



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.

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.

- 4 sequential steps or 15 binary steps
- Input signal 0...10 V and 10...2 V
- Analogue output for controlling a CTR25/CTR40 in conjunction with output steps
- Settable limit for number of steps
- Built-in test facility for simple start-up testing
- Compact design for DIN-rail mounting with settings easily accessible on the front

Function

SC4 is a step-controller designed primarily for control of electric heating. It can also step-control cooling units. The step-controller has four output relays and an analogue output for continuous control of electric heaters.

Function mode and number of steps

The function mode can be selected by means of a slide-switch on the front, sequential or binary. In sequential mode (S) the four output relays are activated one after the other. In binary mode (B) the SC4 gives 15 output steps. The required number of steps can be selected by means of the rotary switch on the front.

Time delays

In order to reduce start-up time and yet maintain stable control when running the SC4 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.

The system is unable to change direction, from increase to decrease or vice-versa, more frequently than every 30 seconds. At each change a shut-off function is activated for a period of 30 seconds which prevents immediate activation/deactivation of the previous step.

Heater configuration

In order to obtain more stable control the analogue out-put on the SC4 is used for continuous control of part of the output of the heater via CTR25/CTR40. Other part outputs are controlled via relays from the step controller.

In sequential mode (S) the five groups should be of equal size. In binary mode (B) the output of the first step should be of the same size as the part controlled by CTR25/CTR40. In binary mode and with one part controlled by CTR25/CTR40 the heater should be divided in parts 1+1+2+4+8.

At three-phase 400V the SC4 together with CTR40 can control (binary) up to 443kW and at three phase 230V up to 255kW.

Controlling together with CTR25/CTR40

CTR25/CTR40 has a built-in temperature controller which is connected to the control input of SC4.

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.

Controlling together with CTR25/CTR40

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 DDC

SC4 can also be controlled by a 0...10 V or 10...2 V signal from a DDC or other controller.

When a part of the heater is to be controlled continuously the analogue output on the SC4 is connected to a CTR25/CTR40.

Test Function

If the maximum step switch is set to 0 at power up the SC4 enters test mode.

By rotating the switch the output functions can be tested. With the sequential/binary switch set to S the relays are activated one after another and the analogue output is stepped up by 2.5V per step. With the switch set to B the relays are activated in a binary sequence. When the switch is set to 0 the unit will leave test mode. The switch is then set to the maximum number of step to be used.

TECHNICAL DATA

Power supply:	24 Vac \pm 15 % 50-60 Hz
Input signal:	0...10 or 10...2 Vdc from CTR25/40 or other controller/DDC.
Output signal:	
Control output	0...10 Vdc (When using CTR25/40)
Relay contact data	4 single pole closing relays. 240 Vac, 2A, the relays have a common supply pole.
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...15. In S-mode setting the switch to 4 or higher will give 4 steps. Position 0 is for activating the self-test function.
Indicators:	Red LED indicates activated output relay. Red LED indicates power supply.
Ambient temperature:	0...50 °C
Storage temperature:	-40...+50 °C
Ambient humidity:	Max. 90% RH
CE	EMC emissions & immunity standards: This product conforms with the requirements of European EMC standards CENELEC EN 50081-1 and EN 50082-1, European LVD standards IEC 669-1 and IEC 669-2-1 and carries the CE-mark..
Mounting:	DIN-rail, 6 modules
Protection:	IP20
Size:	100 x 85 x 74 mm

WIRING AND DIMENSIONS (mm)

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

