



## Film Capacitors – Power Factor Correction

Feed in module for TSM-LC-S

**Series/Type:** ESP24  
**Ordering code:** B44066T0002E400  
Date: July 2014  
Version: 2

**Characteristics**

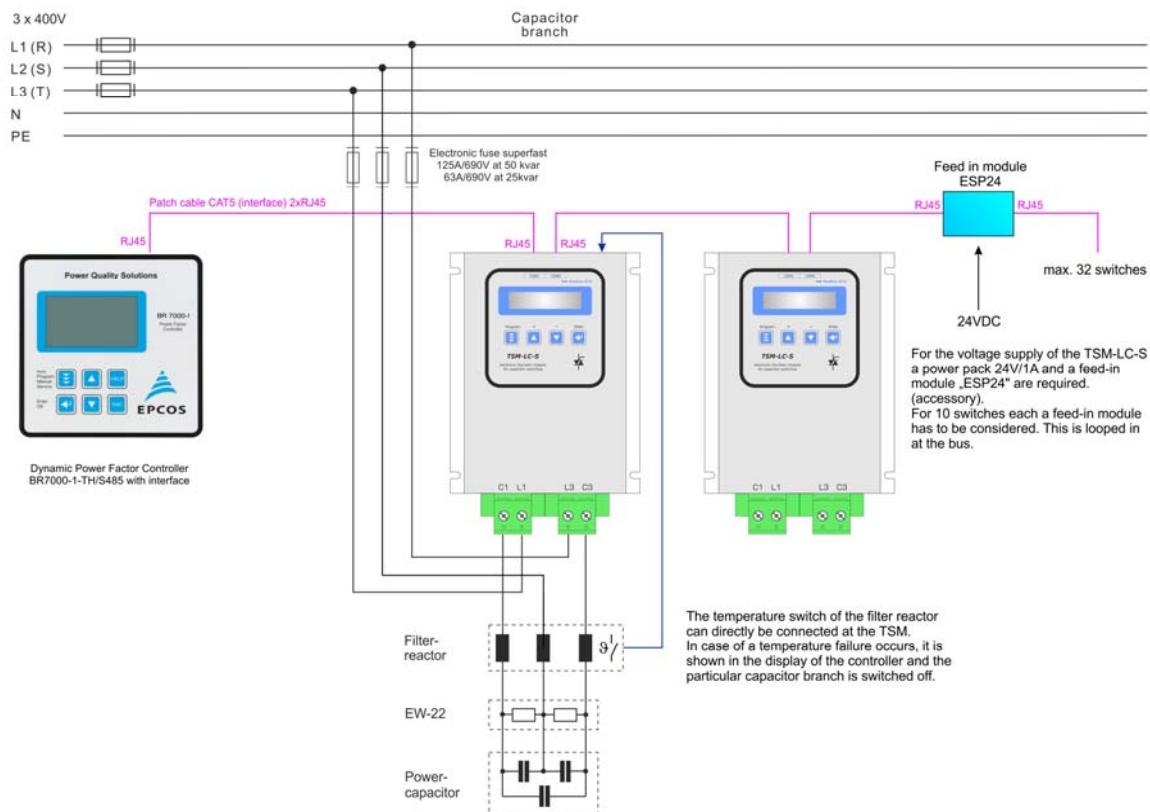
- Feed-in module for thyristor module series TSM-LC-S
- For feed-in of operating voltage 24 V DC into the network
- 1 module per max.10 thyristor switches required

