THYRICON Standard Series (1P3.20 - 1P2.20 - 3P2.20)

Technical Catalogue

Description

THYRICON 1P3.20 - 1P2.20 - 3P2.20 new, compact, zero cross switching thyristor modules, are designed for switching capacitive loads up to 20A per phase in power factor control applications.

THYRICON standard series products can be triggered by means of any type of power factor controllers, programmable logic controllers (PLC) etc. with a response time less than 10msec. Standard series products are low - cost products developed for low power applications.

Features

- Used in the design of dynamic low power PFC systems for low voltage grids.
- Tracks and switches at zero crossing instants of voltage difference between capacitor and line.
- Monitors conduction status via STATUS LED.
- High switching speed, less than 10 msec.
- Prevents inrush currents at switching instants.
- No voltage transients caused by switching operations
- No noise during switching.
- Compact design ready for connection
- Silent operation
- Maintenance free
- Long operational life

Application

THYRICON 1P3.20 - 1P2.20 - 3P2.20 are used in PFC applications requiring fast response and high power quality. Installations with rapid changing and high fluctuating loads like pressing, welding machines, elevators, cranes, arc and ladle furnaces, wind turbines etc. pumping stations, commercial and public buildings are the example application areas.

Technical Specifications	1P2.20	1P3.20	3P2.20
Operating Voltage	230 VAC		400 VAC
Operating Frequency	50Hz, 60Hz		
Nominal Operating Current	20A		
Supply Voltage	Yok		
Max. Power Consumption (Conduction Loss)	36W	54W	36W
Max. Power Consumption (Control+Cooling)	<1W		
Max. Capacitor Power	4.6 kVAr (per phase)		13.8kVAr (total)
Trigger Signal	10 – 30VDC (Recommended: 24VDC)		
Switching Time	<10msec		
Re-switching Time	Depends on degree of de-tuning and value of discharge resistor.		
Operating Temperature	between -10°C to 55°C		
Display	Temperature Alert Led, Status Led		
Number of Thyristor Module	2	3	2
Cooling	Passive cooling with aluminum heat sink		
Thermal Protection	Module is disabled at 85°C		
Dimensions (wxhxd)	49x114x118mm		
Weight (kg)	0.63	0.64	0.62
Assembling	Vertical mounting on mounting plate		
Degree of Protection	IP20		

Structure and Operating Principles

THYRICON standard series products, are compact units with thyristor modules, driver circuit and cooling unit.

Upon the trigger signal from control devide, the thyristors are swictced at the zero crossing instants of anode-cathode voltage difference. Conduction of the thyristor modules are independent from the other. Upon the loss of trigger signal, thyristors turn off by natural commutation.

The status led display belonging to each thyristor module located on the mimic diagram indicate the conduction status of the thyristor modules.

Another display on the device is the “HIGH TEMP” led. This display indicates that the module is in heat protection status.

The device is cooled by the aluminum heat sink. In the case the coolent temperature reaches to 85°C thyristors are disabled due to temperature protection. Module switches to normal operation again when it reaches to the proper temperature.

Safety Instructions and Precautions

Thyristor modules may only be used for the purpose they have been designed for.

The installation and commissioning must be done by qualified electrical staff.

Do not work with live conductors.

Thyristor-modules may only be used in combination with appropriate safety devices (Super-fast fuses and surge arresters - see “Recommended Use” part).

The devices have to be protected against moisture and dust – a sufficient cooling has to be assured.

Use power capacitors with suitable rated values depending on application (see “Recommended Use” part)

For PFC-systems without harmonic filter reactors, it is mandatory to use current limitation reactors per thyristor module.

In dynamic PFC-systems it is advised to use discharge resistors for fast switching. Do not use discharge reactors.

The PFC-capacitors will stay energized even when the particular step has been switched off. Protection against contacts has to be guaranteed.

Even in switched off state no electrical isolation is achieved for electronic switches. Therefore parts of the systems may not be touched after switching off the complete system before the capacitors have been completely discharged and switching device is isolated from the grid.

