



Elite 100 and 300

Multifunction meter



Technical reference manual

BGX701-234-R01

Copyright © 2019, SIHPL

Table of Contents

1	Introduction	5
1.1	Reference Documents.....	5
2	Precautions and safety practices.....	5
3	Terms and standards.....	6
3.1	Acronyms.....	6
3.2	Measurement Units	6
4	Overview	6
5	Features and applications.....	8
5.1	Operational features.....	8
5.2	Benefits.....	9
5.3	Physical and functional features.....	9
5.3.1	Meter dimensions	9
5.3.2	Front panel.....	10
5.3.3	Rear panel	12
6	Meter Operation	14
6.1	Meter display mode	14
6.1.1	Elite 100 meter.....	16
6.1.2	Elite 300 meter.....	18
6.2	Using the setup mode	20
6.2.1	Password entry	23
6.2.2	Messages on display	24
6.2.3	Page navigation within the setup mode.....	25
6.3	Editing set-up mode parameters	26
6.3.1	Meter type.....	27
6.3.2	PT Commissioning.....	28
6.3.3	CT Commissioning	29
6.3.4	Alerts.....	30
6.3.5	Revolution per minute.....	31
6.3.6	Changing the setup mode Password.....	32
6.3.7	Demand setting.....	32
6.3.8	Reset.....	33
6.3.9	MODBUS/ Alarm/ Pulse Configuration (Optional variant selection).....	34
6.3.10	Display update time	36
6.3.11	Mode setting configuration (Available in Elite 101, Elite 301)	36
6.3.12	Save.....	37
6.3.13	Quit the Setup menu mode.....	37
7	Technical specifications	38
8	Installation and commissioning	40
8.1	Connection diagram	40

8.2 Mounting the meter on the panel 41

9 Annexure I: Supported features and parameters in Elite variants 42

10 Annexure II: Pulse energy selection list 43

11 Annexure III: CT Pass Through and Parking Terminal 44

11.1 Parking terminal installation 45

11.2 Advantages of using Pass through Connection 46

12 Appendix IV: Energy meter display resolution 47

13 Appendix V: MODBUS mapping of the meter.....47

1 Introduction

This manual is intended for understanding the various functions and features of the AC three phase multiline digital panel meter range. Broadly it covers the following:

- How to install the meter
- How to configure the meter in Setup mode
- How to configure the meter using ConfigView
- How to interpret the displays
- Variant-wise list of supported parameters.

1.1 Reference Documents

For configuring certain parameters in the meter with the help of configuration tool, the user may find the **ConfigView User Manual** useful in addition to this manual.

2 Precautions and safety practices

- This product must be installed and serviced only by trained personnel. We strongly recommend reading the “Quick Installation Guide” thoroughly before installing the product.
- Use appropriate personal protective equipment (PPE) and follow safe electrical practices.
- DPM meter should only be installed indoors by suitably trained personnel.
- Failure to observe precautions can result in serious or even fatal injury and equipment damage.
- Do not exceed the specified voltage and current ratings.
- Check the auxiliary supply voltage and / or polarity before making connection.
- Prior to any work with the product, isolate the voltage inputs and auxiliary power supply and short-circuit the secondary winding of all external current transformers.
- Under no circumstances, the CT connections to the meter should be disconnected while current is flowing in the primary circuit of the external CT.
- Make sure that there are no loose connections, stray wires or exposed conductors.
- Do not use solvents or abrasive materials to clean the unit, use only a slightly damp cloth and isolate the unit from the supply before cleaning it.
- An easily reachable switch and circuit breaker must be provided while installing Auxiliary supply. Make sure to mark it as “Disconnecting Device for the equipment”.
- The equipment does not incorporate internal fuse. External fuse of rating 300V/0.5 A must be incorporated for safety precautions under fault conditions.
- Impact rating is IK06 and rated impact energy level is 1 Joule.
- Care must be exercised during the installation of the meter due to presence of mains voltages. Various points at the rear side operate at hazardous voltages.



The organization is committed to continuous improvement in our products and upgrading the feature set. While we will endeavour to integrate new features seamlessly, there could be instances when the enhancement is not backward compatible. Please check with the company representative for compatibility check before upgrade on an existing product.

Damage preventing measures:

Before installation, carryout the following checks and note the maximum voltage and current across the input terminals:

- The voltage of the auxiliary power should be in the range of 40-300 V AC/DC.

- The frequency of the distribution system should be in the range of 45-65 Hz;
- The maximum voltage across the voltage-input terminals (V1, V2, V3 and VN) is 300 V AC phase-to-neutral and 500 V AC phase-to-phase.
- The maximum current overload supported by the meter is 7.5 A.



Failure to comply with the above safety measures could cause serious injuries. If the meter is used in a manner not specified by the manufacturer, the protection provided by connections may be impaired. The manufacturer shall not be held responsible for failure to comply with the instructions in this manual.

3 Terms and standards

3.1 Acronyms

Acronym	Definition
VAF	Voltage, Current, Frequency
LCD	Liquid Crystal Display
LED	Light Emitting Diode
PF	Power Factor
O/P	Output
THD	Total Harmonic Distortion
Aux	Auxiliary Power
RPM	Revolution per minute

3.2 Measurement Units

Unit	Description
A	Ampere (unit of current)
Hz	Hertz (unit of frequency)
kVA	kilovolt ampere
W	Watt
kWh	kilowatt-hour
ms	millisecond
V	Volt

4 Overview

The Elite series is a multi-line three-phase digital panel meter for reliable and accurate true-RMS measurement of electrical parameters (voltage, current, power, frequency and energy etc) for industrial and commercial applications.

It is available in two display types, LED display (Elite 100) and LCD display (Elite 300), with MODBUS communication, pulse output or alarm output as an option.

The table given below provides detailed explanation of the available product range:

Meter	Display type	Display details	Variants
Elite 100	LED	Multi line (4) - First line: 7 digits - Second to fourth line: 5 digits	Elite 101: VAF+ Power + Power Factor Elite 102: VAF+ Power + Power Factor + Energy Elite 103: VAF + Power + Power Factor + Energy + Modbus Communication Elite 104: VAF + Power + Power Factor + Energy + Pulse Output Elite 105: VAF + Power + Power Factor + Energy + Alarm Output
Elite 300	LCD	Multi line (4) - First line: 7 digits - Second to fourth line: 5 digits	Elite 301: VAF+ Power + Power Factor Elite 302/ 306: VAF + Power + Power Factor + Energy Elite 303/ 307: VAF + Power + Power Factor + Energy + Modbus Elite 304/ 308: VAF + Power + Power Factor + Energy + Pulse Output Elite 309: VAF + Power + Power Factor + Energy + Alarm Output

Table 1: Product details: Size and Variants

Variant	Product name
VAF+ Power +PF, 4 line LED display, 40-300 V AC/DC Aux, 96X96	Elite 101
VAF+ Power +PF + Energy (Cass 1), 4 line LED display, 40-300 V AC/DC Aux, 96X96	Elite 102
VAF+ Power +PF + Energy (Class 1)+ MODBUS,4 line LED display, 40-300 V AC/DC Aux, 96X96	Elite 103
VAF+ Power +PF + Energy (Class 1)+ Pulse O/P, 4 line LED display, 40-300 V AC/DC Aux, 96X96	Elite 104
VAF+ Power +PF + Energy (Class 1)+ ALARM, 4 line LED display, 40-300 V AC/DC Aux, 96X96	Elite 105
VAF+ Power +PF, 4 line LCD display, 40-300 V AC/DC Aux, 96X96	Elite 301
VAF+ Power +PF + Energy (Class 1), 4 line LCD display, 40-300 V AC/DC Aux,96X96	Elite 302
VAF+ Power +PF + Energy (Class 1)+ MODBUS, 4 line LCD display, 40-300 V AC/DC Aux,96X96	Elite 303
VAF+ Power +PF + Energy (Class 1)+ Pulse O/P, 4 line LCD display, 40-300 V AC/DC Aux,96X96	Elite 304
VAF+ Power +PF + Energy (Class 0.5), 4 line LCD display, 40-300 V AC/DC Aux, 96X96	Elite 306
VAF+ Power +PF + Energy (Class 0.5)+ MODBUS, 4 line LCD display, 40-300 V AC/DC Aux,96X96	Elite 307
VAF+ Power +PF + Energy (Class 0.5)+ Pulse O/P, 4 line LCD display, 40-300 V AC/DC Aux, 96X96	Elite 308
VAF+ Power +PF + Energy (Class 0.5)+ ALARM, 4 line LCD display, 40-300 V AC/DC Aux, 96X96	Elite 309

Table 2: Product variants

Elite 100 and 300 series are multi-function panel meters with multi-line digital displays.

These are panel mounted (96*96) meters capable of measuring and monitoring various electrical quantities as well as detecting fault conditions in LT/HT networks. These meters are an ideal replacement for analogue ammeter/voltmeter combinations and are suitable for sub-metering of distribution system in Industrial and Commercial applications.

Elite 100 having accuracy class of 1.0 and Elite 300 having accuracy class of 0.5s and 1.0 are configurable for

1. HT 3-phase 3-wire
2. HT 3-phase 4-wire
3. LT 3-phase 4-wire
4. LT 3-phase 3-wire

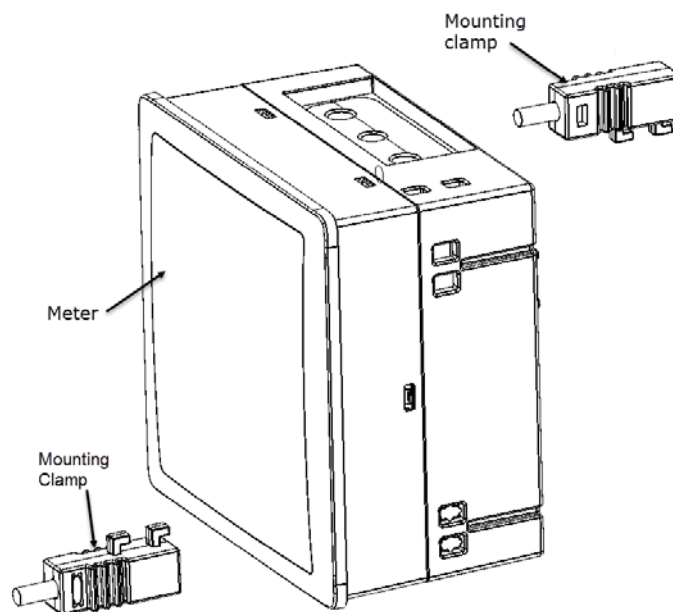


Figure 1: Multi functional Meter Parts

The meter's front panel has an LED/ LCD. When powered, the LED/LCD is capable of displaying a group of related electrical parameter values.

The meter has external detachable parts as shown in the above figure. These are described in the 'Rear Panel' section.

5 Features and applications

5.1 Operational features

Elite 100 and 300 meter has the following operational features:

- Four-line alphanumeric LED/ LCD display with 7 digits for energy, total power, total/ average demand and 5 digits for instantaneous parameters
- Reliable and accurate measurement
- User configurable alert thresholds for various parameters
- Unique pass through mechanism for current termination
- Wide range AC/DC auxiliary power supply
- High level of protection degree
- Display of minimum and maximum values
- Individual and THD measurement for voltage and current, up to 31st harmonic

- Current and power demand monitoring
- Option for RS-485, pulse output or alarm output
- True root-mean squared (RMS) metering
- Password-protected setup mode
- On-site for wiring configuration (3P3W/ 3P4W)
- Auto unit scaling for voltage, current, power and energy
- Scroll-lock feature support

These meters are useful for the following applications:

- Commercial and industrial sub-metering
- Energy Management System (EMS) applications
- Building management and monitoring systems (BMS)
- High and medium voltage switch gear panels
- Power Control Centre (PCC) panels
- Motor Control Centre (MCC) panels
- LV distribution panels
- Control and relay panels
- Automation and monitoring systems

5.2 Benefits

- Quick and easy installation with unique pass through concept for current termination (with minimal burden)
- Alerts on display for monitoring critical parameters
- User-friendly touch-sense keys for easy display access and configuration
- Wide-range aux input makes it suitable for a variety of installation scenarios
- Modbus communication (optional) for system integration
- Multiple electrical parameters in a single device
- Single product suitable for a variety of panel applications, through field configuration.

5.3 Physical and functional features

5.3.1 Meter dimensions

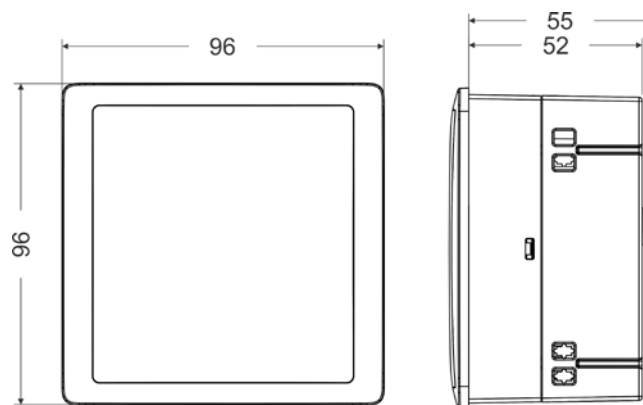


Figure 2: Meter dimensions without mounting screw and parking terminal

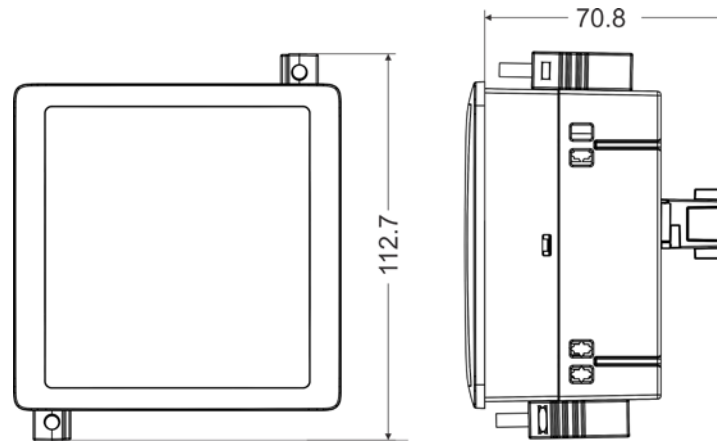


Figure 3: Meter dimensions with mounting screw and parking terminal

Note: All dimensions are in 'mm'. General Tolerance is ± 1.0 mm.

5.3.2 Front panel

The front face of Elite 100/ 300 meter has digital LED or LCD as shown in the following figure and described below:



Figure 4: Display panel meter Front View

5. **Digital display (LED):** Multi line (4) LED, 7 digits first line & 5 digits for other 3 lines with character size as 14.2×8.1 mm (Height × Width). The yellow-green LED with black background is legible from 5 meter distance which when powered can display various measured basic electrical parameters such as voltage, current, power, frequency and energy. In addition, inside borders are reserved to display measuring units, indicators as shown in the figure.
6. **Digital display (LCD):** Multi line (4) LCD, 7 digits first line & 5 digits for other 3 lines with character size as 10.2×6.3 mm (Height × Width). The white LCD with blue background which when powered can display various measured basic electrical parameters such as voltage, current, power, frequency and energy. In addition, inside borders are reserved to display measuring units, indicators and percentage bar graph as shown in the figure.