**Mounting and connection**

- Mounting on DIN rack (top hat rail)
- Mounting position random


**Technical data and specifications**

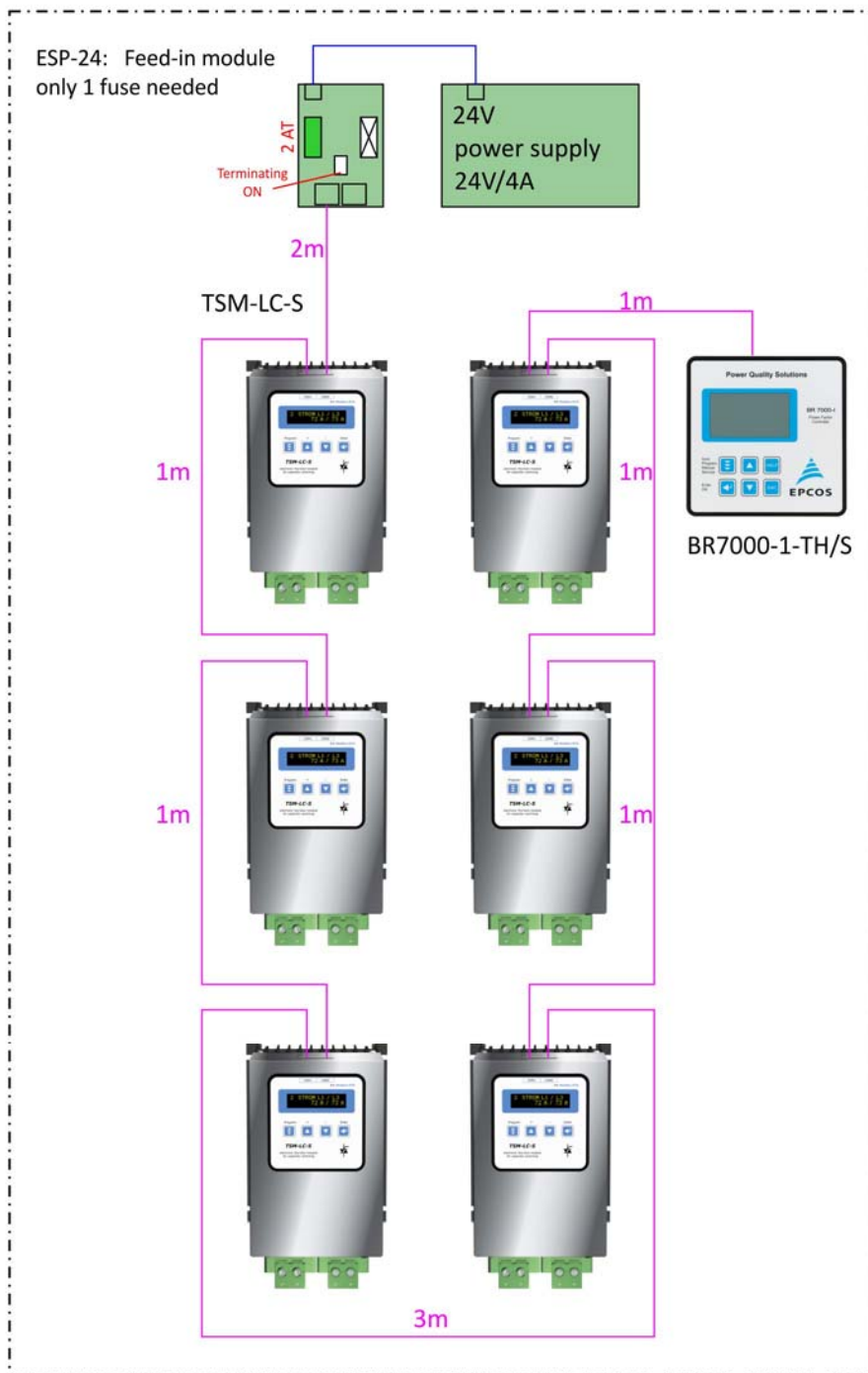
Dimensions	45 x 90 x 50 mm (W x H x D)
Weight	Approx. 0.2 kg
Supply voltage / input	24 V DC / max.4 A via 2-pole screw terminal of external power supply
Signal in- / outputs	2x RJ45 bush (Modbus) for connection of 2 standard patch cables
Degree of protection	IP20
Operation mode	Permanent operation
Maximum ambient operating temperature	+80 °C

