



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
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.
On Hour	9999 Hour
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 - 999999 MWh
Export kWh	000.000 - 999999 MWh
Net kWh	000.000 - 999999 MWh
Total kWh	000.000 - 999999 MWh
kVAh Total	000.000 - 999999 MVAh
Import kVAh	000.000 - 999999 MVAh
Export kVAh	000.000 - 999999 MVAh
Lag kVAh	000.000 - 999999 MVAh
Lead kVAh	000.000 - 999999 MVAh
Total kVAh	000.000 - 999999 MVAh

DIMENSION :

Size	90 (H) x 70 (W) x 62 (D) mm
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COMMUNICATION:

RS-485 MODBUS

DISPLAY & KEY :

Display	LCD DISPLAY
Key	PROGRAM, VAF, POWER/ENERGY THD%

AUXILIARY SUPPLY :

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

LED Indication :

Optical Output: 32000 Imp/kWh & kVAh

ACCURACY:

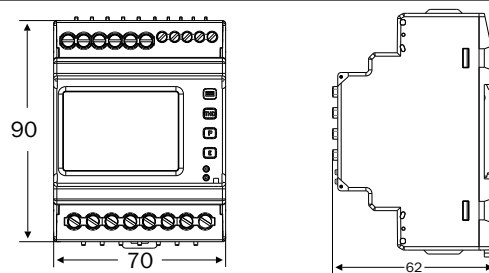
Class 0.5 (Standard)

ENVIRONMENT CONDITION:

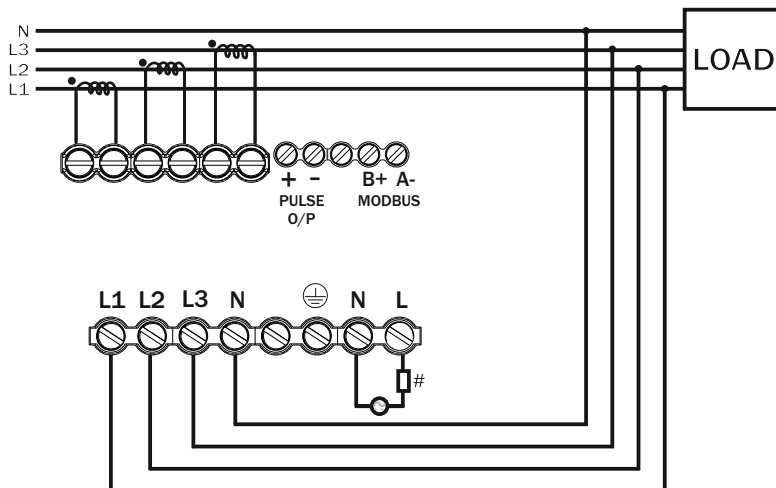
Operating Temp.	5 °C to 50 °C
Relative Humidity	UP to 95% RH (non-condensing)

MECHANICAL INSTALLATION

Outline Dimension (mm)



TERMINAL CONNECTION



KEY OPERATION

FUNCTION	PRESS KEY
OPERATOR MODE	
To view different pages	Or
To Enter into enter setting	Long Press
PARAMETER SETTING MODE	
To Set Parameter Value	
To Increment parameter value	
To Decrement parameter value	
To Exit from parameter setting	
To Scroll & Hold	Press 5 Sec

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) To install the instrument on a DIN rail, raise the clamp at the back of the instrument and place it on the rail. Now release the clamp, so the instrument fits on the DIN rail.
- 2) Ensure proper fitting of the instrument by pulling it outwards.
- 3) To remove the instrument raise the clamp to release it from the DIN rail.
- 4) The equipment in its installed state must not come in close proximity to any heating source, caustic vapors, oil steam, or other unwanted process byproducts.
- 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