Installation and Operation

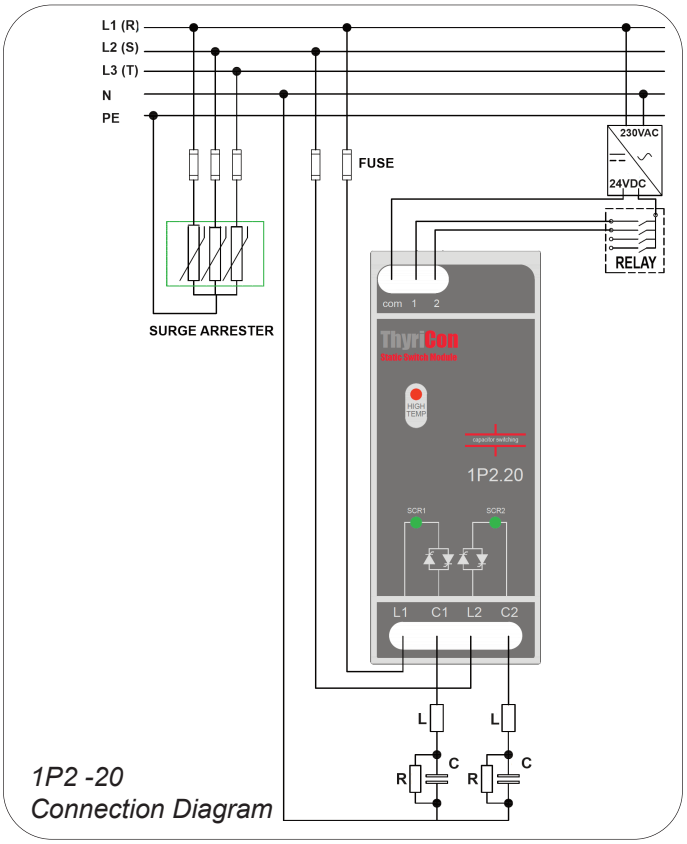
The mechanical mounting is done on a mounting plate from front side using the mounting pieces and screws supplied with the product (see “Mounting and Dimesions” part).

The electrical connections to main terminals are done according to “connection diagram” part according to application. It is mandatory to use super fast electronic fuses as branch fuses of the THYRICON module to protect the semiconductor device!

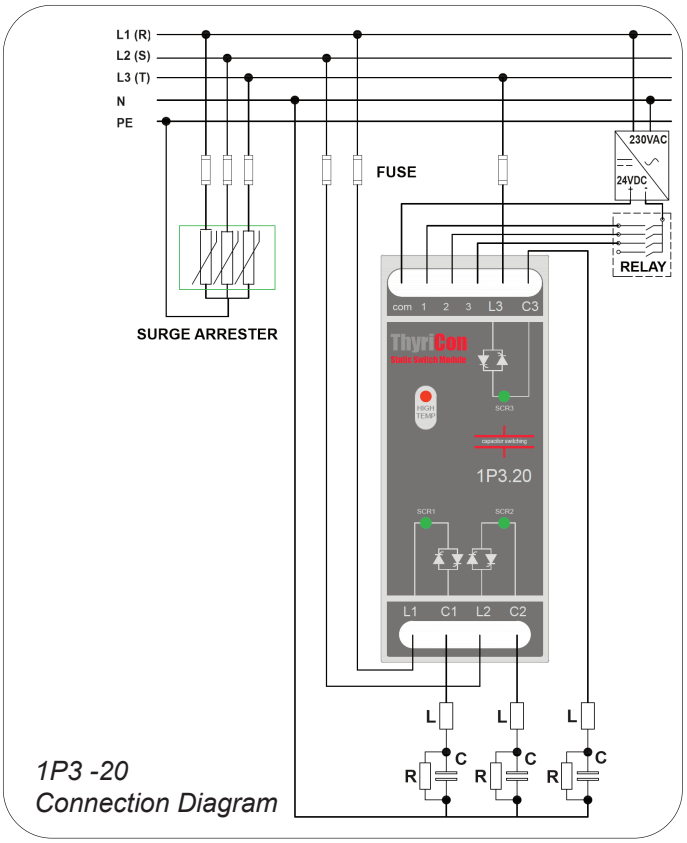
Connect triggering signal of 10 – 30 VDC (coming from the PFC-controller or an adequate control system) to the triggering terminals.

If the supply power for the capacitor bank are switched on, the thyristor module is ready for operation.