**Usage/Connection diagram**


Connection plan ESP-24 – example 1

Control bus wiring when using 6 pieces TSM-LC-S

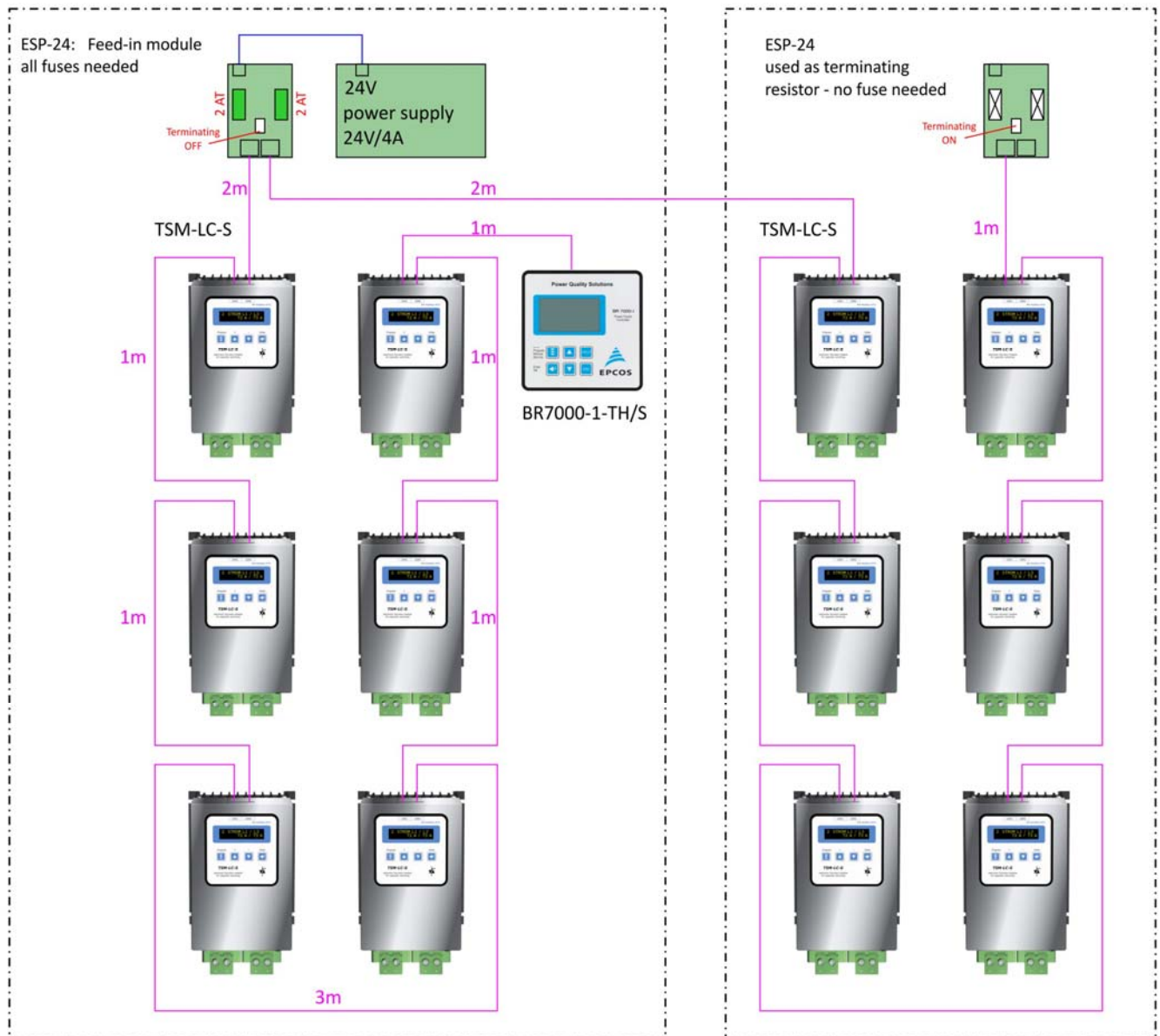
Please take care of placement of the fuses and termination (see picture)!



Connection plan ESP-24 – example 2

Control bus wiring when using 2 x 6 pieces TSM-LC-S (e.g. for a compensation system in 2 cabinets)

