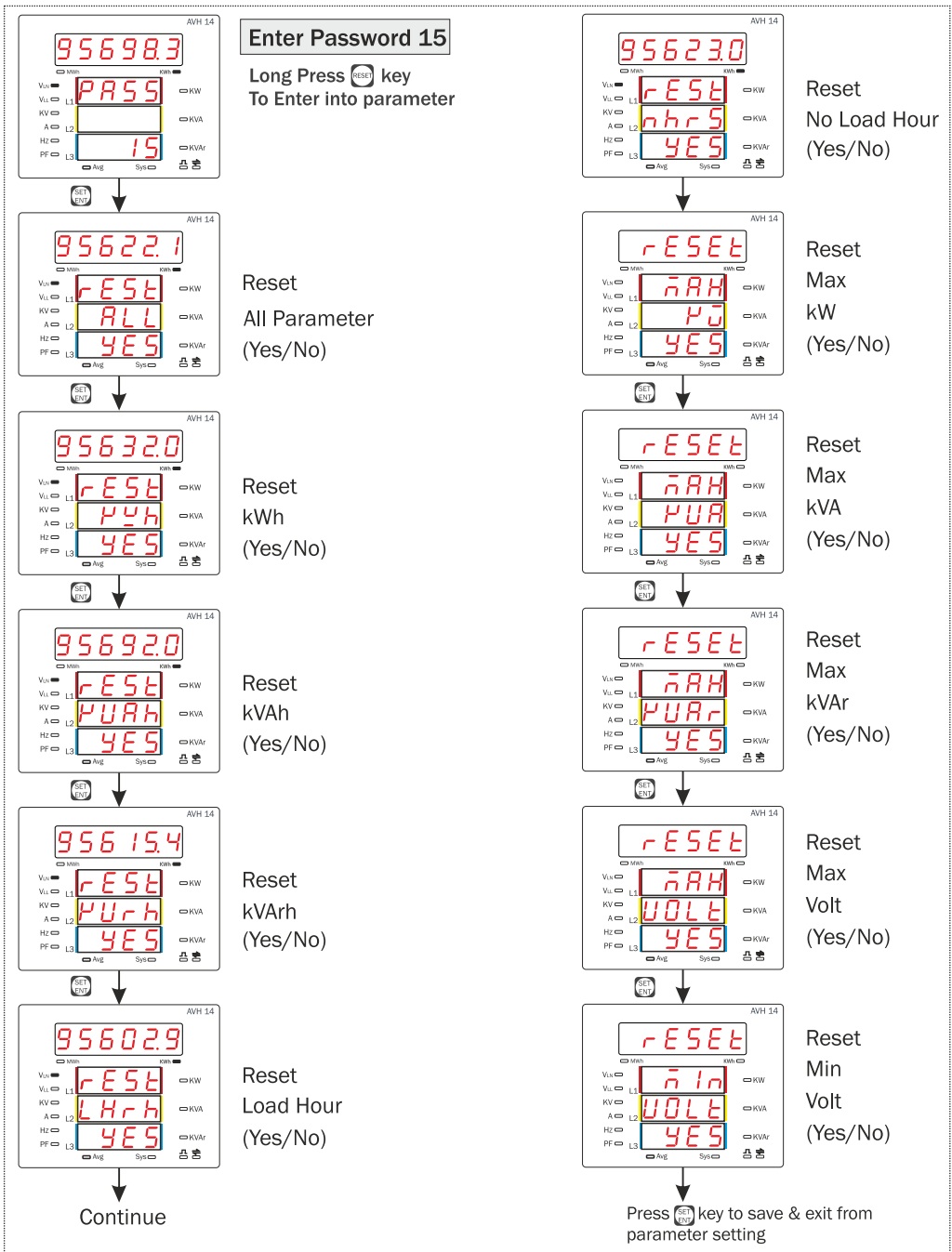
PARAMETER SETTING

Basic Parameter Setting : Network, CT/PT Selection.

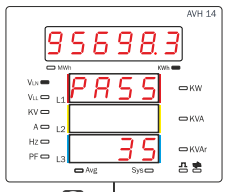


Advance Parameter Setting : Load Hour %, No Load Hour, RPM.

