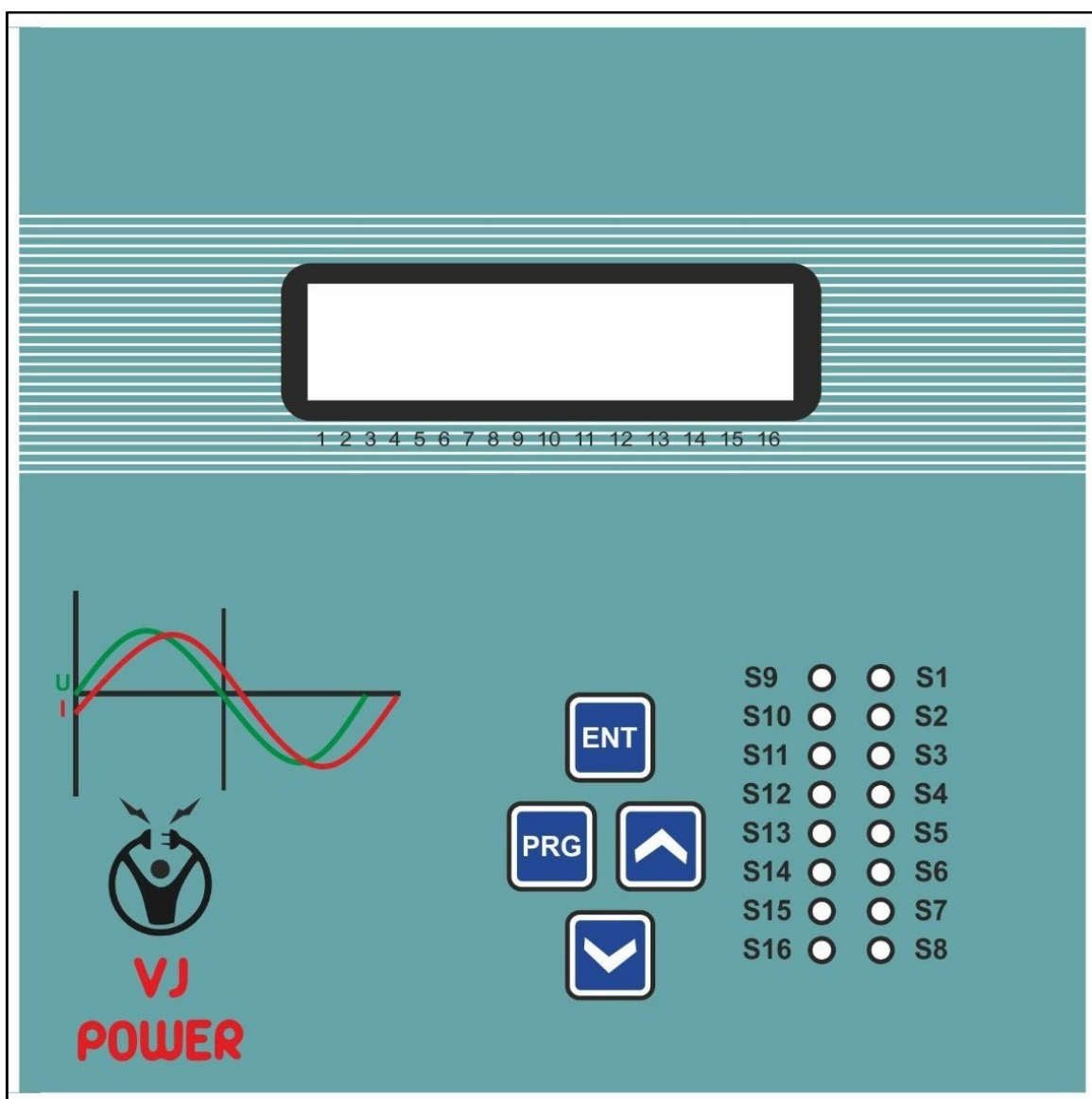


Power Factor Controller For Contactor Switching Application

OPERATION MANUAL



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Features

- Measurements are with Class-1 accuracy.
- Advance Automatic synchronization feature. It is capable of giving correct results even for wrong connections at CT terminals (& also wrong polarity of CTs).
- Load V,I and THD measurement .
- Mode for switching:
 - Un-equal (user defined)
- Capable of doing reactive power measurements on every cycle of the mains waveform.
- Standard 144 X 144 cabinet for panel door flush mounting.
- Serial communication through standard Dedicated protocols.
- One RS-232 communication port is optional.
- Two months of data logging is possible. data in the form of *Hourly Records & Fault Records*– recording all electrical values.
- Event Protections :
 - Over/under Voltage(OV/UV)
 - Over/Under frequency (OF/UF)
 - Under load(UL).
 - Over Current (OC).
 - Over Temperature (OT).
 - Harmonics Fault.

User can configure some of these events for different conditions like:-Indicate, Disable, Trigger(Capacitor) Off, Fast OFF. etc.

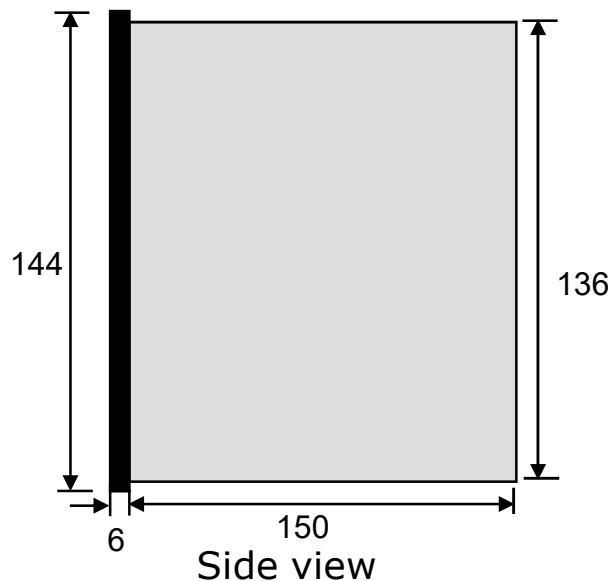
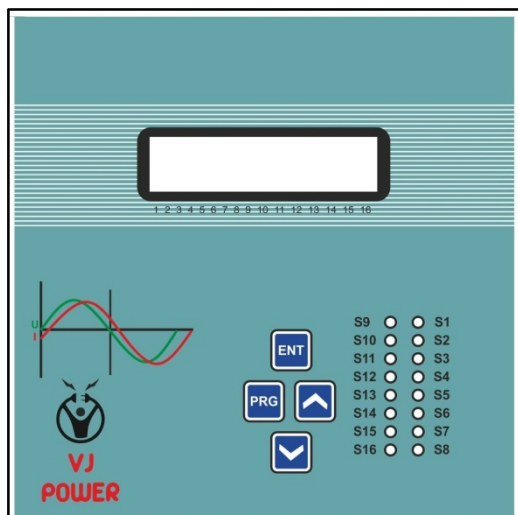
- Warnings :
 - Battery Low Indication(BL)
 - Out of Bank (Insufficient Capacity)
 - Current Over-Load on transformer
 - Battery Fail (BF)
 - over harmonics current (IH)
 - Over harmonics voltage(VH)

Specifications

- Measurement Accuracy: Class 1.
- Feed-back Voltage: Nominal 254 V (L-N), 3-Phase, 4-Wire configuration.
- Current input: 5Amp.
- Auxiliary Supply: 240 (Line-neutral)(+20% to -30%).
- Correction time:
Selectable in seconds from 1sec. to 2500sec.
- Output commands: 4.
(Isolated 'NO' contacts of rating 5Amp ac / 250Vac).
- Dedicated RS232 port is provided.
- Operating temperature: 0 to 65°C.
- RS-232 baud rate selectable up to 38.4kBPS.
- Class-1 measurement operating temperature: 0 to 50°C.
- Storage temperature: 0 to +70°C.
- Humidity: 0 to 95%.
- Supply frequency: 50 Hz.

