RISHABH

Data Sheet

RISH PFC 12

Power Factor Controller
(Size 144 X 144mm)

RoHS CE

Measure Control Record Analyze Optimize

Overview

RISH PFC 12 is power factor controller for reactive power compensation. It controls external reactive power element (Capacitor) to meet reactive power demand of the load. This reduces burden on source to supply additional reactive current. precise and fast measurements are useful tool for system analysis. powerful protection function protects system and switching element in case of system faults

Product Features

Autoinitialisation Function
Controller has auto init function to detect
1. Number of capacitors connected (Capacitor bank count)
2. Capacitor kvar value
3. Phase correction angle

Capacitor programming option
Each output capacitor kvar can be programmed either as
1. Direct kvar value
2. Control series
3. Auto detected value

Control Output
Controller is available in basic 6, 8, 12 output option Selectively each output capacitor can be configured as permanently ON (Fixed compensation), Permanently Off (Faulty Bank), Auto mode.

Control Scheme
Controller has intelligent control of outputs so that equal use of system resources is ensured additionally capacitor health monitoring option is available to detect loss of capacitor power for preventive action.

Manual Mode
Controller has manual function for bank connection / disconnection that is used for diagnosis purpose.

Test Run Function
To measure kVAr value of connected capacitor bank test run function is used. banks are connected and disconnected sequentially and effective change in PF monitored so to calculate capacitor bank value

Programmable PFC parameters
Target PF, Number of banks, Bank kVAr value, connecting time, disconnecting time, discharge time, maximum switching kVAr, switching threshold etc.

Programmable system configuration
Voltage and current inputs are configurable and system adopt itself according to configuration so that correct functioning is possible Voltage Input is configurable as VLN or VLL (R/Y/B) Current Input is configurable as IR(kl),IY(kl),IB(kl) or IR(lk),IY(lk),IB(lk)

Protections and Alarm
Alarm relay can be activated for one or more following events High voltage, Low voltage, undercurrent, over-current, over temperature, Frequency faults, over harmonics-voltage, over harmonics current, out of bank (under compensation), overcompensation For each of above event except under and overcompensation capacitors are switched off sequentially to protect capacitor banks
Controller generates system warning for
1. Over temperature
2. If output switching count limit sets exceeds set value
3. Battery low (if RTC used)
4. Capacitor health fault

Programmable energy meter parameters
CT ratio, Nominal voltage, Energy unit for ex (Wh, kWh,Mwh) energy display resolution (7/8/9) digits, energy updation rate onmodbus (1-60 min), Demand integration time.

Programmable Display parameter
Display contrast level, auto scrolling (On/Off), backlit (On/Off) are configurable for any viewing condition

System parameter Min / Max value storage
Minimum/ maximum values of voltage, current, Frequency, Temperature, Maximum values of kW, V-thd, I-thd are logged

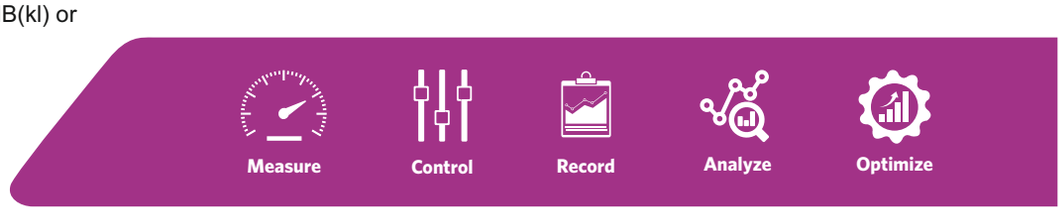
Demand parameters
Demand for kW, kVAr, kVA (import / Export) are logged

THD and individual harmonics
Individual harmonics upto 31st and THD for voltage and current are continuously calculated and displayed

Energy measurement (Import and Export)
Active, Reactive, Apparent energy is measured

High contrast 16 x 2 LCD display
Adjustable contrast with backlit on/off function

Optional MODBUS (RS485) Output
The optional ModBus output enables the instrument to transmit all the measured parameters over standard MODBUS (RS485).



