

MULTISPAN MULTI FUNCTION METER AVH-16-T1



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 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	
Import Kwh	000.000 - 99999999 MWh
Export Kwh	000.000 - 99999999 MWh
Kvah Total	000.000 - 99999999 MVAh
Import Kvarh	000.000 - 99999999 MVAh
Export Kvarh	000.000 - 99999999 MVAh

DISPLAY & KEY :

Display	Upper 8 Digit, 7 Seg 0.40", RED LED
	Lower 4 Digit, 3 Line 7 Seg 0.40", RED
Key	PROGRAM, VAF, POWER, ENERGY, THD%

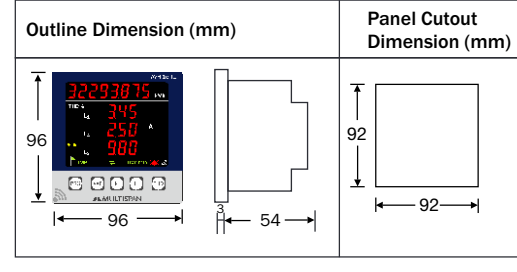
AUXILIARY SUPPLY :

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

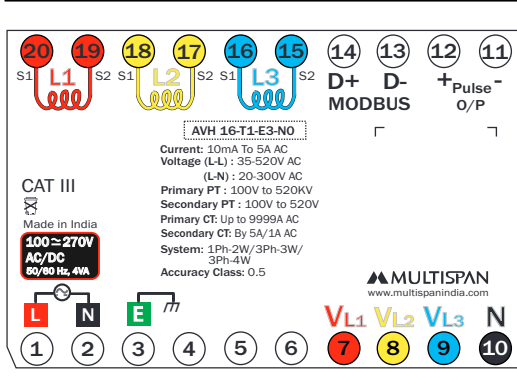
DIMENSION :

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

MECHANICAL INSTALLATION



TERMINAL CONNECTION



KEY OPERATION

FUNCTION	PRESS KEY
OPERATOR MODE	
To view different pages	ⓧ VAF ⓧ P ⓧ E or ⓧ THD
To Enter into enter setting	ⓧ PRG Long Press
PARAMETER SETTING MODE	
To Set Parameter Value	ⓧ PRG
To Increment parameter value	ⓧ P
To Decrement parameter value	ⓧ THD
To Exit from parameter setting	ⓧ PRG

Resolution

PT Ratio x CT Ratio	Pulse/Kwh
<15	0.01Kwh
<150	0.1Kwh
<1500	1Kwh
<15000	10Kwh
<150000	100Kwh
>150000	1000Kwh

INSTALLATION GUIDELINES

- 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.
- 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.
- 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.
- Use and store the instrument within the specified ambient temperature and humidity ranges as mentioned in this manual.



MECHANICAL INSTALLATION GUIDELINES

- Prepare the panel cutout with proper dimensions as shown above.
- Fit the unit into the panel with the help of clamp given.
- 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.
- 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.
- Do not connect anything to unused terminals.

MAINTENANCE

- The equipment should be cleaned regularly to avoid blockage of ventilating parts.
- Clean the equipment with a clean soft cloth. Do not use isopropyl alcohol or any other cleaning agent.
- 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.

