APFC146

Power Factor Controller

144 x 144mm

Features :

- 1 phase current sensing
- Supports intelligent algorithm
- Automatically switches between various capacitor banks
- Alarm indication on display for over temperature
- Plug & Play

Certifications : CE

Display specifications

Type	LCD with backlight
Digits	4 digits 1 Row

Input specifications

Rated input voltage	50 - 520V (L - L)
Rated input current	Nominal 5A AC (Min 50mA, Max 6A)
Frequency	45 - 65 Hz
Burden	20m Ohm
Electrical connection	2ø - 2 wire (Voltage - L2 L3, Current - L1)
Accuracy	Power factor : ±0.01 Temperature : ±3° of full scale
Measurement range	
Power factor	0.8 lag to 0.8 lead
Error indication	Curr (Current less than 50mA)
Alarm indication	Over temperature
Settable parameters	
Target PF	0.8 lag to 0.8 lead
Max number of steps	1 to 12
Step time	1 to 999 sec
Discharge time	1 to 999 sec
Over temperature settings	10°C to 70°C

Output specifications

Output contacts	NO, One common point max fuse 6A
Steps	1 to 12
Relay contact	5A @ 250V AC (max)

Auxiliary supply specifications

Input voltage range	90 - 550V AC
Consumption	15VA max
Frequency	50 - 60 Hz

Control specifications

Target PF	0.8 lag to 0.8 lead
Step time	1 to 999 sec
Discharge time	1 to 999 sec
Control mode	Automatic / Manual

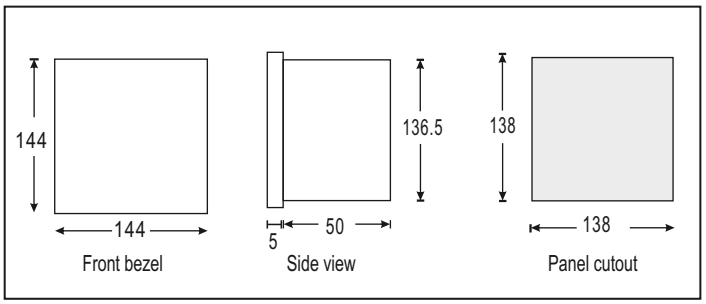
Environmental specifications

Temperature	Operating : 0°C to 60°C Storage : -20°C to 60°C
Humidity	0% to 95% without moisture consideration

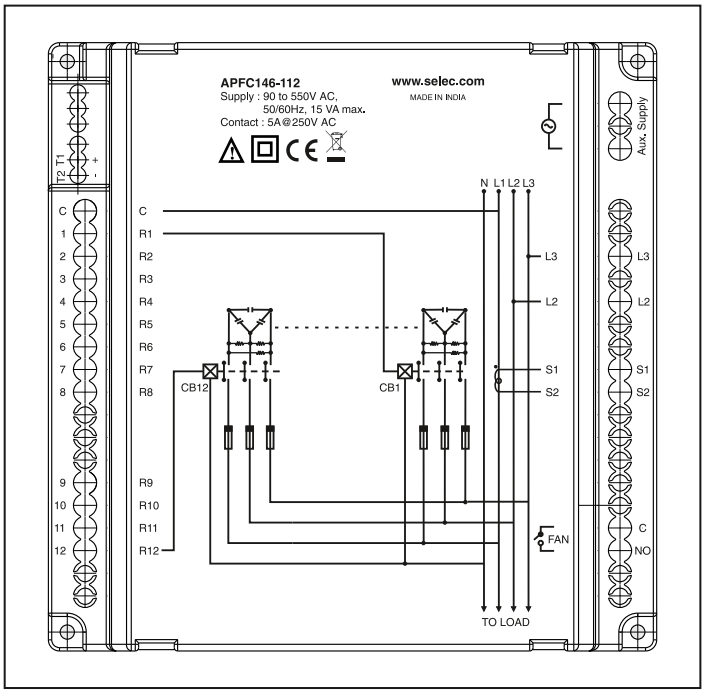
Mechanical specifications

Mounting	Panel
Weight	400 gms

Dimensions (All are in mm)