Reset Parameter : kWh, kVAh, kvarh, Load Hour, No Load Hour, Max kW, Max kVA, Max kVAr, Max Voltage, Min Voltage

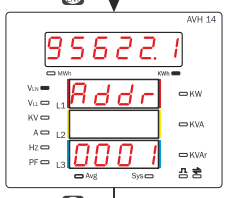


Parameter Setting



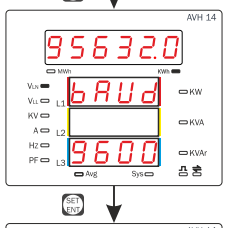
Enter Password 35

Long Press (RESET) key
To Enter into parameter



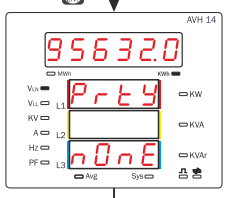
Slave Address

1 to 125



Baudrate

(4800,9600,19200,38400)



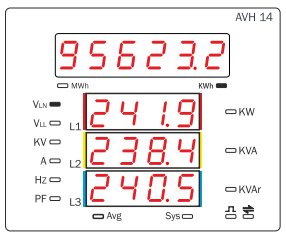
Parity

None/Even/Odd

Press (SET ENT) key to save & exit from parameter setting

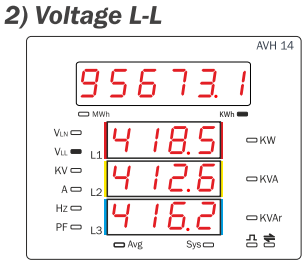
DISPLAY PAGES

1) Voltage L-N



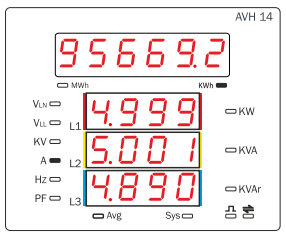
	3P-3W	3P-4W
KWH Value		
Display Line 1	NA	VRN
Display Line 2	NA	VYN
Display Line 3	NA	VBN

2) Voltage L-L



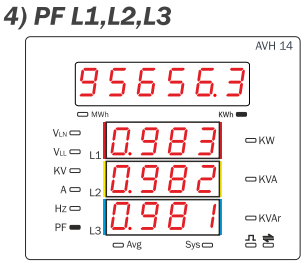
	3P-3W	3P-4W
KWH Value		
Display Line 1	Vry	Vry
Display Line 2	Vyb	Vyb
Display Line 3	Vbr	Vbr

3) Current



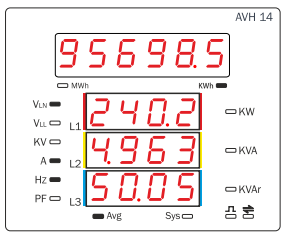
	3P-3W	3P-4W
KWH Value		
Display Line 1	I L1	I L1
Display Line 2	I L2	I L2
Display Line 3	I L3	I L3

4) PF L1,L2,L3



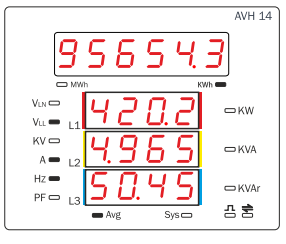
	3P-3W	3P-4W
KWH Value		
Display Line 1	-	L1 PF
Display Line 2	-	L2 PF
Display Line 3	-	L3 PF

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



	3P-3W	3P-4W
KWH Value		
Display Line 1	-	VLN AVG
Display Line 2	-	I AVG
Display Line 3	-	sys freq

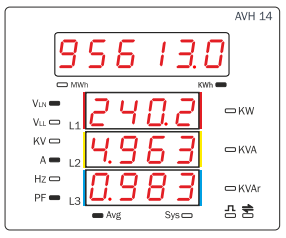
6) AVG V(L-L)-A-F



	3P-3W	3P-4W
KWH Value		
Display Line 1	VLL AVG	VLL AVG
Display Line 2	I AVG	I AVG
Display Line 3	sys freq	sys freq

