

*Technical Specifications*  
*of*  
*Automatic Power Factor Control Relay Meter*  
*(SP1108 / SP1112)*



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## General Specifications

### 1) **GENERAL:**

- True RMS, Accurate & Reliable switching of Capacitor banks
- Available in 8 & 12 Stages
- Two State of operation – Auto and Manual (password Protection)
- Inbuilt Capacitor Bank (KVAR) health checking.
- Healthy checking Limits are programmable.
- Bank ON timer is programmable for Reconnecting the same bank.
- Required PF are programmable.
- Operating PF from 0.050 Lg to 0.999 Lg
- Primary CT value are programmable
- 6 digit, 7 segment LED Display with 4 legend Display
- Operating voltage 85V to 300V
- Operating secondary Current 0.01A to 5A
- Frequency 45 to 65 Hz

## 2) **METER FEATURES:**

### 2.1) **Display Details:**

- 7 segment Red LED Display (Single Row) – The parameters are calculated by the meter are displayed,
- Selectable Parameters – Can select any parameters.
- Scroll rate – The scroll rate of the display parameter scroll in steps of 4secs.
- Keys are provided to stop, scroll, edit and to view the particular parameter.

#### 2.1.1) **Display Parameters:**

APFC Relay displays the following parameters sequentially.

For SP1108:

- Instant Power Factor (**Default Display**)
- Meter ID
- CT Primary Value
- Frequency
- Voltage
- Current
- Instant Reactive Power
- Capacitor Bank 1
- Capacitor Bank 2
- Capacitor Bank 3
- Capacitor Bank 4
- Capacitor Bank 5
- Capacitor Bank 6
- Capacitor Bank 7
- Capacitor Bank 8
- Real Time
- Real Date

For SP1112:

- Instant Power Factor (**Default Display**)
- Meter ID
- CT Primary Value
- Frequency
- Voltage
- Current
- Instant Reactive Power
- Capacitor Bank 1
- Capacitor Bank 2
- Capacitor Bank 3

- Capacitor Bank 4
- Capacitor Bank 5
- Capacitor Bank 6
- Capacitor Bank 7
- Capacitor Bank 8
- Capacitor Bank 9
- Capacitor Bank 10
- Capacitor Bank 11
- Capacitor Bank 12
- Real Time
- Real Date

## 2.2) Key Features:

- The Parameter setup can be done through 4 nos. of soft keys on front fascia,
- Keys on the front panel is used to
  - ✓ scroll, increment, decrement through display parameter and
  - ✓ set the Meter ID,
  - ✓ Time & Date,
  - ✓ Change Password.

Press scroll key once the parameter set is completed, this allows to view the parameters one after the other automatically (change over time period is 4 secs). If this is not done auto scroll will not happen.

Keys	Description
Mode / Set	To Edit and Enter the parameter values
Up	To view Next parameters To increment the value while setting To view the parameters in shortcut mode
Next	To view previous parameters To select digit while value setting
Scroll / Esc	To stop and view the parameters To scroll the parameters To exit from parameter setting

## 2.3) Meter Descriptions:

### Mode selection:

- ✓ Auto/Manual Key is used for Mode Selection. When press it , display ask for PASS WORD.
- ✓ Once enter the correct Pass Word , display will highlight the present mode (either Auto Or Manual) by blinking.
- ✓ Now with UP or Next Key the required Mode can be selected
- ✓ By pressing Mode Key the selected Mode is registered .It can be viewed by concern LED on Auto/Manual Key.

### Auto Mode:-

- ✓ In Auto Mode , the APFC monitor the instant KVAR, and calculates the average KVAR at the interval of 5 sec.
- ✓ If the average KVAR is inductive, the controller will switch on the corresponding capacitor bank to get the unity PF.
- ✓ If the KVAR is Capacitive, turn Off the Bank which is suitable to get the unity PF.

**Note:** Capacitor bank ON Status will be shown by concern Yellow LED on front fascia .

### Manual mode:-

- ✓ Capacitor bank can be switched ON and OFF manually by pressing corresponding switch (CB1 to CB12). The reconnection is possible only after the set time which is programmable .
- ✓ Reswitching On time is programmable and OFF time is 5 Sec.