Product Features

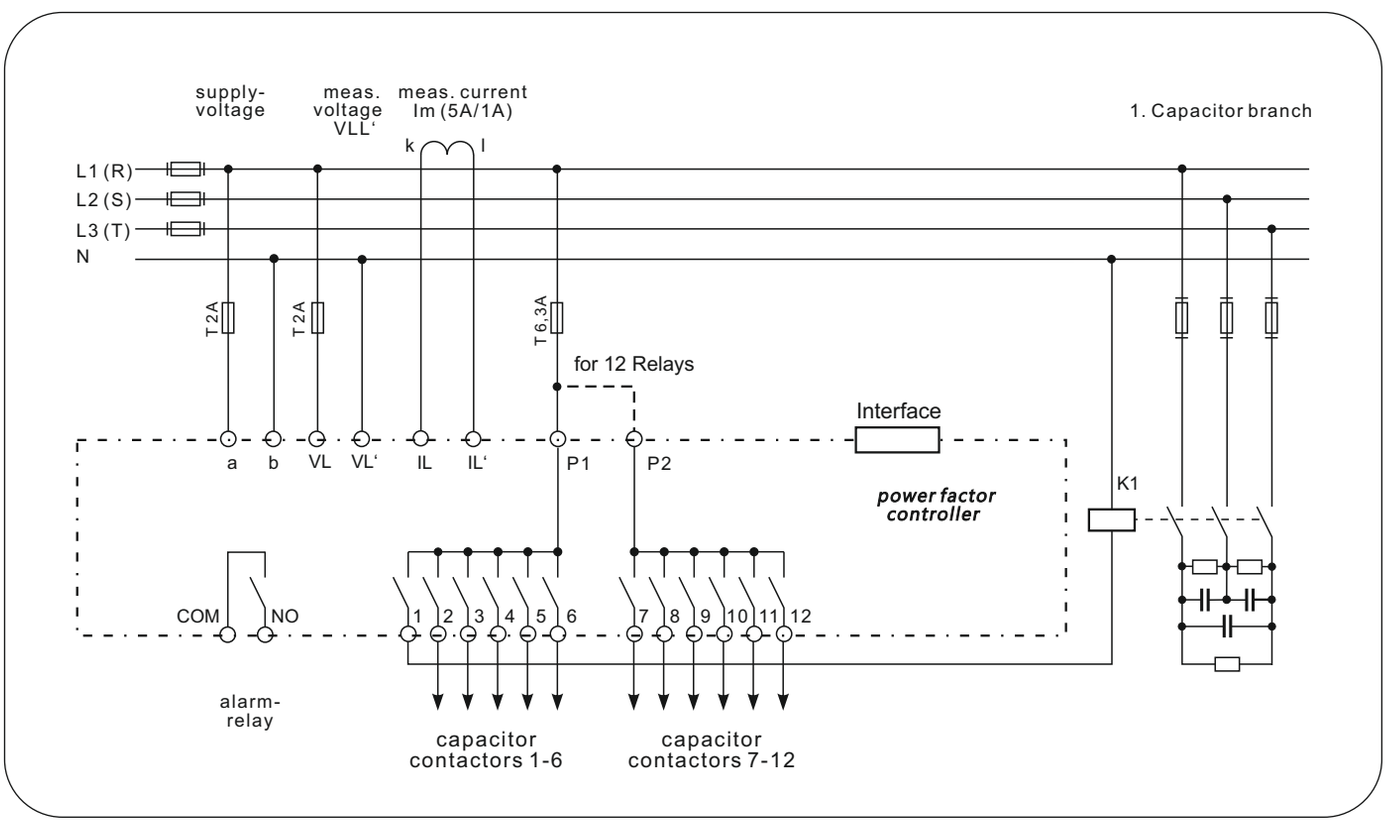
Reset Function
Instrument has reset function which used to Reset
1. Minimum , maximum value of parameters recorded.
2. Switching count, operation time of each bank or all at once
3. Energy counter
4. Demand
5. ON/RUN hour
6. Interruption count

Enclosure Protection for dust and water
conforms to IP 54 (front face) as per IEC60529

Compliance to International Safety standards
Compliance to International Safety standard IEC 61010-1- 2001

