

Microprocessor Controlled Power Factor Controller



Catalogue 2010

- Fully automatic and simple commissioning
- No overcompensation during low load
- Under current trip function, over / under voltage & frequency protections for Capacitors
- Four quadrant regulation

Microprocessor Controlled Power Factor Controller

APFC Relay for Power Factor Correction in Low Voltage applications measures the actual power factor and connect or disconnect capacitors to achieve a target power factor. The single phase electronic measuring system detects the reactive and active component of the network through the current and voltage path. From this it calculates the phase shift between current and voltage and compares this with the set target power factor.

If there are deviations of the power factor, capacitor stages are switched in and out by the APFC relay. The contactor control logic is optimised so that the desired power factor is achieved with minimum switching operations, thus ensuring an optimised life cycle of the capacitor bank.



Features

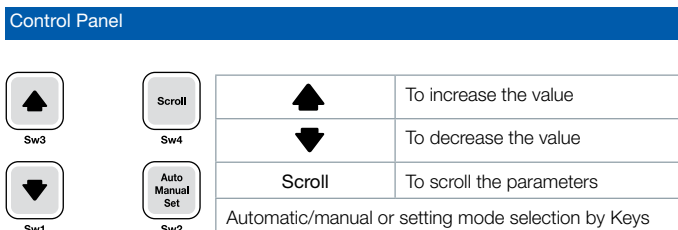
- User friendly program for target power factor, on/off delay, CT ratio.
- Seven segment LCD display with backlight for readability in poorly illuminated areas.
- Display parameters – KW, PF, KVA, KVAR, Volt, Amp, Frequency.
- Key pad for user interface.
- Compatible with RS 232 (Galvanically isolated).
- Recall function of recorded values.
- Available in 6, 8, 12, 14 stages.
- User configurable parameters - Target PF Setting, Power Factor Tolerance, CT ratio, total capacitor banks, under current, Over / Under frequency, Over / Under voltage threshold for alarm / tripping capacitor bank, time delay between steps (2 sec - 1800 sec.).
- Download Parameters - Target PF, CT ratio, total capacitor banks, Capacitor banks status, under current, Over / Under voltage threshold for alarm / tripping capacitor bank, Over / Under frequency threshold for alarm / tripping capacitor bank, time delay between steps (2 sec upto 1800 sec.).
- Load survey for 40 days for each 30 minute interval consisting of: Active energy & demand, reactive energy & demand, apparent energy & demand, average power factor, voltage (average 30 minutes), date, time.
- P.C. based software for data storing and system monitoring.

Compliance / Standard Specification	IEC 61000-6-2, IEC 61000-6-4, IEC 61010-1
Operating Voltage	(Un): 230 V AC \pm 20%; 50/60 Hz
Operating Current	50 mA – 6 A (–/5 A Current Transformer)
Network Type	1 Phase, 2 wire
Capacitor Steps	6, 8, 12, 14 steps (max) + 1 ALARM
Power Consumption	< 2 VA (Current Circuit), < 10 VA (Voltage Circuit)
Output Contact	3 A, 750 VA
Cos ϕ setting	0.8 < cos ϕ \leq 1 (Inductive)
Ambient Operating temp.	-10° C, +60° C
Degree of Protection	IP 54 (Front Panel)
Connection/ Installation	Terminal / Flush - Mounting with rear terminals
Dimensions &	144 x 144 x 85 mm
Packing Weight	770 gm (Approx.)
CT Ratio	Configurable (max. 1000/5)

Operating Mode	
Automatic Mode	Capacitors connect automatically to achieve target power factor of Load
Manual mode	By key pad to connect / disconnect the capacitors
Setting mode	For user configurable target Power factor, CT Ratio, Over / under Voltage limit and Over / Under Frequency limit tripping time, total no of capacitor banks
Communication	RS 232

Protection
<ul style="list-style-type: none"> • Over / Under Voltage • Over / Under Frequency • Over / Under Compensation • Under current

