Automatic Power Factor Controller

MULTISPAN APFC - 96L6

CE

TECHNICAL SPECIFICATION

INPUT:

Voltage AC	
Direct voltage AC	30 to 290V AC (L - N)
Burden	< 0.2 VA
Current AC	
Primary CT Ratio	5 to 9995 Amp Selectable
Secondary Current Ac	0.5 To 5.0 Amp
Burden	< 0.2 VA
Overload	Up to 6A Continuous
Frequency	45.0 to 65.0 Hz

DISPLAY, KEY & LED:

Display	128 x 64 bit Graphical LED
Key	SET/ENT, INC, DEC, BACK

DIMENSION:

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

GENERAL SPECIFICATION:

Counting PF Range	+ 0.80 (Lag) To - 0.80 (Lead)
Operating Mode	Auto / Rotational / KVAR / Manual

OUTPUT SPECIFICATION:

Relay Output	
Relay	6 Nos.
Relay Type	(NO-C)
Rating	5A, 230V AC

AUXILIARY SUPPLY:

Supply voltage	230V AC, 50Hz
Power consumption (VA RATING)	Approx 4 VA @ 230V AC MAX

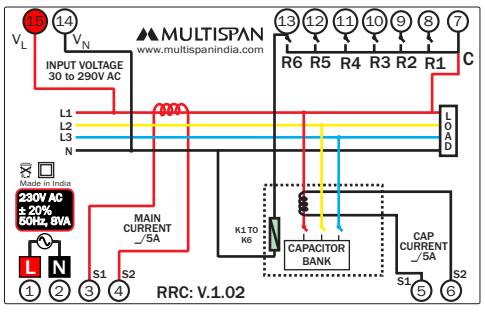
ACCURACY:

Class 0.5 (Standard)

ENVIRONMENT CONDITION:

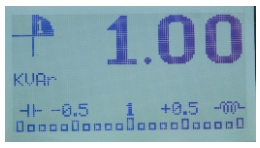
Operating Temp.	0°C to 55°C
Relative Humidity	UP to 95% RH (non-condensing)
Protection Level (AS Per Request)	IP-65 (Front side) As per IS/IEC 60529 : 2001

TERMINAL CONNECTION

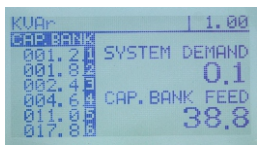


DISPLAY PAGE

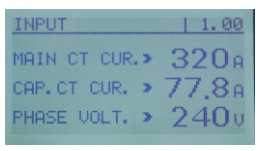
Page 1: PF Page



Page 2: Kvar Page

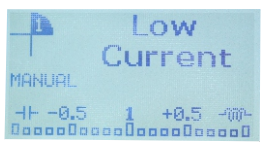


Page 3: Input Page



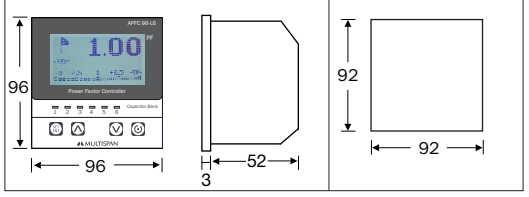
Page 4

When Secondary current of main CT is Less than Min operating curent



MECHANICAL INSTALLATION

Outline Dimension (mm)	Panel Cutout Dimension (mm)



KEY OPERATION

FUNCTION	PRESS KEY
OPERATOR MODE	
To change Home page	
To Keep Page as Home page	Press for 5 sec
To Enter in Parameter setting	SET ENT Press for 3 sec
PARAMETER SETTING MODE	
To Set Parameter Value	SET ENT
To Increment parameter value	
To Decrement parameter value	
To Exit from parameter setting	

INSTALLATION GUIDELINES

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

MECHANICAL INSTALLATION GUIDELINES

1. Prepare the panel cutout with proper dimensions as shown 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 byproducts.
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.

MAINTENANCE

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

SAFETY PRECAUTION

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.

If all the equipment is not handled in a manner specified by the manufacturer, it might impair the protection provided by the equipment.

Read complete instructions prior to installation and operation of the unit.

WARNING : Risk of electric shock.

WARNING GUIDELINES

WARNING : Risk of electric shock.

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

WORKING

CONTROL MODE

1) **AUTO :**

- 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-generative power condition detected.No need for external capacitor CT.

2) **MANUAL :**

- 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. No need for external capacitor CT.

3) **ROTATIONAL :**

- 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. No need for external capacitor CT.

4) **KVAR RUN :**

- This parameter is indicator switching KVAR base, If we have not use external capacitor CT we can put all rated steps Value Manually.

5) **KVAR TUNE :**

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

BASIC PARAMETER

1) **TARGET PF :**

- 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. (Range : +1.00 to -0.99)

2) **SCAN TIME :**

- 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. (Range : 1 to 999 sec)

CAPACITOR BANK KVAR SELECT

- You Can Manually enter capacitor bank kvar value for each step. (Range: 000.0 to 100.0)

OTHER SETTING

1) **HYSTERESIS :**

- It means create band for working of P.F Relay (Range :0.01 to 0.03)

Example for hysteresis:

If set hysteresis is 0.01 & Set CosØ is 1.00.

