



## Thyristor module TSM-HV50

**Series/Type:** TSM  
**Ordering code:** B44066T0050E690  
Date: August 2006  
Version: 4

Preliminary data

Charateristics

- Fast electronically controlled self observing thyristor switch
- Usage in dynamic (fast) power factor correction systems in 690 V grids, **neutral conductor required**
- For capacitive loads up to max. 60 kvar at 690 V
- Micro-processor controlled alignment to tuned or detuned capacitor branches (up to 14%) for optimized switching behaviour
- No system perturbation due to switching operations (transients)
- Switching without delay
- Maintenance-free
- Long useful service life
- No noise emission during switching operations
- Compact module ready for connection



Features

<ul style="list-style-type: none"> <li>• Easy installation</li> </ul>	<ul style="list-style-type: none"> <li>- Mechanical assembly directly on a mounting plate</li> <li>- Self check after turn-on of main voltage</li> <li>- Optimized switching behaviour to the connected load (tuned/detuned) via the internal processor</li> <li>- Storage of optimized parameters for optimum switching behaviour</li> </ul>
<ul style="list-style-type: none"> <li>• Mounting position</li> </ul>	<ul style="list-style-type: none"> <li>- Upright; minimum 100 mm space on top and below</li> </ul>
<ul style="list-style-type: none"> <li>• Display and control via LED display</li> </ul>	<ul style="list-style-type: none"> <li>- Operation</li> <li>- Faults</li> <li>- Activation</li> </ul>
<ul style="list-style-type: none"> <li>• Permanent self-monitoring</li> </ul>	<ul style="list-style-type: none"> <li>- Temperature</li> <li>- Voltage</li> <li>- Capacitor failure</li> </ul>

