

Technical Catalogue

FEATURES

- DSP based controller
- Automatic configuration recognition
- Automatic phase connection correction
- User friendly menu structure
- Thyristor Controlled Reactor (TCR)
- Modbus RTU Communication



USAGE AREAS

- Industrial Facility
- Commercial Building
- Crane
- Spot Welder Machines

DEFINITION

PFC24S.TCR is designed for compensation of balanced or unbalanced, rapid changing loads. Thanks to thyristor controlled reactor feature, it has ability for compensation of more sensitive loads.

1. WORKING PRINCIPLE

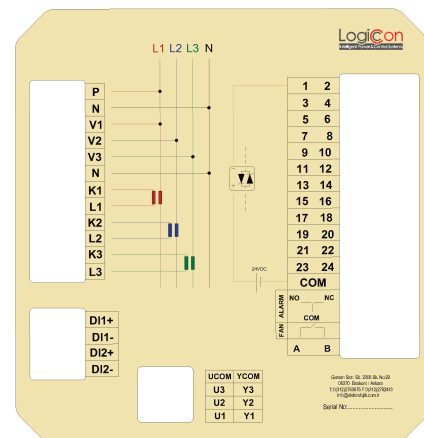
PFC Series Relays devices are developed for automatic switching of three phase and mono phase capacitor banks or shunt reactor groups to provide a user-defined target power factor or target reference reactive power value. PFC series relays have the feature that can control the star or delta connected TCR modules. The relay system parameters can be introduced using automatic connection fault correction and step identification features or manually. The compensation is started after necessary settings are done. The measurement and decision time is 20ms. The delay time for switching on and off the stages can be adjusted separately. The delay times for switching on and off the stages can be set separately as wanted. At each decision-making, the relay on and off the proper stages according to the time delays.

2. DEVICE STRUCTURE AND TERMINALS



All parameters and-measurements can be adjusted and observed via buttons and pages on-theuserpanel. The light of the display lights up when any button is pressed and the light goes off after the one minute after the last button is pressed. The user

interface of the PFC24 TCR is controlled by six buttons on the front of the unit.



Terminals are located on the back of the device and are compatible with 2mm cables. See the user manual for the symbols and explanations of the terminals.

3. TECHNICAL PROPERTIES

Power Supply	
Power Supply	85-265VAC
Supply Frequency	50Hz
Power Consumption	<15W
Input Specifications	
Current Inputs	3 Phase, Neutral (Optional), In:5A
Current Tr. Setting Range	1-9999
Voltage Inputs	0-275V RMS
Voltage Tr. Setting Range	1-999
Connection Type	3P4W
Digital Inputs	24VDC
Output Specifications	
Number of Output Steps	24
Type of Output Steps	Optically isolated transistor output (24V-50mA) (suitable for Thyristor Switching Modules), Dry Contact (Optional)
Types of Compatible Steps	Three or Single Phase Capacitor Banks, Phase to Phase Capacitor Banks, Three or Single Phase Shunt Reactors, Phase to Phase Shunt Reactors
Step Power Range	999.99kVar Capacitive – 999.99kVar Inductive
Step ON Delay	0.02sec-999min, Adjustable
Step OFF Delay	0.02sec-999min, Adjustable
TCR Output	Isolated output for two separate TCR modules (Star TCR, Delta TCR)
TCR Power Range	0-999.99kVar
Auxiliary Outputs	Dry Contact 1 (5A, 250VAC, Form C) Can be programable for fault conditions Dry Contact 2 (5A, 250VAC, Form A) Can be programable for fault conditions.
Control Specifications	
Target Options	Cos(ϕ) Target Mode, Reference VAR Target Mode
Step Control Method	The Most Suitable Two Stage
TCR Control Method	PI Control
Decision Time	20ms
Protection Specifications	
Protections	High Voltage, Low Voltage, Over Current, THDv, Temperature
Fan Control	Adjustable ON and OFF According to Temperature
Measurements	
Measurements	Three Phase Currents (Ia, Ib, Ic), Neutral Current (In), Phase-Neutral Voltage(Va, Vb, Vc, Vn), Phase-Phase Voltages(Vab, Vbc, Vca), Three Phase and ThreePhase ve Total Active Power (Pa, Pb, Pc, Pt), Reactive Power (Qa, Qb, Qc, Qt), Apparent Power (Sa, Sb, Sc, St), Frequency (f), Power Factor(PFa, PFb, PFc), Voltage and Current Harmonics (H1-H31, THD), Total Active Energy (Wh), Total Inductive Reactive Energy (VARh+), Total Capacitive Energy (VARh-), Reactive Energy/Active Energy Ratio, Stage Switching time and Stage Run Time
Accuracy	%1 I,V - %2 P,Q,S - %2 Harmonics - %2 Energy

