

# MULTISPAN

## User Manual

### APFC 9606



#### Multispan Control Instruments Pvt Ltd

72/B, Phase 1, GIDC Estate, Vatva, Ahmedabad-382445, Gujarat, India.

✉ export@multispanindia.com ☎ +91-9978991483

🌐 www.multispanindia.com

## Technical Specification

### INPUT:

Input Current	50mA to 5AmP AC, (Without CT) CAT III
Controlling PF	+0.80(Lag) to -0.80(Lead)
Frequency	50 Hz
Min. Operating Current	Selectable Range of up to 50mA to 500mA
Operating Voltage	30 to 250V AC (L-N) CAT III

### DISPLAY AND KEYS:

Display	4 Digit, 7 Seg 0.56", White Display
Keys	SET/ENT, INC, DEC, EXIT

### DIMENSION:

Size (mm)	96 (H) X 96 (W) X 52 (D) mm
Panel Cutout (mm)	92 (H) X 92 (W) mm

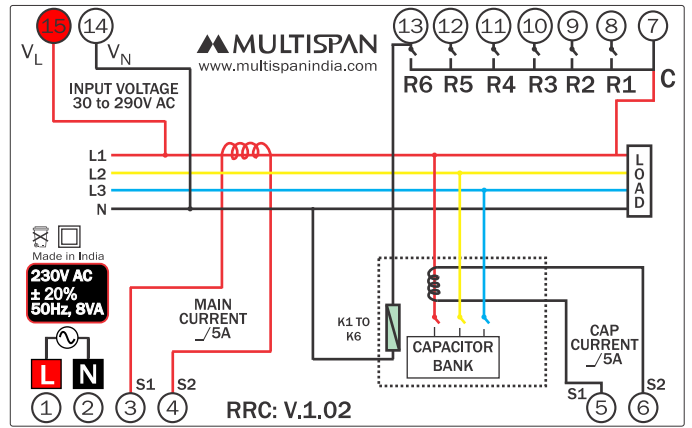
### AUXILIARY SUPPLY:

Supply Voltage	230V AC±20%, 50 Hz
Power Consumption	8VA @ 230 AC MAX

### ENVIRONMENT CONDITION:

Protection Level (As Per Request)	IP-65 (Front side) As per IS/IES 60529 : 2001
Operating Temperature	0 °C To 55 °C
Relative Humidity	Up to 95% RH Non Codensing

