1) Elstein TRD 1 temperature controller

2) Elstein thyristor switching units

TSE 40 A

TSE 20 A

3) Elstein fuse holders

PST 14

PST 10

4) Elstein fuses

URG 50 A

URG 20 A

5) Elstein AK terminal clamp

6) Elstein nickel wire

7) Elstein thermo line

8) Elstein compensating line

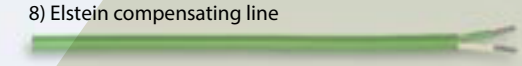
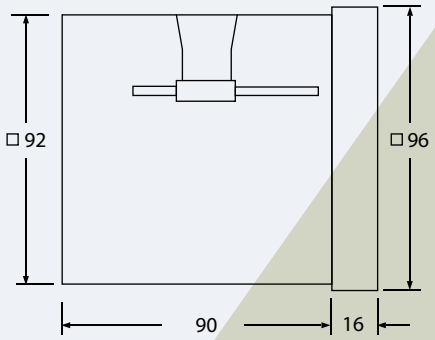
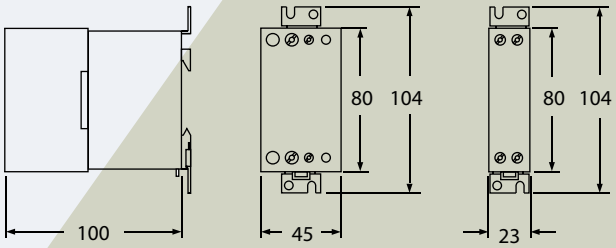
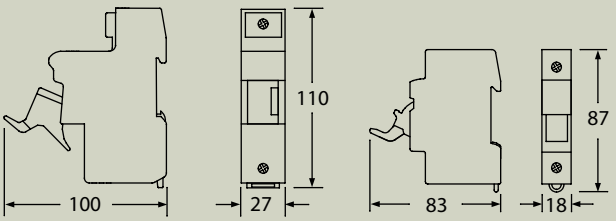


Figure 87: Electrical and temperature controlling accessories





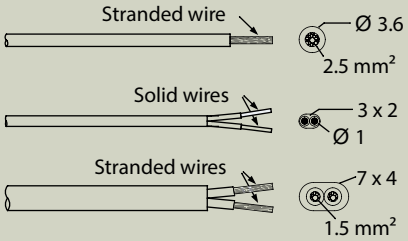




Figure 88: Electrical and temperature controlling accessories, Dimensions in mm

1) Elstein TRD 1 temperature controller

| | |
|---|---|
| Type: | two point controller with PID performance |
| No. of switching units: | max. 6 TSE per controller |
| Temperature sensor: | NiCr-Ni + 16 further types |
| Control range: | up to 1100 °C |
| Setpoint setting: | in 1 °C steps, 4 setpoint values, distant access |
| Outputs: | 2 x 0/12 V DC bi-stable load max. 30 mA and 2 relay outputs |
| Supply voltage: | 95 V - 263 V, 48/63 Hz |
| Measuring circ. monit.: | outputs are switched off in case of break of sensor |
| Perm. ambient temp.: | 0 - 55 °C |
| Perm. air humidity: | < 90% |
| Setpoint value display: | LCD 14.0 mm, green |
| Actual value display: | LCD 19.7 mm, red |
| Degree of protection: | front side IP 65<br>rear side IP 20 |
| Connections: | screwed terminals |
| Installed position: | any |
| Dimensions: | DIN format 96 x 96 mm |

The TRD 1 electronic temperature controllers analyse the signal of the thermocouple being integrated in each thermocouple radiator. The TRD 1 temperature controllers operate as quasi-continuous controllers and their factory settings are specially matched to the controlled process performance of Elstein infrared systems, so that practically no temperature fluctuations occur.

The two 0/12V DC logical outputs control the TSE thyristor switching units. In addition, two programmable floating relay contacts are available, which can be used, for example, as alarm contacts in conjunction with the limit comparators.

Further information and safety information are given in the TRD 1 operating instruction.

2) Elstein TSE thyristor switching units

The TSE thyristor switching units are used to switch the load circuits (infrared radiators) and are available in two power stages:

TSE 40 A, max. 40 A = 9.2 kW at 230 V
TSE 20 A, max. 20 A = 4.6 kW at 230 V

TSE thyristor switching units are supplied complete with heat sink and mounting clips for 35-mm standard rails. They are not subjected to any contact wear and therefore do not cause any switching noises. They are easy to install and their service life is virtually unlimited.

The loads are switched on at voltage zero and switched off at current zero. This means there is no system perturbation.

The load voltage is 24 - 265 V for TSE 20 A and 42 - 660 V for TSE 40 A. The control voltage is 4 - 32 V. A thyristor switching unit must be provided for each phase of a multi-phase connection to a 230/400 V alternating current mains.

The thyristor switching units must be protected against short circuits with super-agile fuses.

Transformers cannot be switched due to the Rush Effect.

Further information and safety information are given in the TSE operating instruction.

3) Elstein PST 14 fuse holder for URG 50
and PST 10 fuse holder for URG 20

The fuse holders can be clipped onto 35-mm standard rails and make a disconnection from the voltage possible according to the technical rules for safety. When changing the fuses, the front lever only has to be pressed down to expose the fuse shaft.

4) Elstein URG 50 A fuse for TSE 40 A
and URG 20 A fuse for TSE 20 A

The super-agile fuses are used to protect the thyristor switching units against short circuits. Conventional fuses are unsuitable.

5) Elstein AK terminal clamp, bipolar, consisting of steatite socket and stainless steel metal parts for cables with a maximum wire cross-section of 2.5 $mm^2$.

6) Elstein nickel wire, stranded, max. 500 °C, max. 11 A, single core, 2.5 $mm^2$ wire diameter, for the electrical connection of the ceramic infrared radiators.

7) Elstein thermo line, NiCr-Ni, max. 400 °C, for connecting the thermocouple integrated in the thermocouple radiator with the temperature controller.

8) Elstein compensating line, stranded, NiCr-Ni, max. 100 °C, for extending the connection thermocouple-controller outside the IR radiation area.