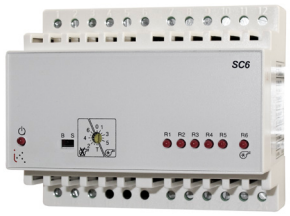


Controllers intended for control of electric heating coils, four relays. The controller can be set to sequential or binary control. It can be used together with any controller with 0...10 Vdc or 10...2 Vdc output signal.
The required number of steps is set by means of the rotating switch on the front. The 0...10 Vdc input signal is divided up into the number of steps, thus setting the switch-on point for each step. Relay 6 on SC6 can be used as a time-lag relay to delay shut-off of the fan when shutting down the system (3 min. delay).
The step controllers also have an analogue output (0…10 V) for control of an electric heating controller (CTR or similar) to give proportional heating between steps.

- 6 steps in sequence or 64 steps binary
- Control signal 0...10 V
- Analogue output for control of CRT25/CTR40 integrated with step activation
- Supply air fan provides run-on-time delay
- Settable limit for number of steps
- Built in testing function for simple start-up testing

Function
SC6 is a step-controller designed for controlling electric heaters etc. It can also be used to step-control cooling processes.It has six relay outputs for controlling heater groups and an analogue output for sequential control of electric heaters. Alternatively the sixth relay can be used as a run on time relay for heater after-cooling. In this case the step-controller works with five steps.

Operating mode and step setting
The operating mode is selected by means of the slide switch on the front, binary or in sequence. In the sequential mode (S) the six (five) steps are activated one after the other. In binary mode (B) SC6 can control up to 64 (32) steps. The figures in brackets refer to number of steps when using the after-cooling function of the sixth relay. The required number of steps is set by means of the rotating switch on the front.

Supply-air fan provides run on time as required
When heating is required the input signal exceeds zero, relay 6 will be activated for a three-minute run on time once the unit is switched off.
The relay contact is wired to the control circuit of the supply-air fan to provide aftercooling. If no heating is required when the unit is switched off, the run on time function will not be activated since it is not necessary.

Time delays
In order to reduce start-up time while still maintaining stable control, the SC6 has a specially developed time-delay function for activating/deactivating output steps. When increasing or decreasing power output there is a 10 second delay between steps. For change of direction (from increase to decrease or vice-versa) there is a 30 second delay.

Heater power-distribution
To achieve more balanced control the analogue output on the SC6 is used for continuous control of part of the heater via CTR25/CTR40. The remainder is controlled by means of output steps from the step controller. When running in sequential mode (S) all loads in the heater should be of equal size. When running in binary mode the first load on the step controller should be of the same size as the part-load controlled by the CTR25/CTR40.

For running in binary mode with part of the load being controlled continuously the heater must be split 1+1+2+4+8+16+32. At three-phase 400V the SC6 in conjunction with CTR40, can control (binary) up to 1600kW and at three-phase 230V up to 960kW.

Controlling together with CTR25/CTR40
CTR25/CTR40 has a built-in temperature controller which is connected to the control input of SC6.
The analogue output of the step controller is connected to the power control input of CTR25/CTR40 which is run together with the step control to equalize the relay steps.
When increased power is required the output to the power control of CTR25/CTR40 is increased. When this is at full power the step controller activates the next step at the same time as the power control output to CTR25/CTR40 is set to zero.
Increased power requirement is provided by an increase in output from CTR25/CTR40.
The corresponding function in reverse applies in the event of reduced power requirement.

Controlling from a controller/ DDC
SC6 can also be controlled by a 0...10V signal from a DDC or other controller.
When a part of the heater is to be controlled continuously the analogue output on the SC6 is connected to CTR25/CTR40.