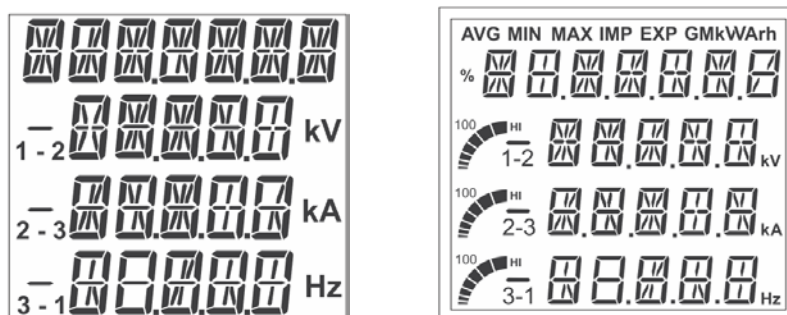


Figure 5: LCD/ LED Display Details

Note: Analogue bar graph in LCD variant shows current load- 20% each bar

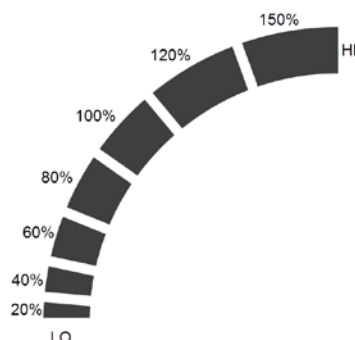


Figure 6: Analogue bar graph

Range	Bars visible
0-15.999%	0
16-35.999%	1
36-55.999%	2
56-75.999%	3
76-95.999%	4
96-115.999%	5
116-135.999%	6
136% and above	7

7. **Touch key functions:** The meter has four touch keys on the front, aligned in a row below the LED/ LCD. Each key has the following specific use in various operating modes:

Key	In Setup mode		
	Long press (5 s)	Short press	
 5 seconds	Enter Setup-mode	No function	
		Navigation	Editing
	No function	Go back to the previous option	No function
	No function	Scroll through the menu list	Increment the value
	No function	Scroll through the menu list	Decrement the value
	No function	Select/ enter the current option	- Confirm or save the entered digit or value. - Move to the next digit or value

Table 3: Touch key functions (In Setup Mode)

Key	In Display mode	
	Long press (5 s)	Short press
	No function	Alert acknowledgement
	No function	Scroll through the parameter list and value
	No function	Scroll through the parameter list and value
	Reset min-max values	Scroll through max (Hi) and min (Lo) values
 & 	Lock the present display	No function

Table 4: Touch key functions (In Display Mode)

Note: Scroll lock feature present in Elite series meter is used to freeze the present display while the user is working in display mode. It is accessed by pressing  &  key.

8. Enunciator

Enunciator is an indicator of value multiplication and phase indication.

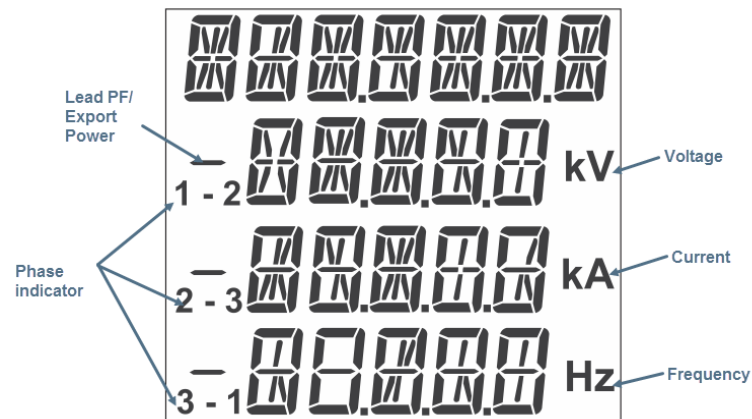


Figure 7: Enunciator details in Elite 100

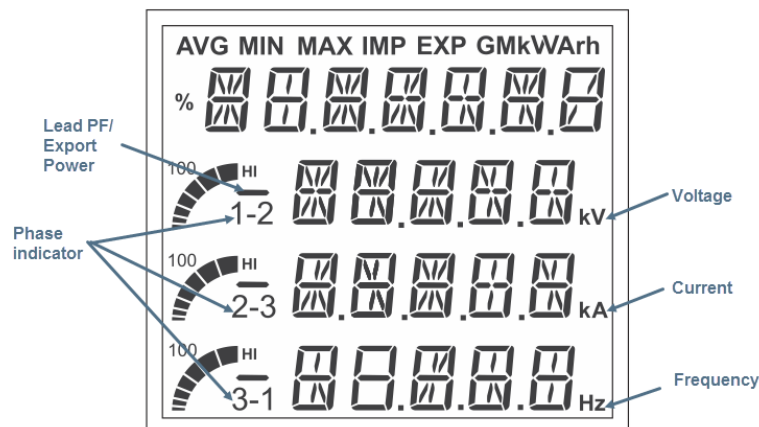


Figure 8: Enunciator details in Elite 300

Note: 3 Ø ~ indicates three phase meter

5.3.3 Rear panel

On the rear panel, these meters have voltage terminals, current terminals, and an auxiliary power supply socket as shown in the following figure. In addition, there are separate sockets for fitting mounting clamps.

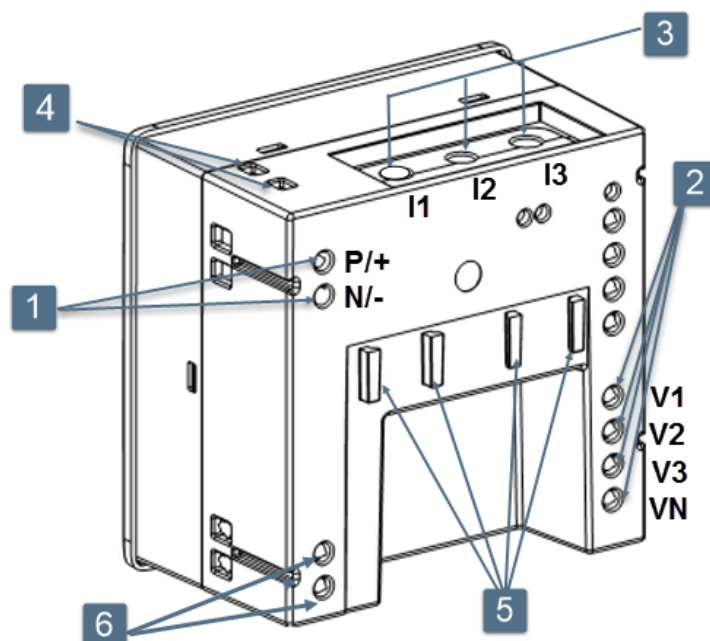


Figure 9: Rear panel details

1	Auxiliary power supply terminals (P+, N-)
2	Measurement circuit (V1, V2, V3, VN)
3	CT Pass through
4	Socket for fitting Mounting clamps
5	Guide for fitting Parking terminal
6	Terminals for Modbus/ Pulse/ Alarm

6 Meter Operation

Operating the meter is necessary for the following purpose:

- Changing the meter display mode and navigating through the display pages in Manual and Auto-display mode.
- Updating configuration or changing password from the Setup Mode (Touch keys).

6.1 Meter display mode

By default, the meter display is configured to cycle through a sequence of preset Auto-cycle display pages at predefined intervals (20 seconds). This default mode can be switched to the Manual display mode in which you can navigate through the pages by using the touch keys.

On pressing  key, the meter will display maximum and minimum values of the parameter that is read by the meter.

Minimum and maximum values that appear on Elite 100 meter on pressing  key are as follows:

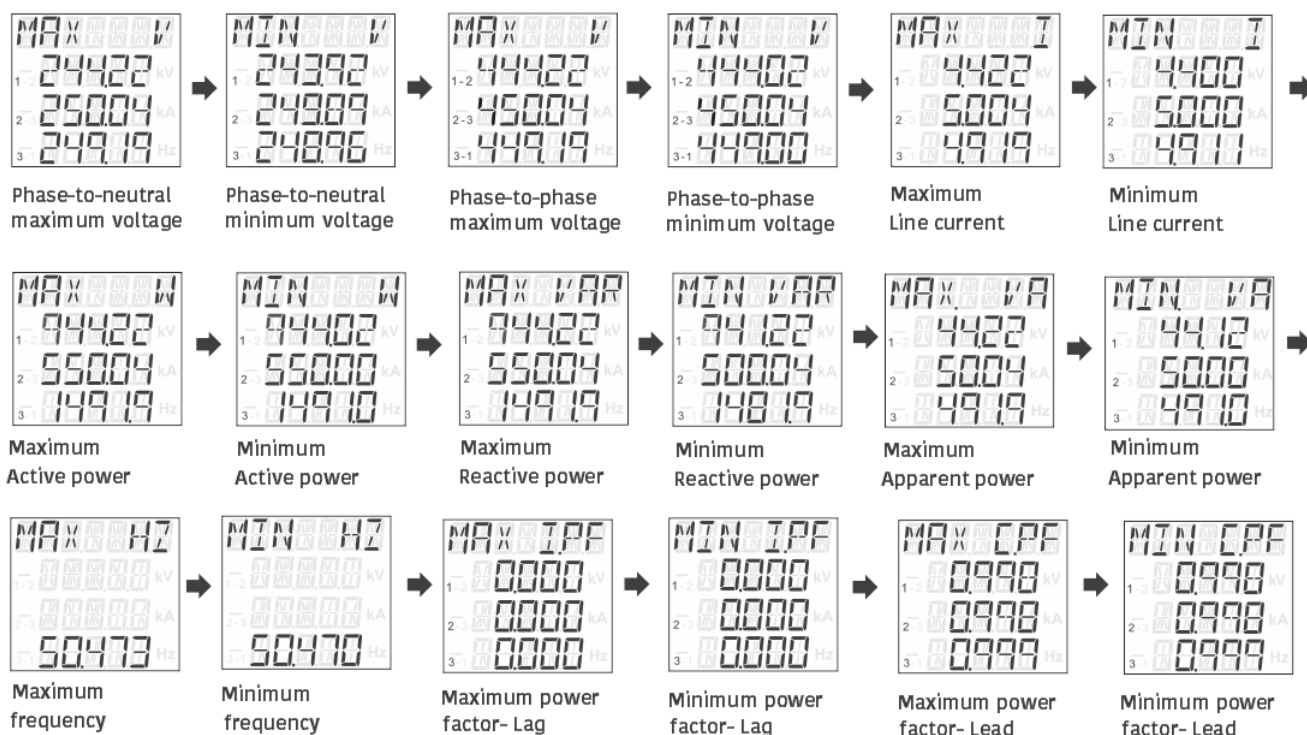


Figure 10: Elite 100 Meter display cycle

Minimum and maximum values that appear on Elite 300 meter on pressing  key are as follows:

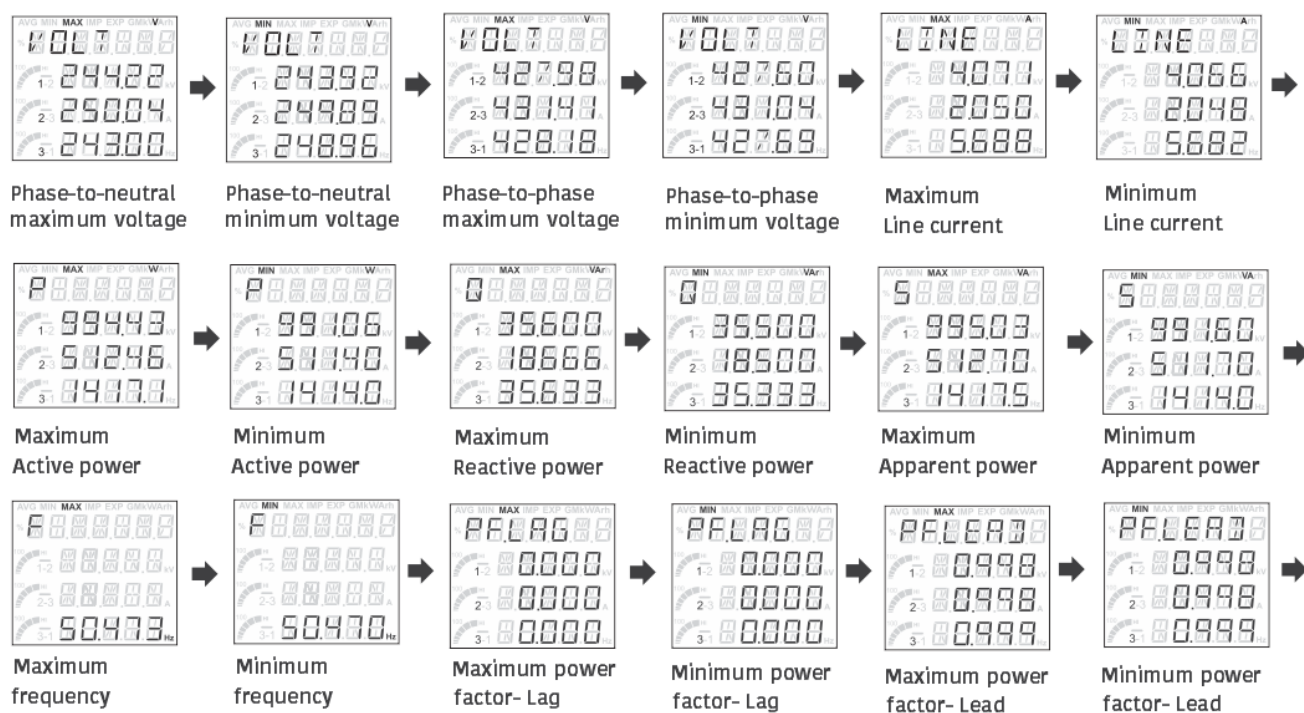


Figure 11: Min-max values of Elite 300 Meter display cycle

Note: User can reset min-max values by pressing  for 5 seconds

6.1.1 Elite 100 meter

6.1.1.1 Elite 101 meter displays

The below given cycle of displays will appear while meter is running in Auto/ Manual mode.

Note: Phase to neutral voltages display is available in LT4, HT4 modes only.

