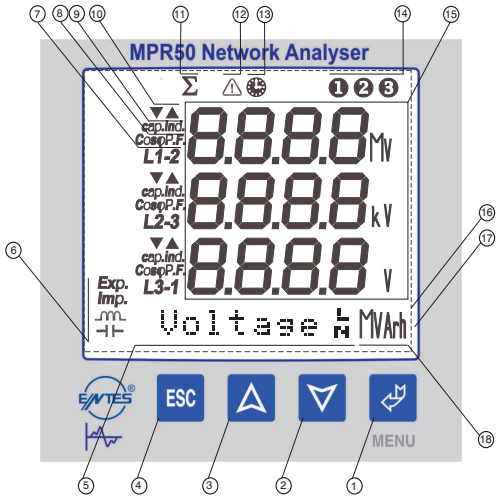
NETWORK ANALYSER
MPR50



FRONT PANEL PROPERTIES

1 ..... Menu (ENTER) button.
2 ..... Down button.
3 ..... Up button.
4 ..... ESC button. It is used to exit from a menu.
5 ..... Menu and Energy line. Shows the present menu. It also shows the energy values.
6 ..... Shows whether the value in the Energy Menu is Export, Import, Inductive or Conductive.
7 ..... Shows which phase / phase - phase that the measured parameter belongs to.
8..... Expresses that the Cosφ or PF (Power Factor) value of the related phase.
9 ..... Shows the direction of the value for the related phase. Capacitive or Inductive. (PF, Cosφ and Reactive Power light up while measuring.)
10 .....Min. and Max. symbols. They light up in the Demand menu.
11 .....Total symbol. Shows the total value of the related parameter.
12 .....Phase sequence failure
13 ..... Demand symbol. Shows the demand value of the related parameter.
14 ..... Phase existence symbols.
15 ..... Display lines for the measured parameters and their units. (V, kV, MV, A, kA, MA, W, kW, MW, VA, kVA, MVA, VAr, kVAr, MVAr)
16 ..... 3.6'' LCD Display
17 ..... Backlight
18 ..... Shows the units of the measured energy values (kWh, kVArh, MWh, MVArh)

TECHNICAL DATA

Operating Voltage (Un)	: Please look behind the device.
Frequency	: 50/60 Hz
Power Consumption	: < 6 VA
Burden	: < 1 VA (Current Burden)
	: < 0.5 VA (Voltage Burden)
Vin	: 1 - 300 VAC 50/60 Hz. (L-N)
	: 2 - 500 VAC (L-L)
Iin	: 0.005 - 5.5 A~
Measurement Ranges	: 1,0...400,0 kV
	: 0.005...10000 A
	: 0-99 999 999 kWh, kVArh or MWh, MVArh
Measurement Category	: CAT III
Accuracy	
Voltage, Current	: 0.5%±2digit
Active Power	: 1%±2digit
Reactive, Apparent Power	: 2%±2digit
Voltage Transformer Ratio	: 1.0 ... 4000.0
Current Transformer Ratio	: 1...5000
Connection Type	: 3P4W, 3P3W, ARON
Demand Time	: 15 minutes
Ambient Temperature	: -5°C; +50°C
Display	: 3.6" LCD with Backlight
Dimensions	: PR-19
Equipment Protection Class	: Double Insulation-Class II (⧈)
Box Protection Class	: IP 40
Terminal Block Protection Class	: IP 00
Box Material	: Non-flammable
Installation	: Flush mounting with rear terminals
Wire Thickness for Voltage Connection	: 2.5 mm^2
Wire Thickness for Current Connection	: 4.0 mm^2
Weight	: 0.75 kg
Installation Category	: Class II
Type	: PR 19
Package Dimensions	: 280x280x265 mm
Package Weight	: 6 kg
Pcs per Package	: 8 pcs

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CORRECT USAGE and SAFETY PRECAUTIONS

Failure to abide by the precautions below may result in SERIOUS INJURY or DEATH.
- Cut all power before connecting the device.
- Once the device is online on the network, do not remove the front panel.
- Do not attempt to clean the device with a solvent or another similar agent. Only a dry piece of cloth is used..
- Check the connections.
- Electrical devices should be repaired only by your authorized seller.
- The device is for panel type installation only.
- The fuse used must be Type FF and the current limit value should be 1A.
- The production company or the authorized seller is not responsible for the consequences resulting from failure to comply with these precautions.

Warning :
- A switch or circuit breaker must be connected between the network and the auxiliary supply input of device.
- Connected switch or circuit breaker must be in close proximity to the device.
- Connected switch or circuit breaker must be marked as the disconnecting device for the equipment.