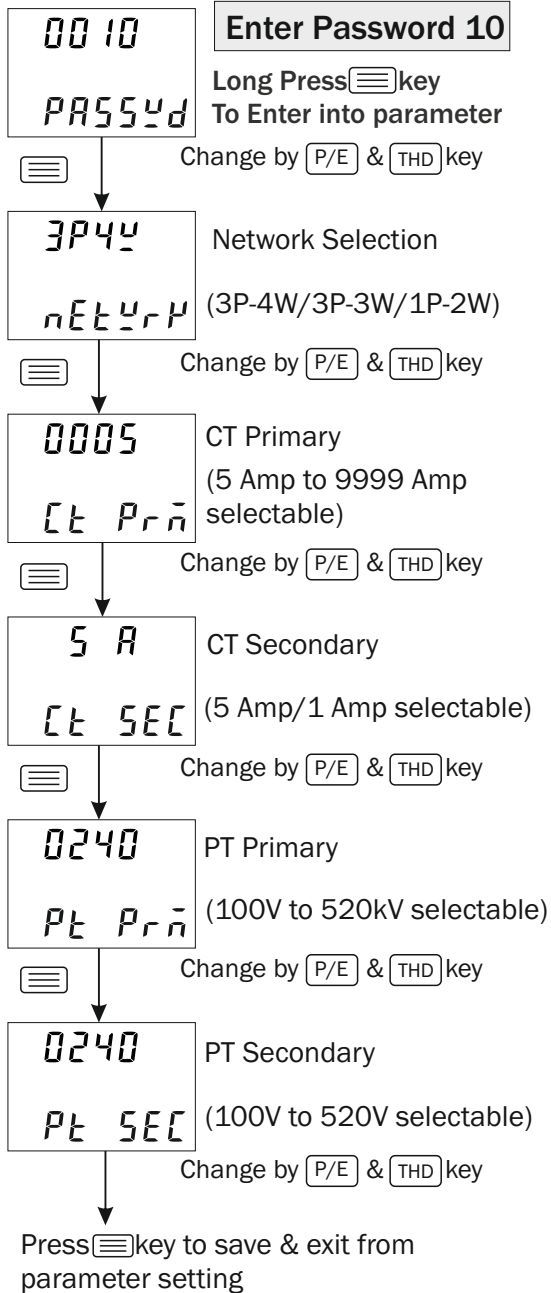


WARNING : Risk of electric shock.