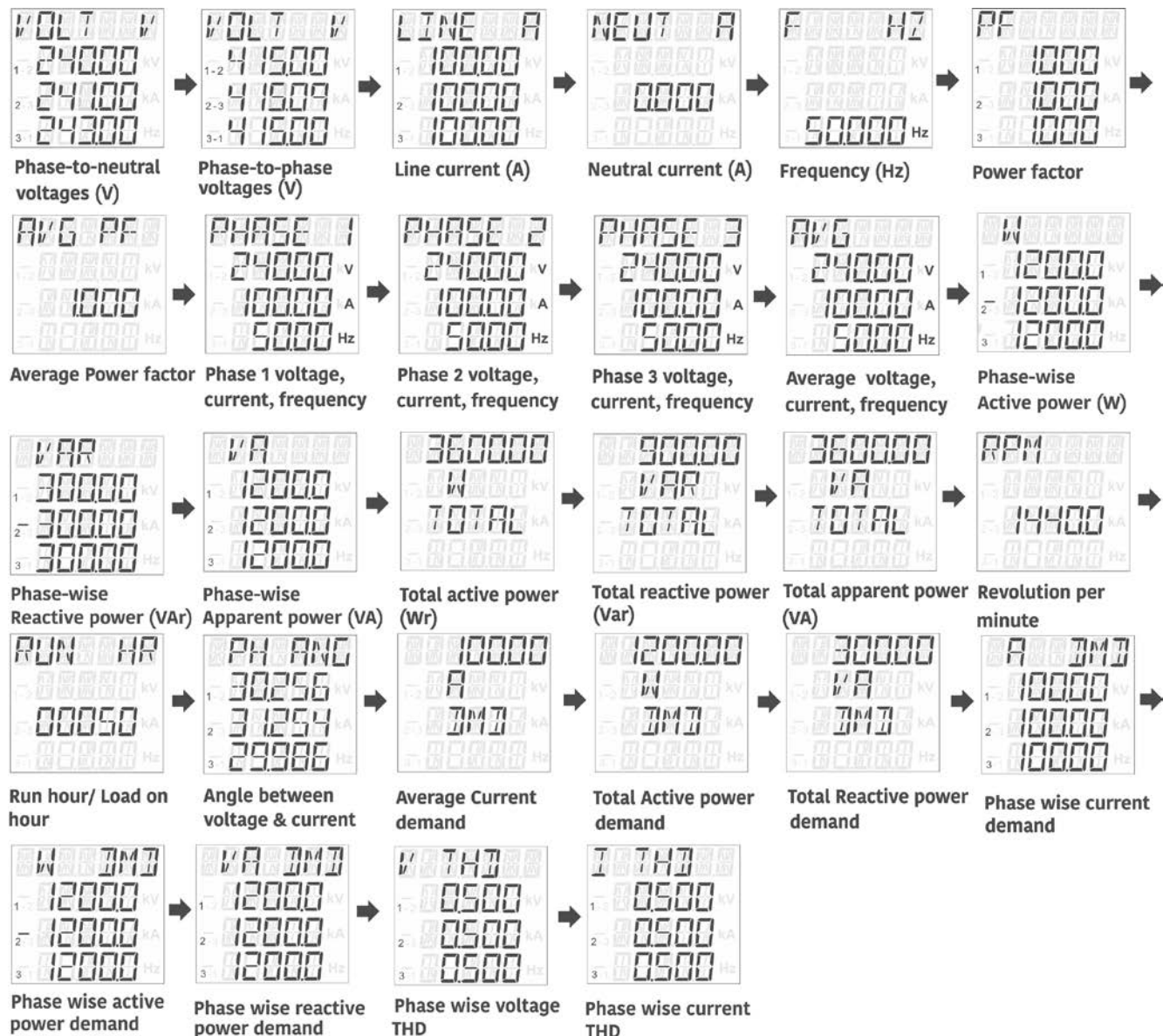


Figure 12: Elite 101 Meter displays in Auto/ Manual mode

6.1.1.2 Elite 102/ 103/ 104/ 105 meter displays

The below given cycle of displays will appear while meter is running in Auto/ Manual mode.

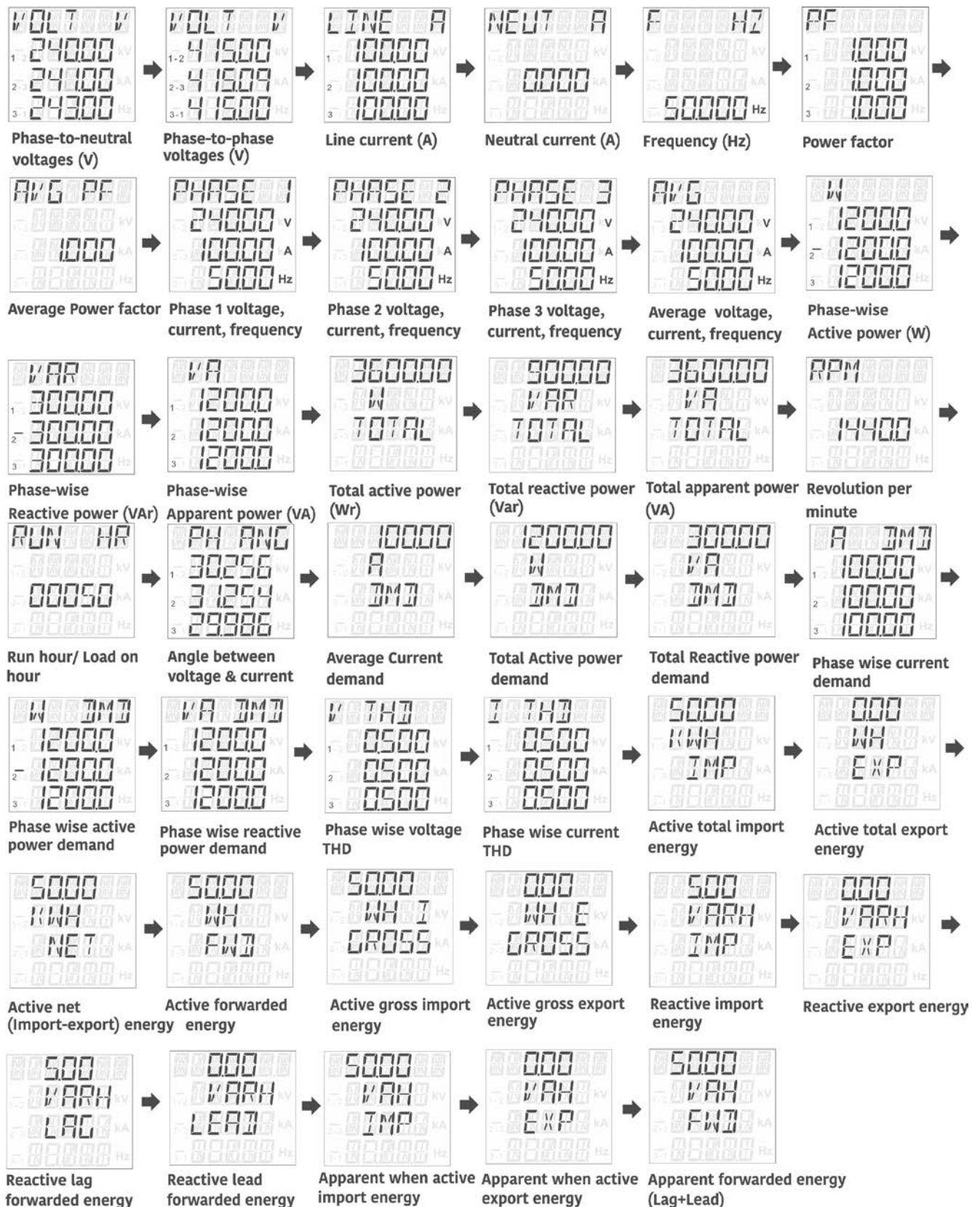


Figure 13: Elite 102/ 103/ 104/ 105 display cycles in Auto/ Manual mode

6.1.2 Elite 300 meter

6.1.2.1 Elite 301 meter displays

The below given cycle of displays will appear while meter is running in Auto/ Manual mode.

Note: P-N voltages page available in LT4 and HT4 meter modes only.



Figure 14: Elite 301 Meter displays in Auto/ Manual mode

6.1.2.2 Elite 302/ 303/ 304/ 306/ 307/ 308/ 309 meter displays

The below given cycle of displays will appear while meter is running in Auto/ Manual mode.

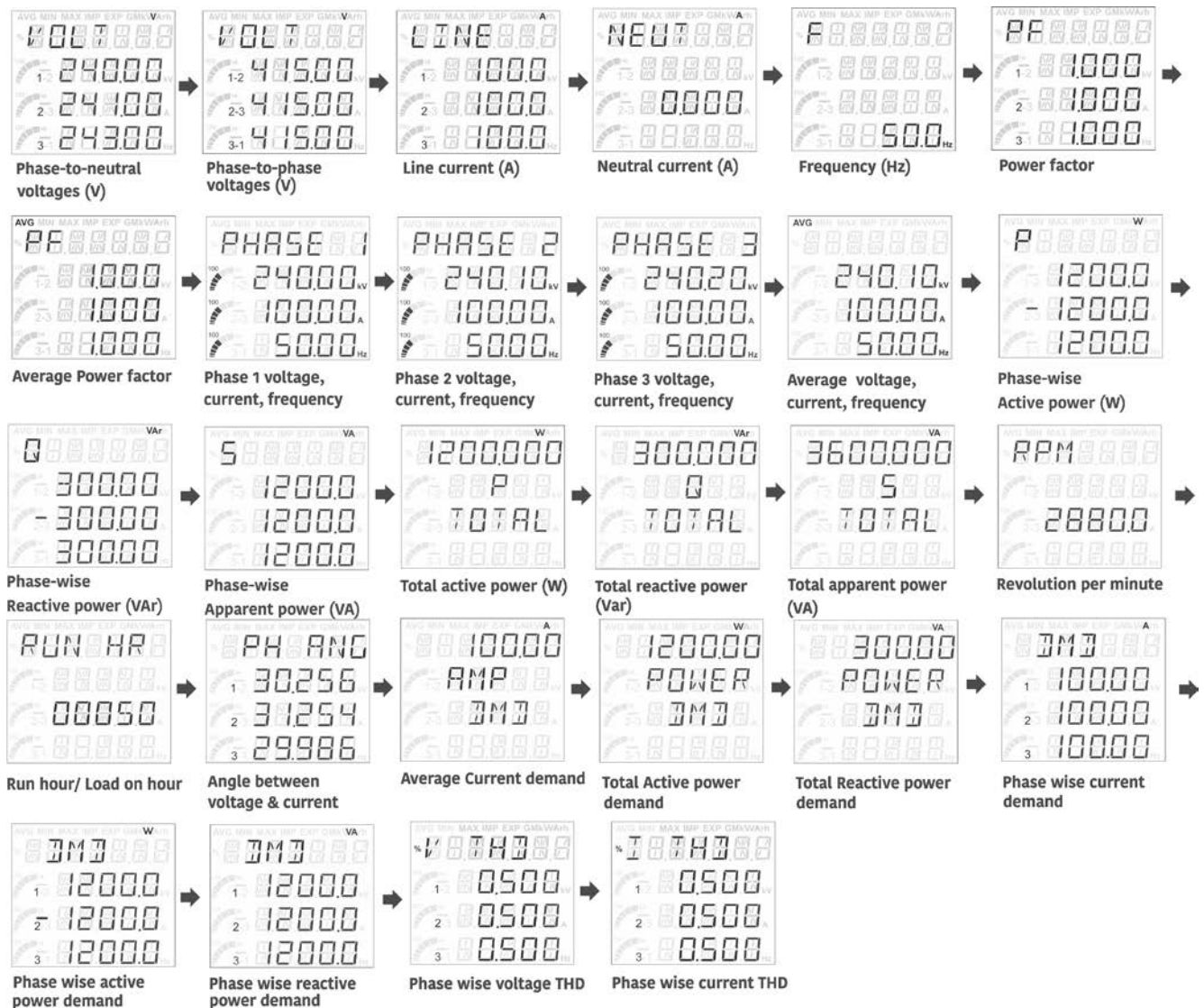


Figure 15: Elite 302/ 303/ 304/ 305/ 306/ 307/ 308/ 309 Meter displays in Auto/ Manual mode

6.2 Using the setup mode

The Setup Mode can be used to configure the following parameters with the help of touch keys:

- Setting the meter type
- CT-PT commissioning
- Alert setting
- RPM setting
- Password change
- Demand setting
- Energy/Demand reset
- Modbus configuration
- Alarm setting
- Pulse setting
- Update time
- Mode

The figure below gives the details of menu sequence in Setup mode.

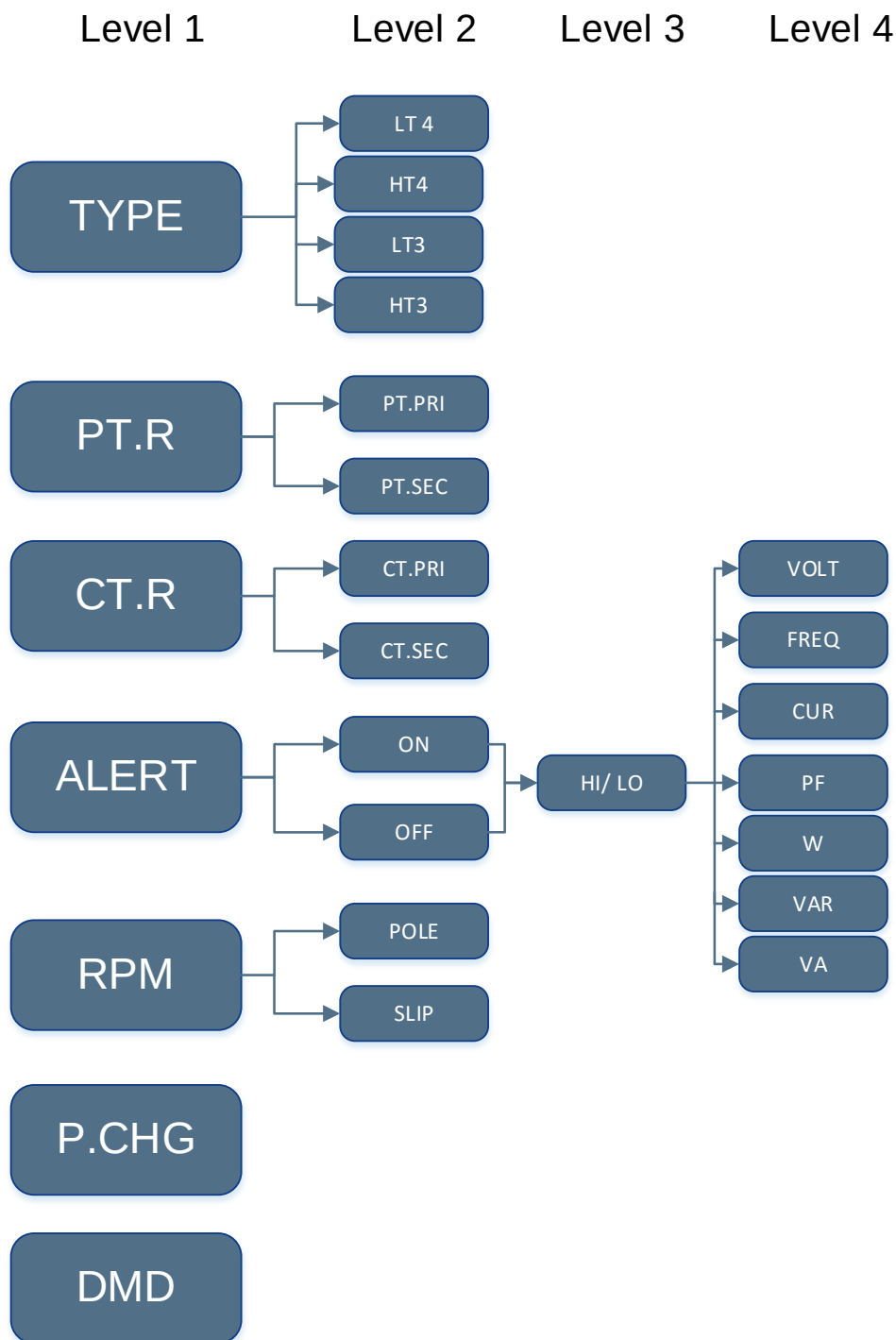


Figure 16: Menu sequence in Setup Mode (a)

