selec

APFC147
Operating Instructions

PRODUCT PROFILE



144 x 144 x 50mm

SPECIFICATIONS

Display : 4 Digit, 7 Segment LED display, height : 0.56"
Auxiliary Supply : 90-550V AC, 50-60Hz
Rated input voltage : 40-300V(L-N), 50-530V(L-L), 45-65Hz
Rated input current : Nominal 5A AC (MIN 50mA, MAX 6A), Single CT Sensing
Burden : 20 mOhms
CT Primary : 5A (Fixed)
CT Secondary : 5A (Fixed)
No. of relay stages : For APFC147-108 : 8 Relay
For APFC147-112 : 12 Relay
Trip indication : Alarm relay turns ON & ALM (Alarm) LED blinks
(Refer LED indication chart)
Controlling Range : Target PF : 0.8 lag to 0.8 lead
Step time : 1 to 999Sec
Discharge time : 1 to 999 Sec
Switching program : Automatic
Control Mode : Automatic/Manual
Auto initialization : Yes / No
Output : Relay output
Alarm mode : CT polarity error, Under compensate, Over compensate, No Voltage
Power Consumption : 15 VA max.
Environmental Condition: Operating : 0^{0}C to 60^{0}C
Storage : -20^{0}C to 60^{0}C
Humidity : 0% to 95% without moisture consideration
Accuracy :

Measurement	Accuracy
Power factor	±0.01

Mounting : Panel Mounting
Weight :

APFC147-112	420gms
APFC147-108	400gms

ORDER CODE INFORMATION :

PRODUCT	SUPPLY	CE	NO. OF STAGES
APFC147-112-90/550V	90 - 550V AC, 50/60Hz	—	12
APFC147-112-90/550V-CE-RoHS	90 - 550V AC, 50/60Hz	■	12
APFC147-108-90/550V	90 - 550V AC, 50/60Hz	—	8
APFC147-108-90/550V-CE-RoHS	90 - 550V AC, 50/60Hz	■	8

⚠ 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.

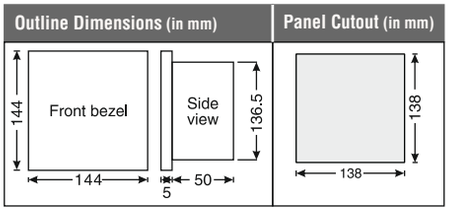
INSTALLATION GUIDELINES

⚠ **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 unit 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.

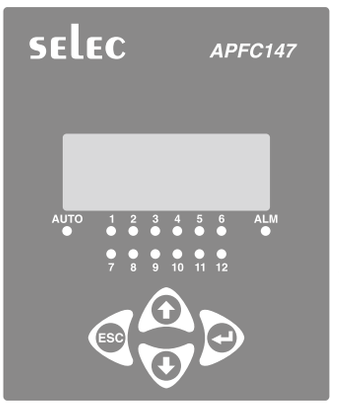
⚠ **CAUTION**

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

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.

FRONT PANEL DESCRIPTION



CONFIGURATION

KEY DESCRIPTION	
Press ↓ & ↵	For 3 sec to enter or exit from the configuration menu.
Press ↑	For increment
Press ↓	For decrement
Press ↵	To save the setting and move on to next page
Press ESC & ↑	For 3 sec to enter in Test Mode

Note : Test mode checks all the relays present in product sequentially.

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

LED INDICATIONS

LED	DESCRIPTION
1 to "X" [X = 8 X = 12]	Capacitor Banks that are ON.
AUTO	Indicates controller is in AUTO mode.
AUTO	Indicates controller is in MANUAL mode.
ALM	No fault condition present.
ALM [Blinking]	Fault condition occurred [Press ENTER key to display trip parameter.]
ALM	This will take place when user will press ENTER key in fault condition. Trip parameters will be displayed for 3sec each.

NOTE :
On occurrence of any new fault condition ALM LED starts blinking again & on pressing ENTER key all trip parameters will be displayed for 3sec each.

SERIAL NUMBER DESCRIPTION

Press ESC ( ) key for 10 sec. to display 8 digit serial number.

Example : Sr. No. 12345678	
Press ESC ( ) key for 10sec.	Displays 1234 for 3 sec. After 3 sec. displays 5678 for 3 sec.