Standards which are applied to the device:
EN 61000-6-2, EN 61000-6-4, EN 55016-2-1, EN 55016-2-3, EN 55011, EN 61000-3-2, EN 61000-3-3, EN 61010-1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11

GENERAL INFORMATION

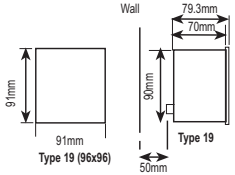
Device, based on DSP(Digital Signal Processor), is designed for the purpose of measuring all parameters in industry plants. The measured parameters can be displayed on LCD screen which has dimension of 3.6 inch and can be read easily in dark environments by activating the Back-Light function.

FEATURES

1- Measurements of parameters given in the parameter table can be displayed on LCD screen.
2- Current and voltage transformer ratios can be programmed.
3- Parameters in 3 phase with neutral, 3 phase without neutral and Aron connection systems can be measured
4- The existence of 3 phases can be displayed as "V_{L1},V_{L2},V_{L3}" on the right corner of the device at any time.
5- Unauthorized access to the device's settings can be prevented by setting up a password from the Setup Menu.

DIMENSIONS

Panel Cut Dimensions



1. The device fits into a Type 19 square cut out (91 mm x 91 mm).
2. Remove the thumbscrews, then slide out the securing brackets from the rear panel.
3. Place the device through the panel cut-out, then slide the securing brackets back into the slots on each side of the device.
4. Tighten the thumbscrews so that the securing brackets bear on the rear of the panel into which the device has been placed.
5. The current and voltage connectors are designed for cables up to 2.5 mm^2, but can accept cables up to 4 mm^2

Excessive force can damage the device. The thumbscrews only need to be 'finger-tight' to hold the device in place.
Note: For 3 phase with neutral connection (Figure1) the neutral must be connected; otherwise the device will not function.

INSTALLATION DIAGRAM

Important note for making system connection;
First, connect the supply and voltage measurement inputs. Apply energy and measurement voltage to the device. Observe the existence of three phases from LCD screen. ❶❷❸ indicators must be seen. If ⚠ indicator (phase sequence is not correct) is seen in addition to these indicators, cut the energy and measurement voltage and change the direction of 2 phases.
At next step, you can connect current and another connections as mentioned in the installation diagram.

*** This box consists of 1 User Manual CD, 1 Installation Guide, 2 clamps and 2 screwed clamps.**

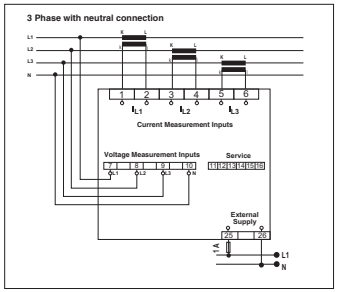


Figure 1

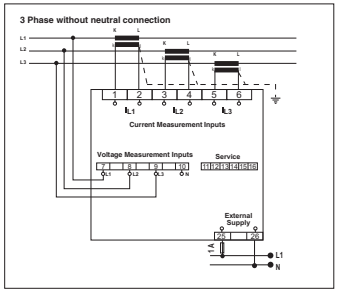


Figure 2

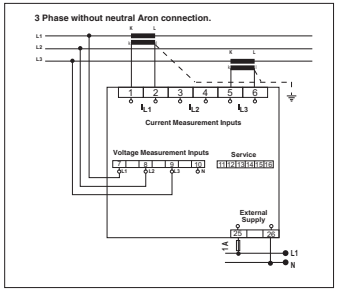


Figure 3

SETUP

Setting up MPR50 on the Network and Configuring its Settings:
After connecting the device as mentioned in the user's manual, supply energy. In order for your measurement and applications to be correct, make the necesarry configurations in the SETUP menu.

"SETUP" To enter to the "SETUP" menu, while in the Instantaneous Values menu;
Press the ENTER button. (The ENERGY menu is displayed)

Find the "SETUP" menu by scrolling using the UP/DOWN buttons.

The image of screen is at side while in this menu

Sub-menus under the **SETUP** menu and what these sub-menu settings can be used for are explained in detail below.

NETWORK

In this menu, current transformer ratio, voltage transformer ratio and system connection type of device are set.

It has 5 sub-menus.
"CT:…..", "VT:……", "Net:……", "Eng:……..", "E.Unit:……..."

CT (Current transformer ratio) :
The current transformer ratio is set in this menu. It can be programmed between 1...5000

"CT" To set the "CT" ratio,
while in the Instantaneous Values menu;

Press the ENTER button. (ENERGY is displayed)
Find the "SETUP" menu by scrolling using the UP/DOWN buttons.
Press the ENTER button. (The Network menu is displayed)
Press the ENTER button. (CT is displayed)
Press the ENTER button
Enter the appropriate "CT" ratio (between 1.....5000) by scrolling using the UP/DOWN buttons.
To record the new "CT" value, press ENTER button.