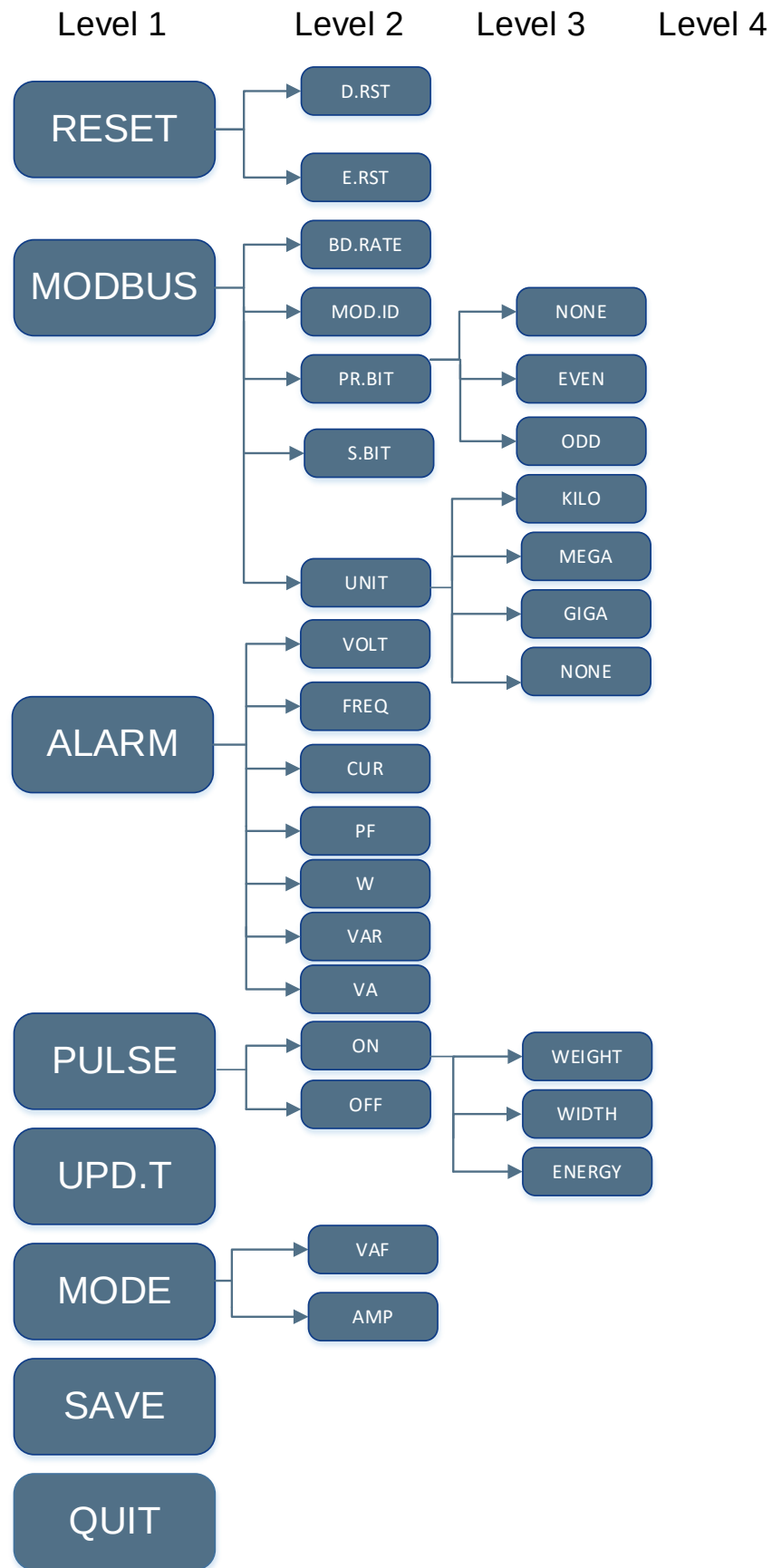


Figure 17: Menu sequence in Setup Mode (b)

6.2.1 Password entry

The following steps will guide you to access the Setup Menu:

1. From the default display mode, simply press  and  key for 5 seconds to access the following Setup Mode.



2. Press  key to confirm the selection of Password entry. This will give access to the following password entry prompt screen:



3. The first digit will start blinking. The user can change the value by pressing  or  key and confirm the selection by pressing  key. The second digit will start blinking now. The value for second digit, third and fourth digit is set by following the same process.
4. At the password prompt enter the 4-digit password (default password is '0000') using  or  key. After completing the entry, press  key to confirm. Correct password gives access to the 1st page of configuration mode, see figure (i). An incorrect password will display 'WRONG' message as shown in figure (ii).



(i) Display after correct password entry



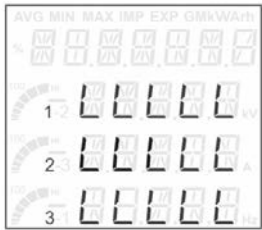
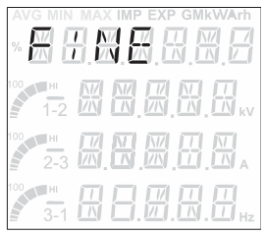
(ii) Display after incorrect password entry

In case you have entered incorrect password, the display will automatically exit the Setup Mode.

6.2.2 Messages on display

The below given table describes the messages which pop-up on display

Add Fine display

Type	Description
	Error message for incorrect password entry
	Error message for entry of invalid value
	High threshold alert
	Low threshold alert
	Indication for correct password entry

6.2.3 Page navigation within the setup mode

The Setup Mode has the following sequence of configurable menus through which you can navigate using the touch keys:

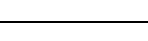
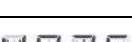
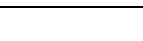
S.No.	Configurable parameters	Description	Variants				
			Elite 101/ 301	Elite 102/ 302/ 306	Elite 103/ 303/ 307	Elite 104/ 304/ 308	Elite 105/ 309
1.)		Meter type	✓	✓	✓	✓	✓
2.)		PT configuration	✓	✓	✓	✓	✓
3.)		CT Configuration	✓	✓	✓	✓	✓
4.)		Alert settings	✓	✓	✓	✓	✓
5.)		Revolution per minute	✓	✓	✓	✓	✓
6.)		Password change	✓	✓	✓	✓	✓
7.)		Demand setting	✓	✓	✓	✓	✓
8.)		Demand & Energy reset	✓	✓	✓	✓	✓
9.)		Modbus	×	×	✓	×	×
		Alarm setting	×	×	×	×	✓
		Pulse setting	×	×	×	✓	×
10.)		Display refresh time	✓	✓	✓	✓	✓
11.)		Mode selection	✓	×	×	×	×
12.)		Save settings	✓	✓	✓	✓	✓
13.)		Back to main menu	✓	✓	✓	✓	✓

Table 5: Setup mode menu for Elite 100 and Elite 300 meter

Use  key for navigation through the above display sequence and  key to select a configuration menu.

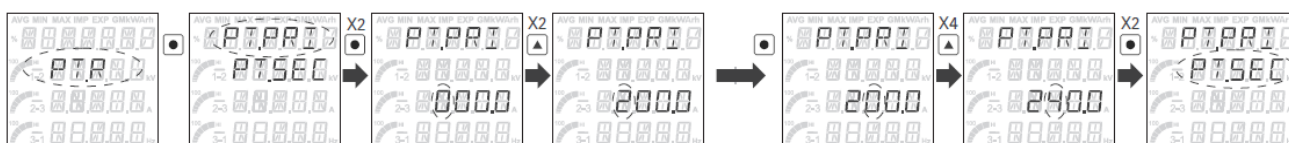
6.3 Editing set-up mode parameters

The following steps describe how to edit parameters in set-up mode:

- 1.) Press  and  key for 5 seconds to enter into set-up mode.
- 2.) Enter password. Default password is 0000.
- 3.) Press  or  key to scroll through the list of parameters. The selected parameter will blink. Click  to freeze the parameter to be set.
- 4.) The selected parameter flashes digit, value, or decimal point that is required to be set. Increase the digit value and move the decimal point using  key.
- 5.) Press  key to freeze the decimal point and value selected.

Below example of PT configuration explains how to set a decimal point and values while editing in set-up mode

- 1.) After entering the default password, the user can scroll through the parameters using  or  key. To edit the particular parameter, user will select the parameter by pressing  key.
- 2.) When the user selects **PT.R** and press  key, the user can now start editing PT configuration by pressing  or  key. The user will select PT.PRI and PT.SEC one after the other and will set values for both.
- 3.) The user can configure the type of PT configuration (PT.PRI and PT.SEC) to be edited by pressing  key.
- 4.) After entering the edit mode, the user will first set the decimal point and scaling factor by pressing  key. Pressing  or  key will move the decimal towards left or right direction respectively. Once the decimal is set, press the  key to confirm.
- 5.) After decimal point adjustment, user will enter the values. The first digit will start blinking. Pressing  or  key will result in scrolling of digits from 0 to 9. The user will set the desired value by pressing  key and the cursor will move to the second digit. As a result, second digit starts blinking. Similarly the value of second digit and remaining digits is fixed and the overall value of the type of PT.PRI is configured. Similarly the process is repeated for PT.SEC.



Below example of CT configuration explains how to set a decimal point and values while editing in the set-up mode

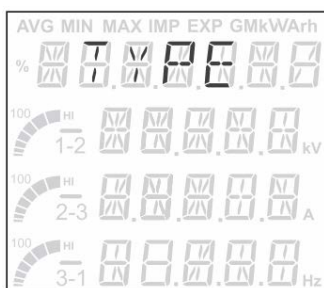
- 1.) After entering the default password, the user can scroll through the parameters using  or  key. To edit the particular parameter, user will select the parameter by pressing  key.
- 2.) When the user selects **CT.R** and press  key, the user can now start editing CT configuration by pressing  or  key. The user will select CT.PRI and CT.SEC one after the other and will set values for both.
- 3.) The user can freeze the type of CT configuration to be edited by pressing  key.
- 4.) After entering the edit mode, the user will first set the decimal point and scaling factor by pressing  key. Pressing  key will move the decimal towards left direction. Once the decimal is set, it is freeze by pressing  key.
- 5.) After decimal point adjustment, user will enter the values. The first digit will start blinking. Pressing  or  key will result in scrolling of digits from 0 to 9. The user will freeze the desired value by pressing  key and the cursor will move to the second digit. As a result, second digit starts blinking. Similarly the value of second digit and remaining digits is fixed and the overall value of the type of CT.PRI is configured. Similarly the process is repeated for CT.SEC.



Note: All other parameters in setup mode are configured in the same way as PT/ CT configuration.

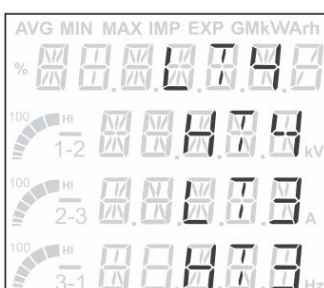
6.3.1 Meter type

This option is used to set the wiring configuration of the meter. The commissioning option can be used to configure the meter type.



Meter type configuration – LT4, HT4, LT3, HT3

To select it, press . The following display page will appear:

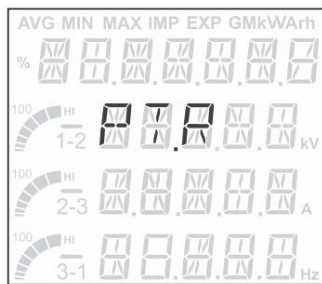


With the help of  or  key select the meter type and then press  to confirm the selection.

Default meter type: LT4

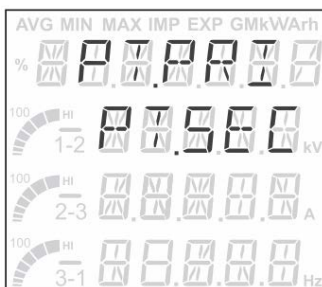
6.3.2 PT Commissioning

This option is used to set PT Primary and Secondary configuration.



The PT commissioning option can be used to configure the following parameter values:

- a. Primary voltage
- b. Secondary voltage



Primary voltage configuration

To select it, press . The following display page will appear

With the help of or key select the type of voltage and then press to confirm the selection.



The display page shown on the left appears. Enter the desired value from the following permissible range and then press to confirm and save the selection.

Applicable range: 50 V to 2000 kV
Default value: 240 V



Secondary voltage configuration

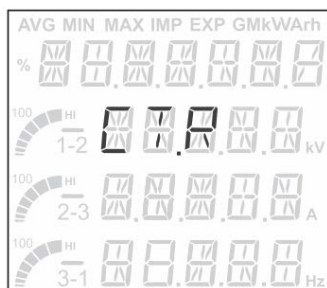
With the help of or key select the type of voltage and then press to confirm the selection.

The display page shown on the left appears. Enter the desired value from the following permissible range and then press to confirm and save the selection.

Applicable range for LT3: 395 V to 440 V
Applicable range for LT4: 200 V to 250 V
Applicable range for HT3 /HT4: 100 V to 130 V
Default value: 240 V

6.3.3 CT Commissioning

This option on the display of Setup Menu is used to set CT Primary and Secondary configuration



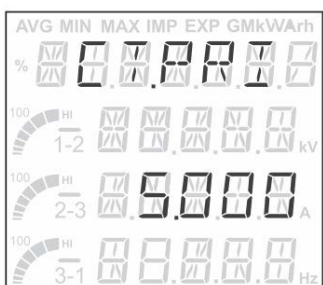
. The commissioning option can be used to configure the following parameter values:

- Primary current rating
- Secondary current rating



Primary current configuration

To select it, press . The following display page will appear



With the help of or key select the type of current configuration and then press to confirm the selection. The display page shown on the left appears.

Enter the desired value from the following permissible range and then press to confirm and save the selection.

Applicable range: 1 A to 15000 A

Default value: 5 A



Secondary current configuration

With the help of or key select the type of current configuration and then press to confirm the selection. The display page shown on the left appears.

Enter the desired value from the following permissible range and then press to confirm and save the selection.

Applicable range: 1 A to 5 A

Default value: 5 A

6.3.4 Alerts

The high and low threshold can be set with this option to raise an alert whenever the value falls either below or above the set range.



Alerts configuration

To select it, press . The display page shown on the left appears.

Note:

By default the Alert function is set to off.

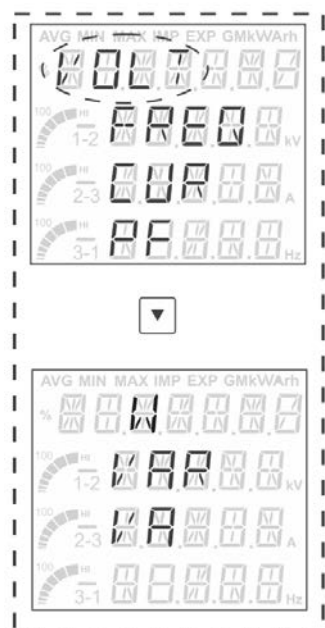


With the help of or key user can switch on or off the alerts. Select on or off and then press to confirm the selection.



With the help of or key select the Alert type. Both high and low alert values are to be configured.

First the user will press HI and will configure the maximum Alert values for voltage, current, frequency, power factor, active / reactive and apparent power as shown on the left.



The user scrolls through various Alert parameters by pressing or key. Press key to confirm and save the selection.

Enter the desired value from the following permissible range and then press to confirm and save the selection.