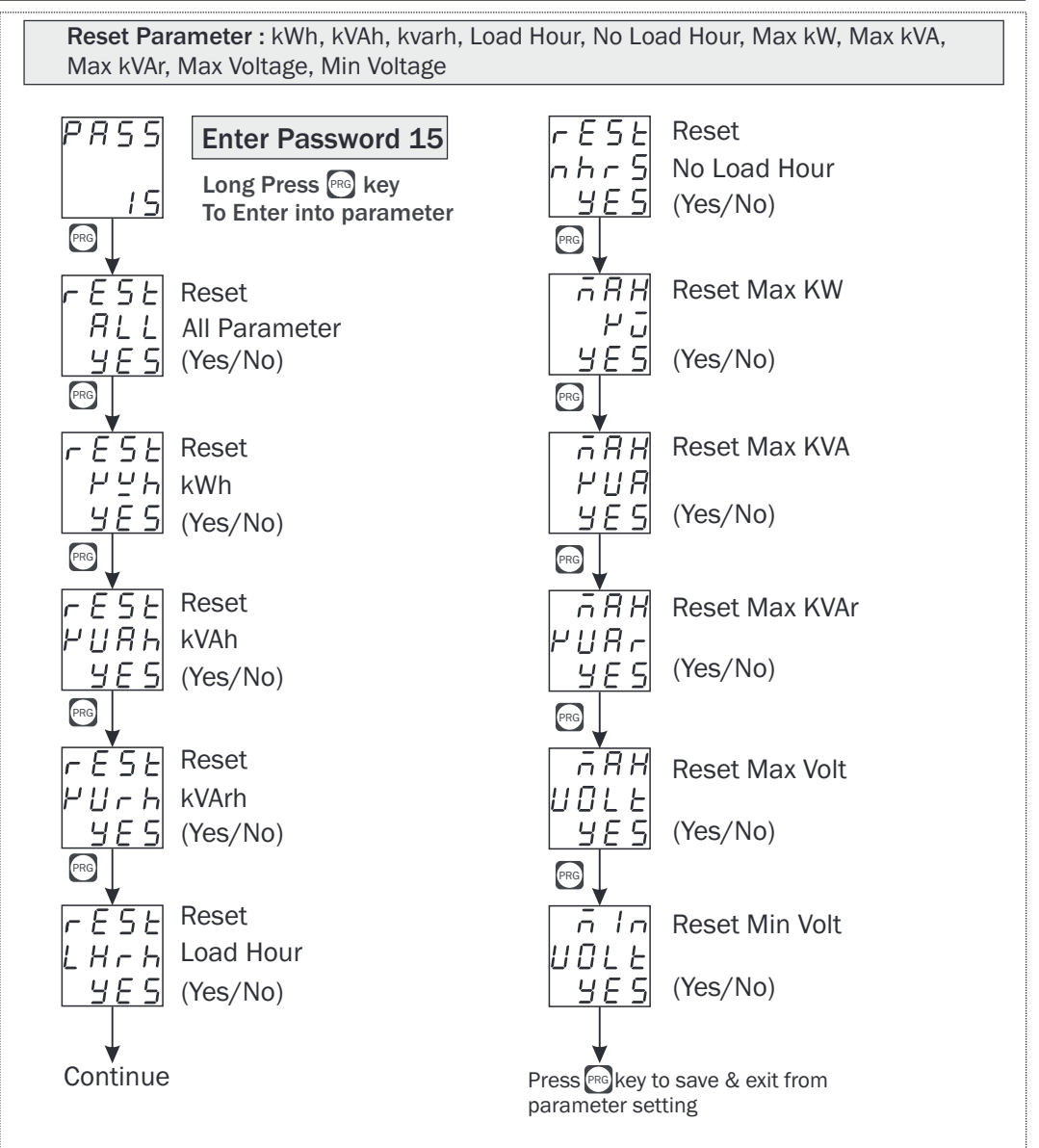
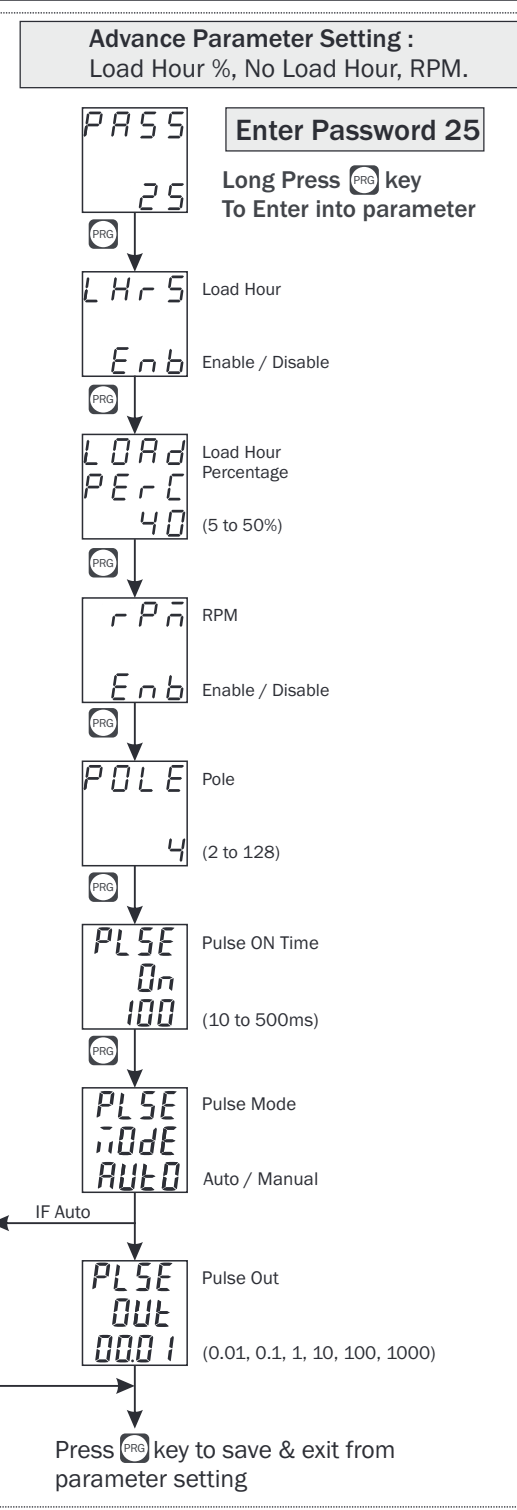
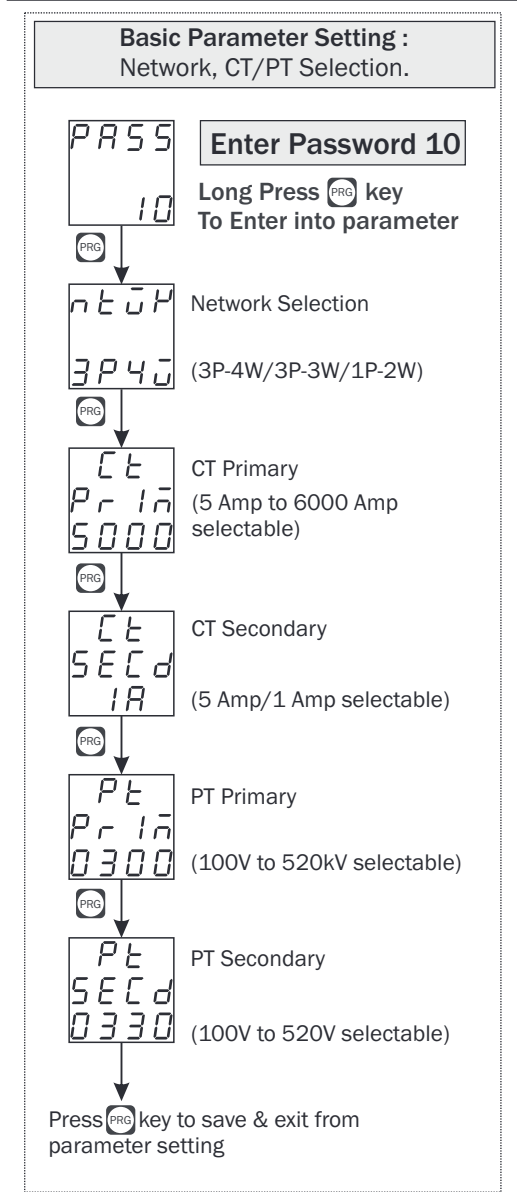
If all the equipment is not handled in a manner specified by the manufacturer, it might impair the protection provided by the equipment.