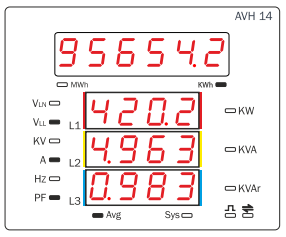
DISPLAY PAGES

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



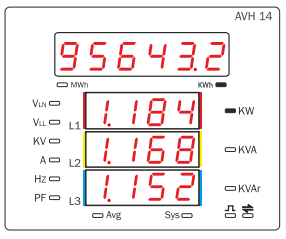
	3P-3W	3P-4W
KWH Value		
Display Line 1	-	VLN AVG
Display Line 2	-	I AVG
Display Line 3	-	sys PF

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



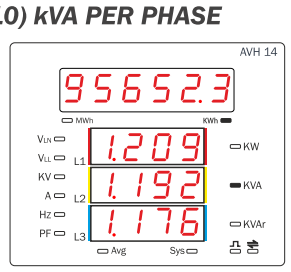
	3P-3W	3P-4W
KWH Value		
Display Line 1	VLL AVG	VLL AVG
Display Line 2	I AVG	I AVG
Display Line 3	sys PF	sys PF

9) kW PER PHASE



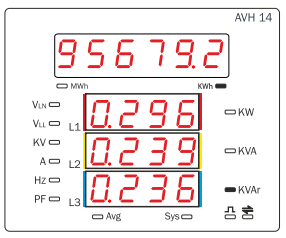
	3P-3W	3P-4W
KWH Value		
Display Line 1		L1 KW
Display Line 2		L2 KW
Display Line 3		L3 KW

10) kVA PER PHASE



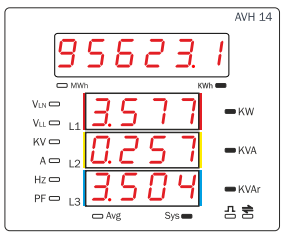
	3P-3W	3P-4W
KWH Value		
Display Line 1		L1 KVA
Display Line 2		L2 KVA
Display Line 3		L3 KVA

11) kvar PER PHASE



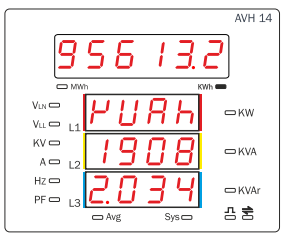
	3P-3W	3P-4W
KWH Value		
Display Line 1		L1 KVAr
Display Line 2		L2 KVAr
Display Line 3		L3 KVAr

12) Total kW,kVA,kvar



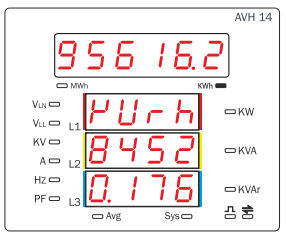
	3P-3W	3P-4W
KWH Value		
Display Line 1	Total KW	Total KW
Display Line 2	Total KVA	Total KVA
Display Line 3	Total KVAR	Total KVAR

13) Total kVAh



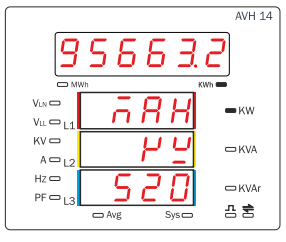
	3P-3W	3P-4W
KWH Value		
Display Line 1	Total kvah	Total kvah
Display Line 2		
Display Line 3		

14) Total kVArh



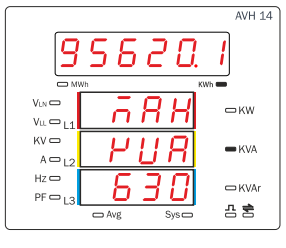
	3P-3W	3P-4W
KWH Value		
Display Line 1	Total kvarh	Total kvarh
Display Line 2		
Display Line 3		