Programmable Parameters
Target Power Factor Setting
Power Factor Tolerance
CT Ratio
Total Capacitor Bank
Number of Active Outputs
Over / Under Voltage Threshold For Alarm / Tripping Capacitor Bank
Over / Under Frequency Threshold For Alarm / Tripping Capacitor Bank
Time Delay Between Steps (2 Sec Upto 1800 Sec.)
Down Load Parameters
Target Power Factor
Power Factor Tolerance
CT Ratio
Total Capacitor Bank
Capacitor Bank Status
Over / Under Voltage Threshold for Alarm / Tripping Capacitor Bank
Over / Under Frequency, Under Current Threshold for Alarm / Tripping Capacitor Bank
Time Delay Between Steps (2 Sec Upto 1800 Sec.)
Load survey for 40 days for each 30 minute interval consisting of:
<ul style="list-style-type: none"> • Active Energy & demand • Reactive Energy & demand • Apparent Energy & demand • Voltage (Average 30 minutes) • Average Power Factor • Date & Time
Fault / Alarm Indication
Alarm relay contact is closed when the fault occur in the AC main supply for persistence of 5 sec. or more
Alarm display on the LCD will appear in the event of any abnormality. Example :
<ul style="list-style-type: none"> • Over / Under Voltage • Over / Under Frequency • Over / Under Compensation • Under Current



PFC11001-Software

Is Windows-based PC Software that has been designed to collect, organize & display the Data. This data includes Energies, Powers, Power Factor, Threshold Data, Alarm Status Logging Data details and Load Analysis Data. The data can be transferred or collected using RS-232 Communication as well as using AMR solutions through modem and telephone lines. This data can then be used for analysis and monitoring or Management. The Software allows the recording and a graphical evaluation of all data.

Load Analysis Data can be displayed as Bar Chart. The Configuration Software is used for complete read out, storing & writing of all parameters of PFC Controller via PC. All data can be stored in configuration file.



Communication with PF Controller

Features

- PFC11001-SOFT is Windows-based PC Software
- Capable of PC to HHU (Hand Held Unit : Portable device to read PFC Controllers) or vice versa communication
- Convenient analysis of recorded Data
- Data Representation in graphical & matrix format
- Data can be exported to Excel Format also.
- Data backup & restoration facility
- Administration of several PFC controllers possible
- Direct connection to USB Port of a PC via USB adapter
- Self Explanatory User Interface

Installation of PFC 11001-SOFT

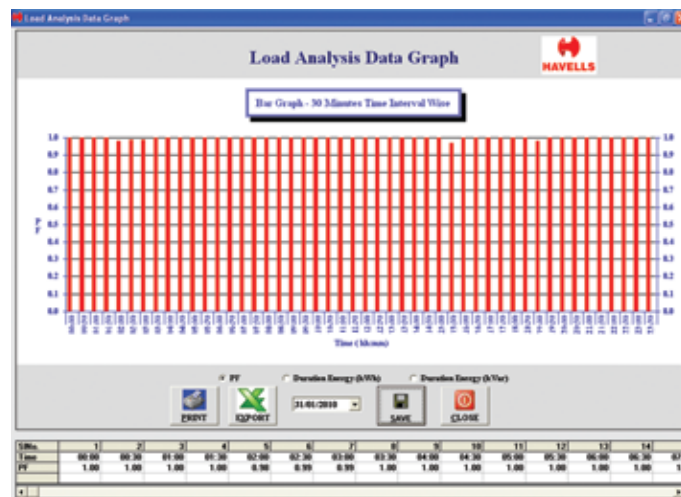
To run this software, the following hardware and software requirements are desired:

Hardware:

- Pentium Processor
- Minimum 32 MB RAM
- CD-ROM Drive
- Serial Port

Software:

- Operating System: Win 98/Win XP /NT.



Load Analysis Data:

For the selected APFC Number, user can view the Load Analysis Data till the APFC reading time. Load Analysis Data includes Energies, Demands , Average Voltage , Power Factor with Date Time as 30 minutes interval wise of 40 days Data, as shown in fig.

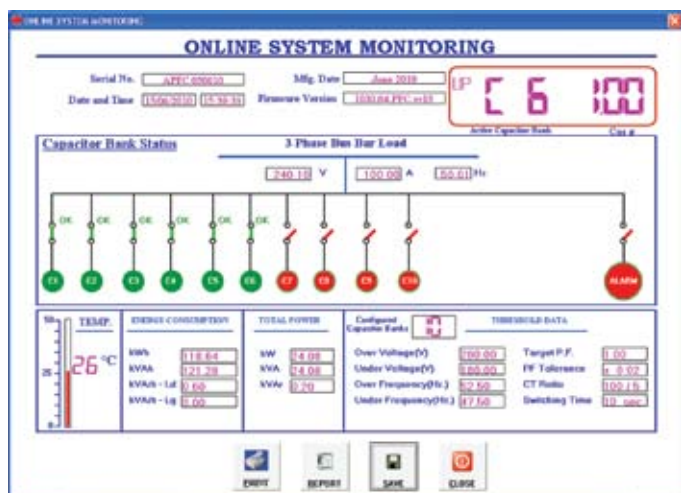


Alarm Status Logging Data:

For the selected APFC Number, user can view the Logging Data till the APFC reading time. Logging Data includes Over Voltage, Under Voltage, Under Current, Over Frequency, & Under Frequency with Date Time 10 records of each abnormality.