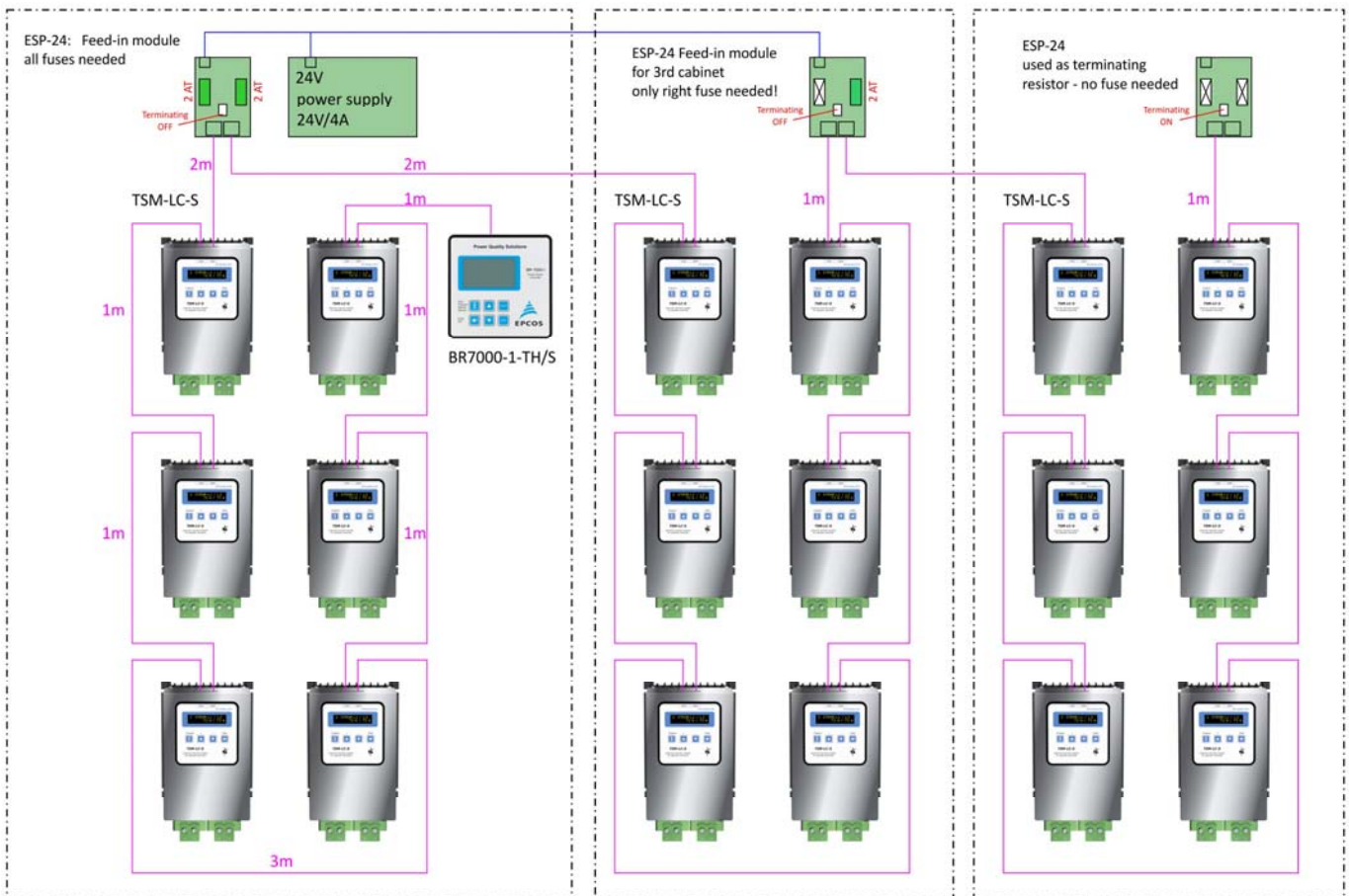
Please take care of placement of the fuses and termination (see picture); last module acts as terminating resistor!



Connection plan ESP-24 – example 3

Control bus wiring when using 3 x 6 pieces TSM-LC-S (e.g. for a compensation system in 3 cabinets)

Please take care of placement of the fuses and termination (see picture); last module acts as terminating resistor!



## 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.
- As the devices are cooled in passive way (no fan), enough space (min. 150 mm distance up and down) must be guaranteed.
- Do not mount several devices one above the other (heat accumulation)!
- Thyristor switches may only be connected to the grid when a possible harm to humans and devices are eliminated.

### 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:

- The discharge resistors of the power capacitors have to be replaced by special voltage resistant types due to the high voltages that occur (2 x peak value of grid voltage); accessory EW22 see connection diagram.
- In dynamic systems with TSM modules no fast discharge reactors may be used (reactor = DC-wise short circuit).
- For standard systems (without reactors) per thyristor switch 2 current limitation reactors are mandatory. Available as accessory (BD100)
- 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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