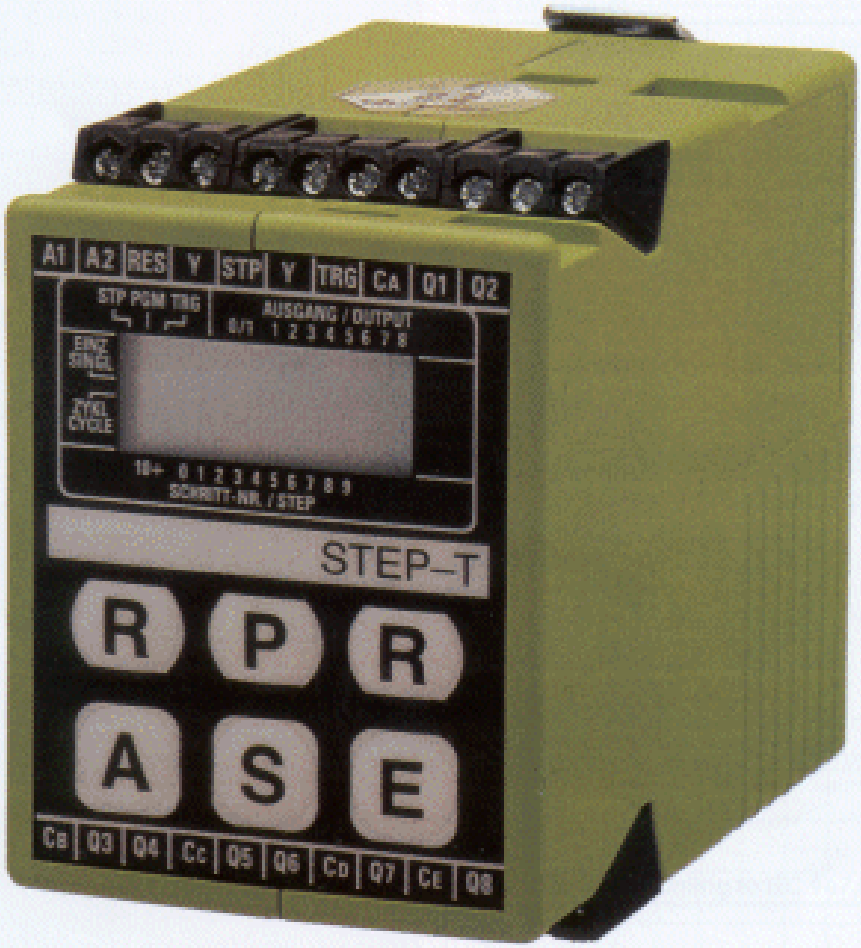
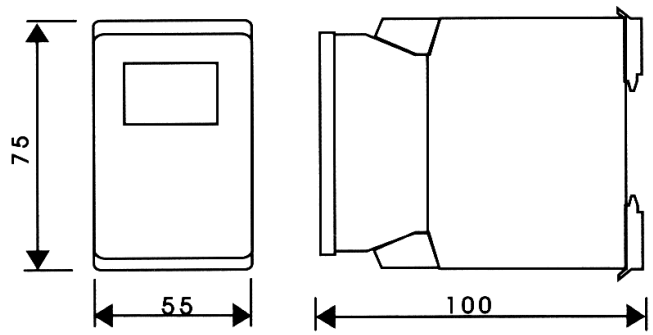
Electronic sequence controller *step-t*



Electronic sequence controller *step-t*

Types	Weight (grammes)	Page
snap-on fitting to DIN-rails with terminal connections		
step-t Version I	275	1-4
step-t Version II	275	1-4

Dimensions



Electronic sequence controller ***step-t***

- ❑ 8 relay outputs
- ❑ 20 programmable steps
- ❑ 8 operating modes e.g. no- voltage protection (Version II)
- ❑ LC display
- ❑ front panel key pad programming
- ❑ single or cyclic mode
- ❑ data protection during voltage loss

Technical Data:

Supply voltage: 12/80, 110/230 V AC/DC

Acceptable voltage range: 12V: 19 to 60 V AC
19 to 80 V DC
110/230 V: 90 to 264 VAC/DC

Nominal consumption: 12 V: 4 VA
110/230 V: 9 VA

Frequency range: 48 to 63 Hz
Duty cycle 100%

Environmental conditions:
Permissible ambient temperature 0°C to +55°C
Climatic resistance to DIN 40040

Mechanical data//specifications:
Enclosure in self-extinguishing plastic (Noryl SE1) conforming to UL 94 VI
Type of protection IP 40

Nominal insulation voltage to DIN DVE 0110 250V AC

Type of connection:
Connection via screw terminals up tp 4 mm² protected against accidental contact
Protection against contact to VDE 0106 and VBG 4. Protection class IP 10