Advantages

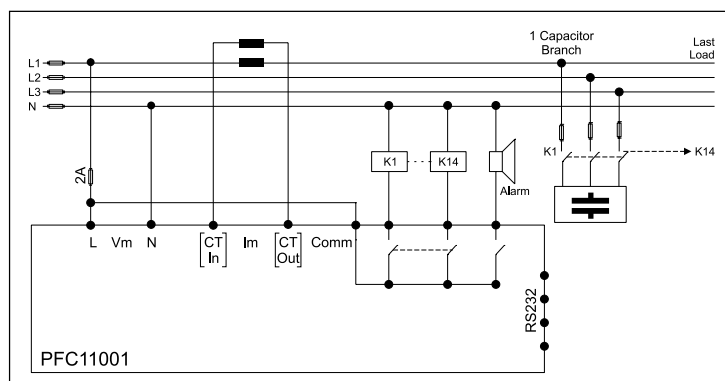
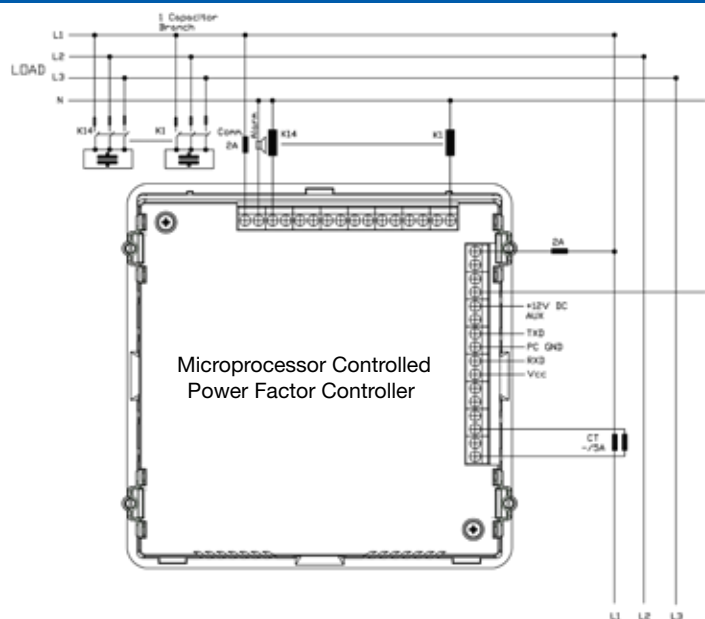
- Automatic Control of upto 14 capacitor banks (6/8/12/14).
- Dust protection.
- Computer compatibility.
- Simple commissioning.
- Alarm for supply abnormality and fault detection.
- Reduction in electricity bills.
- Rebate in electricity bills (where PF surcharge applicable).
- Reduction in MDI (maximum demand).
- Longer life of equipments & lesser breakdowns.
- Improvement in line voltage.
- Low burden on power cables & Transmission systems.



APFC Info:

For the selected APFC Number, user can view the APFC Info till the APFC reading time. APFC Info includes Instantaneous Quantity, Energy Consumption, Power Consumption, and Threshold Data & Temperature, as shown in fig.

Connection Diagram



Ordering Info		
Product Code	Description	Min Packing Qty.
QHMSRA5N0006	1PH/50Hz/230V/6STEP/APFC RELAY	6
QHMSRA5N0008	1PH/50Hz/230V/8STEP/APFC RELAY	6
QHMSRA5N0012	1PH/50Hz/230V/12STEP/APFC RELAY	6
QHMSRA5N0014	1PH/50Hz/230V/14STEP/APFC RELAY	6

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Although every effort has been made to ensure accuracy in the compilation of the technical detail within this publication, specifications and performance data are constantly changing. Current details should, therefore, be checked with Havells Group.

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