Film Capacitors – Power Factor Correction

Thyristor Module TSM-LC25/TSM-LC-50

Series/Type:	**TSM-LC25/TSM-LC50**
Ordering code:	**B44066T0025E402/B44066T0050E402**
Date:	August 2010
Version:	5

Characteristics

- Fast electronically controlled self observing thyristor switch
- Usage in dynamic (fast) power factor correction systems
- For capacitive loads up to 50 kvar

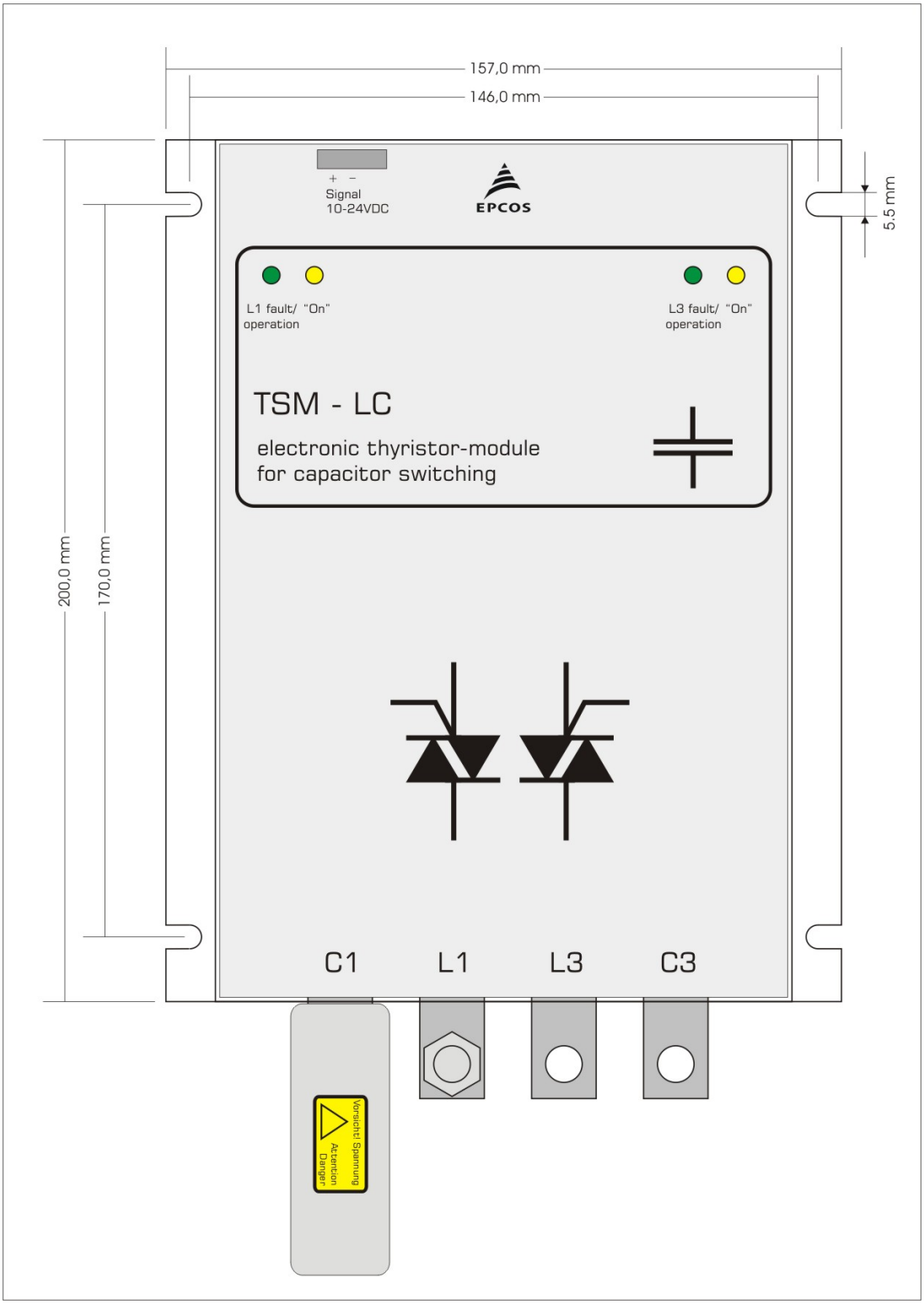
Features

- Easy installation: self-check after turn-on of main voltage
- Display and control via LED-display
- Permanent self-controlling: voltage parameters, phase sequence, capacitor output, temperature