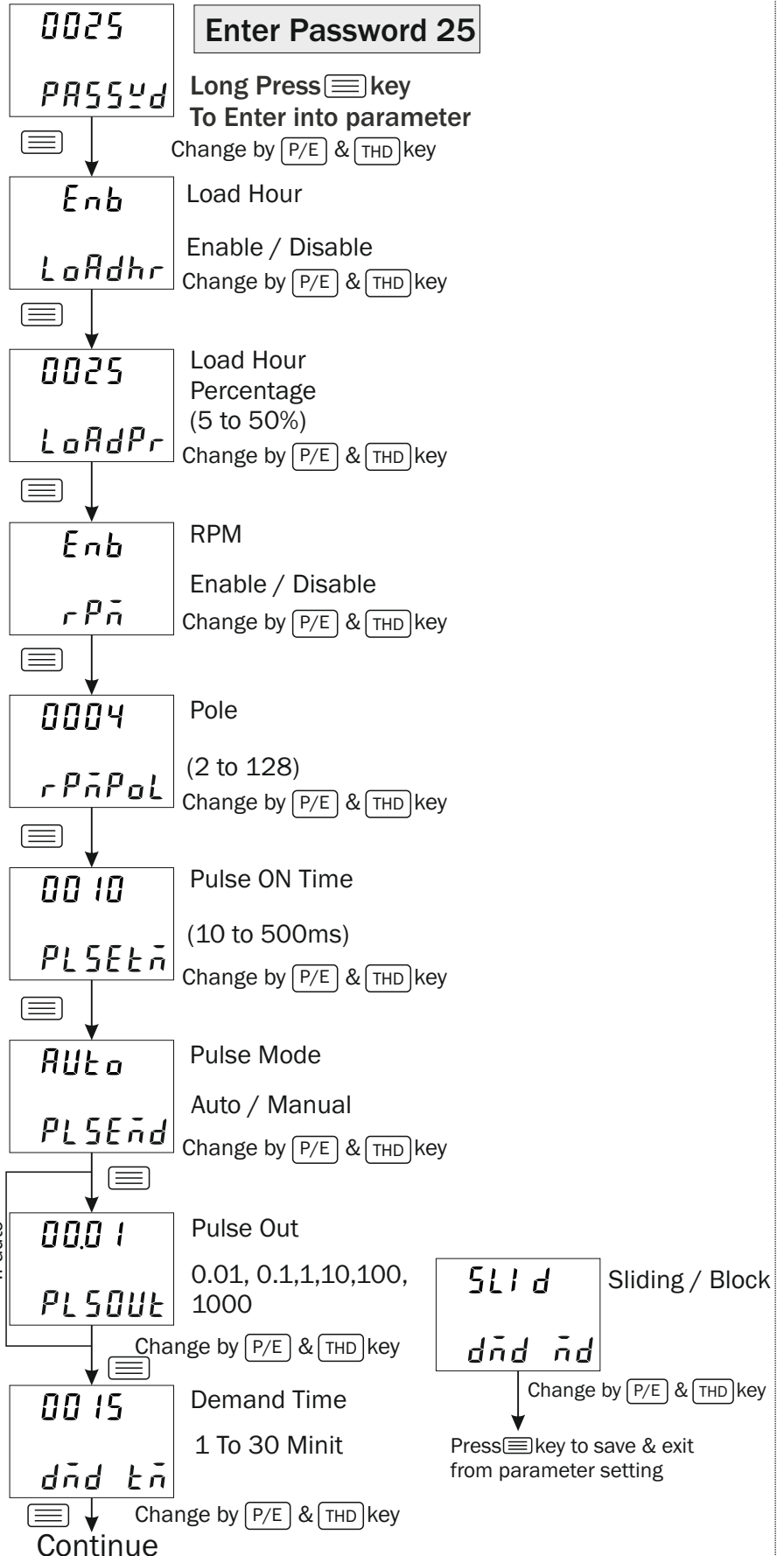
1. To prevent the risk of electric shock, power supply to the equipment must be kept OFF while doing the wiring arrangement. Do not touch the terminals while power is being supplied.
2. To reduce electro magnetic interference, use wire with adequate rating and twists of the same of equal size shall be 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.