WARNING : Risk of electric shock.

WARNING GUIDELINES

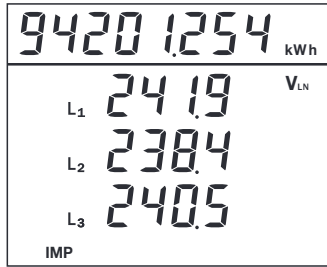
- WARNING : Risk of electric shock.**
- To prevent the risk of electric shock, power supply to the equipment must be kept OFF while doing the wiring arrangement. Do not touch the terminals while power is being supplied.
 - To reduce electro magnetic interference, use wire with adequate rating and twists of the same of equal size shall be made with shortest connection.
 - 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.
 - A better anti-noise effect can be expected by using standard power supply cable for the instrument.

PARAMETER SETTING



DISPLAY PAGES for **ⓧ** Key

1) Voltage L-N



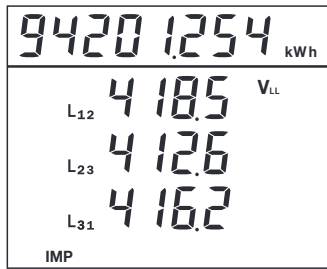
	3P-3W	3P-4W
Energy Value		
Display Line 1	NA	VRN
Display Line 2	NA	VYN
Display Line 3	NA	VBN

9) Max Voltage L-N



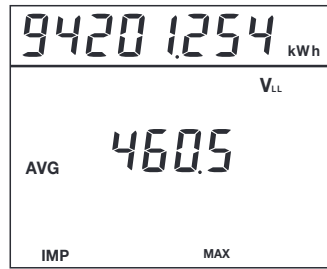
	3P-3W	3P-4W
Energy Value		
Display Line 1	-	-
Display Line 2	-	MAX VALUE
Display Line 3	-	-

2) Voltage L-L



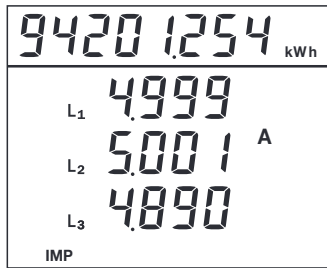
	3P-3W	3P-4W
Energy Value		
Display Line 1	Vry	Vry
Display Line 2	Vyb	Vyb
Display Line 3	Vbr	Vbr

10) Max Voltage L-L



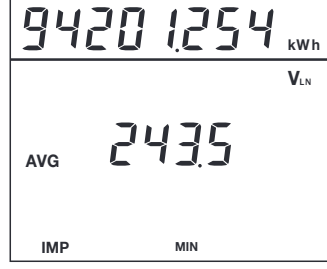
	3P-3W	3P-4W
Energy Value		
Display Line 1	-	-
Display Line 2	MAX VALUE	MAX VALUE
Display Line 3	-	-

3) Current



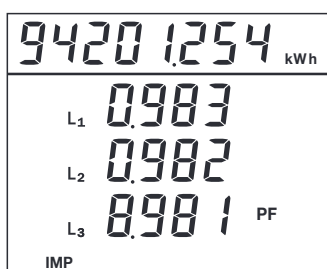
	3P-3W	3P-4W
Energy Value		
Display Line 1	I L1	I L1
Display Line 2	I L2	I L2
Display Line 3	I L3	I L3

11) Min Voltage L-N



	3P-3W	3P-4W
Energy Value		
Display Line 1	-	-
Display Line 2	-	MIN VALUE
Display Line 3	-	-

4) PF L1,L2,L3



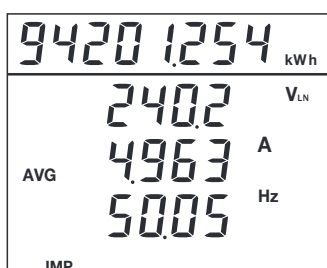
	3P-3W	3P-4W
Energy Value		
Display Line 1	-	L1 PF
Display Line 2	-	L2 PF
Display Line 3	-	L3 PF

12) Min Voltage L-L



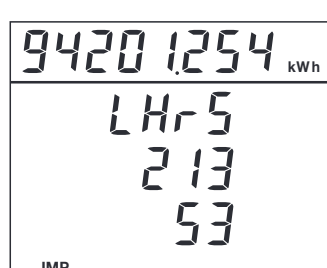
	3P-3W	3P-4W
Energy Value		
Display Line 1	-	-
Display Line 2	MIN VALUE	MIN VALUE
Display Line 3	-	-

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



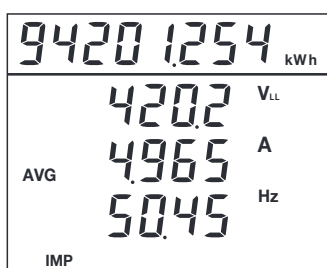
	3P-3W	3P-4W
Energy Value		
Display Line 1	-	VLN AVG
Display Line 2	-	I AVG
Display Line 3	-	sys freq

13) Load Hour



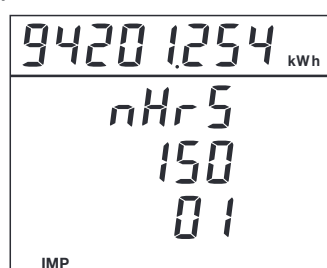
	3P-3W	3P-4W
Energy Value		
Display Line 1	Load Hour	Load Hour
Display Line 2	Value Hour	Value Hour
Display Line 3	Value Min	Value Min