Mechanical dimensions:

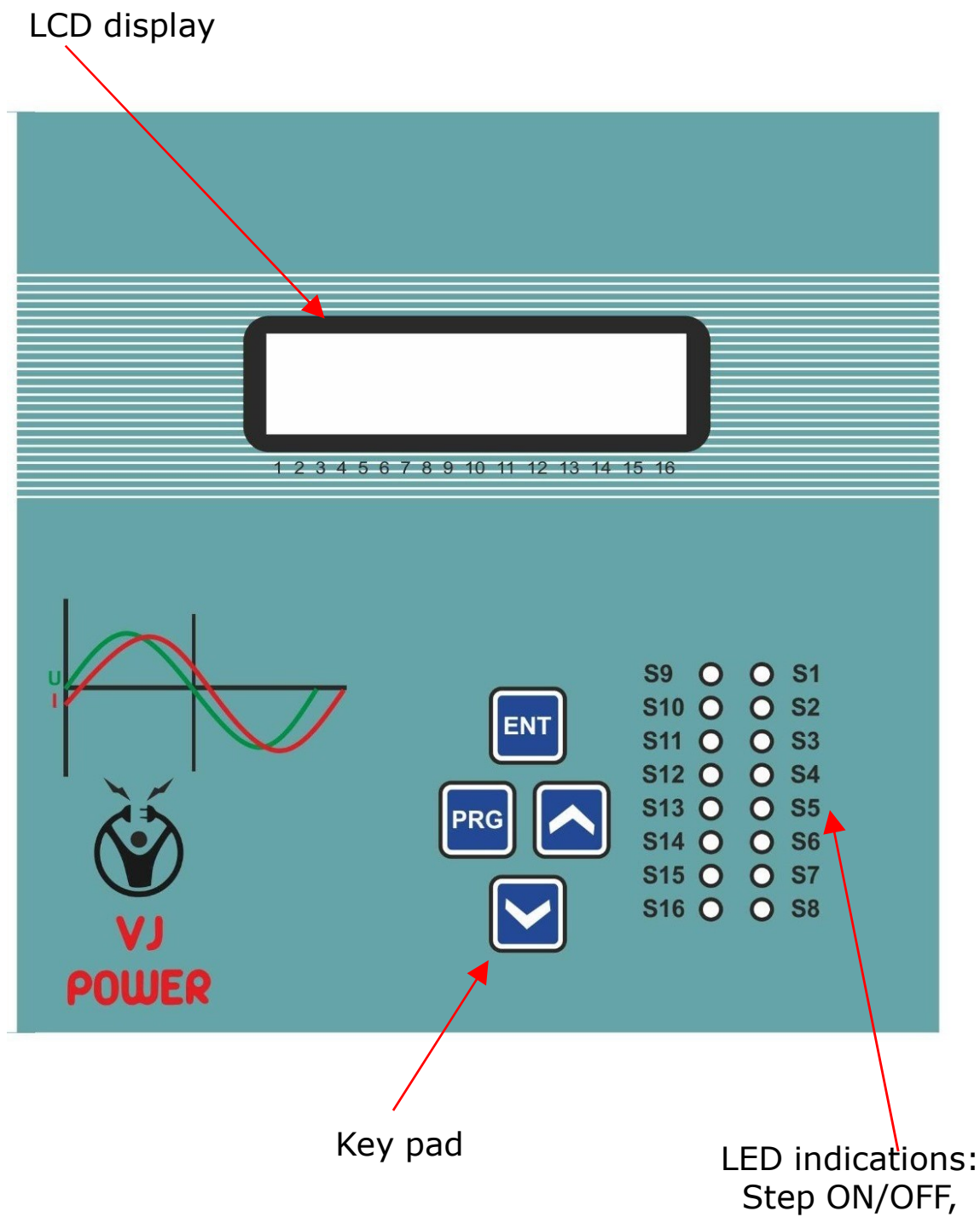
All Dimensions given are in mm.



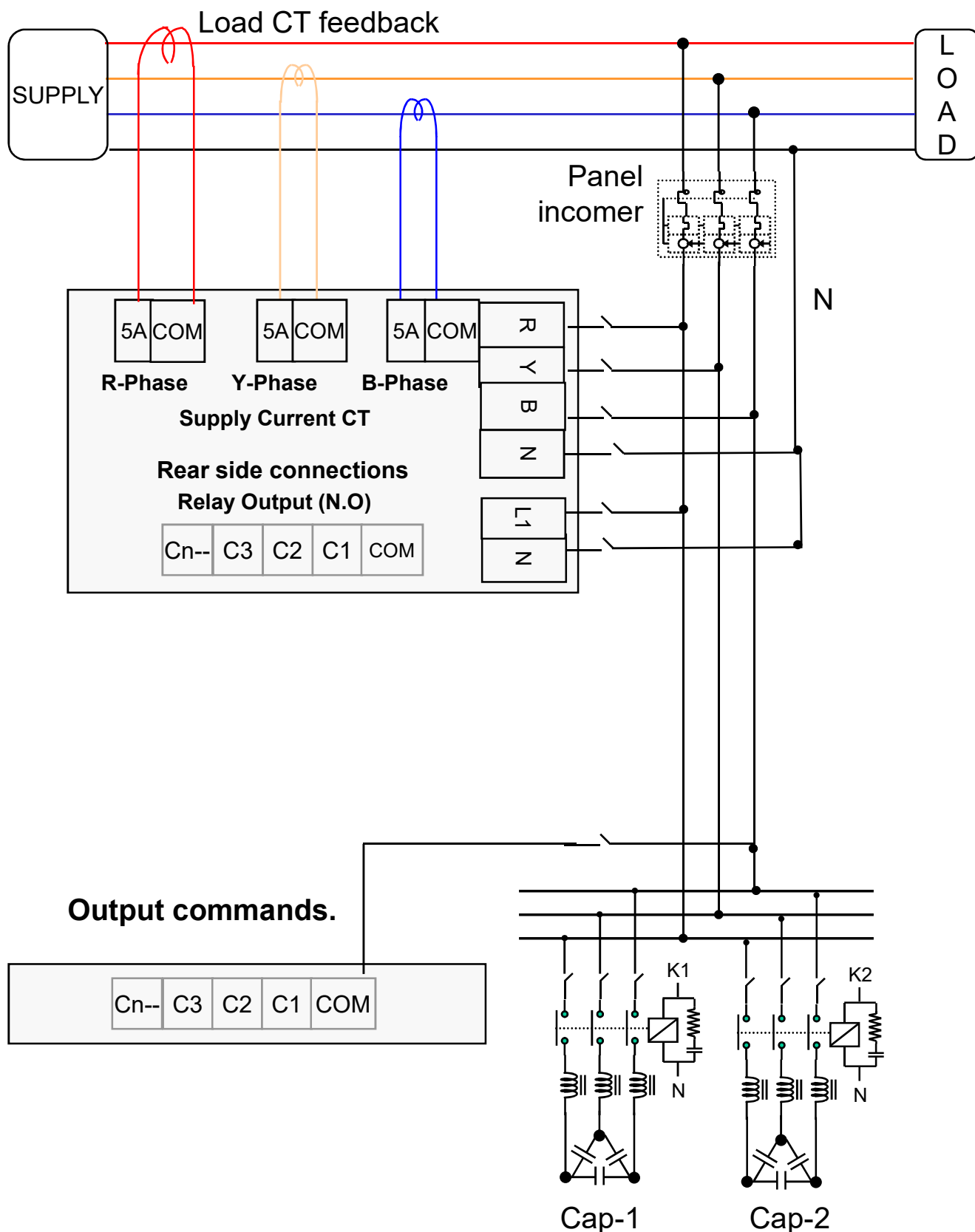
Recommended size for cutout on panel door is 137X 137.
Maximum weight: (with clamps and terminals) = 1.1 kg(approx.).