Technical data and specification

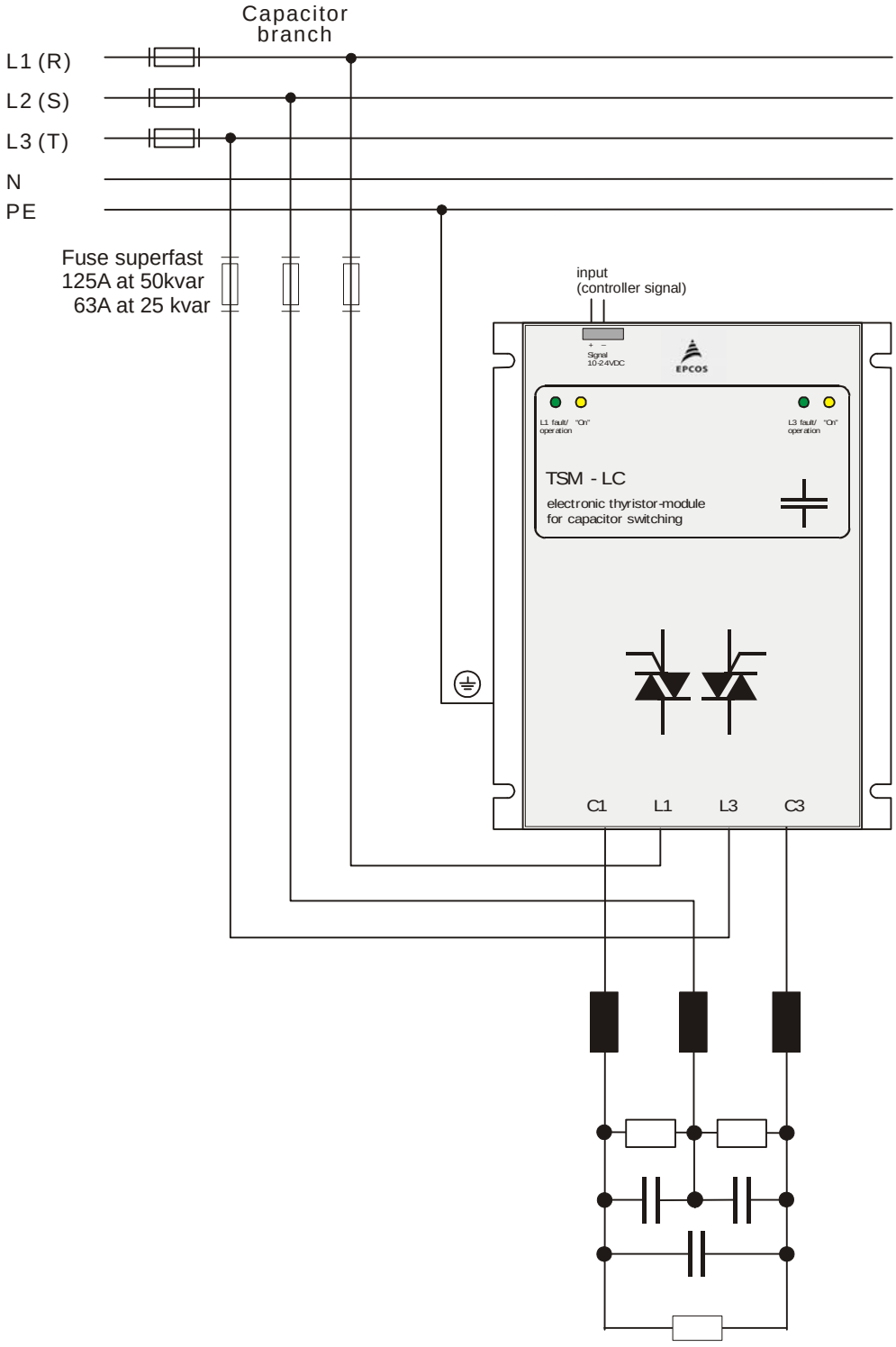
Dimensions	157 × 200 × 180 mm (w × h × d)
Weight	4.8 kg
Voltage	3 × 400 V
Maximum voltage - in conventional PFC-systems (without reactors) - in detuned PFC-systems (7% detuning) - in detuned PFC-systems (14% detuning)	 440 V 440 V (no upward tolerance permitted) 400 V
Frequency	50 Hz/60 Hz
Max. power	TSM-LC 25: 25 kvar for PFC-systems with/without reactors up to 14% TSM-LC 50: 50 kvar for PFC-systems with/without reactors up to 14% (cascading of several modules possible for increasing the kvar output)
Activation	10 … 24 V DC, internally insulated
Monitoring	Operation, faults, activation, temperature Note: Before re-switching after temperature fault, heat sink temperature must be below 50 °C (hysteresis)!
Display	2 LEDs/phase
Power circuit	connection: 2 × two-phase (L1, L3) with 4 terminals; 25 mm^2 cross section
Thermal power	P_D (W) = 2.0 × I (A) 25 kvar: at 400 V typical 75 W 50 kvar: at 400 V typical 150 W
Fuses* (required for protection of TSM-LC and capacitor): *not included in the delivery	3 × electronic fuse „superflink“ (NH00 AC 690 V) 50 kvar: 125 A (e.g. SIBA Art.No.: 20 209 20-125) 25 kvar: 63 A (e.g. SIBA Art.No.: 20 209 20-63)
Switching time	approx. 5 ms
Operating ambient temperature	–10 °C ... +55 °C
Ordering code	TSM-LC 25: B44066T0025E402 TSM-LC 50: B44066T0050E402