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



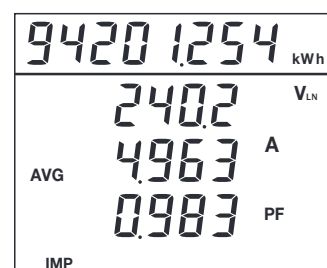
	3P-3W	3P-4W
Energy Value		
Display Line 1	VLL AVG	VLL AVG
Display Line 2	I AVG	I AVG
Display Line 3	sys freq	sys freq

14) No Load Hour



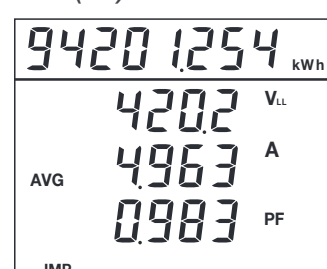
	3P-3W	3P-4W
Energy Value		
Display Line 1	no Load Hour	no Load Hour
Display Line 2	Value Hour	Value Hour
Display Line 3	Value Min	Value Min

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



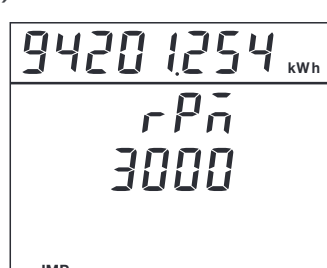
	3P-3W	3P-4W
Energy Value		
Display Line 1	-	VLN AVG
Display Line 2	-	I AVG
Display Line 3	-	sys PF

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



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

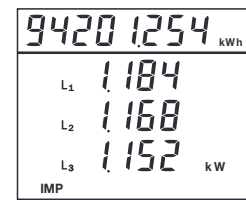
15) RPM



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

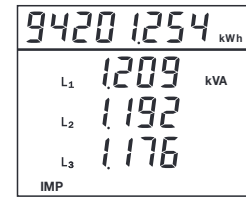
DISPLAY PAGES for **Ⓟ** Key

1) kW PER PHASE



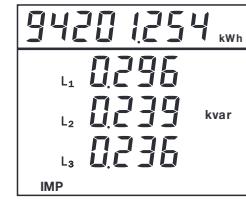
	3P-3W	3P-4W
Energy Value		
Display Line 1	-	L1 KW
Display Line 2	-	L2 KW
Display Line 3	-	L3 KW

2) kVA PER PHASE



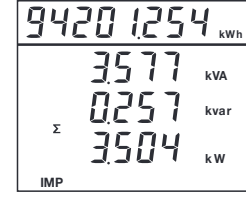
	3P-3W	3P-4W
Energy Value		
Display Line 1	-	L1 KVA
Display Line 2	-	L2 KVA
Display Line 3	-	L3 KVA

3) kvar PER PHASE



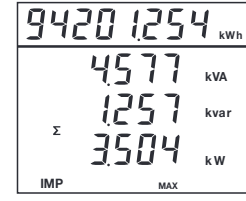
	3P-3W	3P-4W
Energy Value		
Display Line 1	-	L1 KVAR
Display Line 2	-	L2 KVAR
Display Line 3	-	L3 KVAR

4) Total kW,kVA,kvar



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

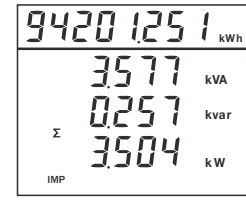
5) Max kW,kVA,kvar



	3P-3W	3P-4W
Energy Value		
Display Line 1	Max KVA	Max KVA
Display Line 2	Max KVAR	Max KVAR
Display Line 3	Max KW	Max KW

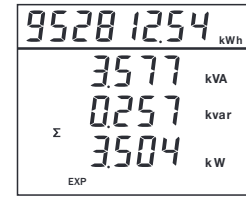
DISPLAY PAGES for **Ⓜ** Key

1) Import Kwh



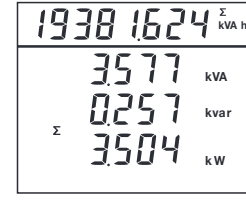
	3P-3W	3P-4W
Import Kwh		
Display Line 1	Total KVA	Total KVA
Display Line 2	Total KVAR	Total KVAR
Display Line 3	Total KW	Total KW

2) Export kwh



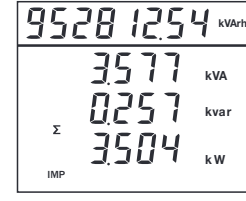
	3P-3W	3P-4W
Export Kwh		
Display Line 1	Total KVA	Total KVA
Display Line 2	Total KVAR	Total KVAR
Display Line 3	Total KW	Total KW