Front fascia

Keyboard, LCD display and LED indications



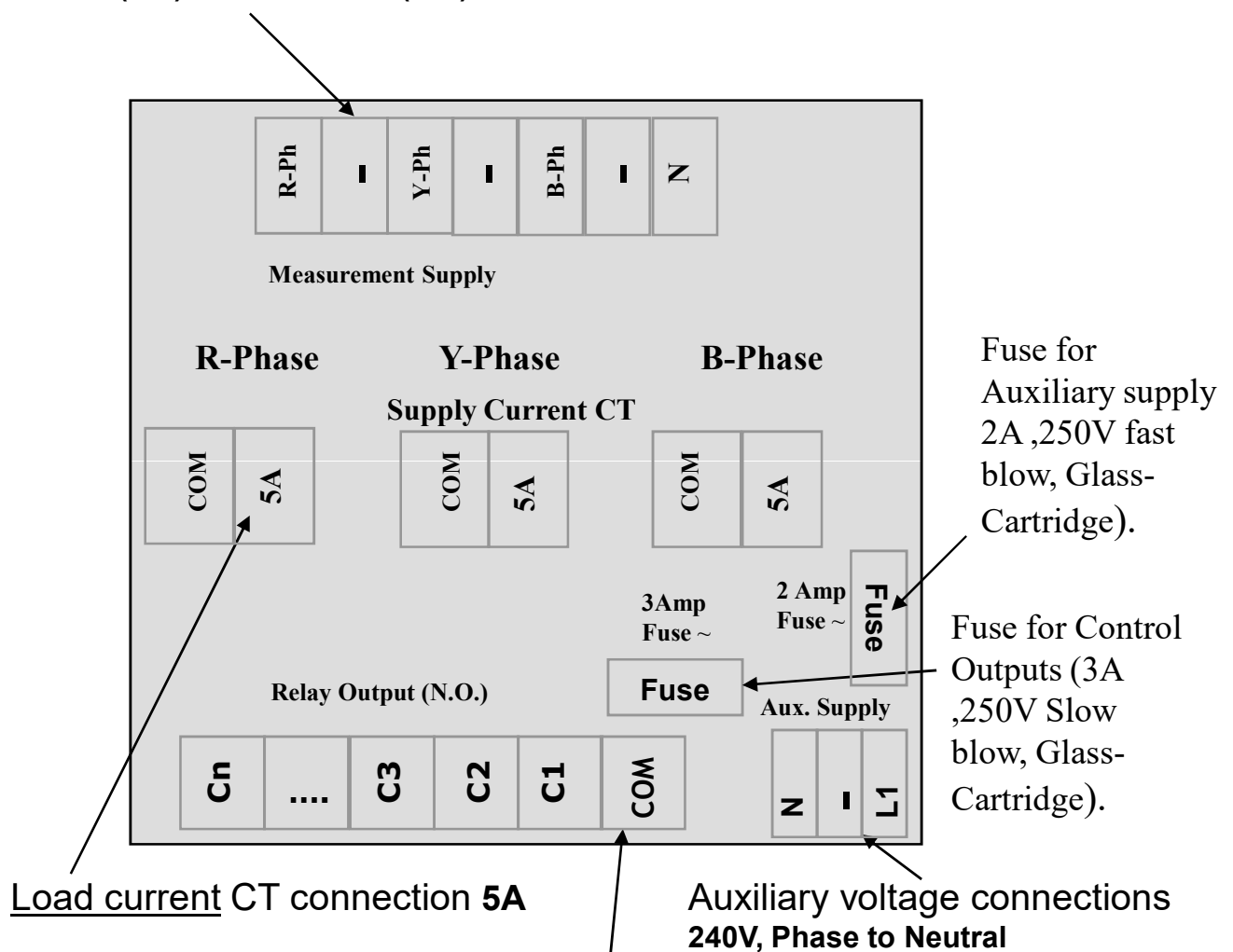
Typical wiring diagram for PF correction



Rear side terminals – measurement voltages, measurement currents, auxiliary voltage.

Measurement Voltage

490(L-L) max. and 290V(L-N) max



Front Screen –

PF=0.999 Lg A OK

— — —

First line indicates the PF value, inductive / capacitive PF, mode of operation and fault / OK status:

“PF = 0.999” indicates the overall PF of the system.

“Lg” or “Ld” indicates if this PF is inductive or capacitive respectively.

“A” or “M” indicates the Auto and Manual mode of operation respectively.

“OK” (blinking) indicates status of the system is healthy.

Last two characters represent one of the following status:

OK	Controller status is okay
ZV	Measurement voltage is absent
ZC	Zero Current
BL	Battery Low
NV	NV RAM error
VH/IH	Voltage/Current Harmonics
OB	Out of bank (under compensation)

PD	Power Fail
UL	Under Load
OC	Over Current
OT	Over internal temperature
UF	Under frequency
OF	Over frequency
UV	Under voltage
OV	Over voltage
CB	Capacitor Banks faulty

Second line indicates the status of each capacitor bank by symbols. The status is also shown by LEDs provided on the front fascia. Following table gives the description of symbols & LEDs.

Symbol	LED	Description
⊕	●	Capacitor is in ON state.
—	○	Capacitor is in OFF state.
⊕	●	Capacitor is declared as FIXED & is in ON state.
⊕	●	Cap. is declared FAULTY.
X	●	Cap. is in Discharging. (blinking the red LED).
D	●	Blinking Green LED(controller is in healthy condition).

Front fascia – LCD screen

Example of a typical LCD display screen is show below:

PF=0.990 Lg A OK
⚡⚡_XD

Meaning of this screen contents:

Total no. of banks connected is .

Power Factor at Load sensing CT is 0.990 'Lg' Inductive. ('Ld' defines Capacitive).

Unit is operating in 'A' Auto mode. ('M' defines Manual mode)

Total number of banks that are operational are Five.

Bank no. 1 is declared as fixed and is in ON condition.

Bank no. 2 is ON condition.

Bank no. 3 is in off state. Ready to be switched on.

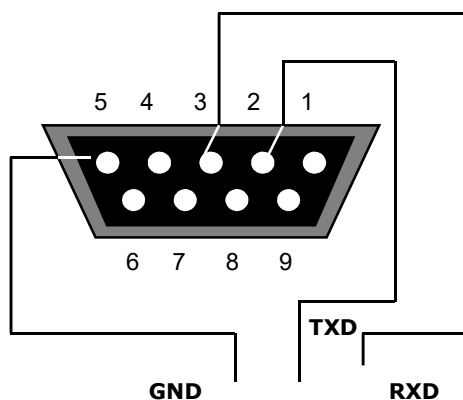
Bank no. 4 is declared as faulty.

Bank no. 5 is in discharging state.

RS232 communication port connection

This port is used for downloading of data logged in the controller memory. The protocol used is RS232. Following gives the pin configuration: This is provided at downside of controller.