Applicable range:

For Voltage: 1 to 3000 k

For Frequency: 45 to 65 Hz

For Current: 0.010 to 22.50 k

For PF: 0.100 to 1.000

For Energy 1.000 to 9999 G

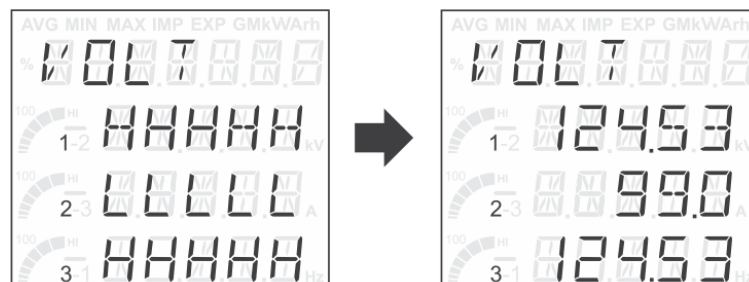
In the same way as given above, the user will configure Low alert values for voltage, current, frequency, power factor, active/ reactive and apparent power.

Once the High and Low values of Alerts are configured, the user can switch on or off the alerts



Note:

- 1.) Alerts will be displayed only when they are configured as 'ON'.
- 2.) Alerts will only be displayed if the event persists for ≥ 15 seconds.
- 3.) Alerts can be configured for Voltage, Frequency, Current, Power factor, and Active/ Reactive/ Apparent Power.
- 4.) User can manually turn on or off the alerts.
- 5.) High and Low Alerts will be displayed continuously on screen till they are acknowledged by pressing key. Once the key is pressed, it will show instantaneous value.
- 6.) Following high/ low threshold alerts will be displayed for each phase in sequential order. Examples consider the high threshold value was set at 110 and low threshold was set at 100.

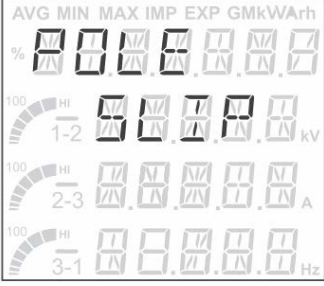


6.3.5 Revolution per minute

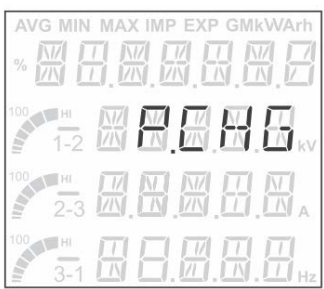
This option is used to configure Pole and Slip to calculate RPM of a motor.

Pole is the number of poles of the motor installed. Slip is the slip of motor installed.

	To select this option, move selection bar on 'RPM' option and then press . The following display will appear: With the help of or key select Pole and Slip one after the other. Both Pole and Slip range are to be configured. Enter the desired value from the following permissible range and then press to confirm and save the selection.
--	--

	Applicable range : For Pole: 2, 4, 6,8, 10, 12, 14,16, 18 For Slip: 00.00 to 99.99%
---	---

6.3.6 Changing the setup mode Password

The Setup Mode password is a 4-digit integer ranging from 0000 to 9999. The default factory setting is '0000' that can be reprogrammed from the setup mode using the meter touch keys. The password can be changed using the 'P.CHG' option.	
	To select it, press . The display page shown on the left appears.
	Enter the desired value from the permissible range and then press  to confirm and save the selection. Applicable range : 0000 to 9999

6.3.7 Demand setting

This option is used to configure demand time:	
	DMD Configuration To select it, press . The display page shown on the left appears. Enter the desired value from the permissible range and then press  to confirm and save the selection. Applicable range: 1 to 60 min Default value: 15 min

Notes:

- Active/ Reactive/ Apparent Power Demand is algebraic sum of phase-wise power demand.

- Current demand is average of phase-wise current demand.

Refer below example:

Parameter	Phase wise power (kVA)	kVA Demand	Phase wise power (kW)	kW Demand	Phase wise Current	I avg Demand
1	1.2	3.6	-1.2	-1.2	5	5
2	1.2		-1.2		5	
3	1.2		1.2		5	

6.3.8 Reset

This option is used to reset demand or energy:



To select it, press ☐. The display page shown on the left appears.

With the help of ☐ or ☐ key select the type of Reset and then press ☐ to confirm and save the selection. The display page shown on the left appears.

Select Yes or No using ☐ or ☐ key and then press ☐ to confirm and save the selection.

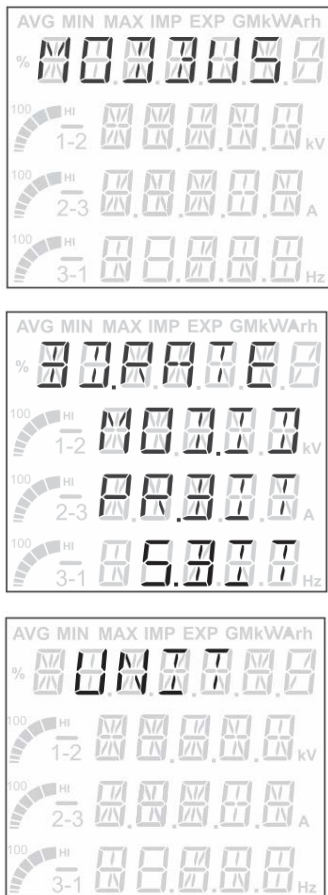
Energy reset will be performed when:

1. A manual reset is done
2. PT/ CT commissioning values are changed
3. Meter type is changed

Note: To reset energy more than once, exit the **Setup** mode and re-enter.

6.3.9 MODBUS/ Alarm/ Pulse Configuration (Optional variant selection)

This option is used to configure MODBUS/ Alarm/ Pulse



MODBUS Configuration (Only for Elite 103/ 303/ 307 variant)

To select it, press . The display page shown on the left appears.

With the help of or key scroll through the Modbus parameters (Baud Rate, Modbus ID, Parity Bit, Stop Bit and Unit). All the parameters are to be configured. Enter the desired value from the following permissible range and then press to confirm and save the selection.

Applicable range

Baud Rate: 1200, 2400, 4800, 9600, 19200

Modbus ID: 1 to 247

Parity Bit: None, Even, Odd

Stop Bit: 1, 2

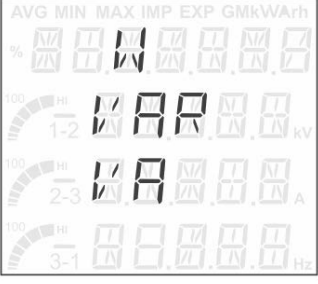
Unit of energy: Kilo, Mega, Giga, and None (This configuration change is applicable for Modbus parameters display units only.)



Alarm output configuration (Only for Elite 105/ 309 variant)

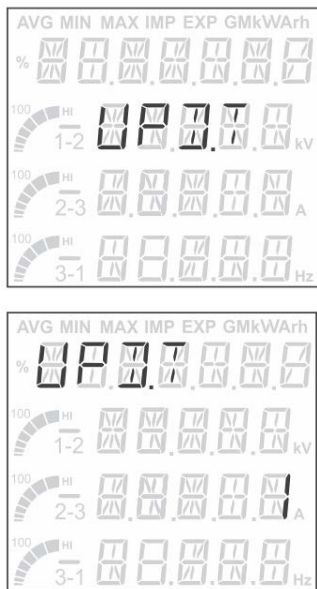
To select it, press . The display page shown on the left appears.

With the help of or key scroll through the Alarm parameters. The user selects the desired parameter for which he wants an alarm to be raised. Press to confirm and save the selection.

	Note: To generate an alarm, the user first needs to set the alert configuration for the parameters such as voltage, frequency, current, power factor and energy. Alarm will ring only when the alert is generated. At a time, the user can set alarm for one parameter only.
	Pulse output configuration (Only for Elite 104/ 304/ 308 variant) To select it, press . The display page shown on the left appears. With the help of  or  key select On or Off. Press  to confirm and save the selection. With the help of  or  key scroll through the Pulse parameters (Weight, Width, Energy). All three are to be configured. Enter the desired value from the following permissible range and then press  to confirm and save the selection. Applicable range: Weight: 1, 10, 100, 1000 (Depends on commissioning) Width: 80, 240, 300 milliseconds Energy: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 (Refer Appendix II)

6.3.10 Display update time

This option is used by the end user to change the update time of the display when the value keeps on changing frequently.



Display update time Configuration

To select it, press . The display page shown on the left appears.

Enter the desired value from the following permissible range and then press  to confirm and save the selection.

Applicable range : 1 to 5 seconds

6.3.11 Mode setting configuration (Available in Elite 101, Elite 301)

This option lets you switch between the VAF and Ampere meter.

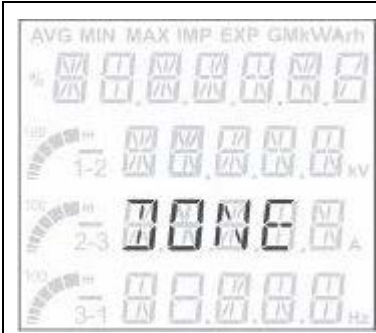


Display Mode selection

To select it, press . The display page shown on the left appears.



With the help of  or  key scroll through the available functions. Select the desired function. Press  to confirm and save the selection.



A confirmation appears as shown in the left.

6.3.12 Save

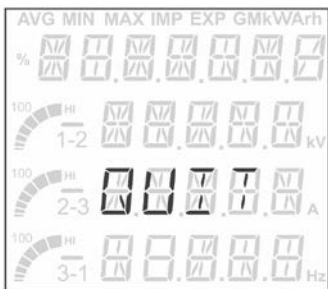
This option is used to save the configuration.



Once all necessary configurations are updated, select the 'Save' option and press . This activates the new configuration in the meter. The 'Save done' message indicates that the activation is successful.

6.3.13 Quit the Setup menu mode

This option is used to quit the set up menu mode



To exit the Commissioning page and return to the Setup menu, move the selection bar over 'Quit' as shown on the left and then press  button.

7 Technical specifications

Electrical	
Wiring configuration	3 Phase 3 Wire/ 3 Phase 4 Wire
Voltage range	
Measuring voltage range	20 V to 300 V AC (P to N), 35 V to 500 V (P to P)
Nominal voltage range (U_n)	57.5 V to 240 V (P to N), 100 V to 415 V (P to P) (50 / 60 Hz)
Over voltage	150 % U_n continuous
Current range	
Measuring current range	50 mA to 6 A
Nominal Current range	1 A or 5 A
Over load	150 % I_n continuous
Short Time Over Current	24 A for 1 sec for 1A, 120 A for 1 sec for 5A
Frequency range	45 to 65 Hz
Power factor	0.1 lag – Unity – 0.1 lead (For I_n and U_n)
Auxiliary supply range	40 to 300 V AC (50/60 Hz) / DC
Accuracy Class	
Voltage, Current	$\pm 0.5\%$ Full scale
Frequency	± 0.1 Hz
Power	$\pm 0.5\%$ Full scale (at unity PF)
Power factor	± 0.005
Active energy	LED: Class 1.0 (acc. to IEC 62053-21) LCD: Class 1.0 (acc. to IEC 62053-21); Class 0.5s (acc. to IEC 62053-22)
Reactive energy	Class 2.0 (acc. to IEC 62053-23)
Temperature coefficient	Voltage, Current: 0.05% / °C
Voltage/ Current THD	5% of FS
Burden	
Voltage circuit	< 0.2 VA / phase
Current circuit	1 A : < 0.1 VA / phase; 5 A : < 0.3 VA / phase
Auxiliary supply	< 4.5 VA
Energy	Measuring voltage range: 40 V to 300 V (P to N) Voltage (U_n): 57.5 V to 240 V (P to N), 100 V to 415 V (P to P) Measuring current range: 50mA to 6A Current (I_n): 1A or 5 A
Compliance	
Safety Standards	CE, UL, EN / IEC 61010-1; EN / IEC 61010-2-030, IEC 61326-1, IEC 62053-

	21/22/23, IEC 61557-12, IEC 60529		
Mechanical			
Dimension (W x H)	Meter Size (mm)	Meter Dimensions WxHxD (mm)	
	96 x 96	With parking terminal	Without parking terminal
		96 x 96 x 70.8	96 x 96 x 52
	Cut-out size (mm)	Dimensions with mounting clamps WxHxD (mm)	
	92 x 92 mm (+ 0.5)		
Weight	300±40 grams		
Enclosure	Flame Retardant Polycarbonate (as per UL 94 V0)		
Terminals			
Voltage/auxiliary	Combicon connectors: up to 2.5 mm ² cable		
Current	Pass-through connections: up to 4 mm ² cable		
Parking terminal for CT termination	U-type / ring-type terminations: maximum up to 4 mm ² cable		
Digital output/ RS-485/ alarm output	Combicon connectors: up to 2.5 mm ² cable		
Environmental			
Protection degree (as per IEC 60529)	Front fascia: IP 54 default, Terminal IP20		
Pollution degree	2		
ESD	EN / IEC 61000-4-2 (compliance to international standard IEC/EN 61326)		
EFT	EN / IEC 61000-4-4 (compliance to international standard IEC/EN 61326)		
Insulation	CAT III, 4 kV RMS 50 Hz for 1 minute		
Impulse withstand	6.5 kV between all terminals and earth		
Temperature	-10 °C to +60 °C (operating), -25 °C to +80 °C (storage)		
Measurement/ Over voltage category	CAT III		
Humidity	95% non-condensing		
Impact energy level	1 J (IK06)		
Flame retardation	UL 94 V0		
ROHS and REACH	Yes		
Maximum altitude	≤2000 m		
Communication			
RS-485 For Elite 103/ 303/ 307	Modbus: half-duplex, floating point, refresh rate: 500 ms at 9600 baud rate; User configurable-Baud rate: 1200 to 19200 bps (default 9600 bps); Parity bit: none, even, odd; Stop Bit: 1,2		
Pulse output (single)	24 V to 240 V DC or 48 to 240 V AC @ 100 mA. Pulse width option of 80/		

For Elite 104/ 304/ 308	240/ 300 ms
Alarm output (single) For Elite 105/ 309	N/O type, voltage rating 230 VAC @ 2 A
Mod ID	1 to 247
Accessories	
Software (ConfigView) For Elite 103/ 303/ 307	www.securemeters.com

Table 6: Technical Specifications

8 Installation and commissioning



The meter should be installed by trained personnel. In addition to the safety precautions recommended in this manual, local best practice and regulatory stipulations should be always followed during the installation and commissioning process.

8.1 Connection diagram

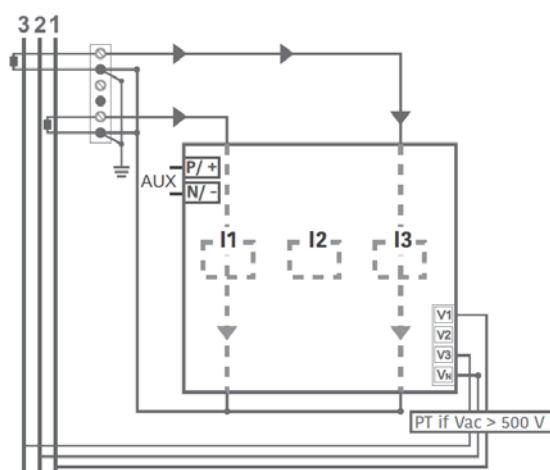


Figure 18: Making connections: 3 Phase 3 Wire connections

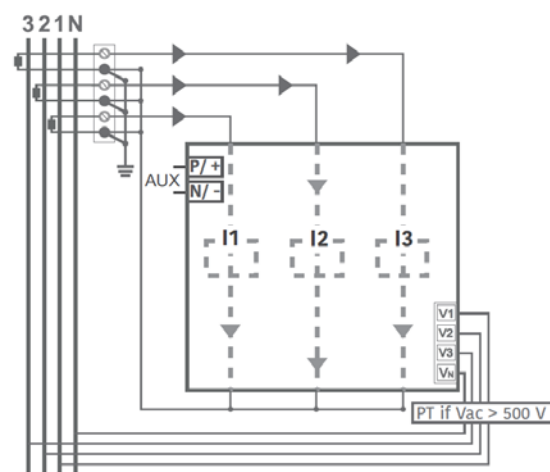


Figure 19: Making connections: 3 Phase 4 Wire connections

8.2 Mounting the meter on the panel

Prepare panel cut-out as per the recommended cut-out dimension and then insert the meter in the panel from outer side. After inserting the meter in the panel, mount the meter with mounting clamps from back side of the meter.