Hysteresis band around be 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) & current P.F is between this band then APFC will hold last relay status.

2) **MINIMUM OPERATING CURRENT :**

Example :

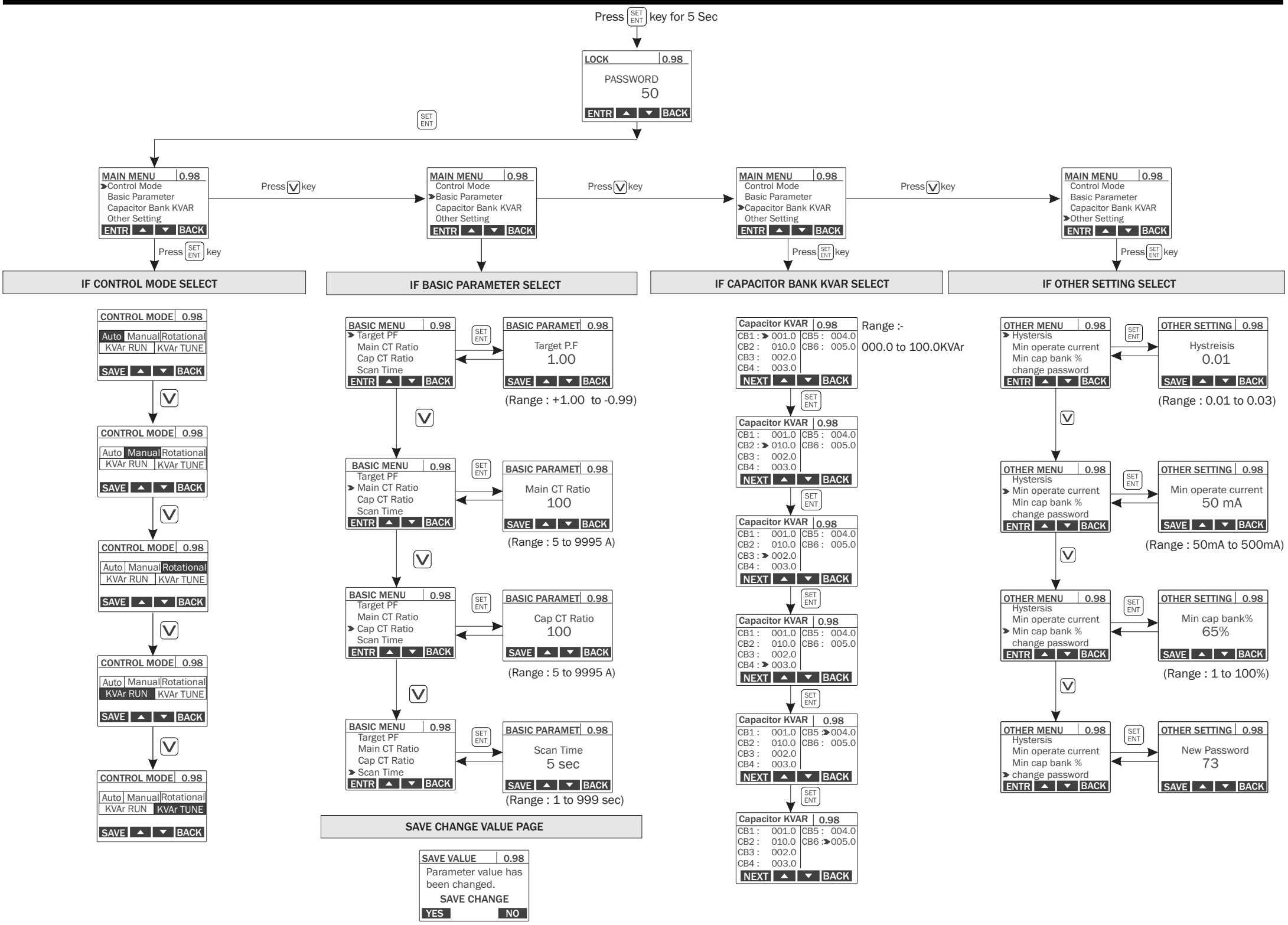
- Minimum Current is set to 100mA ,then in case of secondary CT current is less then 100mA then APFC Relay Will stop there working. (Range : 50mA to 500mA)

3) **MINIMUM CAPACITOR BANK PERCENTAGE :**

Example :

- This Parameter is Applicable only for KVAR mode.
- Minimum Bank size of capacitor is 5 KVAR. if we set 50% of minimum capacitor bank Percentage ,then in case of under 2.5 KVAR, capacitor bank will not working. (Range : 1 to 100%)

PARAMETER SETTING



SAVE CHANGE VALUE PAGE

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