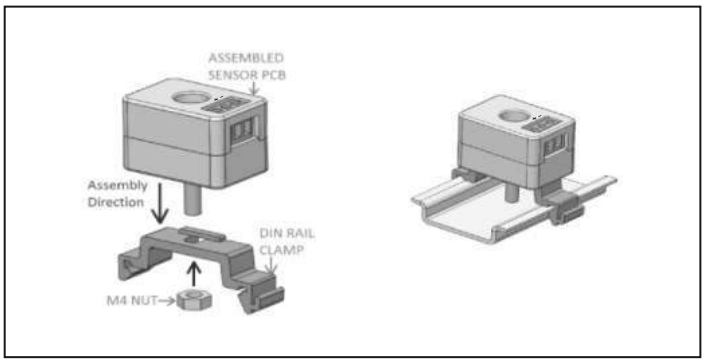
Terminal connections



Compliance

Applicable EMI / EMC standards		
Product standard : IEC 61326-1		
Category		**Standards compliance**
ESD immunity	IEC 61000-4-2	Level III (Air discharge : 8kV), Level II (Contact discharge : 4kV)
Surge immunity	IEC 61000-4-5	2kV common mode, (Line to ground), 1kV differential mode, (Line to Line)
Radiated susceptibility	IEC 61000-4-3	Level III, 80 to 1000MHz (10V/m) Level II, 1.4GHz to 2GHz (3V/m) Level I, 2GHz to 2.7GHz (1V/m)
Conducted susceptibility	IEC 61000-4-6	Level II, (150KHz to 80MHz) (3V/m)
Voltage dips and interruptions	IEC 61000-4-11	**Dips** : 0% during 1 cycle (Criteria B), 40% during 10/12 cycles (Criteria C), 70% during 25/30 cycles (Criteria C) **Interruptions** : 0% during 250/300 cycles (Criteria C)
Conducted emission	CISPR-11	Group 1, Class A (150kHz to 30 MHz)
Radiated emission	CISPR-11	Group 1, Class A (30MHz to 1 GHz)
Electrical fast transient	IEC 61000-4-4	Level III (2kV)
Power frequency Magnetic field	IEC 61000-4-8	Level IV 30 A/m

NTC temperature sensor



Ordering information

Product code	Supply voltage	No. of stages	Certification
APFC146-112-90/550V-CE	90 - 550 VAC, 50 / 60Hz	12	CE

OP656-V01

selec APFC146
Operating Instructions

PRODUCT PROFILE

144 x 144 x 50mm

SPECIFICATIONS

Display	: Liquid crystal display with backlight 4 digits to show electrical parameters.
Wiring input	: 2ø-2 wire (L2-L3)
Rated input voltage	: 50 to 520 V AC (L-L)
Rated input current	: 5A AC (min 50mA, max 6A)
Burden	: 20 mOhms
Frequency range	: 45-65 Hz
Power Consumption	: MAX 15VA
Over Temp indication	: Symbol turns ON
Controlling Range	: Target PF : -0.800 to 0.800 Switching Program : Automatic
Alarm	: Over Temperature Error CURR :Phase Current error
Environmental Conditions:	Outdoor use Temperature : Operating : 0°C to 60°C Storage : -20°C to 60°C Humidity : 0% to 95% without moisture consideration
Mounting	: Panel Mounting
Weight	: 540 gms.

ORDER CODE INFORMATION

PRODUCT	SUPPLY	CE	NO. OF STAGES
APFC146-112-90/550V-CE-RoHS	90 to 550V AC, 50/60Hz	■	12

ACCURACY

Measurement	Accuracy
Power Factor	±0.01
Temprature	±3° of Full Scale

EMC GUIDELINES

1. Use proper input power cables with shortest connections and twisted type.
2. Layout of connecting cables shall be away from any internal EMI source.

SAFETY PRECAUTIONS

All safety related codification, 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 the equipment is not handled in a manner specified by the manufacturer, it might impair the protection provided by the equipment.