## Terminal Diagram

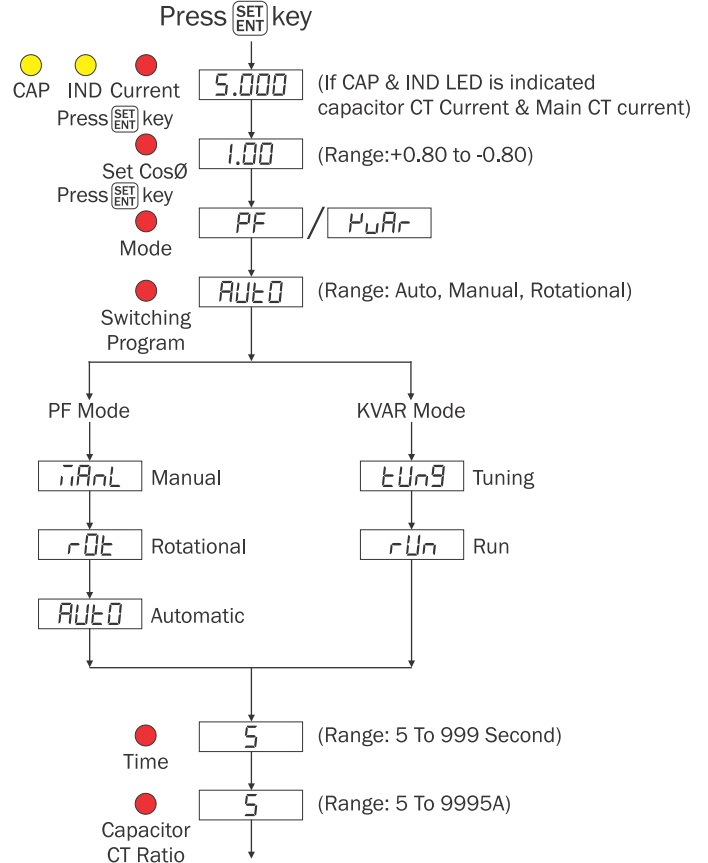


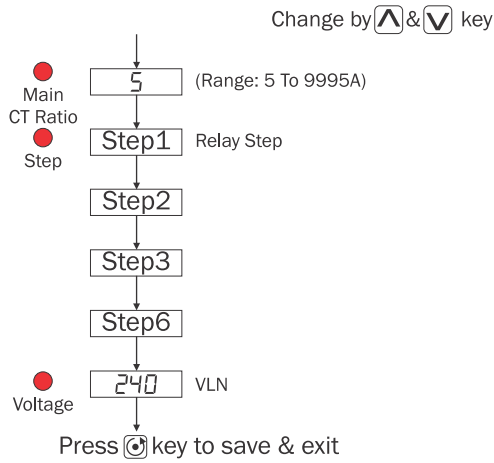
## Key Operation

- \* Press **SET/ENT** key to enter in set value menu.
- \* Press **▲** & **▼** key to change the parameter setting.
- \* Press **▲** + **SET/ENT** key to enter in parameter menu (Input Selection, skip-unkip selection)
- \* Press **▲** + **▼** key to Factory set.
- \* Press **⊙** key to reset Parameter.

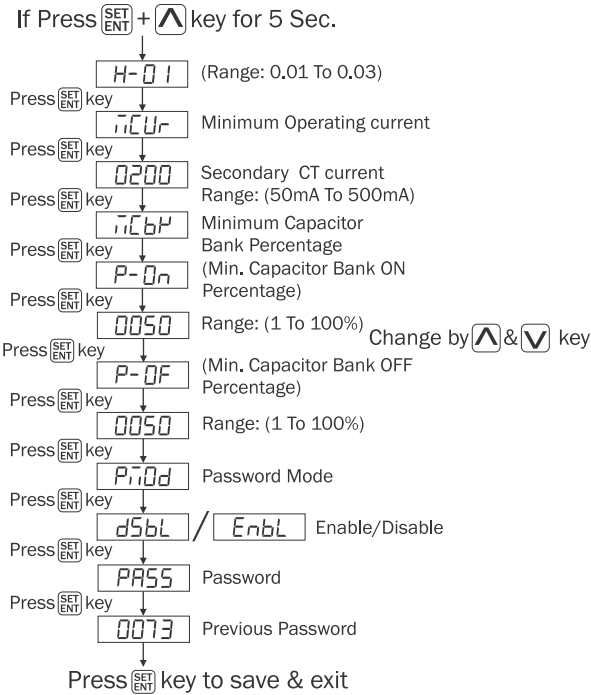
## Parameters

Change by **▲** & **▼** key

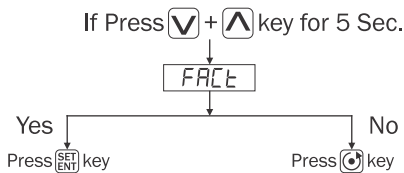




## Parameters



## Factory Set



Parameters	Range	Factory Set
Set Cos $\phi$	-0.80 (Lead) to +0.80 (Lag)	User Set
Time	5 to 999 Sec	5 Sec
Mode	PF Mode & KVAR Mode	PF Mode
Switching Program	Automatic-Manual-Rotational-Run-Tuning	Automatic
Hysteresis	0.00 to 0.03	User Set
Minimum Equred	50mA to 500mA	User Set
Minimum Cap. Bank Percentage	1% to 100%	User Set

## Capacitor CT Current

This parameter set capacitor CT ratio. The numeric display shows the true-rms value of the secondary current measured by the 5A current transformer (CT). If we use capacitor CT tuning capacitor for each rated steps, measured each capacitor KVAR values.

## Setting Manual Switching (iARNL)

When this switching program is selected, the capacitor steps are controlled manually by the "UP" or "DOWN" keys. The "UP" key will connect the capacitor step and "DOWN" key will disconnect the capacitor step. Steps are switched in a rotational manner based on first-in-first-out basis.

## Setting Rotational Switching (rDL)

This switching program is similar to the manual switching method and it is based on rotational first-in-first-out sequence. Unlike the manual switching program, this option will automatically switch in and out the capacitors according to the targeted power factor, sensitivity setting and the reconnecting time setting.

## Setting Automatic Switching (AUTD)

This automatic switching program uses intelligent switching sequence. The step switching sequence is not fixed and the program automatically select the most appropriate steps to switch in or out in order to achieve shortest reaction time with minimum number of steps. For equal ageing of the capacitor and contactors, the program will select the least used step to be switched in if there are two equally rated steps. Under this switching program, the power factor regulator automatically detects the CT polarity during power up. Once this polarity reference is fixed, any subsequent re-regenerative power condition detected.

## Setting KVAR mode

### 1) Setting auto sensing capacitor bank (tLnI nS)

This parameter is indicator auto sensing rated capacitor KVAR for each capacitor bank. We have to Mandatory used external capacitor CT. After Completed tuning automatically switching RUN mode.

### 2) Setting Run Mode (Without tuning) (rLn)

This parameter is indicator switching KVAR base, If we have not use external capacitor CT we canput all rated steps.