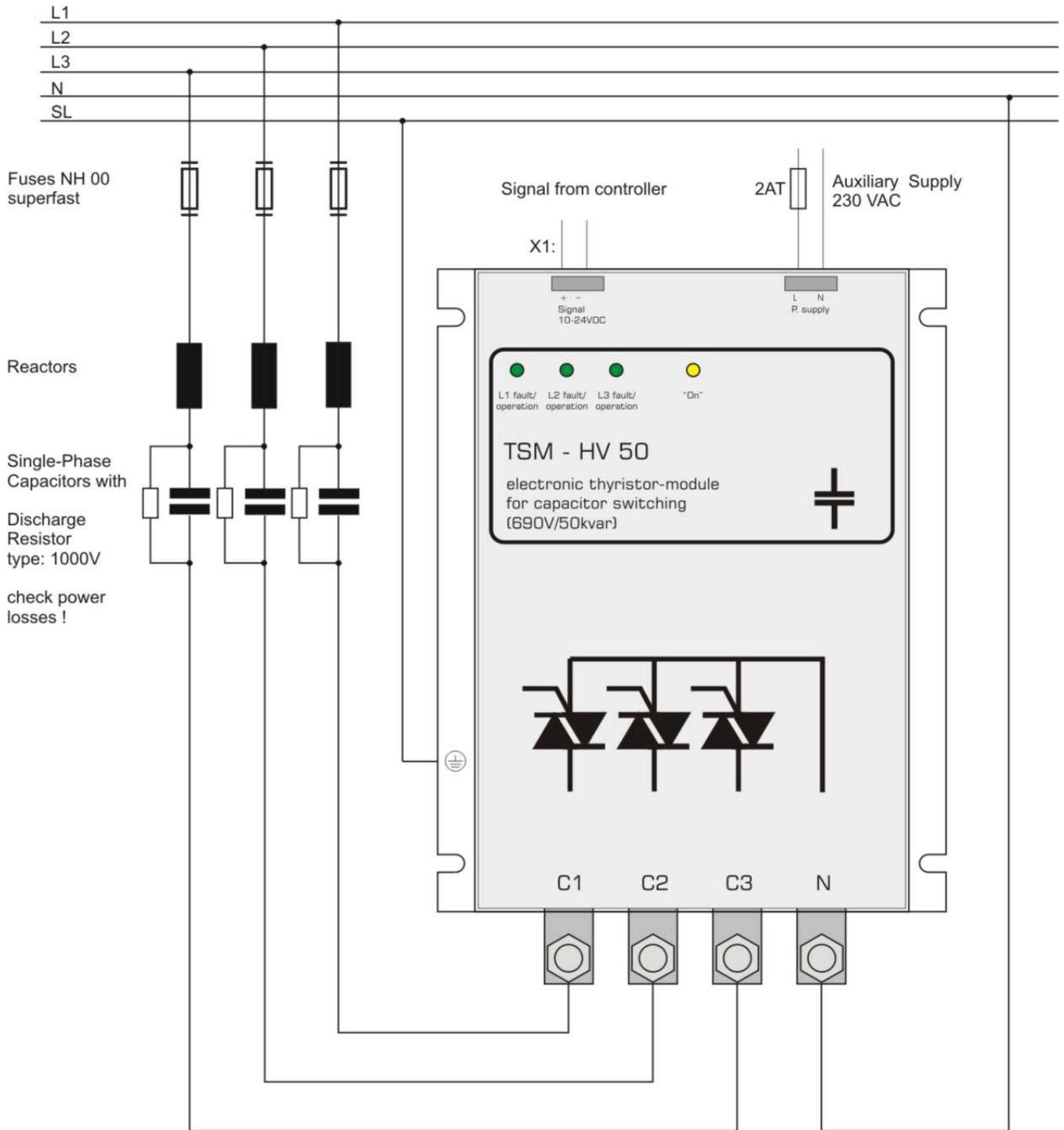
**Preliminary data**
**Technical data**

Dimensions	157 x 200 x 195 mm (w x h x d)
Weight	5 kg
Rated voltage	Max. 690 V
Auxiliary supply	230 V AC
Frequency	50/60 Hz
Switching capability	50 A (max. 60 kvar at 690 V)
Activation	10...24 V DC (approx. 20 mA) via terminal clamp, internally electrically isolated
Switching time	Approx. 5 ms
Reset time	Depending on degree of detuning and dimension of discharge resistor
Display	Status LED per phase LED triggering signal
Power circuit	Direct connection 4 pole via busbar (cable lug 25 mm <sup>2</sup> , D = 8 mm), connection from the bottom
Power dissipation	$P_D$ (in W) = 3.0 x I (in A); at 690 V/50 kvar approx. 125 W thermal
Fuses (mandatory for protection of components)	3 x electronic fuse „superfast“ (NH00 AC 690) 50/60 kvar: max. 125 A (SIBA Art. No.: 20 209 20-125) 25 kvar: max. 63 A (SIBA Art. No.: 20 209 20- 63)
Ambient operating temperature at nominal load	-10 °C ... +55 °C

Preliminary data

Connection diagram: three-phase load at 690 V (standard)

GRID 3x 690V



## Preliminary data

### Cautions and warnings

#### General

- Thyristor modules TSM series may only be used for the purpose they have been designed for.
- Thyristor modules TSM series may only be used in combination with appropriate pre-switched grid separator device.
- Thyristor modules have to be projected in such a way that in case of any failure no uncontrolled high current and voltages may occur.
- The devices in operation have to be protected against moisture and dust, sufficient cooling has to be assured.

#### Attention

Due to the switching principle of the thyristor module the power capacitors are permanently loaded to the peak value of the grid voltage (DC voltage) even when switched off. Therefore following rules have to be obeyed in any case:

- For standard PFC-systems (without reactors) single-phase power capacitors of 400 V nominal voltage have to be used; for detuned systems with detuning factor 7 % at 690 V, PFC capacitors of 440 V nominal voltage have to be used. For detuned systems with detuning factor 14 % at 690 V, PFC capacitors of 480 V nominal voltage have to be used.
- In dynamic systems with TSM modules no fast discharge reactors may be used (reactor = DC-wise short circuit).
- For standard PFC-systems 3 current limiting reactors are mandatory per thyristor module.
- Thyristor modules in general have to be protected by superfast electronic fuses. Principles for dimensioning have to be considered. Fuses in the system have to be marked.
- Due to the special switching, the PFC capacitors are fully loaded even when the particular step has been switched off. Protection against contact has to be guaranteed. Warning signals in the systems are required.
- 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.

**FAILURE TO FOLLOW CAUTIONS MAY RESULT, WORST CASE, IN PREMATURE FAILURES OR PHYSICAL INJURY.**

**⚠** Please read cautions information about PFC capacitors and cautions as well as installation and maintenance instructions in the actual version of the Product Profile Power Factor Correction to ensure optimum performance and prevent products from failing, and in worst case, bursting and fire, etc. The actual Product Profile is available at [www.epcos.com/publications](http://www.epcos.com/publications).

Information given in the PFC-product profile and values given in the data sheet reflect typical specifications. You are kindly requested to approve our product specifications or request our approval for your specification before ordering.

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