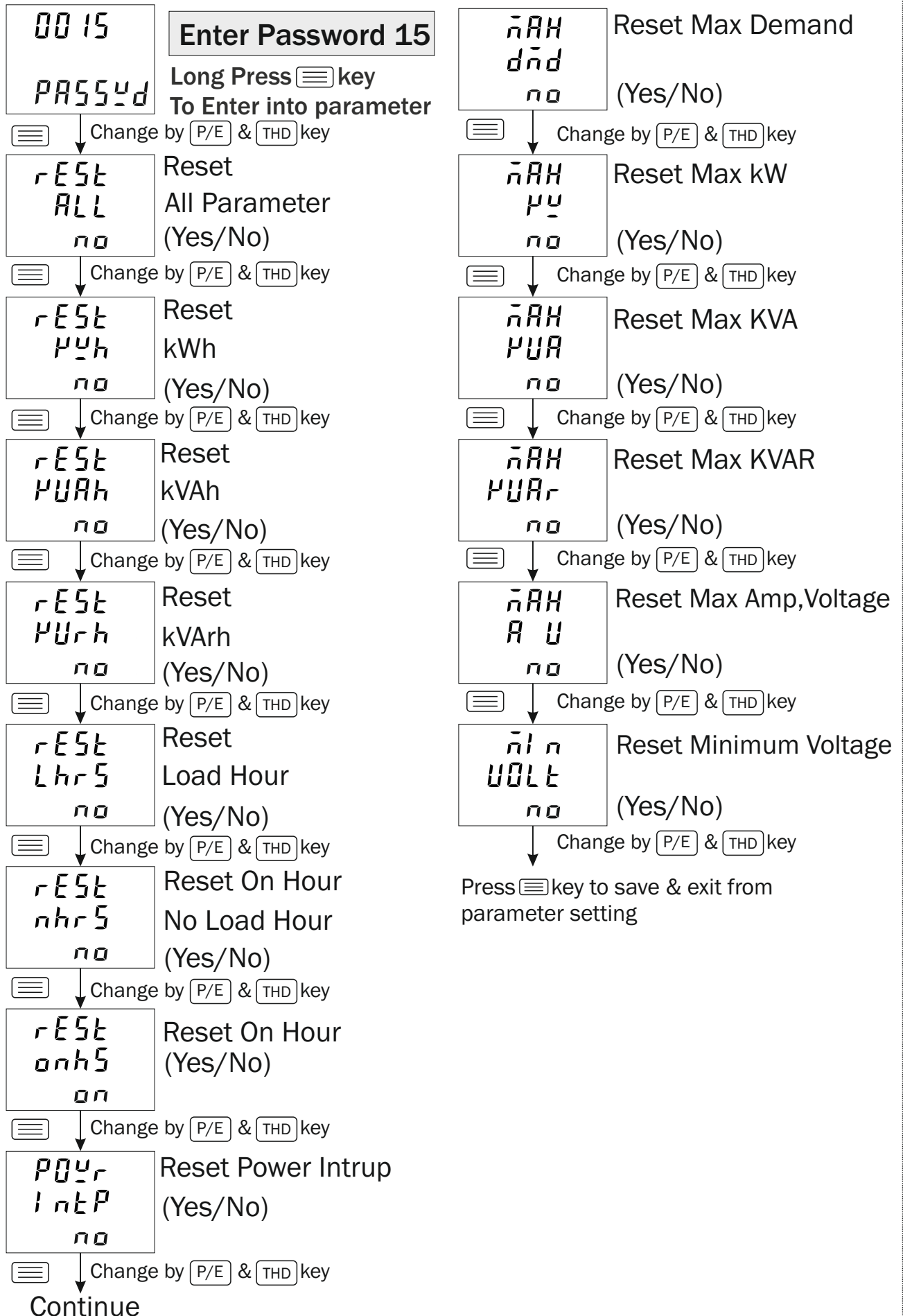


Advance Parameter Setting : Load Hour %, No Load Hour, RPM, Demand, Pulse Output



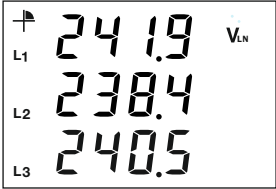
PARAMETER SETTING

Reset Parameter : kWh, kVAh, kVArh, Load Hour, No Load Hour, Max kW, Max kVA, Max kVAR, Max Voltage Amp, Max Demand, Power Intrup On Hour, Min Voltage