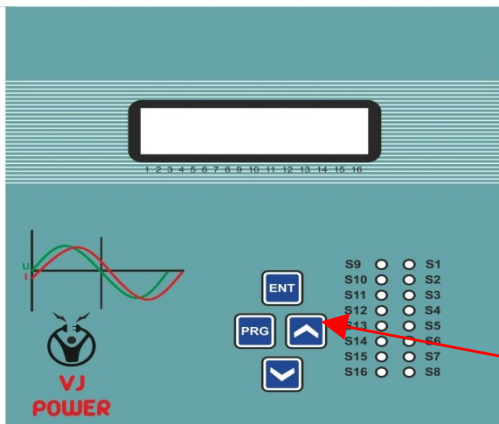
Pin	PC side	Connect	APFC
1	NC		
2	RXD		TXD
3	TXD		RXD
4			
5	GND		GND
6			
7	NC		
8	NC		
9	NC		



RS232, 9 pin D type
connector

Keyboard

Keyboard with soft touch keys are provided on the front fascia of the controller. The various keys are:



Keyboard

Operating keys:

The 4 keys are used for following operations:

UP: to increment numbers; or to go up a menu item;

DN: to decrement numbers; or to go down a menu item;

ENT: Enter key. Used to enter a menu or sub-menu;

Prg(Program): To change the mode of operation.

Cursor Shift:- If user enter into programming mode & change the parameters then by default cursor position remains on extreme right side of display. to move the cursor, user can press Prg key so that cursor moves from right to left. If cursor reaches to extreme left then again press "Prg" to move from extreme left to extreme right . UP and DOWN key used to increase or decrease values/parameters.

Step a) To save the parameters press ENT key ,Which will stop the blinking of cursor & then press "Prg" key to come out from programming mode. Once user comes out of programming mode ,controller will automatically saves the parameters.

To change the contrast press "Ent" in default display screen mode. Contrast only change by pressing "Ent" key when there is default screen on controller display.

Once the contrast increase to maximum value and again "Ent" key is pressed then contrast will reset to its minimum default value .The contrast can further increase by pressing "Ent" key . To save contrast value go into programming menu ,Press "Ent" key & repeat above step a).

Display of various electrical parameters:

Values of various electrical parameters can be viewed by using UP / DN keys & then pressing ENT key. To exit a sub-menu press MODE.

PF=0.990 Lg A OK

⚡ _ _ _ XD

Realtime Electrical Values



Average Voltage
00000.0 V (L-N)
Average Current
0000.0 A
Active Power
000000.0 KW
Reactive Power
000000.0 KVAR
Apparent Power
000000.0 KVA
Total C-Kvar
0000.0
Frequency
00.0 Hz
Max Voltage
0000.0
Max Current
0000.0
Max Kw
0000.0
Max KVAR
0000.0
Max KVA
0000.0

This is factory set default display screen gives information of PF, mode(Auto/Manual), number of banks & controller status.

Electrical Val contains Following Electrical parameters – Average Voltage, Average Current, Total Active Power (kW), Total Reactive Power (kVAR) , Total Apperent Power (kVA) frequency, & Max V,I,KW,KVA,KVAR.

**Realtime
Per-Phase RMS**

R-Phase Voltage
00000.0 V (L-N)
Y-Phase Voltage
00000.0 V (L-N)
B-Phase Voltage
00000.0 V (L-N)
R-Phase Current
0000.0 A
Y-Phase Current
0000.0 A
B-Phase Current
0000.0 A

It gives Per Phase RMS values of voltage & current of each phase.



**Realtime
Electrical Power**

R-Phase PF
1.000 IND
Y-Phase PF
1.000 IND
B-Phase PF
1.000 IND
R-Phase KW
000000.0
Y-Phase KW
000000.0
B-Phase KW
000000.0
R-Phase KVAR
000000.0
Y-Phase KVAR
000000.0

It gives Various electrical Power parameters which are as follows :
PF of each phase , per phase KW,
per phase KVAR and per phase KVA.

B-Phase KVAR
000000.0
R-Phase KVA
000000.0
Y-Phase KVA
000000.0
B-Phase KVA
000000.0

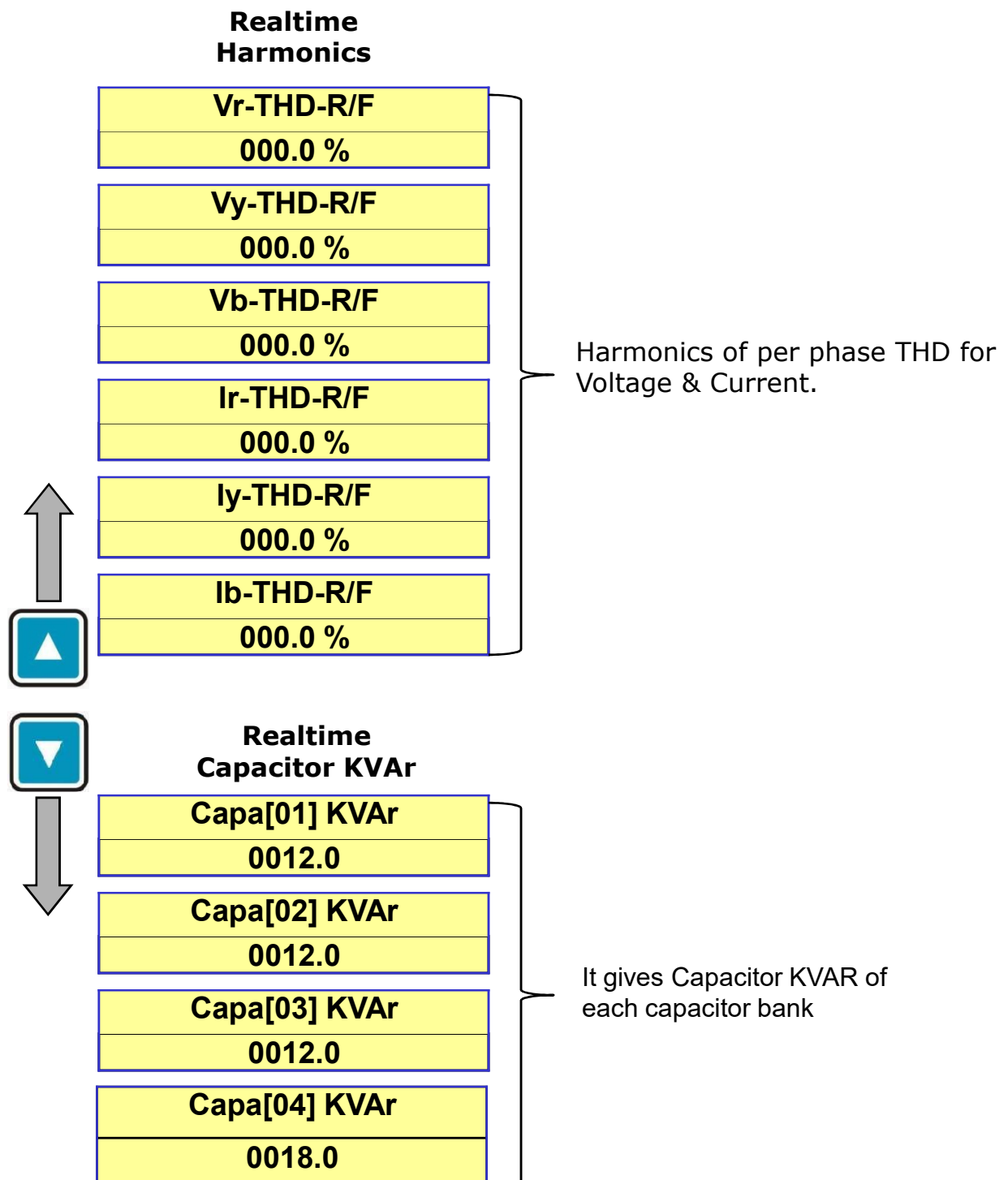
It gives Various electrical Power parameters which are as follows :
PF of each phase , per phase KW,
per phase KVAR and per phase KVA.



Display Energy	
KWH	000000000.0
IND KVARH	0000000.000
CAP KVARH	0000000.000
KVAH	000000000.0
CKVARH	0000000.000

It gives energy counter values. like
KWH, Inductive KVARH.

