

PROGRAMMING MANUAL
APFC-414-1P/APFC-414-144-1P
1 phase 2 wire



APFC-414-1P



APFC-414-144-1P

TECHNICAL SPECIFICATIONS

Parameter	Range
Accuracy	Class 1
Measurement	True RMS 1 phase 2 wire
Input Voltage	19 - 300 VAC LN
Burden	0.2VA Max. per phase
PT ratio	1kv to 100kv / 110v
Input Current	50mA - 6Amps
CT ratio	5 amps to 9999 amps
Burden	0.2VA Max. per phase
Auxiliary Supply	80 - 300V ACDC / 45- 65Hz 230 V AC $\pm 10\%$ Default
Burden	2VA Max
Display resolution	4x1 rows for instantaneous value. Display update in 1sec.
Humidity	5% to 95% non condensing
Operating Temperature	-10°C to +55°C
Storage Temperature	-25°C to +70°C
Relay	5Amp, 250V AC NO contact
Dimension Bezel	96x96mm - 54mm Depth.
Panel Cutout	92 ϕ x 92 ϕ mm.
Mounting	Flush mounting with side clamps.
Dimension Bezel	144x144 - 34mm depth
Panel Cutout	136 x 136mm
Mounting	Flush mounting with side clamps.

MODELS

- ▲ APFC-414: 4, 6relay, 8relay, 10relay, 12relay.
- ▲ APFC-414-144: 6relay, 8relay, 10relay, 12relay, 16relay.

FEATURES

- ▲ 4x1 rows of red led display.
- ▲ Universal Voltage input and current.
- ▲ Capacitor 4,6,8,10,12, stages available.
- ▲ User selection of auto/ manual mode.
- ▲ Auto detection of capacitor kVar value.
- ▲ On site target PF programmable lead/lag.
- ▲ Stage wise led indication.
- ▲ Individual capacitor mode can be programmed by ON-OFF-AUTO.
- ▲ Control function : PF, sensitivity rated steps, reconnecting time, discharge & reaction time.
- ▲ Auto ranging of kilo, mega led indications.
- ▲ Universal auxiliary supply.

DISPLAY PARAMETERS

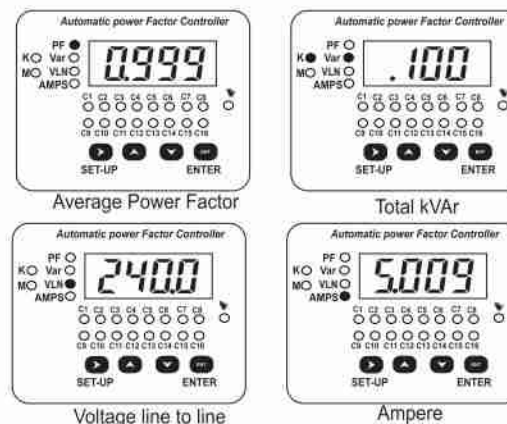
- ▲ Voltage: VLN
- ▲ Ampere: ILN
- ▲ Power: Average PF, kVar.

OPTIONAL FEATURES

- ▲ Single relay alarm output for under compensation.

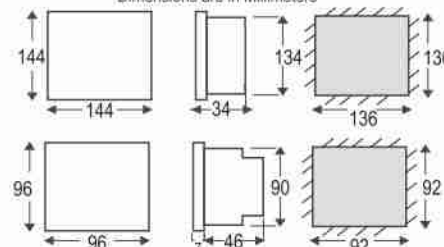
RELEVANT STANDARDS

EMC.....: IEC 61326
Fast Transient Burst Test (EFT): IEC 61000-4-4
Safety.....: IEC 61010-1-2001
Test of insulation properties...: IEC 60060-1
Test of accuracy requirements : IEC 62052-11
Test of electrical requirements: IEC 62052-1
Enclosure: IP-52(Front)
IP-20 (Terminal back)



MECHANICAL INSTALLATION

Dimensions are in Millimeters



- ▲ Push the meter into the panel cutout, Secure the meter in its place by pushing the clamp on the rear side. The screws of panel of the clamp, must be in the farthest forward slot.
- ▲ For proper sealing, tighten the screws evenly with required torque.