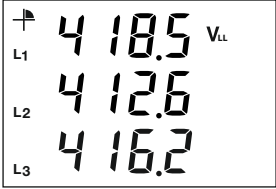


DISPLAY PAGES for Key

1) Voltage L-N



2) Voltage L-L



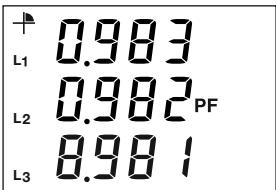
3) Current



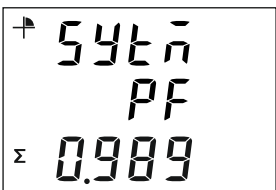
4) Neutral Current, Frequency



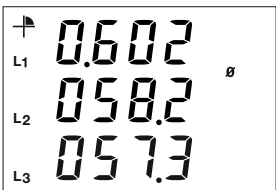
5) PF L1,L2,L3



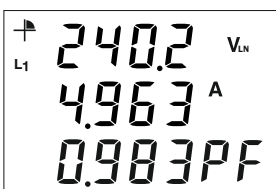
6) System PF



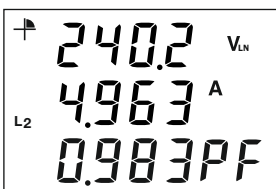
7) ∠ VI Angle



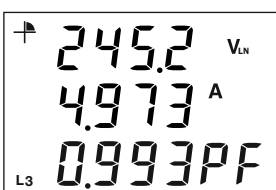
8) L1 Voltage Ampere, PF



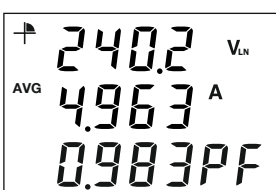
9) L2 Voltage Ampere, PF



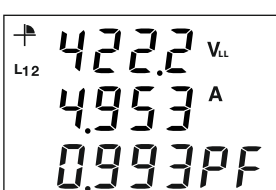
10) L3 Voltage Ampere, PF



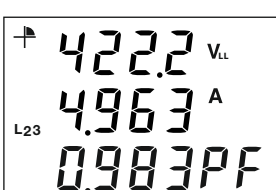
11) AVG V(L-N)-A-PF



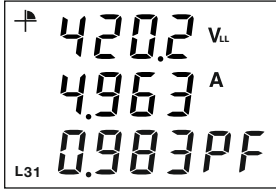
12) L12 Voltage Ampere, PF



13) L23 Voltage Ampere, PF



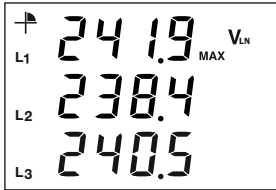
14) L31 Voltage Ampere, PF



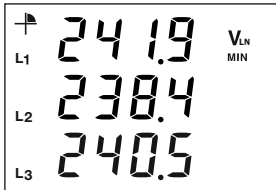
15) AVG V(L-L)-A-PF



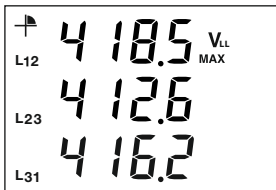
16) Max Voltage L-N



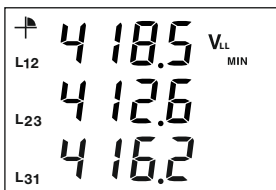
17) Min Voltage L-N



18) Max Voltage L-L



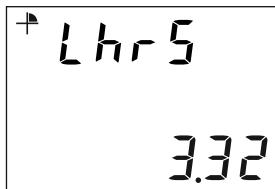
19) Min Voltage L-L



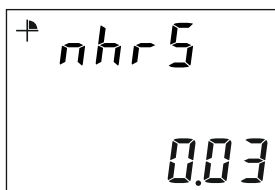
20) Max Current



21) Load Hour