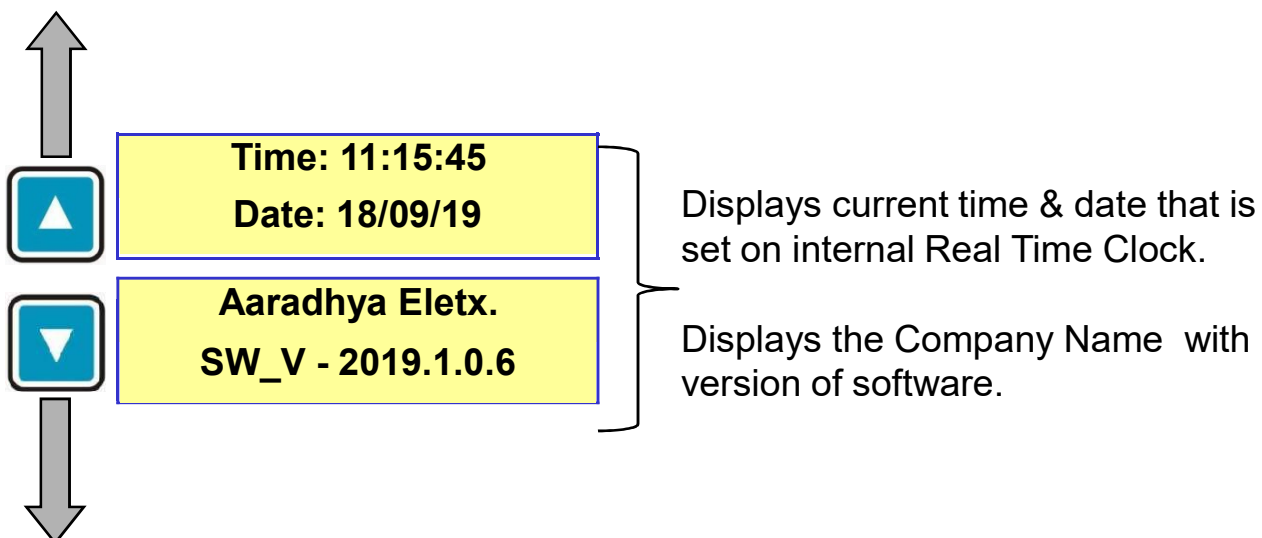
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continued.....