⚠ **CAUTION** : Read Complete instruction prior to installation and operation of the unit.

⚠ **WARNING :** Risk of electric shock.

⚠ WIRING GUIDELINES

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. Wiring shall be done strictly according to the terminal layout. Confirm that all connections are correct.
3. Use pin type lugged terminals.
4. To eliminate electromagnetic interference, use wires with adequate ratings and twists of the same in equal size shall be made.
5. Cables used for connection to power source, must have a cross section of 1.5mm^2. These wires shall have current carrying capacity of 5A.

■ 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.

INSTALLATION GUIDELINES

⚠ **CAUTION**

1. This equipment, being buit-in type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the user end after installation and internal wiring.
2. Conductors must not come in contact with the internal circuitry of the equipment or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
3. Before disconnecting the secondary of the external current transformer from the equipment, make sure that the current transformer is short circuited to avoid risk of electrical shock and injury.
4. The equipment shall not be installed in environmental condition other than those mentioned in this manual.
5. Thermal dissipation of equipment is met through ventilation holes provided on chasis of equipment. Such ventilation holes shall not be obstructed else it can lead to a safety hazard.
6. Connector screw must be tightened after installation.

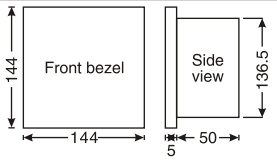
MECHANICAL INSTALLATION / DIMENSIONS

1. Prepare panel cut out with proper dimensions as shown in the figure.
2. Push the meter into the panel cutout. Secure the meter in its place by pushing the clamp on the rear side. The screw of the panel clamp must be in the farthest forward slot.
3. For proper sealing tighten the screw evenly with required torque.

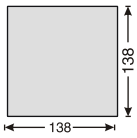
⚠ **CAUTION**

The equipment in its installed state must not come in close proximity to any heating sources, caustic vapors, oils, steam or other unwanted process by product.

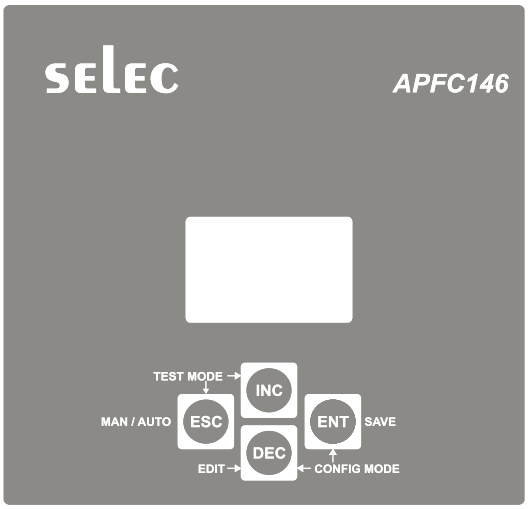
OUTLINE DIMENSIONS (in mm)



PANEL CUTOUT (in mm)



FRONT PANEL DESCRIPTION



KEY DESCRIPTION	
Press DEC	For 3 sec. to enter or exit from the configuration menu.
Press INC	For increment configuration parameter & their value.
Press DEC	To move cursor right by one digit each time after last digit of display cursor shift at 1st digit of display.
Press ENT	To save the setting and move on to next page
Press ESC	To go previous page in configuration menu. Long press for 5sec to toggle from Auto/Manual mode
Press INC & ESC	For 5 sec to enter in Test Mode.Test mode checks all the relays present in product sequentially.

Note: The settings should be done by professional after going through this operating manual.

SERIAL NUMBER DESCRIPTION

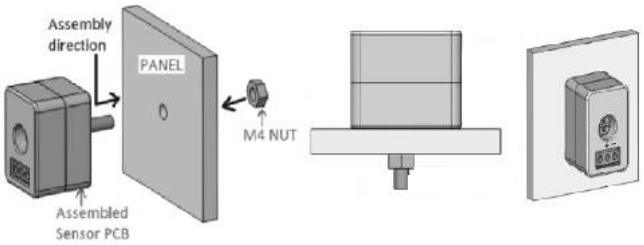
Press (ENT) Key for 5 sec to display 8 digit serial

Example : Sr. No. 12345678	
Press (DEC) Key for 5 sec	Display 1234 for 1sec.
	After 1 sec displays 5678 for 1 sec.