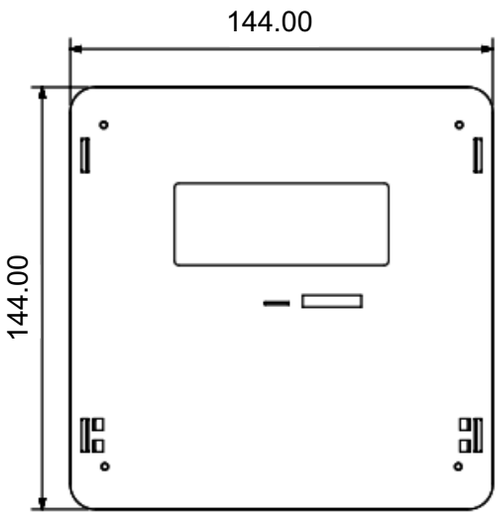
EMC Compatibility
Compliance to International standard IEC 61326

Electrical Connection

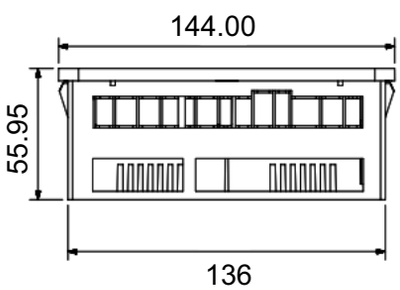


Dimensions Details:

Dimensions : 144 x 144 x 56 mm



Front View



Side View

Technical Specifications

Accuracy

Voltage	± 0.5% of Nominal value
Current	± 0.5% of Nominal value
Frequency	± 0.15% of mid frequency
Active Power	± 1.0 % of Nominal value
Re-Active Power	± 1.0 % of Nominal value
Apparent Power	± 1.0 % of Nominal value
Active energy (kWh)	± 1.0 % of Nominal value
Re Active energy (kVArh)	± 1.0 % of Nominal value
Apparent energy (kVAh)	± 1.0 % of Nominal value
Total Harmonic Distortion	± 1.0 % of Applied value

Measurement error is normally much less than the error specified above. Variation due to influence quantity is less than twice the error allowed for reference condition

Influence of Variations

Temperature coefficient (for rated value Range of use (0…50°C))	0.05%/°C for Voltage (50... 120% of rated value) & 0.05%/°C for Current (10... 120% of rated value)

Display update rate

Response time to step input	1 sec approx.

Applicable Standards

EMC	IEC 61326-1:2012, Table 2
Accuracy	IEC 62053-21
Safety	IEC 61010-1-2010
IP for water & dust	IEC60529
Pollution degree	2
Installation category	III
High Voltage Test	2.2 kV AC, 50Hz for 1 minute between all electrical circuits

Environmental

Operating temperature	-10 to +60°C
Storage temperature	-20 to +65°C
Relative humidity	0... 90% non condensing
Warm up time	Minimum 3 minute
Shock	15g in 3 planes
Vibration	10... 55 Hz, 0.15mm amplitude

Fault / Event	Limits	Default Trip values	Restore values
Under-voltage	75 - 90 % of Vnom	85 %	3% + trip value
Over-voltage	105 -115 % of Vnom	115 %	2% - trip value
Under-Frequency	2 -10 % of Freq-Nom	6 %	1 % of Freq-Nom
Over-Frequency	2 -10 % of Freq-Nom	6 %	1 % of Freq-Nom
Under-current	1 - 3 % of CT primary	2 %	1% of CT primary + trip value
Over-current	60 -120 % of CT primary	110 %	1% of CT primary - trip value
V-thd	1 - 25 %	7 %	2%
I-thd	1 - 99 %	7 %	2%
Temperature	---	60 Degree celcious	55 Degree celcious
Overcompensation/ Out of bank	Threshold x Min CkVAr	Threshold x Min CkVAr	Demand kVAr > Min CkVAr

Technical Specifications

Number of outputs	Upto 12 Max
Alarm output	1
Target PF range	0.8 Ld to 0.8 Lg
Switching Threshold	30 to 100 %
Switch-in-time (Connecting Time)	10 to 1800 Sec
Switch-off-time (Disconnecting Time)	10 to 1800 Sec
Discharge time	60 to 1800 Sec

Input Voltage

Nominal input voltage (AC RMS)	240 V

Input Current

Nominal input current	1A / 5A AC RMS.
System CT secondary values	1A & 5A programmable
System CT primary values	From 1A up to 9999A
Max continuous input current	120% of rated value

Supply (Auxiliary) Voltage

AC supply voltage range	110 V AC to 550 VAC
AC supply frequency range	40 to 70 Hz