VT (Voltage transformer ratio) :
The voltage transformer ratio can be programmed between 1,0...4000,0
Transformer ratio can set in 0,1 step.
Please pay attention that voltage transformer ratio is entered directly instead of primary voltage value.

"VT" To set the "VT" voltage transformer ratio;
While in Instantaneous Values menu;

Press the ENTER button. (The ENERGY menu is displayed)
Find the "SETUP" menu by scrolling using the UP/DOWN buttons.
Press the ENTER button. (The Network menu is displayed)
Press the ENTER button. (CT is displayed)
Find the "VT" Menu by scrolling using the UP/DOWN buttons.
Press the ENTER button
Enter a "VT" value (between 1.0...4000.0) by scrolling using the UP/DOWN buttons.
To record the "VT" value, press the ENTER button.

Net : (Type of system connection) :
The type of system connection is set in this menu.

"Net" To set the connection type;
while in the instantaneous values menu;

Press the ENTER button. (The ENERGY menu is displayed)
Find the "SETUP" menu by scrolling using the UP/DOWN buttons.
Press the ENTER button.(The Network menu is displayed)
Press the ENTER button.(The CT menu is displayed)
Find the "Net" menu by scrolling using the UP/DOWN buttons.
Press the ENTER button.
Enter the "Net" system connection type by scrolling using the UP/DOWN buttons.(3P4W, ARON, 3P3W)
To record the "Net" system connection type, press the ENTER button.

Note: **3P4W :** 3 Phase + Neutral (Star connection)
3P3W : 3 Phase No Neutral(Delta connection)
ARON : ARON connection

Eng: (Energy Calculation)

"Eng" To enter the connetion type that is being used;
While in the Instanteous Values menu,

Press the ENTER button (the ENERGY menu is displayed.)
Find the "SETUP" menu by scrolling using the UP/DOWN buttons.
Press the ENTER button (The Network menu is displayed.)
Press the ENTER button (The CT menu is displayed.)
Find the "Eng" menu by scrolling using the UP/DOWN buttons.
Press the ENTER button.
Using the UP/DOWN buttons enter the "Eng" value (Sprt, Tot)
To record the "Eng" value, press the ENTER button.

Note: If "Tot" menu is selected, device measures the reactive powers of three phases. If total phase value is inductive, it records values to the inductive area. If total phase value is capacitive, it records values to the reactive area.
If "Sprt" menu is selected, device measures the reactive powers of three phases for each phase seperately. If phase value is in the inductive area, it records values to the inductive reactive area. If phase values is in the capacitive area, it records values to the capacitive reactive area. **Measurement for each phase seperately can be done for 3P4W (3 Phase with Neutral) systems.**

E.Unit: (Energy Unit)
It is used for determine the units of energy counters. Counters can be chosen Mega or Kilo.

for example : If energy counter value is 12345678901 kWh when **"k"** is chosen, 45678901 kWh will be displayed or when **"M"** is chosen, 12345678 MWh will be displayed.

DISPLAY

(LCD Display Settings)

In this menu, LCD display settings are configured. It has 3 sub-menus.

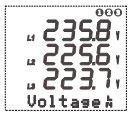
"Loop: ..." , "Cont: ..." , "BL: ..."

Loop:
In this menu, the duration of displaying instantaneous value is adjusted automatically, while in the Instantaneous Values menu. The Loop duration can be adjusted between 1... 600 in terms of seconds.
For example;
The Loop duration is set 10sec. In the Instantaneous Values menu, if any button is not pressed during 10 sec, the Instantaneous values are displayed in sequence for 10 seconds periods.
By using this function all instantaneous values can be observed one after the other without pressing any buttons.
This function can be cancelled by selecting "No" option in the Loop Menu.

INSTANTANEOUS VALUES

Observing the Measured Parameters
Observing the Instantaneous Values

In this menu, instantaneous values of parameters are displayed.
This menu is the last menu that is reached by pressing ESC button while in any menu.
Instantaneous Values menu is the main menu of device. If you wait a while without pressing any buttons in any menu, the Instantaneous value menu automatically comes back.
When a device is energized for the first time, the device is in the Instantenous values menu and shows the instantaneous values.
The display is seen as below.



At the bottom of the screen, which sub-menu you are in and the instantanous values belonging to this menu are displayed.

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By scrolling with ▲(UP), ▼ (DOWN) buttons while in the Instantaneous Values Menu, you can observe the below parameters of the network one after the other.