3) Total kvah



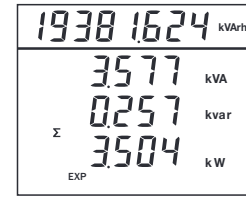
	3P-3W	3P-4W
Total kvah		
Display Line 1	Total KVA	Total KVA
Display Line 2	Total KVAR	Total KVAR
Display Line 3	Total KW	Total KW

4) Import kvarh



	3P-3W	3P-4W
Import Kvarh		
Display Line 1	Total KVAR	Total KVAR
Display Line 2	Total KVAR	Total KVAR
Display Line 3	Total KW	Total KW

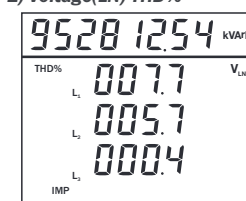
5) Export kvarh



	3P-3W	3P-4W
Export Kvarh		
Display Line 1	Total KVAR	Total KVAR
Display Line 2	Total KVAR	Total KVAR
Display Line 3	Total KW	Total KW

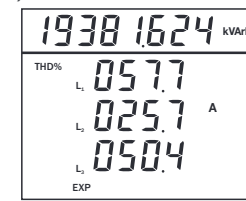
DISPLAY PAGES for **Ⓝ** Key

1) Voltage(LN) THD%



	3P-3W	3P-4W
Import Kvarh		
Display Line 1	L12 THD%	L1 THD%
Display Line 2	L23 THD%	L2 THD%
Display Line 3	L31 THD%	L3 THD%

2) Current THD%



	3P-3W	3P-4W
Export Kvarh		
Display Line 1	L1 THD%	L1 THD%
Display Line 2	L2 THD%	L2 THD%
Display Line 3	L3 THD%	L3 THD%

MODBUS (AVH 16)

Slave Address :	1 to 127
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	Import kWh Value *N1	0
		Export kWh Value *N1	2
2	R	Import kVAh Value *N1	4
		Export kVAh Value *N1	6
3	R	kVAh Value * N1	8
			10
			12
			14
			16
			18

*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	20	
5	R	V L1-N Unit	22	
		Selection		Value
		Volt		0
		Kilo Volt	1	
6	R	Voltage L2-N Value	24	
7	R	V L2-N Unit	26	
		Selection		Value
		Volt		0
		Kilo Volt	1	
8	R	Voltage L3-N Value	28	
9	R	V L3-N Unit	30	
		Selection		Value
		Volt		0
		Kilo Volt	1	
10	R	AVG VLN Value	32	
11	R	AVG VLN Unit	34	
		Selection		Value
		Volt		0
		Kilo Volt	1	
12	R	Voltage L12 Value	36	
13	R	V L12 Unit	38	
		Selection		Value
		Volt		0
		Kilo Volt	1	
14	R	Voltage L23 Value	40	
15	R	V L23 Unit	42	
		Selection		Value
		Volt		0
		Kilo Volt	1	

Sr.No	Access Type	Parameter	Register	
			Data Type	
			Float	
16	R	Voltage L31 Value	44	
17	R	V L31 Unit	46	
		Selection		Value
		Volt		0
		Kilo Volt	1	
18	R	AVG VLL Value	48	
19	R	AVG VLL Unit	50	
		Selection		Value
		Volt		0
		Kilo Volt	1	
20	R	Current L1 Value	52	
21	R	Current L1 Unit	54	
		Selection		Value
		Ampere	0	
22	R	Current L2 Value	56	
23	R	Current L2 Unit	58	
		Selection		Value
		Ampere		0
24	R	Current L3 Value	60	
25	R	Current L3 Unit	62	
		Selection		Value
		Ampere		0
26	R	AVG Current Value	64	
27	R	AVG Current Unit	66	
		Selection		Value
		Ampere		0
28	R	Line 1 Power Factor	68	
29	R	Line 2 Power Factor	70	
30	R	Line 3 Power Factor	72	
31	—	NA	74	
32	R	Average Power Factor	76	
33	R	System Frequency	78	
34	R	Line 1 kW value	80	
35	R	Line 1 kW Unit	82	
		Selection		Value
		kW		1
		MW	2	
36	R	Line 2 kW value	84	
37	R	Line 2 kW Unit	86	
		Selection		Value
		kW		1
		MW	2	
38	R	Line 3 kW value	88	
39	R	Line 3 kW Unit	90	
		Selection		Value
		kW		1
		MW	2	