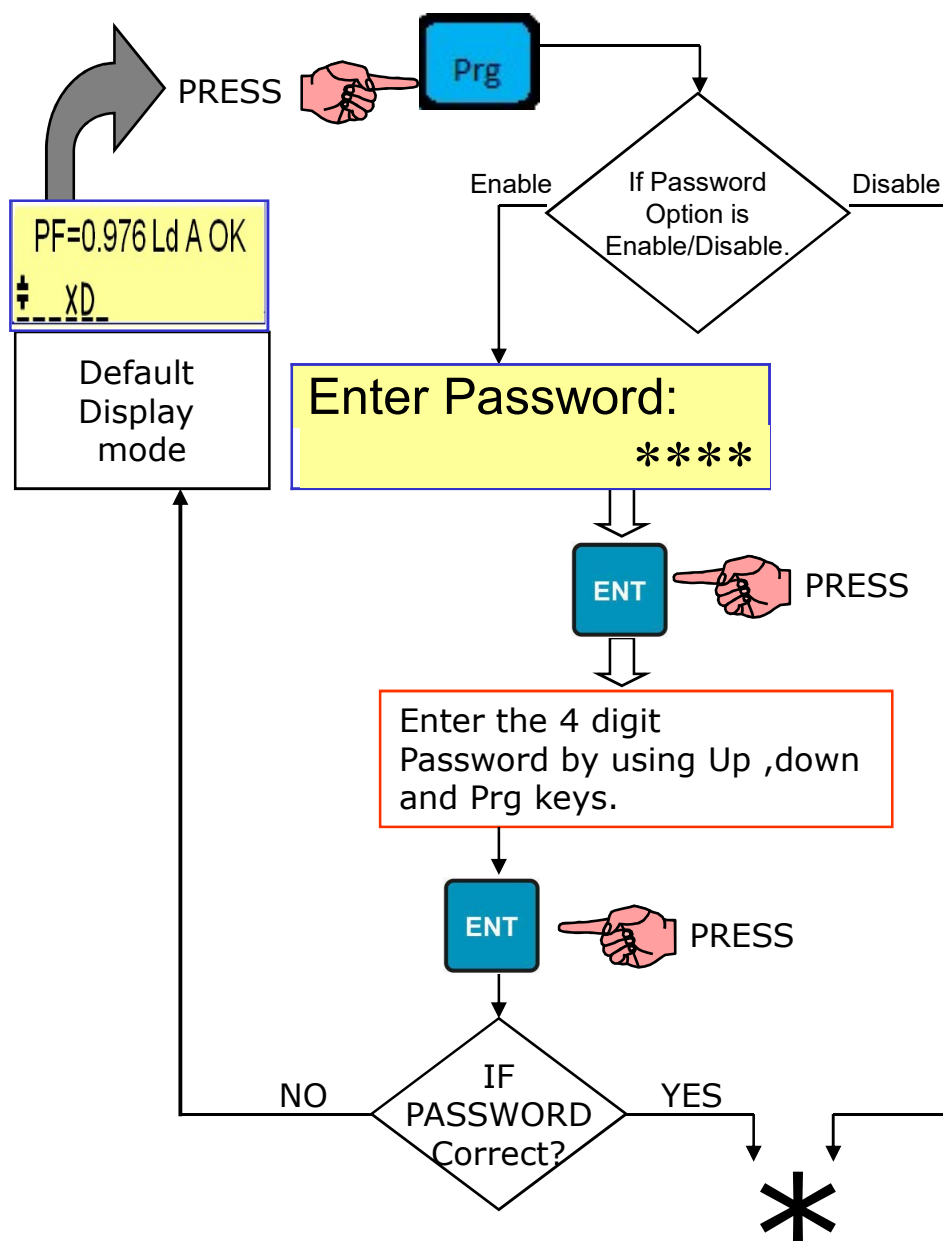
**Realtime
Aux-Function**

INT-Temperature	}	Internal temperature of Power Factor controller unit.
30 Deg C		

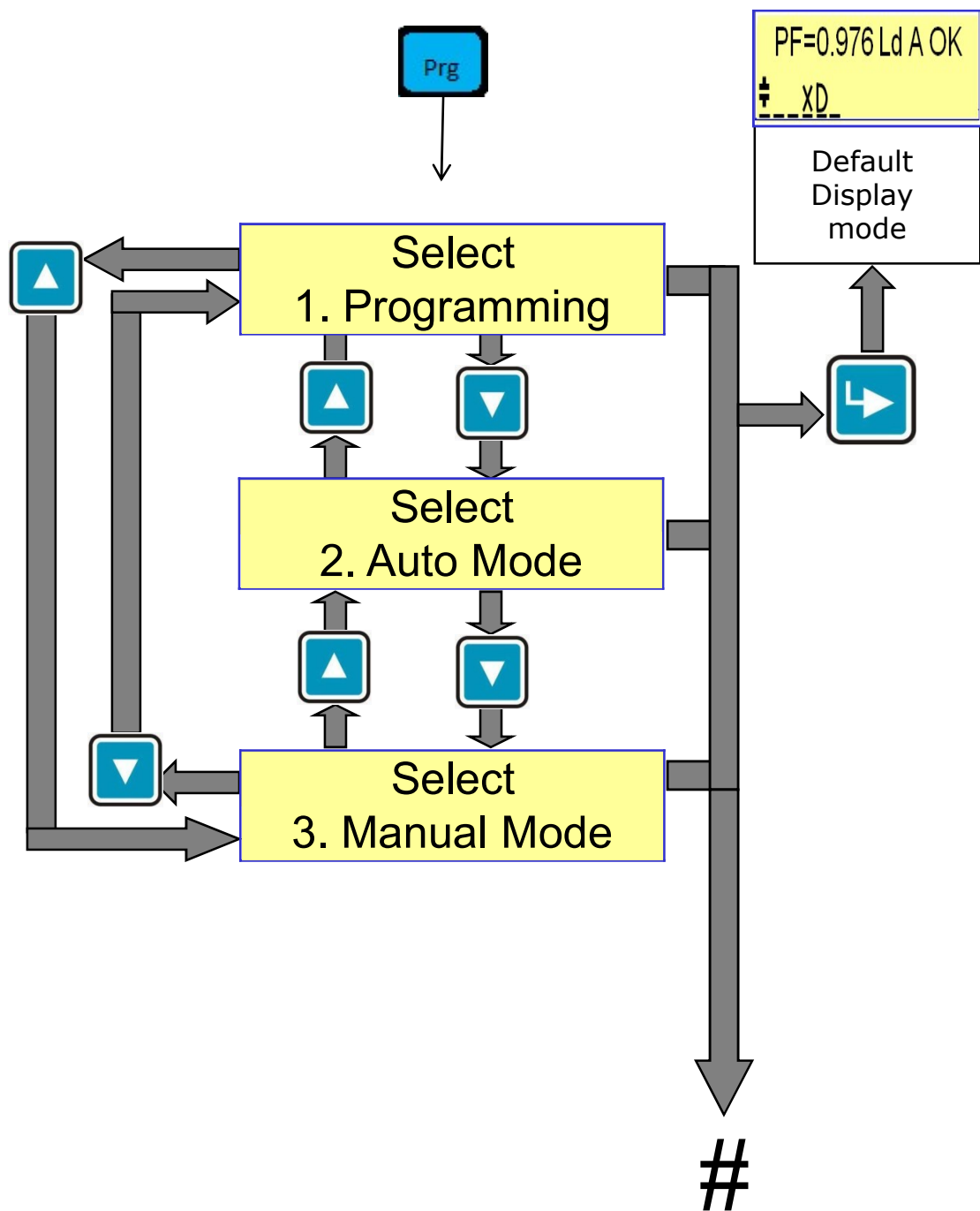


Method for keyboard / display usage

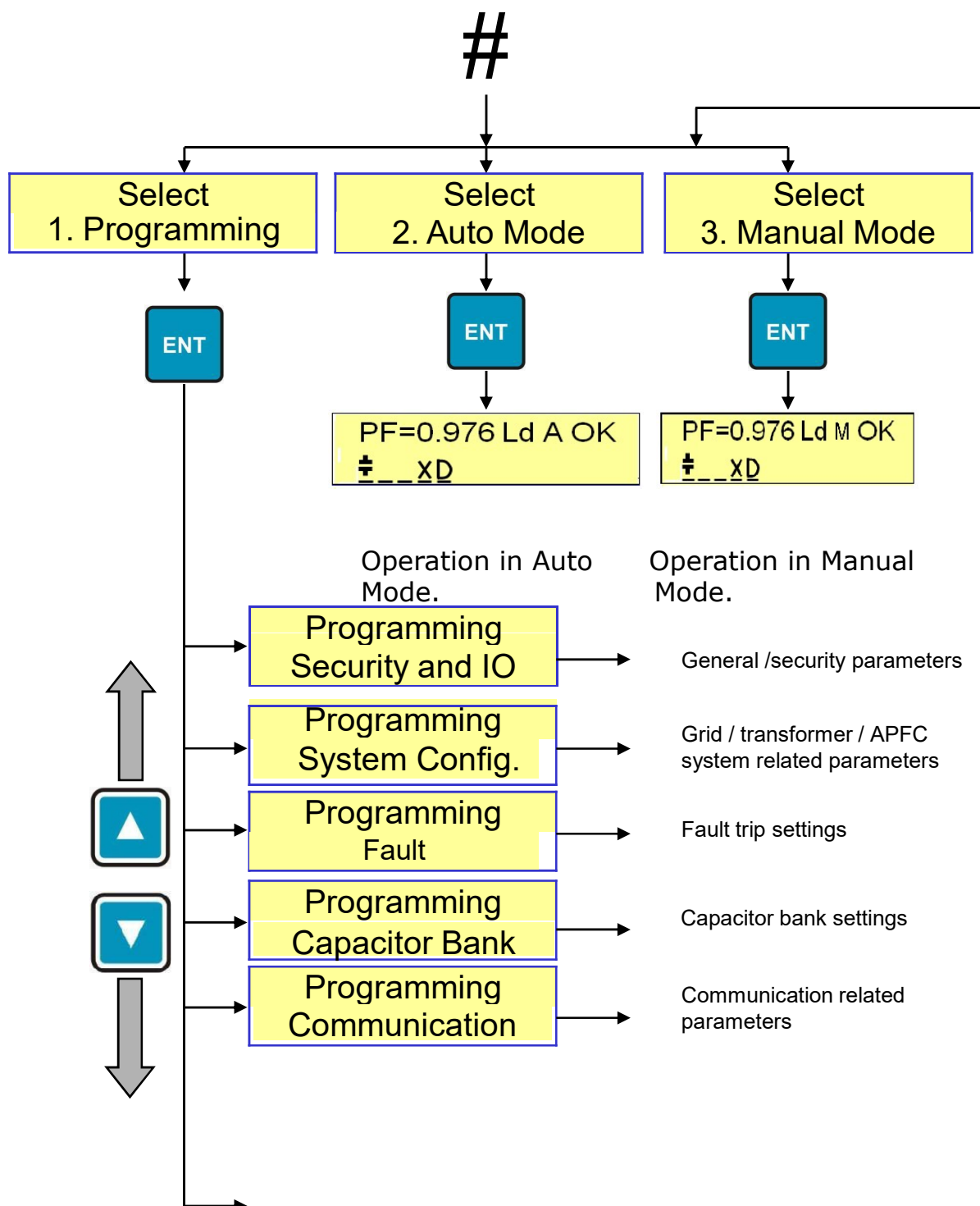
Flowchart for entering into different modes:



Continued on next page



Continued on next page



Display operations

Mode Selection

There are two modes of operation (Manual and Auto) and one mode for data entry (Select Programming).

Press the PROGRAM key. Enter password (if enabled) by using up,down and Prg keys. Press ENTER Now using up and down keys, select the Mode of operation:

- **AUTO Mode**
- **MANUAL Mode**
- **PROGRAMMING**

Then press ENTER to enter the specific mode.

Auto Mode:For functioning in automatic compensation.

Manual Mode:

Pressing ENTER button on this screen will put APFC in Manual mode. This mode would continue to run till it is purposefully changed or power down occurs.

This mode is normally used to perform the operations like:

- Resetting of faulty banks to healthy status.
 - Checking the Capacitor banks by turning them ON/OFF.
 - Declaring specific bank/s faulty. Masking of the banks so that once auto mode is selected, these faulty declared banks would not be used for PF correction.
- **In manual mode if no key is press then for more than 5 minutes, the controller goes into AUTO mode.**

For Declaring banks faulty or Resetting faulty banks:

In (M)manual mode default screen press ENTER key.

The cursor above bank 1 will start blinking. Use "prg" keys to select the specific bank. Then use down key to declare it faulty. To reset the faulty bank, bring the blinking cursor to that bank and use down key again to declare that bank as healthy.

After any of these operations press ENTER key so that cursor stops blinking. **To save the status on permanent basis press "Ent" key to stop blinking of cursor and go into programming menu and press Enter and come out from programming menu which will automatically saves the status.** After saving the settings, the unit will jump back to default Auto mode.