Dimensional drawing



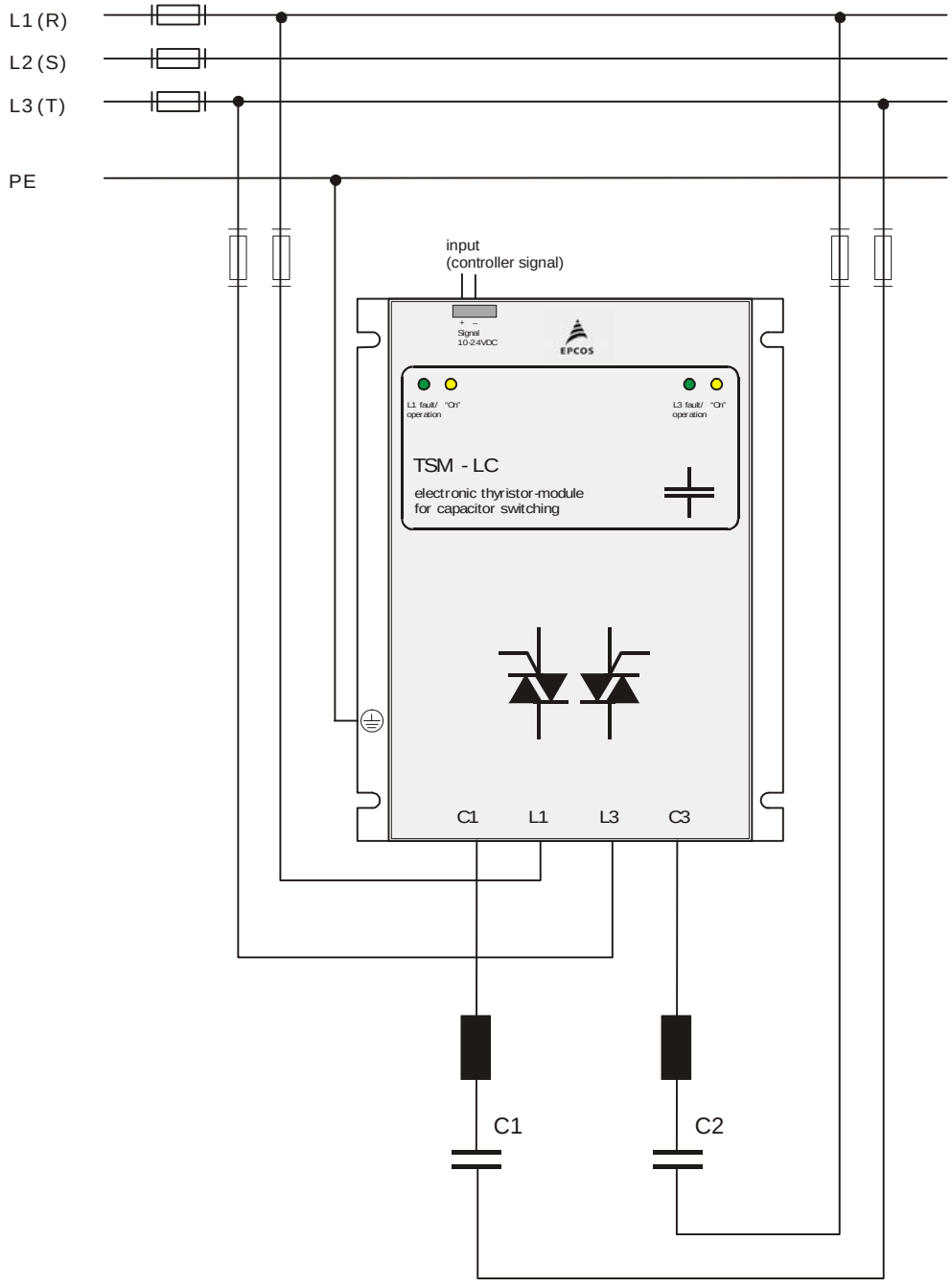
Connection diagram

Three-phase load (standard)



Connection diagram

Single (two) phase load
e.g. single phase welding machine



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 the following rules have to be obeyed in any case:

- For standard PFC-systems (without reactors) power capacitors of 440 V nominal voltage have to be used; for detuned systems PFC capacitors of 525 V nominal voltage have to be used.
- Due to the high voltage (2 × peak value of nominal voltage) that occurs, the discharge resistors of the power capacitors have to be replaced by special types.
- In dynamic systems with TSM modules no fast discharge reactors may be used (reactor = DC-wise short circuit).
- For standard PFC-systems 2 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.

Note

For detailed information about PFC capacitors and cautions, refer to the latest version of EPCOS PFC Product Profile.

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