22) No Load Hour



23) RPM



DISPLAY PAGES for P/E Key

1) Total kW



2) Total kVA



3) Total kVAr



4) Per Phase kW



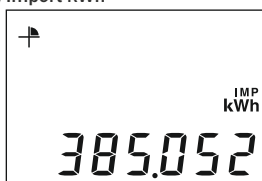
5) Per Phase kVA



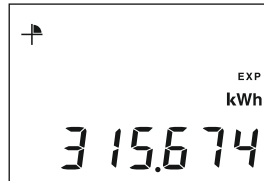
6) Per Phase kVAr



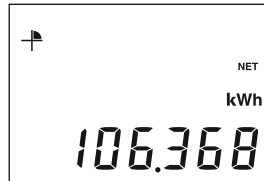
7) Import kWh



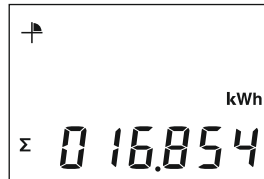
8) Export kWh



9) Net kWh



10) Total kWh



11) Total kVAh



12) Imp kVArh



13) Expot kVArh



14) Lag kVArh



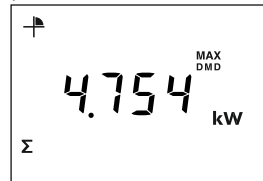
15) Lead kVArh



16) Total kVArh



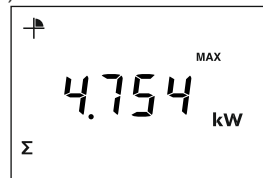
17) Max Demand kW



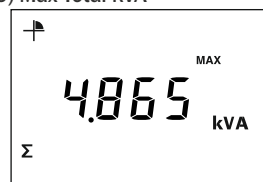
18) Max Demand kVA



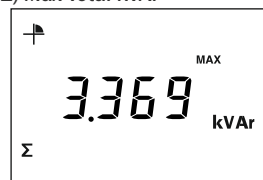
19) Max Total kW



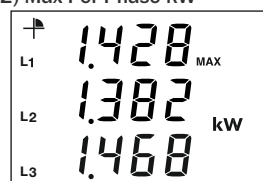
20) Max Total kVA



21) Max Total kVAr



22) Max Per Phase kW



23) Max Per Phase kVA



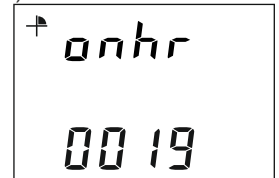
24) Max Per Phase kVAr



25) Power Intrup



26) On Hours



DISPLAY PAGES for THD Key

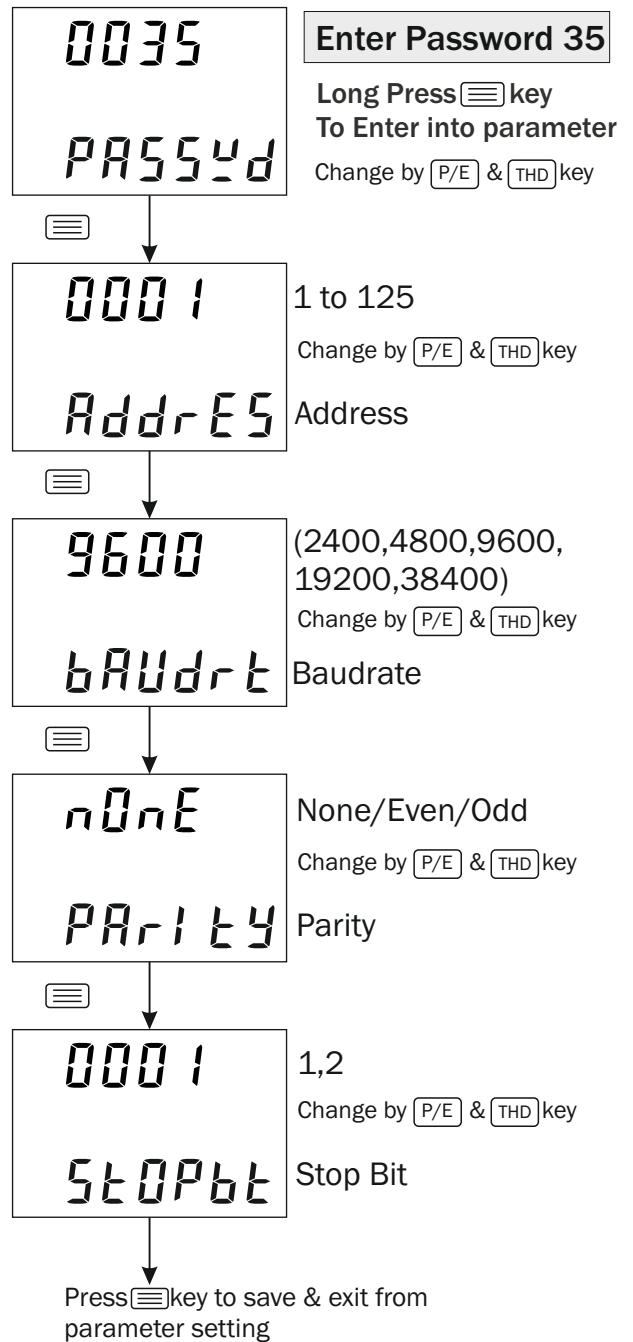
1) Voltage(LN) THD%

⏏ 007.7 THD%
L1 V_{LN}
005.7
L2
000.4
Σ
L3

2) Current THD%

⏏ 057.7 THD%
L1 A
025.7
L2
050.4
Σ
L3

Modbus Setting



MODBUS (EPM 70)