TROUBLESHOOTING ERRORS

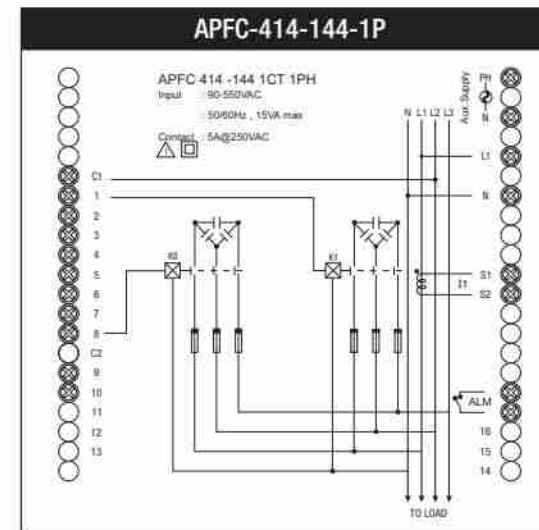
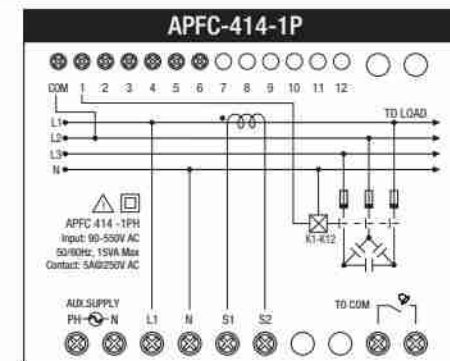
- ▲ Do not change the phase sequence of L1, L2, L3. Suppose phase sequence made reversed during the auto sense of the capacitor, the meter will not read the correct capacitor value. Once error corrected, do the auto sense again.
- ▲ While doing the "Auto sense" check the capacitor value on screen. The value must be in positive, If negative(-) sign comes, It means

CT polarity S1, S2 error. So user made the connection properly then do the auto sense again.

WARNING GUIDELINES

- ▲ To prevent risk of electric shock power supply to the equipment must be kept off while doing the wiring.
- ▲ Wiring shall be done strictly according to the terminal layout confirm that all connections are correct.
- ▲ Use lugged Terminals.
- ▲ To eliminate electromagnetic interference use of wires with adequate rating & twists of the same in equalize shall be made.
- ▲ Cable used for connection to power source, must have cross section of 1.5mm. These wires shall have carrying capacity of 5A.

TYPICAL DIAGRAMS



TEST CERTIFICATE

S.No.	TEST	TEST CONDITION	STATUS																												
1	Insulation	a) Voltage Circuit and Earth b) Current Circuit and Earth	Complied																												
2	H V Test	2kV for 1min a) Voltage Circuit and Earth b) Current Circuit and Earth	Complied																												
3	Accuracy Test	<table border="1"> <thead> <tr> <th>Parameter</th><th>100%</th><th>50%</th><th>5%</th></tr> </thead> <tbody> <tr> <td>PF</td><td>Less than 1elect.</td><td>Complied</td><td></td></tr> <tr> <td>kW</td><td>Within 0.5%</td><td>Complied</td><td></td></tr> <tr> <td>kVA</td><td>Within 0.5%</td><td>Complied</td><td></td></tr> <tr> <td>V</td><td>Within 0.5%</td><td>Complied</td><td></td></tr> <tr> <td>A</td><td>Within 0.5%</td><td>Complied</td><td></td></tr> <tr> <td>F</td><td>Less than 0.1Hz</td><td>Complied</td><td></td></tr> </tbody> </table>	Parameter	100%	50%	5%	PF	Less than 1elect.	Complied		kW	Within 0.5%	Complied		kVA	Within 0.5%	Complied		V	Within 0.5%	Complied		A	Within 0.5%	Complied		F	Less than 0.1Hz	Complied		
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Ref Calibration standards

- MTE SWS 1.3 class 0.1
- YEW 2533E 31 class 0.1

S.No. 26664 ☒
S No 26BU006513 ☐

S.No. 39822 ☒

Tested by :

Approved by :

Date:

There are basically two modes of operation in :

1. Programming Mode 2. Run Mode

After supplying power (230 VAC), the unit displays immediately power receiving information, on LED display screen and by default stored last display at factory comes into Run Mode. Now, the unit can be operated by using the following keypad provided for both the Programming Mode and Run Mode such as shown below.

Keypad Description

- ▶ SET UP key to go to set up menu and exit from programming mode. SET UP Key to move the cursor from left to right side in programming mode.
- ▲ UP Direction key to scroll the alpha numeric value 0-9 in programming mode and To scroll the pages forward direction in RUN mode. To go into Scroll mode ON(continuous press 7Sec.)
- ▼ Down Direction key to scroll the alpha numeric value 9-0 in direction and To scroll the pages reverse direction in RUN MODE. To go into Scroll mode OFF(continuous press 7Sec.)
- ↵ Complete the operation in programming mode once have done, ENTER.

Programming Mode

Press ▶ SET UP key on Run Mode for about **FIVE** seconds continuously, the unit will therefore enter into Programming Mode such as shown below. GEN

- ▲ In order to operate for all the field programmable parameters, it is easy for user interface by pressing the keys such as ▶, ▲, ▼ and ↵. Once the display is in Programming Mode, press ▲ key to move into the following programmable parameters: CT Primary & Secondary, PT Primary & Secondary, PF setting, Auto-sense, Password.