...continued.

For Testing banks with manual ON / OFF commands:

Press ENTER key, the cursor will start blinking. Use "prg" keys to select the specific bank/s that are healthy and use ▲ key to turn ON and use ▼ key to turn OFF that capacitor banks. Capacitor bank will not get switched ON if there are system fault.(like ZV,UV,OV etc.)

To come out of Manual ON/OFF edit mode, press ENTER key so that cursor stops blinking.

Programming:

This mode is used to carry out system settings. In this mode various system settings can be carried out. To do the same, use the ▲ ▼ keys and select the type of parameters to be edited. The types of parameters that can be edited are:

Security & IO	: For general settings.
System Config.	: Transformer / APFC system related settings.
Fault	: Fault settings.
Capacitor Bank	: Capacitor bank step settings.
Communication	: Communication parameters.
Switching counter	: Capacitors switching counters.

After selecting the type, press ENTER to enter the sub-menu of that specific type.

The details of these sub-menus for every type is given further. You can edit all these sub-menu settings by using the ENTER, ▲, ▼, & "Prg" keys.

To come out of the sub-menu press "PRG" (PROGRAM) key once. This will automatically stores the edited parameters permanently,

Note: In the Programming area, if no keys are pressed for more than two minutes, the default display screen comes on and the changes done till that time are discarded.

Programming Security & IO

Password Disable	: 0
Modify password	: 0000
THD To Display F-THD	: 1
Clear Energy Cnt No	: 0
REVERSE_CT_R_PH Disable	: 0
REVERSE_CT_Y_PH Disable	: 0
REVERSE_CT_B_PH Disable	: 0
CT_5A_Selection Disable	: 0

Password: Enable or disable the password. Enable=1, Disable=0.

Modify password: Set a new password (4-digit).

THD To Display:- It is use to select F-THD or R-THD .1=F-THD,0 =R-THD.

Clear Energy Cnt:- It used to reset the Energy Counter's.

REVERSE CT R PH:- This parameter is useful to revere Current direction instead of physically reversing the CT terminals..same is for Y and B phase parameters.

CT 5A Selection:- This parameter is use to select the external CT 1A or 5A.

Programming System Config

Load CT Primary Mains	: 1000
PF upper L: Mains [CAP:0]	0.999
PF upper L: Mains CAP:0	[0.999]
PF lower L: Mains [IND:1]	0.990
PF lower L: Mains IND:1	[0.990]

Load CT Primary Mains: This parameter use to set the CT ration.

Power factor limits: Two PF limits can be set for PF correction (lower limit & upper limit). Each of these can be set either inductive or capacitive.

Programming Fault

Over Voltage Flt Fast Off : 4
Over Voltage Flt Limit(%) : 113
Over Voltage Flt Resume (%): 110
Under Volt Flt Fast Off : 4
Under Volt Flt Limit (%) : 068
Under Volt Flt Resume (%) :071
Under Ld. KW Flt Off Cap : 2
Under Load Flt Limit (%) : 002
Under Load Flt Resume (%) :003
Over Current Indicate : 1
Over Current Limit (%) : 100
Over Current Resume (%) :095

For most of the faults defined here the options available are as follows:

0=Disable.

1=Indicative. Flash a fault message.

2=Off Step. Switch off non-fixed steps one by one.

3=Fixed Off. Switch off all fixed step.

4=Fast Off Step. Switch off all steps in one shot.

For all the faults, normally two limits are defined. One is Detection Limit and other is Resume Limit. If detection limit is exceeded any one of the above action is performed as set by the user.

Similarly if the fault limit drops below the resume limit, then the action is deactivated.

Over voltage fault: As the name suggests it is for over voltage condition.

Under voltage fault: For under voltage.

Under load kW fault: The value here is set as the percentage of Maximum rated kW. This is useful in case of banks are put in circuit to take care of no-load compensation.

Over Current: As the name suggests it is for over Current condition.

Temperature Flt Fast Off: 4

Temperature Upper Limit: 70

Temperature Lower Limit: 60

Internal Temperature Fault: The unit monitors temperature inside the housing. This temperature can go up either due to ambient within the APFC panel or due to component failure within APFC. Set upper limit to trip and lower limit to resume.

Harmonic Overld. Off Fix : 3

Voltage THD Flt. Limit (%) : 5

Voltage THD Flt. Resume(%) : 2

Current THD Flt. Limit(%) : 10

Current THD Flt. resume(%) : 5

HARMONICS Time. CYCLE : 180
--

Cap Health Check Disable : 0

Harmonic Overload: As the name suggest it is a harmonic overload on the line.

Voltage THD Flt Limit(%):-This is Limit for voltage THD.

Voltage THD Flt Resume(%):-This is Resume limit for voltage THD fault.

Current THD Flt Limit(%):-This is Limit for Current THD.

Current THD Flt Resume(%):-This is Resume limit for current THD fault.

HARMONICS Time Cycle:- V-THD or I-THD fault gets reset(cleared)after this time (recommended value= 180 seconds).

Cap Health Check:- This can be enable or disable. This computes the healthiness of capacitor bank.

Cap. KVAR Fault Tolerance: 20%
Cap.KW Fault Tolerance: 0.1 %
STEP KVAR LIMIT(%): 002
Neutral fault Set Value: 09

Cap.KVAR fault: This is tolerance limit of capacitor step KVAR for deciding the healthiness of it.

Cap.KW Fault: This is percentage tolerance limit for load variation when healthiness of capacitor step decided.

STEP KVAR LIMIT: If Display step kvar is within this limit then PF Controller will displays rated(defined) step kvar for each capacitor bank.

Neutral Fault Set value:- This is limit used for internal software. The percentage of unbalance with respect to neutral floating is computed.

Programming Capacitor Bank

Total Capacitors : 05
Correction Perio. Seconds :00120
Discharge Period Seconds :00060
Fix-Capacitor -----
Capacitor volt (L-L): 00440V
Capacitor [1] kVAr : 012
Capacitor [2] kVAr : 012
Capacitor [3] kVAr : 012
Capacitor [4] kVAr : 018

Total Capacitors: Defines the number of Capacitors connected in panel.

Correction time: Time between two consecutive kVAr compensations.

Discharge Time: Time defined here is the time for discharge of the capacitors ,so that they can be turned ON again.

Fix-bank setting: Defines the banks that are to be declared as fixed.

Capacitor voltage: The line-line voltage at which the kVAr is defined.

Capacitor kVAr [--]: capacitor KVAR for each step is defined .Default values of capacitor KVAR are depends on the panel KVAR setting. User can edit these values in edit KVAR mode.

Programming Communication

PFC Unit ID : 00001
COMM FEATURE Modbus RTU 2
Baud Rate 38400 : 3
Set Time 09:58:40
Set Date 18:09:13
Initialize RTC No : 0
Clear NVRAM No : 0

Unit ID: Value can be 00000 to 61000. Default value 00001. This ID is used for serial communication on RS232.

To select the feature Modbus for data logging

RS-232 port will be used for data logging feature. Baud rate is selectable up 38.5Kbps.

Option 1:- GSM/GPRS
Option 2 :-ModbusRTU.

Time: Defines the time setting.

Date: Defines the date setting.

Initialize RTC: 0=No; 1=Yes. If 'yes' it initializes the real time clock.

Clear NVRAM: 0=No; 1=Yes. Defining Yes clears the NVRAM (real time clock). This is generally used to clear the NVRAM Check sum fault. Press Save after setting this parameter. After clearing NVRAM all Energy counters get reset ie. KWH,KVAH,LEAD/LAG KVARH & CKVARH = 000000.00.

Note:

Please note the following events:

(1) If there is no current feedback given to the APFC unit or the measured current is below 0.9% of rated load current in any one of the phases then, APFC displays following event on LCD.