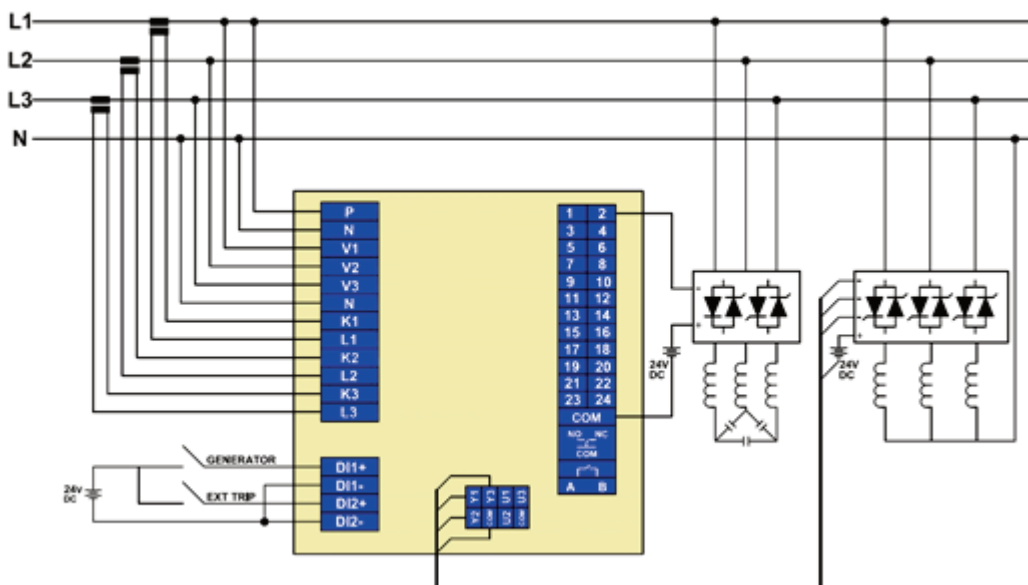
Communication	
Communication Protocol	Modbus RTU
Communication Interface	RS485
Supported Baud Rates (kbaud)	2400, 4800, 9600, 19200, 38400
Mechanical Specifications	
Dimensions (mm)	144x144x94,5
Mounting	On front of Panel
Weight (gr)	560
Terminals	0.5 - 2.5mm ² , Springy
Protection Class	IP41
Operating Temperature	-10 +70°C
Relative Humidity	Max. 95%
Other Specifications	
Supported Language	English, Turkish
Display	240*160 One Color LCD Display
Auxiliary Features	Auto. Stage Assignment, Auto. Correction of Connection Faults, Test Function