Setting the Main CT Ratio

In order to give actual current values in your systems, the main CT Ratio between the primary and secondary current should be set accordingly. The CT Ratio can be set from 5 A to 9999 A.

Press ▶ SET UP key on Run Mode for about **five** seconds continuously, the unit will therefore enter into Programming Mode such as shown below. GEN

- ▲ On Pressing Enter key once, the display will prompt CTR.
- ▲ The CT primary value to be set here. Press Enter, the display indicates the default value 0005. Set CTR by pressing ▶, ▲, ▼ keys until desired CT value is received, Press ENTER key to conform the value stored.
- ▲ If the CONTROL mode is not desired, Press ▲ key to go to the desired parameter. Or else, Press ▶ key once to return into Run Mode.

Set Meter Password

Press ▶ SET UP key on Run Mode for about **five** seconds continuously, the unit will therefore enter into Programming Mode such as shown below. GEN

- ▲ On Pressing Enter key twice, the display will prompt CTRP. Pressing ▲ key four time, the display will prompt PASS.
- ▲ User can set desired password here. On pressing Enter key once, the display indicates the default value 0000. Set password by pressing ▶, ▲, ▼ keys until desired password is received, Press ENTER key to value stored.

- ▲ If the CONTROL mode is not desired, Press ▲ key to go to the desired parameter. Or else, Press ▶ key once to return into Run Mode.

Set Desired Power factor

Press ▶ SET UP key on Run Mode for about five seconds continuously, the unit will therefore enter into Programming Mode such as shown below. GEN

- ▲ On Pressing ▲ key twice, the display will prompt PFC. Then Press enter key, display indicates on screen PF.
- ▲ User can set desired power factor here. On pressing Enter key once, the display indicates the default value 0.999. Set PF by pressing ▶, ▲, ▼ keys until desired PF value is received, Then press ENTER key to set LEAD or LAG. Once setting done, press enter key to store the value, what we set.
- ▲ If the CONTROL mode is not desired, Press ▲ key to go to the desired parameter. Or else, Press ▶ key twice to return into Run Mode.

Re-connection time of capacitor

Press ▶ SET UP key on Run Mode for about five seconds continuously, the unit will therefore enter into Programming Mode such as shown below. GEN

- ▲ On Pressing ▲ key twice, the display will prompt PFC. Then Press enter key, display indicates on screen PF.
- ▲ Then press ▲ key twice PCON will appear on the screen. Then press enter, display indicates the default value 010. Set by pressing ▶, ▲, ▼ keys until desired value is received. Once setting done, press enter key to store the value.
- ▲ If the CONTROL mode is not desired, Press ▲ key to go to the desired parameter. Or else, Press ▶ key twice to return into Run Mode.

Check stored capacitor kVAr value

Press ▶ SET UP key on Run Mode for about five seconds continuously, the unit will therefore enter into Programming Mode such as shown below. GEN

- ▲ On Pressing ▲ key twice, the display will prompt PFC. Then Press enter key, display indicates on screen PF.
- ▲ Here we can see the stored kVAr value. Then press ▲ key three time CAPU will appear on the screen. Then press enter key, here user can see the kVAr value. For remaining press enter key.
- ▲ If the CONTROL mode is not desired, Press ▲ key to go to the desired parameter. Or else, Press ▶ key twice to return into Run Mode.

Capacitor mode (Manual (1) or auto(2) or Off (0))

Press ▶ SET UP key on Run Mode for about five seconds continuously, the unit will therefore enter into Programming Mode such as shown below. GEN

- ▲ On Pressing ▲ key twice, the display will prompt PFC. Then Press enter key, display indicates on screen PF.
- ▲ Then press ▲ key four time CAPA will appear on the screen. Then press enter, display indicates default mode 1.2. Set by pressing ▶, ▲, ▼ keys until desired value is received. Once setting done, press enter key to store the value.
- ▲ If the CONTROL mode is not desired, Press ▲ key to go to the desired parameter. Or else, Press ▶ key twice to return into Run Mode.

Performing Auto sense of capacitor

Press ▶ SET UP key on Run Mode for about five seconds continuously, the unit will therefore enter into Programming Mode such as shown below. GEN

- ▲ On Pressing ▲ key twice, the display will prompt PFC. Then Press enter key, display indicates on screen PF.
- ▲ Then press ▲ key five time AUTO will appear on the screen. Then press enter key once, the display senses capacitor value in sequence from cap1(C01) to selection of capacitor. Once capacitor sense done, it comes into same screen AUTO SENSE.
- ▲ Press ▶ key twice to return into Run Mode.