NOTE :

- Auto - Initialization (A.INT) is working at best, under stable load conditions.
- Auto - Initialization (A.INT) works only with capacitor banks and not with reactors.
- A.INT will be update to 'NO' automatically in configue after auto initialization.
- Reauto - Initialization will be done by only changing A.INT - Yes in configue manually.
- Recommended that number of relays not to be changed during normal operation. If done so, restart the unit.
- When condition of low current occurs, the display of controller will show the 'CURR'.

USER GUIDE

A) Automatic switching (AUTO)

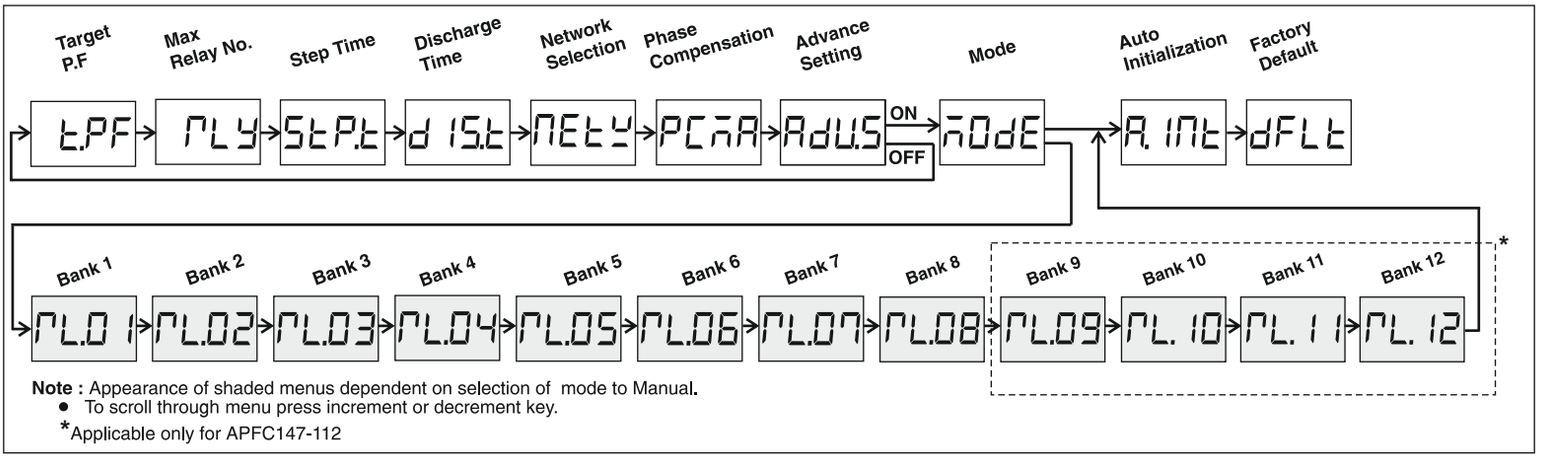
This automatic switching program uses intelligent switching sequence. The step switching sequence is not fixed and the program automatically selects the most appropriate steps to switch in or out in order to achieve shortest reaction time with minimum number of steps.

B) Manual switching (MANL)

When this switching program is selected, the capacitor steps are controlled manually by the user by entering in configuration menu.

CONFIGURATION MENU

PRESS + KEYS for 3 sec. to enter or exit from configuration menu.



Note : Appearance of shaded menus dependent on selection of mode to Manual.

- To scroll through menu press increment or decrement key.