15) Max kW



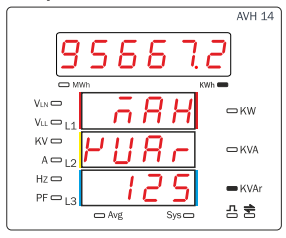
	3P-3W	3P-4W
KWH Value		
Display Line 1	Max	Max
Display Line 2	KW	KW
Display Line 3	VALUE	VALUE

16) Max kVA



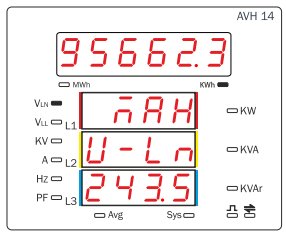
	3P-3W	3P-4W
KWH Value		
Display Line 1	Max	Max
Display Line 2	KVA	KVA
Display Line 3	VALUE	VALUE

17) Max kVAr



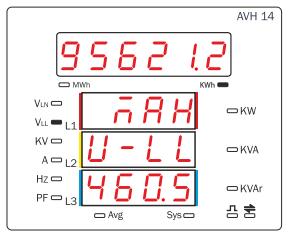
	3P-3W	3P-4W
KWH Value		
Display Line 1	Max	Max
Display Line 2	KVAR	KVAR
Display Line 3	VALUE	VALUE

18) Max Voltage L-N



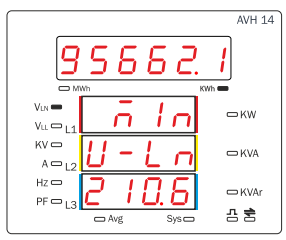
	3P-3W	3P-4W
KWH Value		
Display Line 1		Max
Display Line 2		V LN
Display Line 3		VALUE

19) Max Voltage L-L



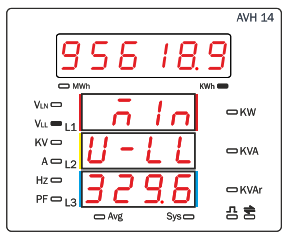
	3P-3W	3P-4W
KWH Value		
Display Line 1	Max	Max
Display Line 2	V LL	V LL
Display Line 3	VALUE	VALUE

20) Min Voltage L-N



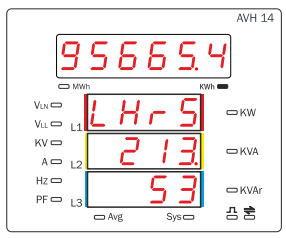
	3P-3W	3P-4W
KWH Value		
Display Line 1		MIN
Display Line 2		V LN
Display Line 3		VALUE

21) Min Voltage L-L



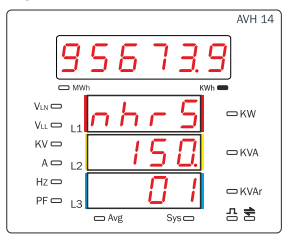
	3P-3W	3P-4W
KWH Value		
Display Line 1	MIN	MIN
Display Line 2	V LL	V LL
Display Line 3	VALUE	VALUE

22) Load Hour



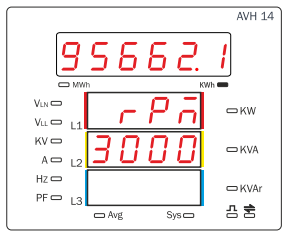
	3P-3W	3P-4W
KWH Value		
Display Line 1	Load Hour	Load Hour
Display Line 2	Value	Value
Display Line 3		

23) No Load Hour



	3P-3W	3P-4W
KWH Value		
Display Line 1	no Load Hour	no Load Hour
Display Line 2	Value	Value
Display Line 3		

24) RPM



	3P-3W	3P-4W
KWH Value		
Display Line 1	RPM	RPM
Display Line 2	Value	Value
Display Line 3		

MODBUS (AVH 14-M1)