Slave Address :	1 to 125
Baudrate :	2400,4800,9600,19200, 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	Import kWh Value *N1	0
2	R	Export kWh Value *N1	2
3	R	Net kWh	4
4	R	Total kWh	6
5	R	Total kVAh	8
6	R	Import kVArh	10
7	R	Export kVArh	12
8	R	Lead kVArh	14
9	R	Lag kVArh	16
10	R	Sys kVArh	18

Sr.No	Access Type	Parameter	Register
			Data Type
			Float
11	R	Voltage L1-N Value	60
12	R	V L1-N Unit	62
13	R	Voltage L2-N Value	64
14	R	V L2-N Unit	66
15	R	Voltage L3-N Value	68
16	R	V L3-N Unit	70
17	R	AVG VLN Value	72
18	R	AVG VLN Unit	74
19	R	Voltage L12 Value	76
20	R	V L12 Unit	78
21	R	Voltage L23 Value	80
22	R	V L23 Unit	82
23	R	Voltage L31 Value	84
24	R	V L31 Unit	86
25	R	AVG VLL Value	88
26	R	AVG VLL Unit	90
27	R	Current L1 Value	92
28	R	Current L1 Unit	94
29	R	Current L2 Value	96
30	R	Current L2 Unit	98
31	R	Current L3 Value	100
32	R	Current L3 Unit	102
33	R	AVG Current Value	104
34	R	AVG Current Unit	106
35	R	Neutral Current Value	108
36	R	Neutral Current Unit	110
37	R	∠ VI Angle Line 1	112
38	R	∠ VI Angle Line 2	114
39	R	∠ VI Angle Line 3	116
40	R	Line 1 Power Factor	118
41	R	Line 2 Power Factor	120
42	R	Line 3 Power Factor	122

43	R	System PF	124
44	R	Average Power Factor	126
45	R	System Frequency	128
46	R	Line 1 kW value	130
47	R	Line 1 kW Unit	132
48	R	Line 2 kW value	134
49	R	Line 2 kW Unit	136
50	R	Line 3 kW value	138
51	R	Line 3 kW Unit	140
52	R	Total kW	142
53	R	Total kW Unit	144
54	R	Line 1 kVA value	146
55	R	Line 1 kVA Unit	148
56	R	Line 2 kVA value	150
57	R	Line 2 kVA Unit	152
58	R	Line 3 kVA value	154
59	R	Line 3 kVA Unit	156
60	R	Total kVA value	158
61	R	Total kVA Unit	160
62	R	Line 1 kVAr value	162
63	R	Line 1 kVAr Unit	164
64	R	Line 2 kVAr value	166
65	R	Line 2 kVAr Unit	168
66	R	Line 3 kVAr value	170
67	R	Line 3 kVAr Unit	172
68	R	Total kVAr value	174
69	R	Total kVAr Unit	176
70	R	Line1 Voltage THD%	178
71	R	Line2 Voltage THD%	180
72	R	Line3 Voltage THD%	182
73	R	Line1 Current THD%	184
74	R	Line2 Current THD%	186
75	R	Line3 Current THD%	188
76	R	LDH Hour	190
77	R	LDH Minit	192
78	R	NO LDH Hour	194
79	R	NO LDH Minit	196
80	R	RPM	198
81	R	ON Hour	200
82	R	Power Intrup	202
83	R	kW Max DMD	204
84	R	kW Max DMD Unit	206
85	R	kVA Max DMD	208
86	R	kVA Max DMD Unit	210
87	R	Line 1 Max Volt	212
88	R	Line 1 Max Volt Unit	214
89	R	Line 2 Max Volt	216
90	R	Line 2 Max Volt Unit	218
91	R	Line 3 Max Volt	220
92	R	Line 3 Max Volt Unit	222
93	R	Line 12 Max Volt	224
94	R	Line 12 Max Volt Unit	226
95	R	Line 23 Max Volt	228
96	R	Line 23 Max Volt Unit	230
97	R	Line 31 Max Volt	232
98	R	Line 31 Max Volt Unit	234