Sr.No	Access Type	Parameter	Register	
			Data Type	
			Float	
40	R	Total kW	92	
41	R	Total kW Unit	94	
		Selection		Value
		kW		1
		MW	2	
42	R	Line 1 kVA value	96	
43	R	Line 1 kVA Unit	98	
		Selection		Value
		kVA		1
		MVA	2	
44	R	Line 2 kVA value	100	
45	R	Line 2 kVA Unit	102	
		Selection		Value
		kVA		1
		MVA	2	
46	R	Line 3 kVA value	104	
47	R	Line 3 kVA Unit	106	
		Selection		Value
		kVA		1
		MVA	2	
48	R	Total kVA value	108	
49	R	Total kVA Unit	110	
		Selection		Value
		kVA		1
		MVA	2	
50	R	Line 1 kVAR value	112	
51	R	Line 1 kVAR Unit	114	
		Selection		Value
		kVAR		1
		MVAR	2	
52	R	Line 2 kVAR value	116	
53	R	Line 2 kVAR Unit	118	
		Selection		Value
		kVAR		1
		MVAR	2	
54	R	Line 3 kVAR value	120	
55	R	Line 3 kVAR Unit	122	
		Selection		Value
		kVAR		1
		MVAR	2	
56	R	Total kVAR value	124	
57	R	Total kVAR Unit	126	
		Selection		Value
		kVAR		1
		MVAR	2	
58	R	Load Hour Value (In Hour)	128	
59	R	Load Hour Minute (In Min.)	130	
60	R	No Load Hour Value (In Hour)	132	
61	R	No Load Hour Minute (In Min.)	134	
62	R	RPM	136	

Sr.No	Access Type	Parameter	Register	
			Data Type	
			Float	
63	R	Max KW Value	138	
64	R	Max KW Unit	140	
		Selection		Value
		KW		1
		MW	2	
65	R	Max KVA Value	142	
66	R	Max KVA Unit	144	
		Selection		Value
		KVA		1
		MVA	2	
67	R	Max KVAR Value	146	
68	R	Max KVAR Unit	148	
		Selection		Value
		KVAR		1
		MVAR	2	
69	R	Max V-LN Value	150	
70	R	Max V-LN Unit	152	
		Selection		Value
		Volt		0
		Kilo Volt	1	
71	R	Max V-LL Value	154	
72	R	Max V-LL Unit	156	
		Selection		Value
		Volt		0
		Kilo Volt	1	
73	R	Min V-LN Value	158	
74	R	Min V-LN Unit	160	
		Selection		Value
		Volt		0
		Kilo Volt	1	
75	R	Min V-LL Value	162	
76	R	Min V-LL Unit	164	
		Selection		Value
		Volt		0
		Kilo Volt	1	
77	R/W	Network Selection	166	
		Selection		Value
		3P-3W		0
		3P-4W	1	
		1P-2W	2	
78	R/W	CT Primary Value	168	
79	R/W	CT Secondary Value	170	
80	R/W	PT Primary Value	172	
81	R/W	PT Secondary Value	174	
82	—	NA	176	

Note :- To Reset Below Parameter Enter 15 Value

83	R/W	Reset All Parameter	178
84	R/W	Reset kWh	180
85	R/W	Reset kVAh	182
86	R/W	Reset kvarh	184
87	R/W	Reset Max KW	186
88	R/W	Reset Max KVA	188
89	R/W	Reset Max KVAr	190
90	R/W	Reset Max Volt	192
91	R/W	Reset Min Volt	194
92	R/W	Reset Load Hour	196
93	R/W	Reset No Load Hour	198

94	R/W	Address	200
95	R/W	Baudrate	202
		Selection	Value
		4800	0
		9600	1
		19200	2
		38400	3
96	R/W	Parity	204
		Selection	Value
		None	0
		Even	1
		Odd	2
97	—	NA	206
98	R/W	Load Hour	208
		Selection	Value
		Disable	0
		Enable	1
99	R/W	Load Hour Percentage	210
100	R/W	RPM	212
		Selection	Value
		Disable	0
		Enable	1
101	R/W	Pole	214
102	R	NA	216
103	R	L1 Voltage THD%	218
104	R	L2 Voltage THD%	220
105	R	L3 Voltage THD%	222
106	R	L1 Current THD%	224
107	R	L2 Current THD%	226
108	R	L3 Current THD%	228