Recommended panel sheet thickness is 1.8 mm to 3.0 mm.

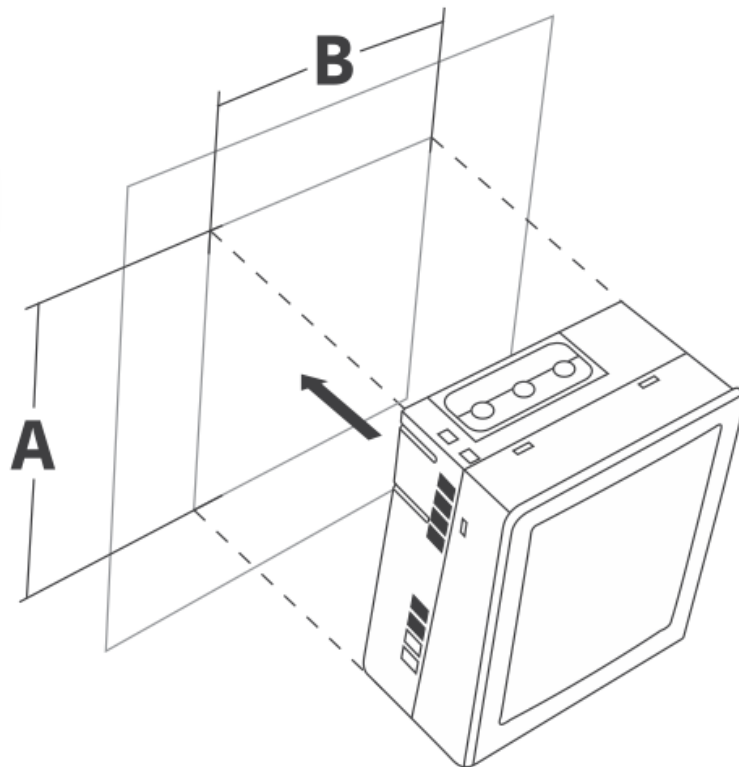


Figure 20: Inserting meter in the panel

S.no.	Meter size (mm)	Cut-out dimensions (mm)		Meter dimensions W×H×D (mm)	
		A	B	Without parking terminal	With parking terminal
1	96×96	92 (+0.5)	92 (+0.5)	96×96×52	96×96×70.8

Table 7: Panel cut out and meter dimensions (With and without parking terminal)

The next step after inserting the meter in the panel is fitting of mounting clamps. Tilt the mounting clamp 1 and insert the leg 1 in meter hole 1 and leg 2 in meter hole 2 as shown in the below figure. Please note that Leg 1 should go first followed by Leg 2. Repeat the same process for mounting clamp 2. To ensure proper sealing, tighten the mounting clamps evenly at recommended torque 0.5 Nm to 0.7 Nm

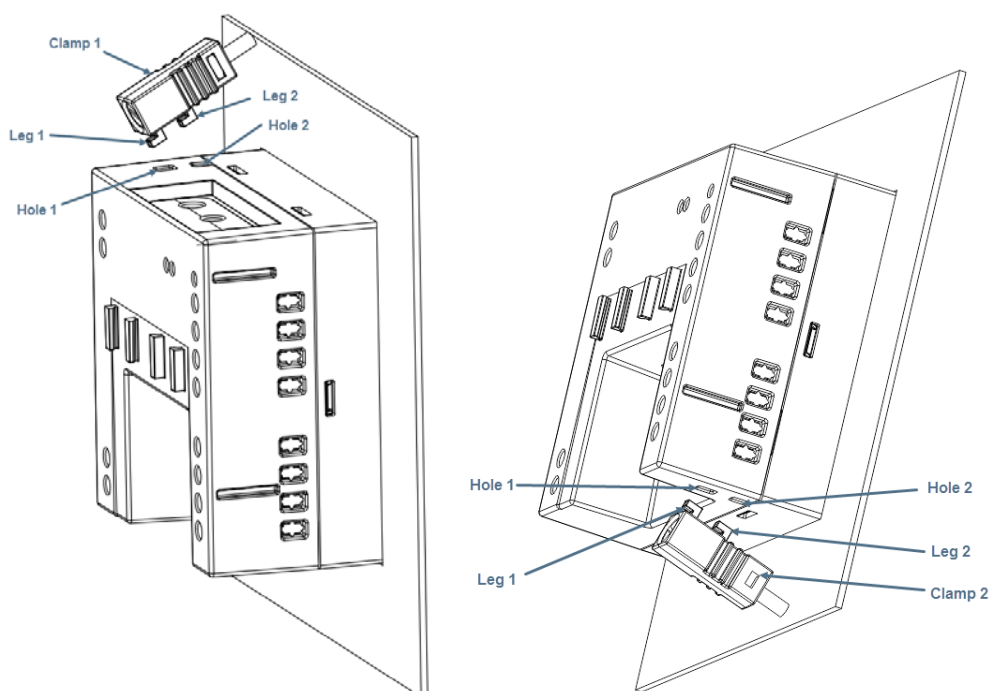


Figure 21: Mounting the meter with the clamps

S.No.	Meter size (mm)	Dimensions with mounting clamps W×H×D (mm)
1	96×96	112.7×96×52

Table 8: Dimensions with mounting clamps

9 Annexure I: Supported features and parameters in Elite variants

	Elite 100-101	102	103	104	105
	Elite 300-301	302/306	303/307	304/308	309
Features					
Phase-to-neutral voltage (L1, L2, L3)	✓	✓	✓	✓	✓
Phase-to-phase voltage (L12, L23, L31)	✓	✓	✓	✓	✓
Average voltage	✓	✓	✓	✓	✓
Line current (L1, L2, L3)	✓	✓	✓	✓	✓
Neutral current	✓	✓	✓	✓	✓
Average current	✓	✓	✓	✓	✓
System frequency	✓	✓	✓	✓	✓
Power factor (L1, L2, L3)	✓	✓	✓	✓	✓
Average power factor	✓	✓	✓	✓	✓
VAF phase-wise (L1, L2, L3)	✓	✓	✓	✓	✓
Active power (L1, L2, L3)	✓	✓	✓	✓	✓
Total active power	✓	✓	✓	✓	✓
Apparent power (L1, L2, L3)	✓	✓	✓	✓	✓

	Elite 100-	101	102	103	104	105
	Elite 300-	301	302/306	303/307	304/308	309
Features						
Total apparent power		✓	✓	✓	✓	✓
Reactive power (L1, L2, L3)		✓	✓	✓	✓	✓
Total reactive power		✓	✓	✓	✓	✓
Current demand (L1, L2, L3, Total)		✓	✓	✓	✓	✓
Power demand (L1, L2, L3, Total)		✓	✓	✓	✓	✓
Active import/ export energy			✓	✓	✓	✓
Active forwarded energy			✓	✓	✓	✓
Reactive import/ export energy			✓	✓	✓	✓
Reactive lag/ lead forwarded energy			✓	✓	✓	✓
Net active energy*			✓	✓	✓	✓
Gross active import/ export energy**			✓	✓	✓	✓
Apparent forwarded energy			✓	✓	✓	✓
Apparent when active import/ export energy			✓	✓	✓	✓
RPM		✓	✓	✓	✓	✓
Run hours		✓	✓	✓	✓	✓
THD Voltage (L1, L2, L3)		✓	✓	✓	✓	✓
THD Current (L1, L2, L3)		✓	✓	✓	✓	✓
Min/ max values		✓	✓	✓	✓	✓
Modbus on RS-485				✓		
Pulse output (single)					✓	
Alarm output (single)						✓

Table 9: Supported features and parameters in Elite variants

Note:

*Net = Active Import – Active export energy

**Gross = Sum of all import/ export energy

10 Annexure II: Pulse energy selection list

While configuring Pulse energy output, the user will get a list of digits from 1 to 12. Each digit stands for a particular energy type given as follows:

1	Reactive - Lead Forwarded
2	Reactive - Lag Forwarded
3	Active - Forwarded
4	Apparent - Forwarded (Lag+Lead)
5	Active Total - Import
6	Reactive - Import (Q1+Q2)
7	Active Gross (Import)

8	Apparent when Active Import
9	Active Total – Export
10	Reactive - Export (Q3+Q4)
11	Active Gross (Export)
12	Apparent when Active Export

11 Annexure III: CT Pass Through and Parking Terminal

CT Pass Through is provided with the meters for current connection between multiple panel meters. It connects multiple meters without terminating current supplying wires. However, when the user wants to replace the meter he is left with the only option of terminating the current supply by cutting the wire. Parking terminal is provided with the meter to connect the replaced meter with the current supplying wire. It connects the replaced meter with the rest of the meters through current supplying wire.

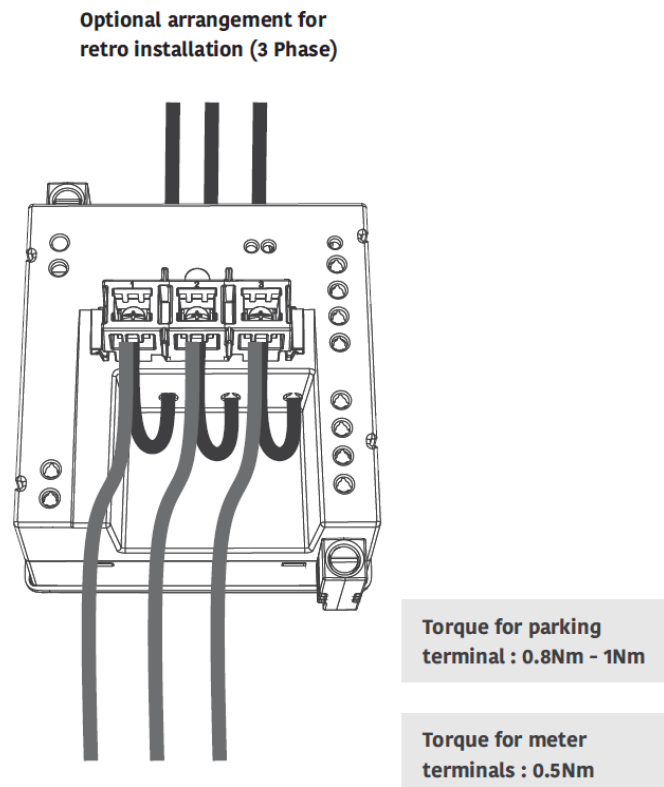


Figure 22: Parking terminal

11.1 Parking terminal installation

Insert parking terminal in meter guide. Ensure direction of terminal snap is towards meter guide as shown in the below picture.

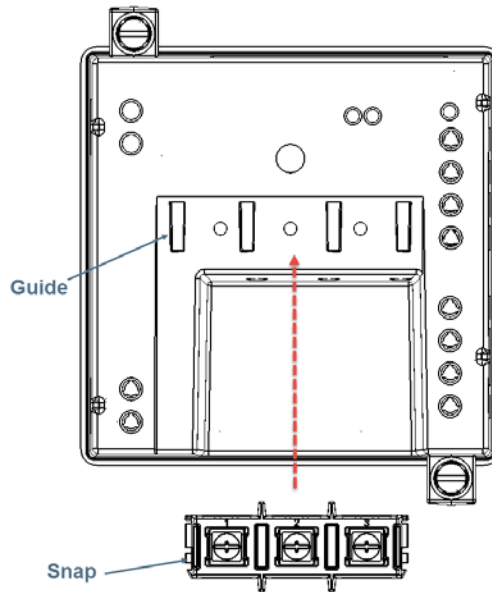


Figure 23: Parking terminal installation

Parking terminal design is suitable for two types of lug wire :

1.) U-lug

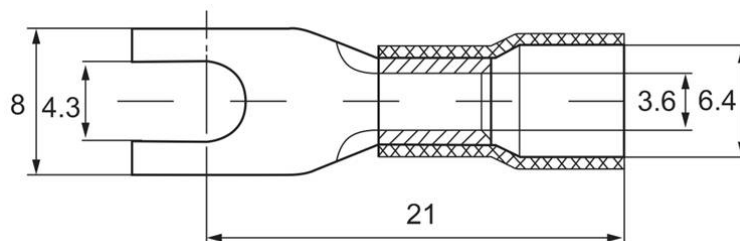


Figure 24: U-lug

2.) Ring lug

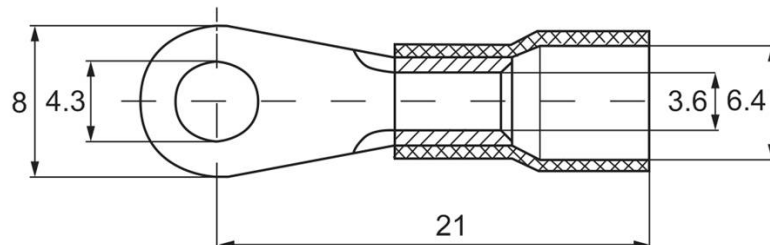


Figure 25: Ring lung

Remove the terminal screw (integrated with washer) by applying torque of 0.5 Nm using driver. Insert the U-lug wire in Parking terminal as shown in below picture. Place the terminal screw in U-lug hole and tighten the screw by applying torque of 0.5 Nm.

Note: Recommended stripping of wire to fix it in lug wire is 8 mm

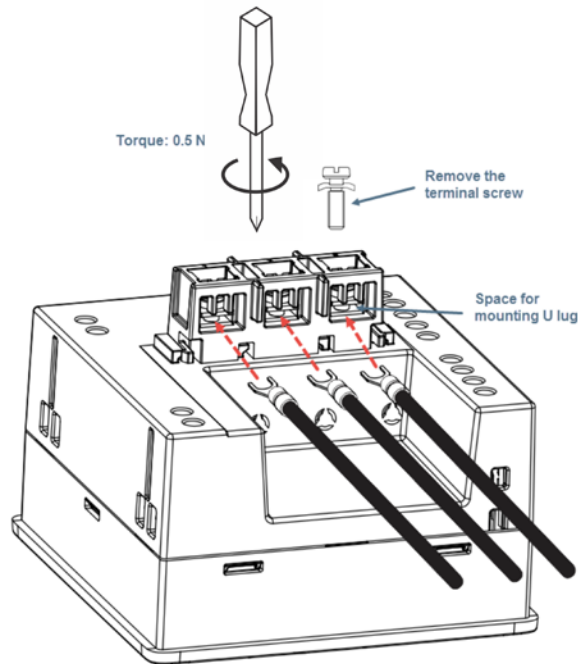


Figure 26: U-lug wire fitting in Parking Terminal

Remove the terminal screw (integrated with washer) by applying torque of 0.5 Nm using driver. Insert the Ring-lug wire in Parking terminal as shown in below picture. Place the terminal screw in Ring-lug hole and tighten the screw by applying torque of 0.5 Nm.