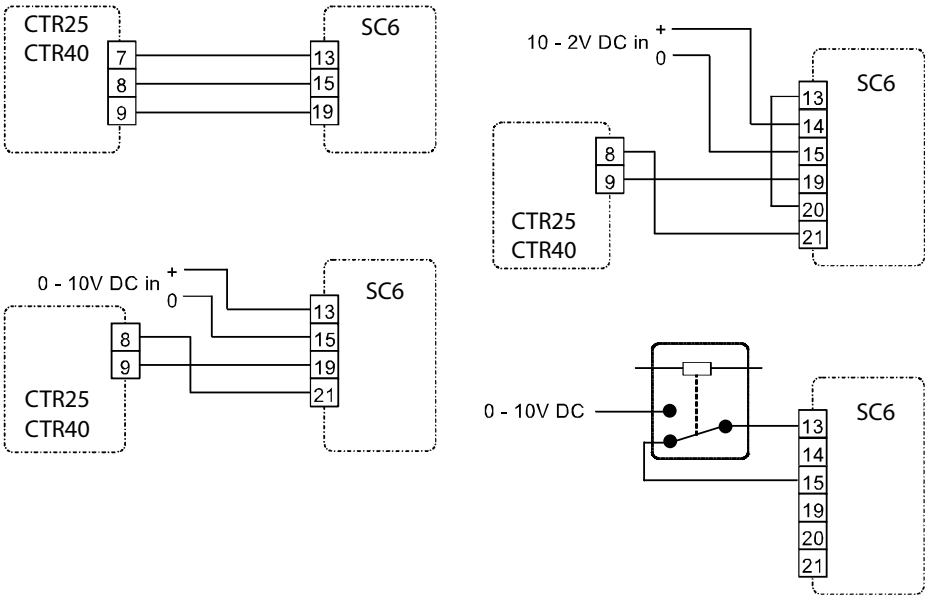
Test function
If the rotary switch is set to T on start up the SC6 will start in test mode. In test mode the relays are force activated by turning the rotary switch. Also, the analogue output signal will be incremented by 1 V / step.
To exit test mode, restart with the switch set to a position other than T.

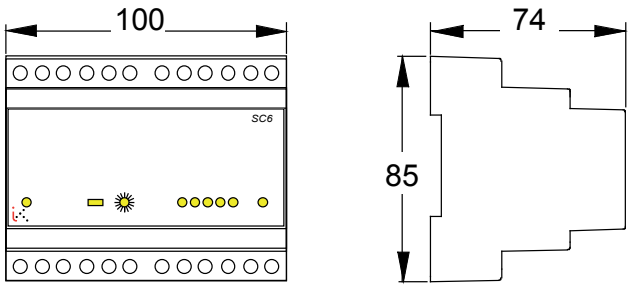
TECHNICAL DATA

Power supply:	24 Vac ± 15 % 50-60 Hz
Input signal:	0...10 Vdc from CTR25/40 or other controller/DDC.
Output signal:	
Control output	0...10 Vdc to CTR25/40
Relay contact data	6 single pole closing relays. 240 Vac, 2A. Relay 1...5 have a common supply pole. Relay 6 is single pole change-over.
Power cons.:	6 VA
Settings:	
Binary/sequential switch	Binary (B), Sequential (S).
Rotary switch	For setting the maximum number of output steps to be activated, 1...6. Relay 6 may, depending on the setting of the rotary switch, be used either as a sixth output relay or for run-on time delay to shut off the fan on shutting down the system.
Indicators:	Red LED (6) indicates activated output relay. Red LED indicates power supply.
Ambient temperature:	0...50 °C, non condensing
Storage temperature:	-40...+50 °C
Ambient humidity:	Max. 90% RH
CE	**Low Voltage Directive (LVD) standards:** This product conforms to the requirements of the European Low Voltage Directive (LVD) 2006/95/EC through product standards EN 60669-1 and EN 60669-2-1. **EMC emissions & immunity standards:** This product conforms to the requirements of the EMC Directive 2004/108/EC through product standards EN 61000-6-1 and EN 61000-6-3. **RoHS:** This product conforms with the Directive 2011/65/EU of the European Parliament and of the Council.
Mounting:	DIN-rail, 6 modules
Protection:	IP20
Size:	100 x 85 x 74 mm

WIRING AND DIMENSIONS (mm)

1	Relay 1 out	
2	Relay 2 out	
3	Relay 3 out	
4	Relay 4 out	
5	Relay 5 out	
6	Not connected	
7	Relays 1-5 in common	
8	Not connected	
9	Relay 6 common pole	
10	Not connected	
11	Relay 6 normally open	
12	Relay 6 normally closed	
13	0 - 10V DC input	
14	Signal conv. 10-2V DC in	
15	Signal neutral	
16	Not connected	
17	Not connected	
18	Not connected	
19	0 - 10V DC output	
20	Signal conv. 0-10V DC out	
21	Signal neutral	
22	Not connected	
23	24V AC in	Supply voltage
24	Neutral	





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