4. INSTALLATION AND OPERATION SAFETY PRECAUTIONS

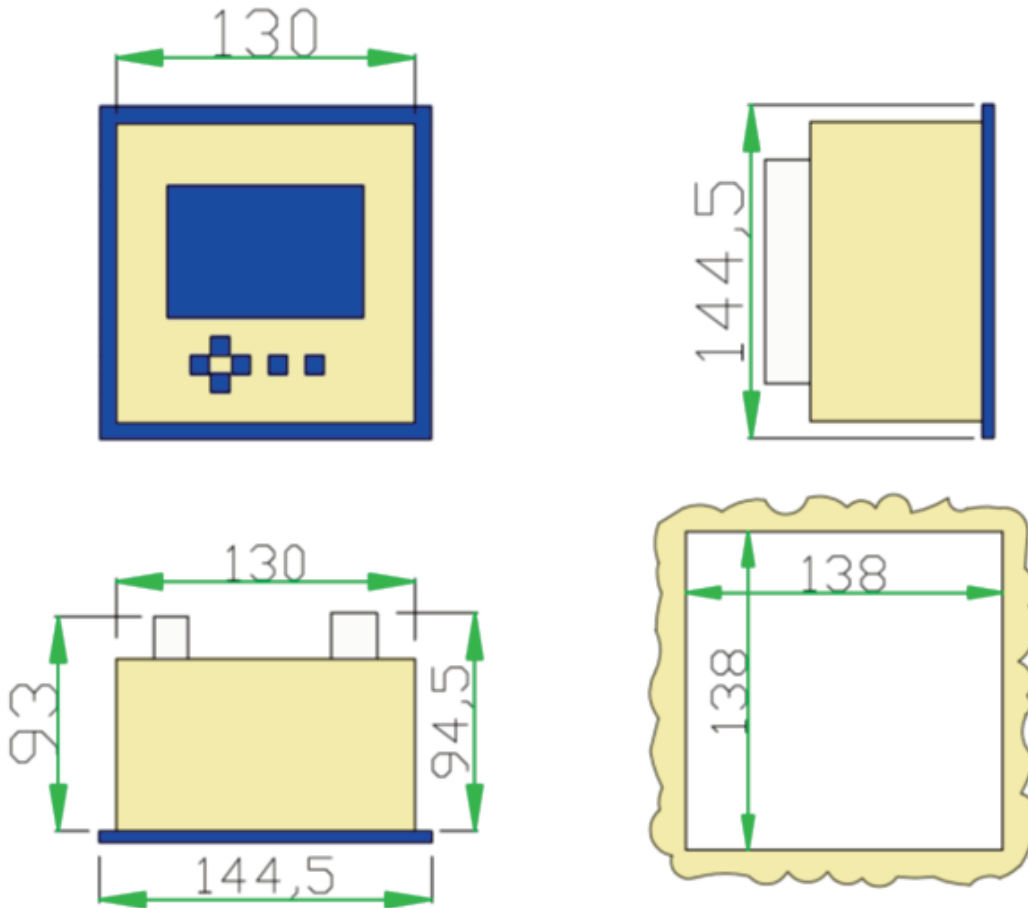


1. The installation and commissioning must be done by qualified electrical stuff.
2. The instructions must be followed when connection is made and do not work live conductors.
3. The device must be protected against the humidity

1. The device must be fixed before the electrical connections are done.
2. Open a cross section with size 144x144mm for assembling the device.
3. The device is inserted to the panel from front side and tightened via the fixing apparatus.
4. Be sure that not working with the live conductors during cabling.
5. It is recommended the using cable lug for healthy cabling operation.
6. When mounting the current transformer, make sure that the wires are strictly inserted into the terminals.



5.DIMENSIONS



6. ORDERING INFORMATION

<u>PFC</u> MODEL	<u>24</u>	<u>TO</u>	<u>TCR</u>	<u>C</u>	
					COMMUNICATION
				C	WITH COMMUNICATION
				N	WITHOUT COMMUNICATION
					THYRISTOR CONTROLLED REACTOR
				TCR	AVAILABLE
				N	NOT AVAILABLE
					OUTPUT TYPE
				TO	THYRISTOR OUTPUT
				DO	CONTACTOR OUTPUT
					NUMBER of OUTPUT
				24	24 Stage
				18	18 Stage
				12	12 Stage

7. WARRANTY TERMS AND CONDITIONS

Elektrolojik Energy Tech. Ltd. Co. warrants a trouble free operation of the PFC SERIES within 24 months from the date of sale, on condition that following terms are provided:

1.The proper connection and operation

2.The safety of the quality control seal

3.The integrity of case, no trace of opening, cracks, spalls etc.

The warranty shall not apply to malfunctions or damages resulting from accidents or user supplied faults.

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