### Capacitor Read:-

- ✓ In set mode, we can execute the Capacitor read function.
- ✓ APFC read the KVAR Value in Capacitor banks and store in the location C1 to Cn. (where n is the no of Stages)

### Capacitor Value:-

- ✓ In set mode, we can enter the KVAR Value for health checking.

### Health Checking:-

- ✓ Limits of health checking are programmable.
- ✓ If banks are Unhealthy capacitor banks are indicated by glowing red LED.

### Input Supply:-

- ✓ Both voltage and current circuit should take from the same phase.

### **2.4.1) Set Parameters:**

- Device ID
- CT Value
- Required PF
- Capacitor Read (CAP rd)
- Reconnection Time (rt)
- Capacitor Value
- Unhealthy Limit
- Real Time
- Real Date
- Change Password

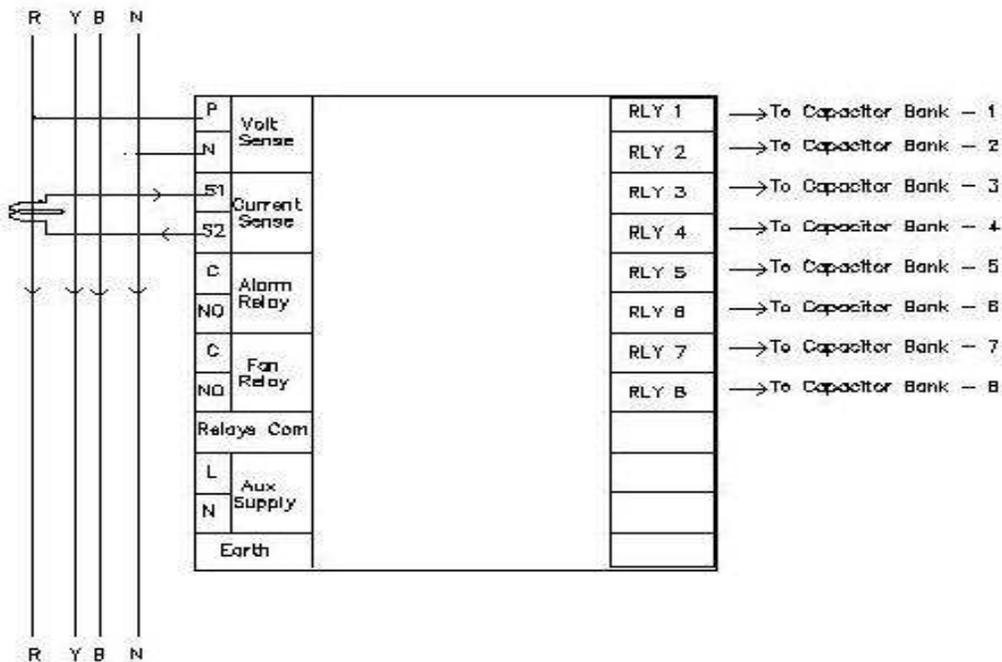
### **2.4.2) Enabling Auto scroll / Manual Scroll :**

2.4.1) *Enabling Manual scroll:* Press **Stop/Scroll** key to enable manual scroll mode. Now parameters can be viewed one by one using **Up** and **Next** Keys