99	R	Line 1 Min Volt	236
100	R	Line 1 Min Volt Unit	238
101	R	Line 2 Min Volt	240
102	R	Line 2 Min Volt Unit	242
103	R	Line 3 Min Volt	244
104	R	Line 3 Min Volt Unit	246
105	R	Line 12 Min Volt	248
106	R	Line 12 Min Volt Unit	250
107	R	Line 23 Min Volt	252
108	R	Line 23 Min Volt Unit	254
109	R	Line 31 Min Volt	256
110	R	Line 31 Min Volt Unit	258
111	R	Line 1 Max Amp	260
112	R	Line 1 Max Amp Unit	262
113	R	Line 2 Max Amp	264
114	R	Line 2 Max Amp Unit	266
115	R	Line 3 Max Amp	268
116	R	Line 3 Max Amp Unit	270
117	R	Line 1 Max kW Value	272
118	R	Line 1 Max kW Unit	274
119	R	Line 2 Max kW	276
120	R	Line 2 Max kW Unit	278
121	R	Line 3 Max kW	280
122	R	Line 3 Max kW Unit	282
123	R	Max Total kW	284
124	R	Max Total kW Unit	286
125	R	Line 1 Max kVA	288
126	R	Line 1 Max kVA Unit	290
127	R	Line 2 Max kVA	292
128	R	Line 2 Max kVA Unit	294
129	R	Line 3 Max kVA	296
130	R	Line 3 Max kVA Unit	298
131	R	Max Total kVA	300
132	R	Max Total kVA Unit	302
133	R	Line 1 Max kVAr	304
134	R	Line 1 Max kVAr Unit	306
135	R	Line 2 Max kVAr	308
136	R	Line 2 Max kVAr Unit	310
137	R	Line 3 Max kVAr	312
138	R	Line 3 Max kVAr Unit	314
139	R	Max Total kVAr	316
140	R	Max Total kVAr Unit	318

331	R/W	Network Selection		700
		Selection	Value	
		3P-3W	0	
		3P-4W	1	
		1P-2W	2	
332	R/W	CT Primary Value		702
333	R/W	CT Secondary Value		704
334	R/W	PT Primary Value		706
335	R/W	PT Secondary Value		708

336	—	NA	710
337	R/W	All Reset	712
338	R/W	kWh Reset	714
339	R/W	kVAh Reset	716
340	R/W	kVArh Reset	718
341	R/W	Load Hour Reset	720
342	R/W	No Load Hour Reset	722
343	R/W	Power Intrup Reset	724
344	R/W	On Hour Reset	726
345	R/W	Maximum Demand Reset	728
346	R/W	Max kW Reset	730
347	R/W	Max kVA Reset	732
348	R/W	Max kVAr Reset	734
349	R/W	Max Voltage, Current Reset	736
350	R/W	Minimum Voltage Reset	738

Note :- To Reset Below Parameter Enter 15 Value

351	—	NA		740
352	R/W	Address		742
353	R/W	Baudrate		744
		Selection	Value	
		2400	0	
		4800	1	
		9600	2	
		19200	3	
	38400	4		
354	R/W	Parity		746
		Selection	Value	
		NON	0	
		Even	1	
		Odd	2	
355	—	NA		748
356	R/W	Load Hour E / D		750
		Selection	Value	
		Disable	0	
		Enable	1	
357	R/W	Load Hour Percentage		752
358	R/W	RPM E / D		754
		Selection	Value	
		Disable	0	
		Enable	1	
359	R/W	Pole		756
360	R/W	Demand Time		758
361	R/W	Demand Mode		760
		Selection	Value	
		Block	0	
		Sliding	1	

Note :

● Voltage & Current Unit

Selection	Value
Volt & Amp	0
Kilo Volt & Kilo Amp	1

● Power Unit

Selection	Value
Kilo	1
Mega	2