Voltage L-N	Voltage L-L	Currents	P. Factor	Cosφ
Active (W)	Reactive (VAr)	Apparent (VA)	ΣPowers	Σ P.F.
Freq. Hz	Average L-N	Average L-L	ΣCurrent	Neutral Current (In)

Note : If there is a "-" symbol before the measured active power, it shows the existence of active export power

Note:
When ARON connection is choosed, "L2 ---" symbol is seen at the Currents, P.Factor, Cosφ, Active, Reactive, Apparent, DEMAND, max.IL, DEMAND min.IL, DEMAND IL menus.

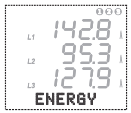
Note: When device's phase voltages exceed 330.0 V, phase-phase voltages exceed 530.0 V, phase currents exceed 5.500 A according to upper limits of measurement, **"HIGH"** is displayed on display.

ENERGY

Observing The Energy Values:
In this menu, energy values are displayed and cleared.In this menu, energy values can be observed which are listed below:

Exp. Export Active Energy **Imp.** Import Active Energy
Inductive Reactive Energy Capacitive Reactive Energy values
These energy values can be cleared one by one or all at once.

To enter the ENERGY menu,
while in the Instantaneous Values menu;
Press the ENTER button.(The ENERGY menu is displayed)



The image of screen is at side while in this menu

DEMAND

"DEMAND" To see the DEMAND Menu; While in the Instantaneous Values Menu,

Demand : It shows the averages which arise on power and current during demand time (15 min.).
min. value : It shows the min. value different from zero that measured on voltages.
max. value: It shows the max. value that measured on voltages.
This is the menu in which it is possible to observe the below values;
max. VL-N (Max. voltages between Phase-Neutral)
min. VL-N (Min. voltages between Phase-Neutral)
max. Demand IL (Max. demand values of phase currents)
min. Demand IL (Min. demand values of phase currents)
Demand IL (Demand values of phase currents)
max. Demand ΣI and min. Demand ΣI (Total max. and min. demand values of phase current)
Demand ΣIL (Demand value of total phase currents)
Demand ΣP, Demand ΣQ and Demand ΣS (Demand values of total power values)
max. Demand ΣP, max. Demand ΣQ and max. Demand ΣS (Max. demand values of total powers)
min. Demand ΣP, min. Demand ΣQ and min. Demand ΣS (Min. demand values of total powers)
Observed minimum, maximum and demand values can be cleared one by one or at once.

"DEMAND" To see the DEMAND Menu;
While in the Instantaneous Values Menu,
Press the ENTER button (The ENERGY menu will is displayed.)
Find the "DEMAND" menu by scrolling using the UP/DOWN buttons.

The image of screen is at side while in this menu

INFO

INFO: In this menu, the information about the producer are obtained.
Producer-Production Information.....

PASSWORD

Password Menu : (Menu for setting up a user password)

In this menu, a user password is set and activated.
In order to prevent the device's SETUP, DEMAND and ENERGY menus from unauthorized access, it is necesarry to set up a 3 digit user password and then activate it.

Set Psw: (Menu for setting up a user password)

Press the ENTER button (The ENERGY menu is displayed.)
Find the "SETUP" Menu scrolling UP/DOWN buttons.
Press the ENTER button (The Network menu is displayed.)
Find the "Set Psw" menu by scrolling using the UP/DOWN buttons.
Press the ENTER button. ''New 000'' is displayed.
Enter the new 3 digit password by using the UP/DOWN and ENTER buttons. (Don't enter the new password as 000)
Press the ENTER button. The Chg Psw menu is displayed. (For cancel the password enter as Chg Psw: 000). The new pasword is saved to the SETUP, DEMAND and ENERGY menus.
You can press the ESC button to return to instantaneous values menu.

Chg Psw: (Menu for changing user password)

Press the ENTER button (The ENERGY menu is displayed.)
Find the "SETUP" Menu scrolling UP/DOWN buttons.
"SETUP ♪" menu is displayed.
Press the ENTER button (Psw: 000 is displayed.)
Enter the old 3 digit password using the UP/DOWN and ENTER buttons (ie Psw:999).
Press the ENTER button (Network menu is displayed.)
Find the "Chg Psw" menu by scrolling using the UP/DOWN buttons.
Press the ENTER button, previous password (ie New: 999.) is displayed
Enter the new 3 digit password by using the UP/DOWN and ENTER buttons. (Don't enter the new password as 000)
Press the ENTER button. The Chg Psw menu is displayed. (For cancel the password enter as Chg Psw: 000). The new pasword is saved to the SETUP, DEMAND and ENERGY menus.
You can press the ESC button to return to instantaneous values menu.