## Setting Steps

Total 6 capacitor rated steps is indicated capacitor bank sensing. If Capacitor bank is sensing then capacitor step value is 1 & not sensing (Not Connected) then capacitor step value is 0.

## Automatic CT polarity detection

During the power on start-up process, the power factor regulator, if programmed under Rotational or Automatic switching program, detects the CT polarity and correct it internally if the CT polarity is reversed.

## Alarm

Alarm LED is indicated power factor is not achieve, capacitor bank is under compensation.

## Hysteresis

It means create band between under working PF.  
Range for PF hysteresis 0.00 to 0.03

## Example for hysteresis:

If set hysteresis is 0.01 & SetCos $\phi$  is 1.00.  
Hysteresis is work in 1.00-0.01 = 0.99(Lag) to 1.00+0.01 = 0.99(CAP).  
Band is create for relay switching.  
If Load is fluctuating (Load is not constant ) then relay switching is slow.

## Working

### Main CT Current

This function display mode is indicated by the "CURRENT" light indicator. The numeric display shows the true-rms value of the secondary current measured by the 5A current transformer (CT).

#### Example:

If a 1000/5A CT is used and the display shows "2.50", the primary measured current is 500A.

### Set CosØ

This set the targeted power factor required when the system is under automatic mode. The power factor regulator will switch the capacitors in or out in order to achieve this set value.

### Mode

If we use PF mode no need for external capacitor CT. In PF Mode Three switching program such as Manual, Rotational, Automatic for there. If we use KVAR mode in tuning capacitor KVAR values for each capacitor bank will be sense automatically through capacitor bank CT. If we use KVAR mode without external capacitor CT. We have to put manually each capacitor bank KVAR value in rated steps.

### Time (ti $\bar{i}E$ )

This parameter set the speed of the switching. A larger sensitivity Time will result in slower switching speed and conversely, a smaller sensitivity time will result in a faster switching speed. This sensitivity applies to both switching on and switching off of the capacitor. If switching program is automatic switching. Then sensitivity time is based on current power factor and target power factor.

### Minimum Operating current: ( $\bar{i}C\bar{U}r$ )

#### Example

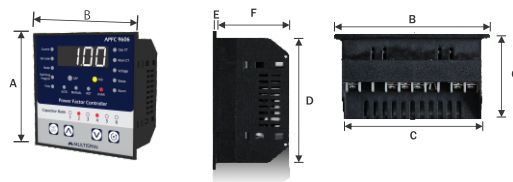
Minimum Current are set to under current working it set 50mA Range in parameter then secondary ct current less then 50mA current APFC Relays are not working.

### Minimum Capacitor Bank Percentage : ( $\bar{i}C\bar{b}P$ )

#### Example

This Parameter Applicable only for KVAR mode Minimum Bank size of capacitor is 5KVAR if we set 50% Of minimum capacitor bank Percentage, it was under 2.5 KVAR capacitor bank are not working.

## Mechanical Dimenssions & Installation



MODEL	A	B	C	D	E	F	G
DIMENSIONS	96mm	96mm	92mm	92mm	3mm	52mm	55mm

- 1) Prepare the panel cutout with proper dimensions as show above.
- 2) Fit the unit into the panel with the help of clamp given.
- 3) The equipment in its installed state must not come in close proximity to any heating source, caustic vapors, oils steam, or other unwanted process by products.
- 4) Use the specified size of crimp terminal (M3.5 screws) to wire the terminal block. Tightening the screws on the terminal block using the tightening torque of the range of 1.2 N.m.
- 5) Do not connect anything to unused terminals.

### Safety Precautions



- All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.
- If all the equipment is not handled in a manner specified by the manufacturer, it might impair the protection provided by the equipment.
- Read complete instructions prior to installation and operation of the unit.

### Warning Guidelines

- To prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement. Do not touch the terminals while power is being supplied.
- To reduce electro magnetic interference, use wire with adequate rating & twists of the same of equal size shall be made with shortest connection.
- Cable used for connection to power source, must have a cross section of 1mm or greater. These wires should have insulations capacity made of at least 1.5kV.
- A better anti-noise effect can be expected by using standard power supply cable for the instrument.

### Installation Guidelines

- This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and internal wiring.
- Do not allow pieces of metal, wire clippings, or fine metallic fillings from installation to enter the product or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
- Circuit breaker or mains switch must be installed between power source and supply terminal to facilitate power 'ON' or 'OFF' function. However this mains switch or circuit breaker must be installed at convenient place normally accessible to the operator.
- Use and store the instrument within the specified ambient temperature & humidity ranges as mentioned in this manual.

### Maintenance

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

Specifications are subject to change, since development is a continuous process,  
So for more updated operating information and Support,  
Please contact our Helpline: 9925032374/9714639666 or  
Email at [service@multispanindia.com](mailto:service@multispanindia.com) Ver:2108