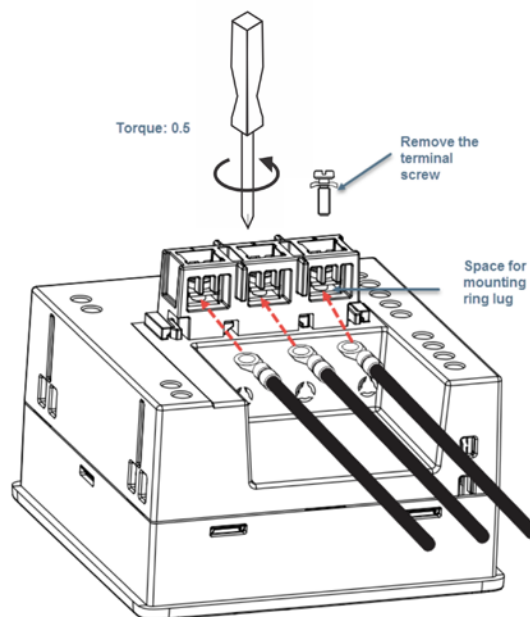


Figure 27: Ring-lug wire fitting in Parking Terminal

11.2 Advantages of using Pass through Connection

- 1.) Cost reduction as no lugs are required. Wire cutting cost is also reduced
- 2.) Minimal burden
- 3.) No requirement of tightening of screws for connection
- 4.) No more risk of CT wire going open.

12 Appendix IV: Energy meter display resolution

Energy Unit (none, k, M, G)	Energy resolution in Elite 100 (none, k, M, G)	Energy resolution in Elite 300 (none, k, M, G)
Below 1000	0.0001	0.0001
1000 to 9999	0.01	0.001
10000 to 99999	0.01	0.01
100000 to 999999	0.1	0.1

13 Appendix V: MODBUS mapping of the meter

1. Registers for General (Meter) information

HEX	MODBUS register		Parameter Description	Format		R/W	Units	Remarks
0001	40001	40004	Meter Serial Number	HEX (8 bytes)	40001 (MSR) -40004 (LSR)	R	NA	
0005	40005	40008	FirmWare Name	ASCII (8 bytes)	40005 (MSR) -40008 (LSR)	R	NA	
0009	40009	40016	CAT CODE	ASCII (16 bytes)	40014 (MSR) -40021 (LSR)	R	NA	
0011	40017	40018	MODBUS ID (Start from 1 up to 247)	32 bit FP	40009 (LSR) -40010 (MSR)	R/W	NA	
0013	40019	40019	Protocol Version (MS byte) and revision (LS Byte)	Unsigned 16 bits		R	NA	
0014	40020	40021	To change MODBUS Baud Rate write 0 = 1200, 1 = 2400, 02 = 4800, 03 = 9600, 04 = 19200	32 bit FP	40012(LSR) - 40013 (MSR)	R/W	NA	Change Baud Rate

2. Register for commissioning information

HEX	MODBUS register		Parameter description	Format		R/W	Units
001E	40030	40031	Metre type: 3W/4Wire info, LT4:0, HT4: 1, LT3: 2, HT3:3	32 bit FP	40030 (LSR) - 40031 (MSR)	R/W	NA
0020	40032	40033	CT Primary	32 bit FP	40032 (LSR) - 40033 (MSR)	R/W	Amp
0022	40034	40035	Ct Secondary	32 bit FP	40034 (LSR) - 40035 (MSR)	R/W	Amp

HEX	MODBUS register		Parameter description	Format		R/W	Units
0024	40036	40037	PT Primary	32 bit FP	40036 (LSR) - 40037 (MSR)	R/W	Volt
0026	40038	40039	PT Secondary	32 bit FP	40038 (LSR) - 40039 (MSR)	R/W	Volt
0028	40040	40041	Pole: Number of poles for RPM	32 bit FP	40040 (LSR) - 40041 (MSR)	R/W	NA
002A	40042	40043	Slip: Slip of the motor	32 bit FP	40042 (LSR) - 40043 (MSR)	R/W	NA
002C	40044	40045	Update rate: Display Update Rates	32 bit FP	40044 (LSR) - 40045 (MSR)	R/W	NA
002E	40046	40047	Energy reset : 0x01	32 bit FP	40046 (LSR) - 40047 (MSR)	W	NA
0030	40048	40049	Demand Reset: 0x01	32 bit FP	40048 (LSR) - 40049 (MSR)	W	NA
0032	40050	40051	Demand Time	32 bit FP	40050 (LSR) - 40051 (MSR)	R/W	NA
0034	40052	40053	Alert ON/OFF	32 bit FP	40052 (LSR) - 40053 (MSR)	R/W	NA
0036	40054	40055	Alert Threshold High Voltage (P-N for LT4, P-P for HT4,LT3,HT3)	32 bit FP	40054 (LSR) - 40055 (MSR)	R/W	NA
0038	40056	40057	Alert Threshold High Current	32 bit FP	40056 (LSR) - 40057 (MSR)	R/W	NA
003A	40058	40059	Alert Threshold High PF	32 bit FP	40058 (LSR) - 40059 (MSR)	R/W	NA
003C	40060	40061	Alert Threshold High Frequency	32 bit FP	40060 (LSR) - 40061 (MSR)	R/W	NA
003E	40062	40063	Alert Threshold High W	32 bit FP	40062 (LSR) - 40063 (MSR)	R/W	NA
0040	40064	40065	Alert Threshold High VAR	32 bit FP	40064 (LSR) - 40065 (MSR)	R/W	NA
0042	40066	40067	Alert Threshold High VA	32 bit FP	40066 (LSR) - 40067 (MSR)	R/W	NA
0044	40068	40069	Alert Threshold Low Voltage(P-N for	32 bit FP	40068 (LSR) -	R/W	NA

HEX	MODBUS register		Parameter description	Format		R/W	Units
			LT4, P-P for HT4,LT3,HT3)		40069 (MSR)		
0046	40070	40071	Alert Threshold Low Current	32 bit FP	40070 (LSR) - 40071 (MSR)	R/W	NA
0048	40072	40073	Alert Threshold Low PF	32 bit FP	40072 (LSR) - 40073 (MSR)	R/W	NA
004A	40074	40075	Alert Threshold Low Frequency	32 bit FP	40074 (LSR) - 40075 (MSR)	R/W	NA
004C	40076	40077	Alert Threshold Low W	32 bit FP	40076 (LSR) - 40077 (MSR)	R/W	NA
004E	40078	40079	Alert Threshold Low VAr	32 bit FP	40078 (LSR) - 40079 (MSR)	R/W	NA
0050	40080	40081	Alert Threshold Low VA	32 bit FP	40080 (LSR) - 40081 (MSR)	R/W	NA
0052	40082	40083	Modbus Resolution 0: N; 1: K; 2:M; 3:G	33 bit FP	40082 (LSR) - 40083 (MSR)	R/W	NA

3. Register for Instantaneous parameters1

HEX	MODBUS register		Parameter Description	Format		R/W	Units	Remarks
0064	40100	40101	V1: R Phase to Neutral Voltage	32 bit FP	40100 (LSR) - 40101 (MSR)	R	Volt	Configurable
0066	40102	40103	V2: Y Phase to Neutral Voltage	32 bit FP	40102 (LSR) - 40103 (MSR)	R	Volt	Configurable
0068	40104	40105	V3: B Phase to Neutral Voltage	32 bit FP	40104 (LSR) - 40105 (MSR)	R	Volt	Configurable
006A	40106	40107	Vavg: Average Voltage	32 bit FP	40106 (LSR) - 40107 (MSR)	R	Volt	Configurable
006C	40108	40109	V12: RY Voltage	32 bit FP	40108 (LSR) - 40109 (MSR)	R	Volt	Configurable
006E	40110	40111	V23: YB Voltage	32 bit FP	40110 (LSR) - 40111 (MSR)	R	Volt	Configurable
0070	40112	40113	V31: BR Voltage	32 bit FP	40112 (LSR) - 40113 (MSR)	R	Volt	Configurable
0072	40114	40115	L1: R Phase Line current	32 bit FP	40114 (LSR) - 40115	R	Amp	Configurable

HEX	MODBUS register		Parameter Description	Format		R/W	Units	Remarks
					(MSR)			
0074	40116	40117	L2: Y Phase Line current	32 bit FP	40116 (LSR) -40117 (MSR)	R	Amp	Configurable
0076	40118	40119	L3: B Phase Line current	32 bit FP	40118 (LSR) -40119 (MSR)	R	Amp	Configurable
0078	40120	40121	LN: Neutral Line current	32 bit FP	40120 (LSR) -40121 (MSR)	R	Amp	Configurable
007A	40122	40123	Reserved1	32 bit FP	40122 (LSR) -40123 (MSR)	R	NA	NA
007C	40124	40125	Reserved2	32 bit FP	40124 (LSR) -40125 (MSR)	R	NA	NA
007E	40126	40127	Reserved3	32 bit FP	40126 (LSR) -40127 (MSR)	R	NA	NA
0080	40128	40129	Reserved4	32 bit FP	40128 (LSR) -40129 (MSR)	R	NA	NA
0082	40130	40131	Reserved5	32 bit FP	40130 (LSR) -40131 (MSR)	R	NA	NA
0084	40132	40133	Reserved6	32 bit FP	40132 (LSR) -40133 (MSR)	R	NA	NA
0086	40134	40135	Q1: Power factor	32 bit FP	40134 (LSR) -40135 (MSR)	R	NA	Configurable
0088	40136	40137	Q2: Power factor	32 bit FP	40136 (LSR) -40137 (MSR)	R	NA	Configurable
008A	40138	40139	Q3: Power factor	32 bit FP	40138 (LSR) -40139 (MSR)	R	NA	Configurable
008C	40140	40141	QA: Avg power factor	32 bit FP	40140 (LSR) -40141 (MSR)	R	NA	Configurable
008E	40142	40143	R- Phase Active Power	32 bit FP	40142 (LSR) -40143 (MSR)	R	W	Configurable
0090	40144	40145	Y- Phase Active Power	32 bit FP	40144 (LSR) -40145 (MSR)	R	W	Configurable
0092	40146	40147	B- Phase Active Power	32 bit FP	40146 (LSR) -40147 (MSR)	R	W	Configurable
0094	40148	40149	3 Phase Active Power	32 bit	40148 (LSR)	R	W	Configurable

HEX	MODBUS register		Parameter Description	Format		R/W	Units	Remarks
				FP	-40149 (MSR)			
0096	40150	40151	R- Phase Reactive Power	32 bit FP	40150 (LSR) -40151 (MSR)	R	VAr	Configurable
0098	40152	40153	Y- Phase Reactive Power	32 bit FP	40152 (LSR) -40153 (MSR)	R	VAr	Configurable
009A	40154	40155	B- Phase Reactive Power	32 bit FP	40154 (LSR) -40155 (MSR)	R	VAr	Configurable
009C	40156	40157	3 Phase Reactive Power	32 bit FP	40156 (LSR) -40157 (MSR)	R	VAr	Configurable
009E	40158	40159	R- Phase Apparent Power	32 bit FP	40158 (LSR) -40159 (MSR)	R	VA	Configurable
00A0	40160	40161	Y- Phase Apparent Power	32 bit FP	40160 (LSR) -40161 (MSR)	R	VA	Configurable
00A2	40162	40163	B- Phase Apparent Power	32 bit FP	40162 (LSR) -40163 (MSR)	R	VA	Configurable
00A4	40164	40165	3 Phase Apparent Power	32 bit FP	40164 (LSR) -40165 (MSR)	R	VA	Configurable
00A6	40166	40167	Current to voltage Angle R phase	32 bit FP	40166 (LSR) -40167 (MSR)	R	Degr ee	Configurable
00A8	40168	40169	Current to voltage Angle Y phase	32 bit FP	40168 (LSR) -40169 (MSR)	R	Degr ee	Configurable
00AA	40170	40171	Current to voltage Angle B phase	32 bit FP	40170 (LSR) -40171 (MSR)	R	Degr ee	Configurable
00AC	40172	40173	Frequency Hz	32 bit FP	40172 (LSR) -40173 (MSR)	R	Hz	Configurable
00AE	40174	40175	Reserved7	32 bit FP	40174 (LSR) -40175 (MSR)	R	NA	NA
00B0	40176	40177	Reserved8	32 bit FP	40176 (LSR) -40177 (MSR)	R	NA	NA
00B2	40178	40179	R-Phase Voltage THD	32 bit FP	40178 (LSR) -40179 (MSR)	R	%	Configurable
00B4	40180	40181	Y-Phase Voltage THD	32 bit FP	40180 (LSR) -40181 (MSR)	R	%	Configurable

HEX	MODBUS register		Parameter Description	Format		R/W	Units	Remarks
00B6	40182	40183	B-Phase Voltage THD	32 bit FP	40182 (LSR) -40183 (MSR)	R	%	Configurable
00B8	40184	40185	R-Phase Current THD	32 bit FP	40184 (LSR) -40185 (MSR)	R	%	Configurable
00BA	40186	40187	Y-Phase Current THD	32 bit FP	40186 (LSR) -40187 (MSR)	R	%	Configurable
00BC	40188	40189	B-Phase Current THD	32 bit FP	40188 (LSR) -40189 (MSR)	R	%	Configurable

4. Registers for Energy Parameters¹ in 4 bytes

HEX	MODBUS register		Parameter description	Format		R/W	Units	Remarks
00CA	40202	40203	Active Total - Export	32 bit FP	40202 (LSR) -40203 (MSR)	R	Wh	Configurable
00CA	40202	40203	Active Total - Export	32 bit FP	40202 (LSR) -40203 (MSR)	R	Wh	Configurable
00CC	40204	40205	Active NET(Import -Export)	32 bit FP	40204 (LSR) -40205 (MSR)	R	Wh	Configurable
00CE	40206	40207	Reserved9	32 bit FP	40206 (LSR) -40207 (MSR)	R	NA	NA
00D0	40208	40209	Reserved10	32 bit FP	40208 (LSR) -40209 (MSR)	R	NA	NA
00D2	40210	40211	Reserved11	32 bit FP	40210 (LSR) -40211 (MSR)	R	NA	NA
00D4	40212	40213	Reserved12	32 bit FP	40212 (LSR) -40213 (MSR)	R	NA	NA
00D6	40214	40215	Reserved13	32 bit FP	40214 (LSR) -40215 (MSR)	R	NA	NA
00D8	40216	40217	Apparent when Active Import	32 bit FP	40216 (LSR) -40217 (MSR)	R	VAh	Configurable
00DA	40218	40219	Apparent when Active Export	32 bit FP	40218 (LSR) -40219 (MSR)	R	VAh	Configurable
00DC	40220	40221	Reactive - Import (Q1+Q2)	32 bit FP	40220 (LSR) -40221 (MSR)	R	VARh	Configurable