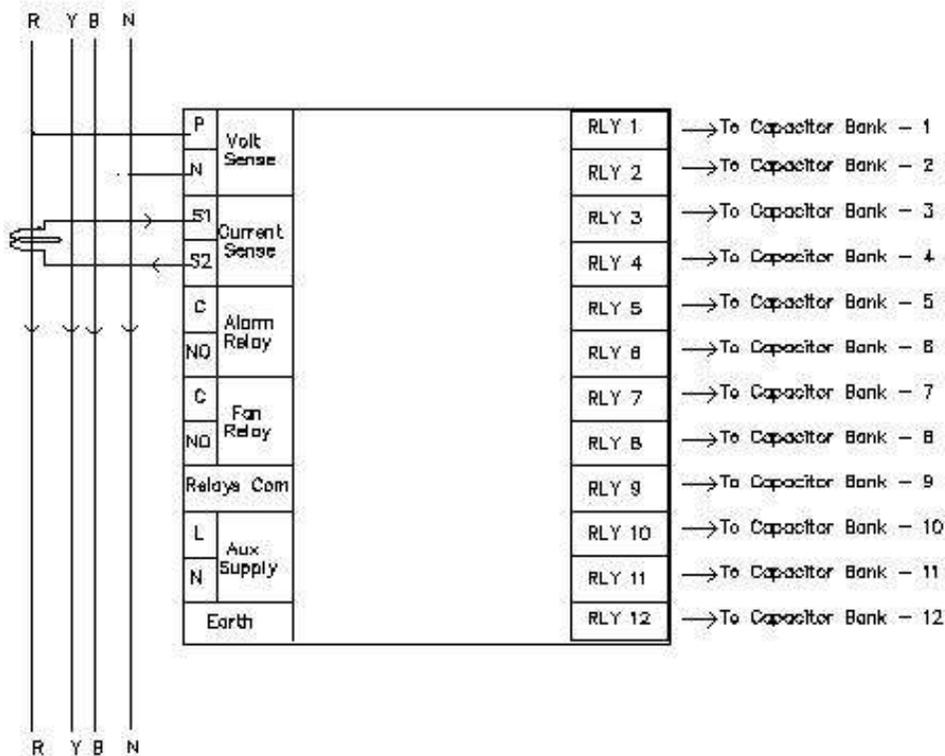
2.4.2) *Enabling Auto scroll* : When display in manual mode, press **Stop/Scroll** to enter into auto scroll mode. Parameters will scroll 4 secs. one after the other. By default, when meter is switched ON it will be in auto scroll mode.

## 2.5) Rear Terminal / Connection Diagram:

### SP1108:



### SP1112:



## **2.6) Safety Precautions:**

### ***HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH***

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- Only qualified electrical workers should install this equipment. Such work should be performed only after reading this entire set of instructions.
- If the equipment is not used in a manner specified by the manufacturer, the protection provided by the equipment may be impaired.
- NEVER work alone.
- Before performing visual inspections, tests, or maintenance on this equipment, disconnect all sources of electric power.
- Assume that all circuits are live until they have been completely de-energized, tested, and tagged.
- Pay particular attention to the design of the AC power system.
- Consider all sources of power, including the possibility of back feeding.
- Turn off all power supplying the APFCR meter and the equipment in which it is installed before working on it.
- Always use a properly rated voltage sensing device to confirm that all power is off.
- Before closing all covers and doors, inspect the work area for tools and objects that may have been left inside the equipment.
- The successful operation of this equipment depends upon proper handling, installation, and operation.
- Neglecting fundamental installation requirements may lead to personal injury as well as damage to electrical equipment or other property.
- High voltage testing may damage electronic components contained in the APFCR meter.
- Ensure that no wiring strands are straying outside after connecting the wires.
- APFCR Meter should be installed in a suitable electrical enclosure.

**Failure to follow these instructions will result in death or serious injury**

### Technical Specifications

System type	: 230 VAC Input Voltage
Resolution	: 0.001 (for p.f.)
Display	: 7 segment LED display (single row)
Auxiliary Supply	: 85 – 265 V <sub>AC</sub>
AC Current	: Primary side – Programmable (5A – 6000A)
Starting Current	: 10mA
Frequency	: 50Hz, $\pm 5\%$
Temperature	: Operating Temp. – (-10 to 55) $^{\circ}$ C Storage Temp. – (-20 to 70) $^{\circ}$ C Humidity 5 to 95% RH at 50 $^{\circ}$ C (Non-Condensing)
Dimension	: (144 x 144 x 48) mm (Inclusive of connector)
Panel Cutout	: 138 x 138 mm (-0.5mm)
Mounting	: Panel Mountable
Connector Type	: Screw type terminals (U Lug 2.5mm)
Weight	: 350gms. (app.)

**Note: If supply Voltage and current is different phase, APFC relay may not work properly.**