*Applicable only for APFC147-112

CONFIGURATION TABLE

Parameter	Display	Range	Default Value	Condition
Target P. F	T. PF	-0.800 to 0.800	1.000	-
Max Relay Numbers	RLY	1 to 8/12*	8/12 *	-
STEP TIME	STP.T	1s to 999s	15s	-
Discharge time (Reconnection time)	DIS.T	1s to 999s	40s	-
Network Selection	NETW	1P2W/ 2P2W	2P2W	-
Phase Compensation	PCMA	0°, 90°, 120°, 210°, 240°, 330°	90°	-
Advance Settings	ADV.S	ON/OFF	OFF	-
Control Mode	MODE	AUTO/ MANL	Auto	-
Relay 1	RL.01	ON/OFF	OFF	Prompted only if control mode is set to manual
Relay 2	RL.02	ON/OFF	OFF	
Relay 3	RL.03	ON/OFF	OFF	
Relay 4	RL.04	ON/OFF	OFF	
Relay 5	RL.05	ON/OFF	OFF	
Relay 6	RL.06	ON/OFF	OFF	
Relay 7	RL.07	ON/OFF	OFF	
Relay8	RL.08	ON/OFF	OFF	
* Relay 9	RL.09	ON/OFF	OFF	
* Relay 10	RL.10	ON/OFF	OFF	
* Relay 11	RL.11	ON/OFF	OFF	
* Relay12	RL.12	ON/OFF	OFF	
Auto Initialization	A.INT	NO/YES	YES	-
Factory Default	DFLT	NO/YES	NO	-

*Applicable only for APFC147-112

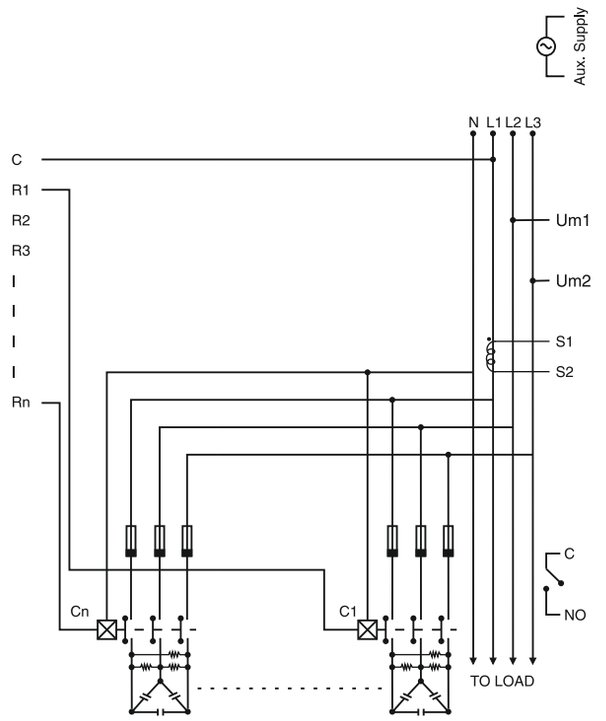
FIXED PARAMETER SETTING

Parameter	Default Value	Status
Over Compensation	-	ON
Under Compensation	-	ON
Low Current	Less than 50mA	ON
CT Primary	5A	-
CT secondary	5A	-
C/K Setting	60%	-
Nominal voltage	VLL : 415V VLN : 240V	-
Hysteresis Power Factor	1%	-

TRIP TIME

Parameter	Display	Activate	Deactivate	Action to be taken by APFC
No Voltage	N.VLT	3sec	Instantaneous	Disconnect All Steps
Over Compensation	O.CMP			-
Under Compensation	U.CMP			-
CT Polarity Error	CTER			-

WIRING DIAGRAM



Where,
Um1 & Um2 - **I**nput Voltage of Phase or phase to Phase
S1 & S2 - CT **I**nput
R1**...** Rn - Relay to switch capacitor
C1**...** Cn - Capacitor banks
n - 8 for APFC147-108
12 for APFC147-112
C - Relay COM
NO - Normally Open

PHASE-ANGLE SETTING

Voltage	L1-N	L2-N	L3-N	L1-N	L2-N	L3-N	L1-N	L2-N	L3-N
CT	L1	L2	L3	L2	L3	L1	L3	L1	L2
Phase-Angle	0^{o}	0^{o}	0^{o}	240^{o}	240^{o}	240^{o}	120^{o}	120^{o}	120^{o}
Voltage	L2-L3	L3-L1	L1-L2	L2-L3	L3-L1	L1-L2	L2-L3	L3-L1	L1-L2
CT	L1	L2	L3	L2	L3	L1	L3	L1	L2
Phase-Angle	90^{o}	90^{o}	90^{o}	330^{o}	330^{o}	330^{o}	210^{o}	210^{o}	210^{o}

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

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