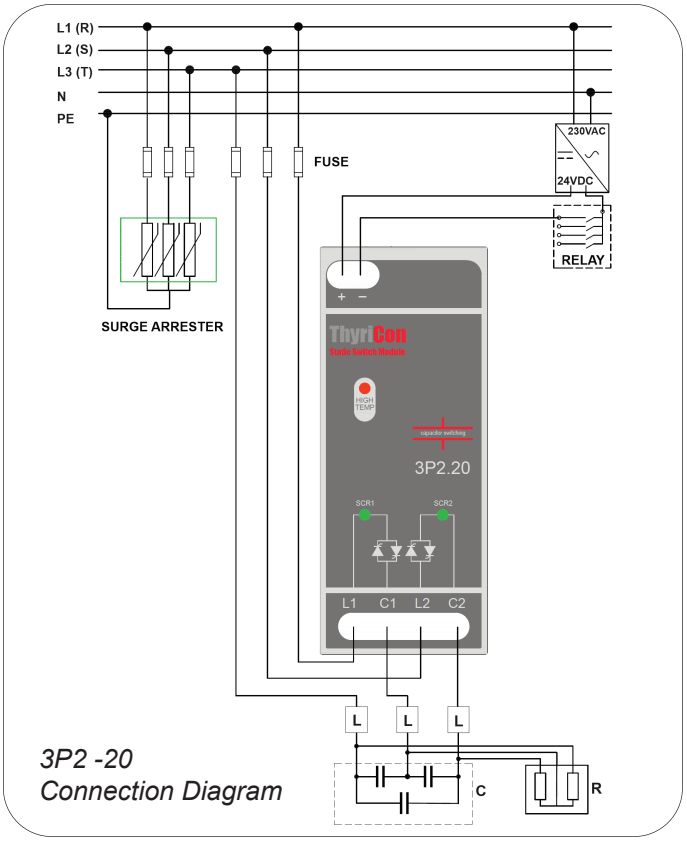
Connection Diagram



1P2 -20
Connection Diagram



1P3 -20
Connection Diagram



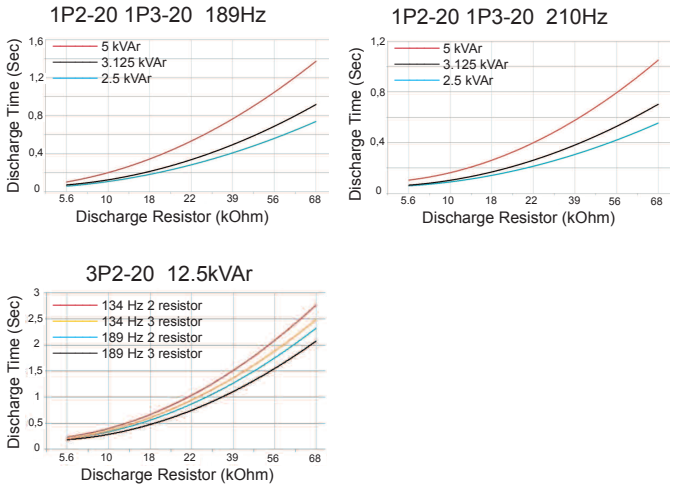
3P2 -20
Connection Diagram

Recommended Use

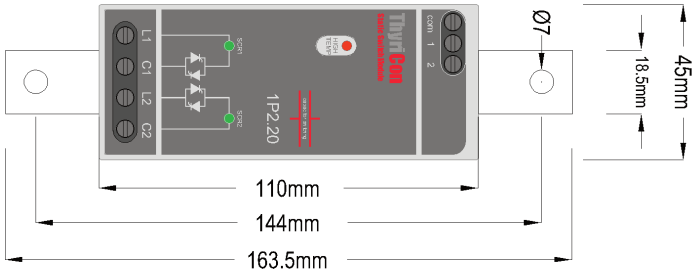
* Its recommended to use 32A super fast fuses for each thyristor module.

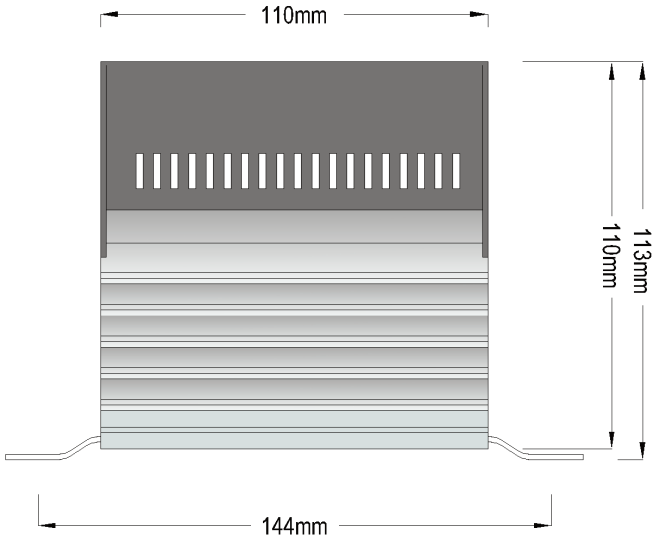
* it is recommended to use surge arresters in the panel. (ex: VAL-MS-230ST Phoenix Contact)

* The value of discharge resistors can be selected according to the desired switching time using the graphs:



Mounting and Dimensions





Top View, Side View

Ordering Information

3	P	2	-	2	0	S	Z

Z	Zero Cross Switching
N	Random Switching

1P	Single Phase
3P	Three Phase

2	Number of Thyristor Module
3	

20	Nominal Operating Current

S	Standard Series

Warranty Terms and Conditions

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

- the proper connection and operation
- the safety of the quality control seal
- 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.

Elektrolojik Energy Technologies Engineering, Industry and Trading Ltd. Co.
Gersan Sanayi Sitesi, 2308 Sok. No: 29 06370 Batıkent/Yenimahalle/ANKARA
Tel: +9 (0) 312 278 38 76 - Fax: +9 (0) 312 278 24 13
E-mail: info@elektrolojik.com.tr - Web: www.elektrolojik.com.tr