HEX	MODBUS register		Parameter description	Format		R/W	Units	Remarks
00DE	40222	40223	Reactive - Export (Q3+Q4)	32 bit FP	40222 (LSR) -40223 (MSR)	R	VArh	Configurable
00E0	40224	40225	Active - Forwarded	32 bit FP	40224 (LSR) -40225 (MSR)	R	Wh	Configurable
00E2	40226	40227	Apparent - Forwarded (Lag+ Lead)	32 bit FP	40226 (LSR) -40227 (MSR)	R	VAh	Configurable
00E4	40228	40229	Reactive - Lag Forwarded	32 bit FP	40228 (LSR) -40229 (MSR)	R	VARh	Configurable
00E6	40230	40231	Reactive - Lead Forwarded	32 bit FP	40230 (LSR) -40231 (MSR)	R	VARh	Configurable
00E8	40232	40233	Active Gross (Import)	32 bit FP	40232 (LSR) -40233 (MSR)	R	Wh	Configurable
00EA	40234	40235	Active Gross (Export)	32 bit FP	40234 (LSR) -40235 (MSR)	R	Wh	Configurable

5. Registers for Instantaneous parameters2

	MODBUS register		Parameter description	Format		R/W	Units	Remarks
012C	40300	40301	Average Demand Current	32 bit FP	40300 (LSR) -40301 (MSR)	R	Amp	Configurable
012E	40302	40303	Demand Active Power - Total	32 bit FP	40302 (LSR) -40303 (MSR)	R	W	Configurable
0130	40304	40305	Demand Apparent Power - Total	32 bit FP	40304 (LSR) -40305 (MSR)	R	VA	Configurable
0132	40306	40307	A12: Voltage to voltage Angle RY	32 bit FP	40306 (LSR) -40307 (MSR)	R	Degree	Configurable
0134	40308	40309	A23: Voltage to voltage Angle YB	32 bit FP	40308 (LSR) -40309 (MSR)	R	Degree	Configurable
0136	40310	40311	A31: Voltage to voltage Angle BR	32 bit FP	40310 (LSR) -40311 (MSR)	R	Degree	Configurable
0138	40312	40313	Run Hour	32 bit FP	40312 (LSR) -40313 (MSR)	R	Hrs	Configurable
013A	40314	40315	RPM: Rotations per minute	32 bit FP	40314 (LSR) -40315 (MSR)	R	rev/min	Configurable

013C	40316	40317	Demand Current R phase*	32 bit FP	40316 (LSR) -40317 (MSR)	R	Amp	Configurable
013E	40318	40319	Demand Current Y phase*	32 bit FP	40318 (LSR) -40319 (MSR)	R	Amp	Configurable
0140	40320	40321	Demand Current B phase*	32 bit FP	40320 (LSR) -40321 (MSR)	R	Amp	Configurable
0142	40322	40323	Demand Active Power R Phase*	32 bit FP	40322 (LSR) -40323 (MSR)	R	W	Configurable
0144	40324	40325	Demand Active Power Y Phase*	32 bit FP	40324 (LSR) -40325 (MSR)	R	W	Configurable
0146	40326	40327	Demand Active Power B Phase*	32 bit FP	40326 (LSR) -40327 (MSR)	R	W	Configurable
0148	40328	40329	Demand Apparent Power R Phase*	32 bit FP	40328 (LSR) -40329 (MSR)	R	VA	Configurable
014A	40330	40331	Demand Apparent Power Y Phase*	32 bit FP	40330 (LSR) -40331 (MSR)	R	VA	Configurable
014C	40332	40333	Demand Apparent Power B Phase*	32 bit FP	40332 (LSR) -40333 (MSR)	R	VA	Configurable
014E	40334	40335	Average Current*	32 bit FP	40334 (LSR) -40335 (MSR)	R	Amp	Configurable
Note: *Only applicable for firmware version DPMTC30 and above.								

6. Registers For MinMax parameters

HEX	MODBUS register		Parameter description	Format		R/W	Units
01C2	40450	40451	Maximum Voltage of R Phase	32 bit FP	40450 (LSR) -40451 (MSR)	R	Volt
01C4	40452	40453	Minimum Voltage of R Phase	32 bit FP	40452 (LSR) -40453 (MSR)	R	Volt
01C6	40454	40455	Maximum Voltage of Y Phase	32 bit FP	40454 (LSR) -40455 (MSR)	R	Volt
01C8	40456	40457	Minimum Voltage of Y Phase	32 bit FP	40456 (LSR) -40457 (MSR)	R	Volt
01CA	40458	40459	Maximum Voltage of B Phase	32 bit FP	40458 (LSR) -40459 (MSR)	R	Volt

HEX	MODBUS register		Parameter description	Format		R/W	Units
01CC	40460	40461	Minimum Voltage of B Phase	32 bit FP	40460 (LSR) -40461 (MSR)	R	Volt
01CE	40462	40463	Maximum Line Current of R Phase	32 bit FP	40462 (LSR) -40463 (MSR)	R	Amp
01D0	40464	40465	Minimum Line Current of R Phase	32 bit FP	40464 (LSR) -40465 (MSR)	R	Amp
01D2	40466	40467	Maximum Line Current of Y Phase	32 bit FP	40466 (LSR) -40467 (MSR)	R	Amp
01D4	40468	40469	Minimum Line Current of Y Phase	32 bit FP	40468 (LSR) -40469 (MSR)	R	Amp
01D6	40470	40471	Maximum Line Current of B Phase	32 bit FP	40470 (LSR) -40471 (MSR)	R	Amp
01D8	40472	40473	Minimum Line Current of B Phase	32 bit FP	40472 (LSR) -40473 (MSR)	R	Amp
01DA	40474	40475	Maximum Active Power of R Phase	32 bit FP	40474 (LSR) -40475 (MSR)	R	W
01DC	40476	40477	Minimum Active Power of R Phase	32 bit FP	40476 (LSR) -40477 (MSR)	R	W
01DE	40478	40479	Maximum Active Power of Y Phase	32 bit FP	40478 (LSR) -40479 (MSR)	R	W
01E0	40480	40481	Minimum Active Power of Y Phase	32 bit FP	40480 (LSR) -40481 (MSR)	R	W
01E2	40482	40483	Maximum Active Power of B Phase	32 bit FP	40482 (LSR) -40483 (MSR)	R	W
01E4	40484	40485	Minimum Active Power of B Phase	32 bit FP	40484 (LSR) -40485 (MSR)	R	W
01E6	40486	40487	Maximum Reactive Power of R Phase	32 bit FP	40486 (LSR) -40487 (MSR)	R	VA
01E8	40488	40489	Minimum Reactive Power of R Phase	32 bit FP	40488 (LSR) -40489 (MSR)	R	VA
01EA	40490	40491	Maximum Reactive Power of Y Phase	32 bit FP	40490 (LSR) -40491 (MSR)	R	VA
01EC	40492	40493	Minimum Reactive Power of Y Phase	32 bit FP	40492 (LSR) -40493	R	VA

HEX	MODBUS register		Parameter description	Format		R/W	Units
					(MSR)		
01EE	40494	40495	Maximum Reactive Power of B Phase	32 bit FP	40494 (LSR) -40495 (MSR)	R	VA
01F0	40496	40497	Minimum Reactive Power of B Phase	32 bit FP	40496 (LSR) -40497 (MSR)	R	VA
01F2	40498	40499	Maximum Apparent Power of R Phase	32 bit FP	40498 (LSR) -40499 (MSR)	R	VA _r
01F4	40500	40501	Minimum Apparent Power of R Phase	32 bit FP	40500 (LSR) -40501 (MSR)	R	VA _r
01F6	40502	40503	Maximum Apparent Power of Y Phase	32 bit FP	40502 (LSR) -40503 (MSR)	R	VA _r
01F8	40504	40505	Minimum Apparent Power of Y Phase	32 bit FP	40504 (LSR) -40505 (MSR)	R	VA _r
01FA	40506	40507	Maximum Apparent Power of B Phase	32 bit FP	40506 (LSR) -40507 (MSR)	R	VA _r
01FC	40508	40509	Minimum Apparent Power of B Phase	32 bit FP	40508 (LSR) -40509 (MSR)	R	VA _r
01FE	40510	40511	Maximum Lagging PF of R Phase	32 bit FP	40510 (LSR) -40511 (MSR)	R	NA
0200	40512	40513	Minimum Lagging PF of R Phase	32 bit FP	40512 (LSR) -40513 (MSR)	R	NA
0202	40514	40515	Maximum Lagging PF of Y Phase	32 bit FP	40514 (LSR) -40515 (MSR)	R	NA
0204	40516	40517	Minimum Lagging PF of y Phase	32 bit FP	40516 (LSR) -40517 (MSR)	R	NA
0206	40518	40519	Maximum Lagging PF of B Phase	32 bit FP	40518 (LSR) -40519 (MSR)	R	NA
0208	40520	40521	Minimum Lagging PF of B Phase	32 bit FP	40520 (LSR) -40521 (MSR)	R	NA
020A	40522	40523	Maximum Leading PF of R Phase	32 bit FP	40522 (LSR) -40523 (MSR)	R	NA
020C	40524	40525	Minimum Leading PF of R Phase	32 bit FP	40524 (LSR) -40525 (MSR)	R	NA
020E	40526	40527	Maximum Leading PF of Y Phase	32 bit FP	40526 (LSR)	R	NA

HEX	MODBUS register		Parameter description	Format		R/W	Units
					-40527 (MSR)		
0210	40528	40529	Minimum Leading PF of y Phase	32 bit FP	40528 (LSR) -40529 (MSR)	R	NA
0212	40530	40531	Maximum Leading PF of B Phase	32 bit FP	40530 (LSR) -40531 (MSR)	R	NA
0214	40532	40533	Minimum Leading PF of B Phase	32 bit FP	40532 (LSR) -40533 (MSR)	R	NA
0216	40534	40535	Maximum Frequency	32 bit FP	40534 (LSR) -40535 (MSR)	R	Hz
0218	40536	40537	Minimum Frequency	32 bit FP	40536 (LSR) -40537 (MSR)	R	Hz
021A	40538	40539	Maximum Voltage of RY Phase-Phase	32 bit FP	40538 (LSR) -40539 (MSR)	R	Volt
021C	40540	40541	Minimum Voltage of RY Phase-Phase	32 bit FP	40540 (LSR) -40541 (MSR)	R	Volt
021E	40542	40543	Maximum Voltage of YB Phase-Phase	32 bit FP	40542 (LSR) -40543 (MSR)	R	Volt
0220	40544	40545	Minimum Voltage of YB Phase-Phase	32 bit FP	40544 (LSR) -40545 (MSR)	R	Volt
0222	40546	40547	Maximum Voltage of BR Phase-Phase	32 bit FP	40546 (LSR) -40547 (MSR)	R	Volt
0224	40548	40549	Minimum Voltage of BR Phase-Phase	32 bit FP	40548 (LSR) -40549 (MSR)	R	Volt

7. Registers for energy parameters1 in 8 bytes

HEX	MODBUS Register		Parameter Description	Format		R/W	Units
0258	40600	40603	Active Total - Import	64 bit FP	40600 (LSR) - 40603 (MSR)	R	Wh
025C	40604	40607	Active Total - Export	64 bit FP	40604 (LSR) - 40607 (MSR)	R	Wh
0260	40608	40611	Active NET(Import -Export)	64 bit FP	40608 (LSR) - 40611 (MSR)	R	Wh
0264	40612	40615	Apparent when Active Import	64 bit FP	40612 (LSR) - 40615 (MSR)	R	VAh
0268	40616	40619	Apparent when Active Export	64 bit FP	40616 (LSR) -	R	VAh

					40619 (MSR)		
026C	40620	40623	Reactive - Import (Q1+Q2)	64 bit FP	40620 (LSR) - 40623 (MSR)	R	VARh
0270	40624	40627	Reactive - Export (Q3+Q4)	64 bit FP	40624 (LSR) - 40627 (MSR)	R	VARh
0274	40628	40631	Active - Forwarded	64 bit FP	40628 (LSR) - 40631 (MSR)	R	Wh
0278	40632	40635	Apparent - Forwarded (Lag+ Lead)	64 bit FP	40632 (LSR) - 40635 (MSR)	R	VAh
027C	40636	40639	Reactive - Lag Forwarded	64 bit FP	40636 (LSR) - 40639 (MSR)	R	VARh
0280	40640	40643	Reactive - Lead Forwarded	64 bit FP	40640 (LSR) - 40643 (MSR)	R	VARh
0284	40644	40647	Active Gross (Import)	64 bit FP	40644 (LSR) - 40647 (MSR)	R	Wh
0288	40648	40651	Active Gross (Export)	64 bit FP	40648 (LSR) - 40651 (MSR)	R	Wh

8. Register for configurable parameters

HEX	MODBUS Register		Parameter Description	Format		R/W	Units
02BC	40700	40701	Register 1	32 bit FP	40700 (LSR) -40701 (MSR)	R	As per configuration
02BE	40702	40703	Register 2	32 bit FP	40702 (LSR) -40703 (MSR)	R	As per configuration
02C0	40704	40705	Register 3	32 bit FP	40704 (LSR) -40705 (MSR)	R	As per configuration
02C2	40706	40707	Register 4	32 bit FP	40706 (LSR) -40707 (MSR)	R	As per configuration
02C4	40708	40709	Register 5	32 bit FP	40708 (LSR) -40709 (MSR)	R	As per configuration
02C6	40710	40711	Register 6	32 bit FP	40710 (LSR) -40711 (MSR)	R	As per configuration
02C8	40712	40713	Register 7	32 bit FP	40712 (LSR) -40713 (MSR)	R	As per configuration
02CA	40714	40715	Register 8	32 bit FP	40714 (LSR) -40715 (MSR)	R	As per configuration
02CC	40716	40717	Register 9	32 bit FP	40716 (LSR) -40717 (MSR)	R	As per configuration
02CE	40718	40719	Register 10	32 bit FP	40718 (LSR) -40719 (MSR)	R	As per configuration
02D0	40720	40721	Register 11	32 bit FP	40720 (LSR) -40721 (MSR)	R	As per configuration
02D2	40722	40723	Register 12	32 bit FP	40722 (LSR) -40723 (MSR)	R	As per configuration
02D4	40724	40725	Register 13	32 bit FP	40724 (LSR) -40725 (MSR)	R	As per configuration
02D6	40726	40727	Register 14	32 bit FP	40726 (LSR) -40727 (MSR)	R	As per configuration

HEX	MODBUS Register		Parameter Description	Format		R/W	Units
02D8	40728	40729	Register 15	32 bit FP	40728 (LSR) -40729 (MSR)	R	As per configuration
02DA	40730	40731	Register 16	32 bit FP	40730 (LSR) -40731 (MSR)	R	As per configuration
02DC	40732	40733	Register 17	32 bit FP	40732 (LSR) -40733 (MSR)	R	As per configuration
02DE	40734	40735	Register 18	32 bit FP	40734 (LSR) -40735 (MSR)	R	As per configuration
02E0	40736	40737	Register 19	32 bit FP	40736 (LSR) -40737 (MSR)	R	As per configuration
02E2	40738	40739	Register 20	32 bit FP	40738 (LSR) -40739 (MSR)	R	As per configuration
02E4	40740	40741	Register 21	32 bit FP	40740 (LSR) -40741 (MSR)	R	As per configuration
02E6	40742	40743	Register 22	32 bit FP	40742 (LSR) -40743 (MSR)	R	As per configuration
02E8	40744	40745	Register 23	32 bit FP	40744 (LSR) -40745 (MSR)	R	As per configuration
02EA	40746	40747	Register 24	32 bit FP	40746 (LSR) -40747 (MSR)	R	As per configuration
02EC	40748	40749	Register 25	32 bit FP	40748 (LSR) -40749 (MSR)	R	As per configuration



BGX701- 234