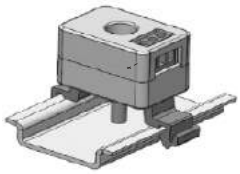
SENSOR CLIP ASSEMBLY

Assemble sensor on the panel /Din rail clamp by using center screw Provision and M4 nut. As shown in below diagram.

1. PANEL MOUNTING ASSEMBLY :



2: DIN RAIL MOUNTING ASSEMBLY:



ONLINE PAGE DESCRIPTION

KEY PRESS	PARAMETER KEY	DESCRIPTION
	——	Display Power factor
Press key (1st time)	(INC)	Display Temperature

Note: Temperature page will be displayed only if Temperature sensor is connected.

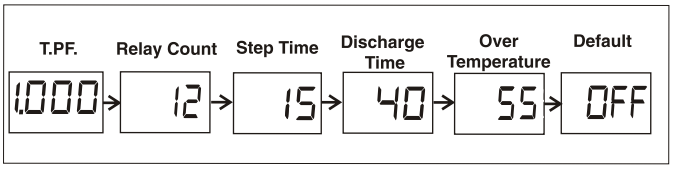
AUTO / MANUAL MODE DESCRIPTION

Press (ESC) key for 1 sec to change mode(Auto/Manual).

Relay will turn OFF when mode is set to manual.

Press (INC) key to turn ON relay one by one in manual mode.

CONFIGURATION MENU



There are 4 dedicated keys (INC) (ESC) (DEC) (ENT) Use these 4 keys to scroll through configuration menu & enter or exit from configuration menu.

CONFIGURATION MENU

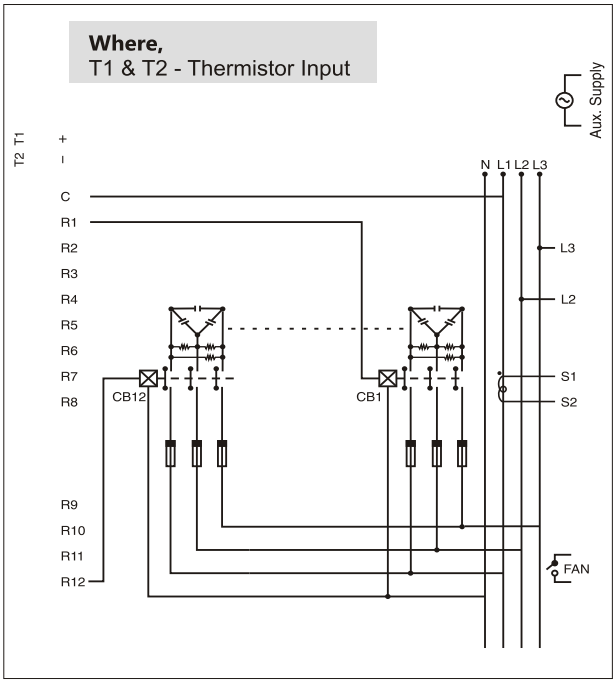
Parameter	Display	Range	Default Value
Target P.F.	T. P.F.	-0.800 to +0.800	1.000
Relay count	RLY	1-12	12
Step time	STP.T	1s-999s	15s
Discharge Time	DST.T	1s-999s	40s
Over Temperature	O.TMP	10°c to 70°c	55°c
Default	DFLT	ON/OFF	OFF

USER GUIDE

a) Manual switching (MANL) : When this switching program is selected, the capacitor steps are controlled manually by the user.

b) Automatic switching (AUTO) : This automatic switching program uses intelligent switching sequence. The step switching sequence is not fixed and the program automatically selects the most appropriate steps to switch in or out in order to ahieve. shortest reaction time with minimum number of steps.

WIRING DIAGRAM



(Specifications are subject to change, since development is a continuous process.)

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