PF= 1.000 Ig A ZC
- - - - -

(3) **Neutral fault:** If "Neutral" gets removed from the rear-terminal block of the APFC unit, this is indicated as neutral fault "NF" on the LCD display.

PF= +0.980 A NF
- - - - -

If the neutral connection is given to the APFC then it sense automatically & clears the "NF " fault.

If there is neutral fault, all the capacitor banks are switched off to protect them.

(4) **Battery Low** :If the internal Lithium coin Battery Voltage of nominal 3V drops below 2.2 V then the controller will flash "BatteryLow" (BL) message on the Default screen display (in a blinking state with certain delay) until the battery is replaced by a new healthy battery. Please note that even when the "Battery Low(BL)" message is being flashed on the LCD display the user can still operate the keypad.

It is essential to have the battery operational to maintain the Real Time Clock and Calendar information specifically during Source supply power down condition. If the Battery Voltage falls below certain limit the RTC will stop functioning. All Data Logging operations are prohibited if the RTC (Real Time Clock) is Stopped even momentarily.

APFC Controller fault indications and fault actions

Sr.No.	Status on LCD Display	Status / Fault Description	Programmable Options provided on Fault	Fault description	Action taken by APFC controller	Status in Data Logging
			Enable / Disable / Indicative / Fast OFF/Fixed OFF/Cap OFF		If Enabled	Yes / No
1	OK	Controller status is OK				Yes
2	ZV	Zero Voltage	Not Programmable	If voltage absent in all three phases	Fast OFF	Yes
3	OV	Over voltage	Programmable	If voltage exceeds than defined limit in any one of the 3 P-N values	Fast OFF	Yes
4	UV	Under Voltage	programmable	If voltage reduces than defined limit in any one of the 3 P-N values	Fast OFF	Yes
5	VH	Voltage over-harmonics THD%	Enable / Disable	If V-THD exceeds than defined limit , in any one of the 3 P-N values	OFF Fix	Yes
6	IH	Current over-harmonics THD%	Enable / Disable	If I-THD exceeds than defined limit, in any one of the 3 P-N values	OFF Fix	Yes
7	NV	Battery for RTC faulty	Not programmable	Battery checked as unusable	Stops data logging	Yes
8	ZC	Zero current	Not programmable	Load Current less than 0.9% in any one of the three phases	Fast OFF	Yes
9	OB	Out of Banks	Enable	Insufficient bank kvar	Indicative	Yes
10	OT	Over temperature	Fast off / Disable	Indicates temperature inside the micro-controller	Fast OFF	Yes
11	AS	Auto synchronization	Enable / Disable	Auto synchronization pending	---	NO
12	UF	Under frequency	Not programmable	If reduces below 47Hz (limit)	Fast OFF	Yes
13	OF	Over frequency	Not programmable	If exceeds 53Hz (limit)	Fast OFF	Yes
14	NF	Neutral fault	Not programmable	Neutral is removed from the rear side of BR 5100	Fast OFF	Yes
15	UL	Under Load	Enable / Disable	If KW reduces than defined limit, in any one of the 3 P-N values	OFF Cap. (only normal banks off)	Yes
16	OC	Over current	Enable / Disable	Load Current exceeds than defined limit, in any one of the 3 P-N values	Indicative	Yes
17	Battery Fault	Low battery(BF fail)	Not programmable	No action	Indicative	Yes

APFC panel commissioning instructions

Before panel is powered up for the first time:

1. Panel Wiring Check

It is recommended that all connections in the panel is tightened properly and there are no loose connections. Also ensure that the wiring is done as per the wiring diagram. It is recommended that use the end sealing lugs for all the connections.

2. Power Wiring Check

Ensure that the power cables are connected properly from the Panel I/C to the feeder I/C or the transformer bushings. The connection has to be after the Load Feed back CT looking from the Transformer side.

Ensure that the Bus Bars and/or Lugs are clean and free of Dust, Corrosion or Oxidation on the contact sides so that good electrical connection is maintained. The surface area should be flat so as to get maximum contact area.

3. Load Feed Back CT connection

Ensure that the load feed back CT connections are done & tightened properly. Confirm that correct phase CT is connected with the correct phase input terminals. (Even though auto sync is capable of taking care of wrong CT polarities or CT position interchanging, but then on display, the Phase readings may be seen to be interchanged. (May be R-phase reading would be seen in B-phase and vice-versa.

CT connections to be done carefully so as to ensure that the wire does not get open and there is no loose connection.

Loose connection or open CT secondary can result in very high voltages getting developed in the circuit which can damage the CT and also produce high levels of noise in the system.

After the panel is powered up:

- Remove the fuses/switch-off MCBs/MCCBs which are in series with every capacitor bank. Connect supply to the **PF Controller**. Keep the load feedback in shorted condition.
 - Turn ON the supply to the panel and set date/time & various other parameters as per the panel configuration. It is important to understand the meaning of every parameter from the instructions given before and then put the appropriate values in them. Wrong values entered can give the wrong performance of the panel.
 - Once the parameterization is complete, put the PF Controller in Manual mode to check if every bank command is being transmitted to the Contactor switch. The corresponding output should be checked for physical turn ON / OFF of the Contactor.
 - Once all the Capacitor banks are seen to be getting the correct commands, switch off the supply to the panel and replace all the fuses (or turn on MCBs/MCCBs if they are provided instead of fuses). Turn on the panel.
5. Put PF Controller back in Manual mode and turn ON/OFF the individual steps. Use Tong tester (ac current measurement) to check that current in all three phase of the corresponding bank are OK. In case any bank is not giving the desired current, check for capacitor bank healthiness or power circuits.
 6. Keep all the banks in off mode. Remove the short of Load feedback CT. In case KW value is seen as -ve for any phase, CT is with wrong polarity. change CT polarity(If Auto Synchronization is enable then no need to do this step).
 7. Now turn ON the capacitor banks one by one and observe that capacitor current increases as per the rating of the steps on capacitor Current display. Turn ON all the Capacitor banks to see that almost full rated current flows through the capacitors.

Observe panel performance for about 1hrs after commissioning.

Troubleshooting procedure

Nature of Fault	Probable Reason	Action to be taken
Unit does not turn ON.	•Input auxiliary supply not coming. •Input side fuses blown	•Check the input supply to restore. •Check fuses in the unit are OK.
"NV RAM Checksum error" display. <i>OR</i> Corruption of date & time.	In all these three conditions the battery needs to be checked. • Internal Ni-Cd 3.2V D.C. battery used for RTC and NV RAM must be drained down.	• Replace this battery in consultancy with trained personnel.
Some steps are declared as faulty even if they are checked to be OK.	•Individual step health monitoring is enabled and tolerance limits set are too stringent.	•Clear the faulty bank in Manual mode (for detailed Refer page18). Make the step ON in manual mode & measure the current in all 3 phases, if the current reading are balance & within the tolerance limit then increase the tolerance limits. • Inform the details of capacitors to Factory.

Troubleshooting procedure ... continued

Nature of Fault	Probable Reason	Action to be taken
Serial Communication is not working.	• Default Baud rate is 38.5Kbps so HHU/PC side baud rate should be equal to 38.5Kbps. • Unit ID is not set properly. • Serial communication cable connections are not proper.	• Select proper baud rate at HHU/PC side . • Set the unit ID correctly. • Check the serial cable continuity as per the connections given earlier in this manual.
Data logging is not taking place.	• If Battery Health monitoring is enabled and battery is Low/Weak, possibility of battery unhealthy message being displayed. • Improper settings in PC software and/or PC.	• Change the battery with the help of authorized personnel only. • Ensure proper settings in date / time format of PC, and settings in the PC S/W are correct.