VA Burden

Nominal input voltage burden	< 0.2 VA approx. per phase
Nominal input current burden	< 0.6 VA approx. per phase
Auxillary Supply burden	< 13 VA approx

Overload Withstand

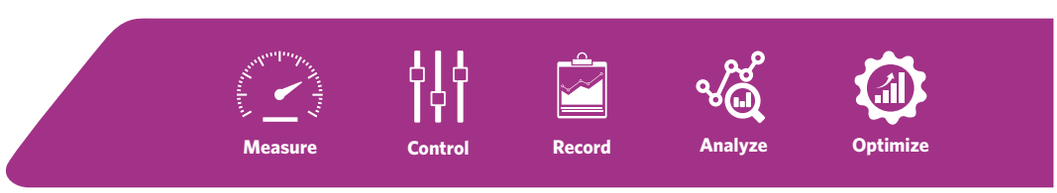
Voltage	2 x rated value for 1 second, repeated 10 times at 10 second intervals
Current	20 x for 1 second, repeated 5 times at 5 min

Operating Measuring Ranges

Voltage	30 - 550 VAC
Current	3 mA measuring starting current, 10 mA operating current , Max 6 Amp
Frequency	40…70 Hz

Reference conditions for Accuracy

Reference temperature	23°C +/- 2°C
Input waveform	Sinusoidal (distortion factor 0.005)
Input frequency	50 or 60 Hz ±2%
Auxiliary supply voltage	Rated Value ±1%
Auxiliary supply frequency	Rated Value ±1%
Voltage Range	50... 100% of Nominal Value. 60... 100% of Nominal Value for THD.
Current Range	10... 100% of Nominal Value. 20... 100% of Nominal Value for THD.
Power	Cos phi / sin phi = 1 for Active / Reactive Power & Energy. 10... 100% of Nominal Current & 50... 100% of Nominal Voltage.



Parameter Measurement and Display

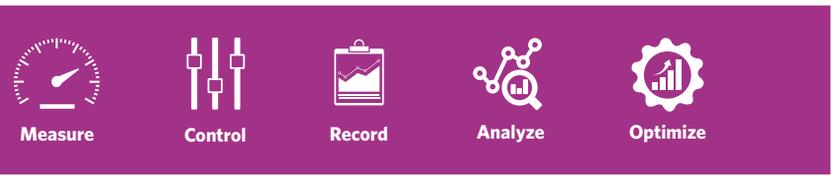
Sr.No.	Displayed Parameters	Sr No	Displayed Parameters
1.	Voltage	21.	Date/Time
2.	Current	22.	System warning
3.	Power factor, Bank status	23.	Active demand Import, Export
4.	Active Power	24.	Min, Max Voltage
5.	Re-active Power (kVAr)	25.	Min, Max Current
6.	Apparent Power	26.	Min, Max Frequency
7.	Difference kVAR to Target Power factor	27.	Min, Max Temperature
8.	Frequency	28.	Max VTHD
9.	THD-V, THD-I in %	29.	Max ITHD
10.	Individual harmonics upto 31st	30.	Max active import power
11.	Energy kWh (Import, Export)	31.	Max active export power
12.	Energy kVARh (Inductive, Capacitive)	32.	Max reactive capacitive power
13.	Energy kVAh	33.	Max reactive inductive power
14.	Demand kVA	34.	Max Apparent power
15.	Demand current	35.	Max active import demand
16.	Run Hour	36.	Max active export demand
17.	On Hour	37.	Bank switching count (Number of banks configured)
18.	Number of interruptions	38.	Bank operation time (Number of banks configured)
19.	System fault window1	39.	Bank value (Number of banks configured)
20.	System fault window2	40.	Test run menu

Ordering Information

Ordering Information	PF40-	B	1	H	X	A	X	X	0000RI
Size	144X144								
Input Voltage	240V; 50/60Hz								
Aux Voltage	110-550VAC								
Relay Output	6 Relay Output				6				
	8 Relay Output				8				
	12 Relay Output				A				
Alarm Output	Alarm Output								
Communication Option	With MODBUS - RS485						R		
	Without MODBUS - RS485						Z		
RTC Option	With RTC							R	
	Without RTC							Z	

Order Code Example : PF40-B1HAARR0000RI

RISH PFC 12 - LCD Display Size 144X144, with 12 Relay Modbus and RTC



Specifications may change without prior notice

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