Slave Address :	1 to 125
Baudrate :	4800,9600,19200,38400bps
Parity :	None,Even,Odd
Datatype :	Float
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 Selection: Value Volt: 0 Kilo Volt: 1	14
6	R	Voltage L2-N Value	16
7	R	V L2-N Unit Selection: Value Volt: 0 Kilo Volt: 1	18
8	R	Voltage L3-N Value	20
9	R	V L3-N Unit Selection: Value Volt: 0 Kilo Volt: 1	22
10	R	AVG VLN Value	24
11	R	AVG VLN Unit Selection: Value Volt: 0 Kilo Volt: 1	26
12	R	Voltage L12 Value	28
13	R	V L12 Unit Selection: Value Volt: 0 Kilo Volt: 1	30
14	R	Voltage L23 Value	32
15	R	V L23 Unit Selection: Value Volt: 0 Kilo Volt: 1	34
16	R	Voltage L31 Value	36
17	R	V L31 Unit Selection: Value Volt: 0 Kilo Volt: 1	38
18	R	AVG VLL Value	40
19	R	AVG VLL Unit Selection: Value Volt: 0 Kilo Volt: 1	42
20	R	Current L1 Value	44
21	R	Current L1 Unit Selection: Value Ampere: 0	46
22	R	Current L2 Value	48
23	R	Current L2 Unit Selection: Value Ampere: 0	50
24	R	Current L3 Value	52
25	R	Current L3 Unit Selection: Value Ampere: 0	54
26	R	AVG Current Value	56
27	R	AVG Current Unit Selection: Value Ampere: 0	58
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 Selection: Value kW: 1 MW: 2	74
36	R	Line 2 kW value	76
37	R	Line 2 kW Unit Selection: Value kW: 1 MW: 2	78
38	R	Line 3 kW value	80
39	R	Line 3 kW Unit Selection: Value kW: 1 MW: 2	82
40	R	Total kW	84
41	R	Total kW Unit Selection: Value kW: 1 MW: 2	86
42	R	Line 1 kVA value	88
43	R	Line 1 kVA Unit Selection: Value kVA: 1 MVA: 2	90
44	R	Line 2 kVA value	92
45	R	Line 2 kVA Unit Selection: Value kVA: 1 MVA: 2	94
46	R	Line 3 kVA value	96
47	R	Line 3 kVA Unit Selection: Value kVA: 1 MVA: 2	98
48	R	Total kVA value	100
49	R	Total kVA Unit Selection: Value kVA: 1 MVA: 2	102
50	R	Line 1 kVAr value	104
51	R	Line 1 kVAr Unit Selection: Value kVAr: 1 MVAr: 2	106
52	R	Line 2 kVAr value	108
53	R	Line 2 kVAr Unit Selection: Value kVAr: 1 MVAr: 2	110
54	R	Line 3 kVAr value	112
55	R	Line 3 kVAr Unit Selection: Value kVAr: 1 MVAr: 2	114
56	R	Total kVAr value	116
57	R	Total kVAr Unit Selection: Value kVAr: 1 kVAr: 2	118
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	Max KW Value	130
64	R	Max KW Unit Selection: Value KW: 1 MW: 2	132
65	R	Max KVA Value	134
66	R	Max KVA Unit Selection: Value KVA: 1 MVA: 2	136
67	R	Max KVAr Value	138
68	R	Max KVAr Unit Selection: Value KVAr: 1 MVAr: 2	140
69	R	Max V-LN Value	142
70	R	Max V-LN Unit Selection: Value Volt: 0 Kilo Volt: 1	144
71	R	Max V-LL Value	146
72	R	Max V-LL Unit Selection: Value Volt: 0 Kilo Volt: 1	148
73	R	Min V-LN Value	150
74	R	Min V-LN Unit Selection: Value Volt: 0 Kilo Volt: 1	152
75	R	Min V-LL Value	154
76	R	Min V-LL Unit Selection: Value Volt: 0 Kilo Volt: 1	156
77	R/W	Network Selection Selection: Value 3P-3W: 0 3P-4W: 1 1P-2W: 2	158
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 Selection / Value 4800 / 0 9600 / 1 19200 / 2 38400 / 3	194
96	R/W	Parity Selection / Value None / 0 Even / 1 Odd / 2	196
97	—	NA	198
98	R/W	Load Hour Selection / Value Disable / 0 Enable / 1	200
99	R/W	Load Hour Percentage	202
100	R/W	RPM Selection / Value Disable / 0 Enable / 1	204
101	R/W	Pole	206