Mounting on DIN rails to DIN 46277/3 (European standard EN 50022)

Output stage:
Contact assembly: 8 make contacts
Max. switching voltage: 250 V AC, 30 V DC
Continuous current: per channel: max. 5A/250 V AC (resistive load)
or 5 A/30 V DC (resistive load)
overall for 8 channels: max. 16 A
Contact life: 10^5 switching operations at nominal load
Mechanical life: 20.10^6 switching operations
Contact material: AgNi thin-film gold coating

Adjustment/programming: front panel
Display status and clock count-down via LCD

Control inputs: STOP
RESET
TRIGGER
can be triggered by potential-free contacts or semi-conductors, load: typically 24V/10mA DC

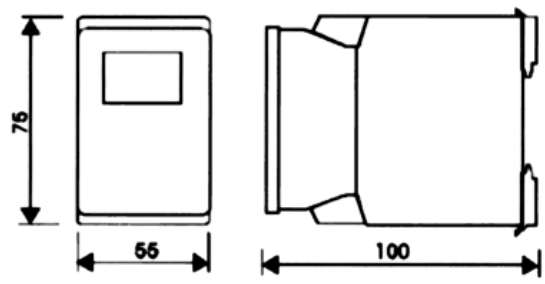
Control input response time: approx 20ms

Step duration: 0,01 sec to 99,9 h variable

Max. number of steps: 20 steps

Data protection with mains failure or disconnected input voltage

Dimensions:



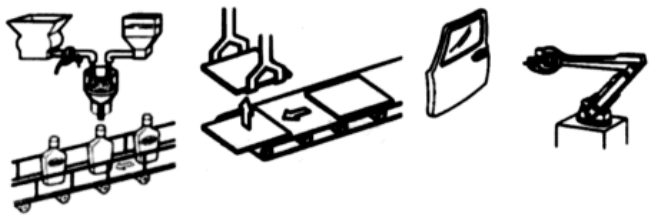
step-t, Version II

Description of function:

- 20 programmable steps
- programming via keypad and LCD display
- single run or cycle
- data protection with mains failure
- step duration 10 ms - 99.9 hr

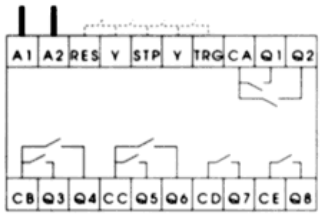
The electronic sequence controller ***step-t*** may be used to process step-wise operations such as the control of:
automatic packaging, bottling machines, machine tools, wood-working machines, flow controls, assembly lines, test rigs, etc

Bottling machines **Wood-working machines** **Assembly lines**

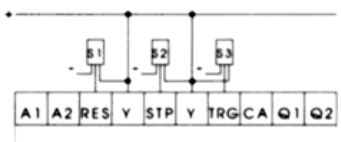


The front panel keypad makes it easy to program up to 20 steps and 8 channels.
The LC display shows the relevant data for each step, such as step number, output mask etc.
8 operating modes give a choice between no-voltage protection, starting via control inputs and extended STOP-input for step selection.

step-t terminal configuration:



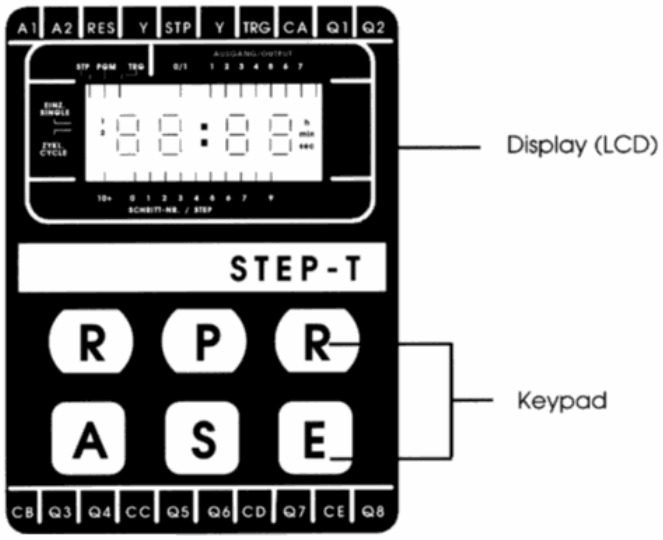
PNP- sensor triggering:



A1, A2	...connections for supply voltage
RES	...RESET input (control input)
STP	....STOP input (control input)
TRG	...TRIGGER input (control input)
Y	...Common (supply) for control inputs
Q1-Q8	...Outputs 1 to 8
CA	...Common for outputs 1 and 2
CB	...Common for outputs 3 and 4
CC	...Common for outputs 5 and 6
CD	...Common for outputs 7
CE	...Common for outputs 8
S1, S2, S3	...Sensor with PNP-output

Electronic sequence controller ***step-t***

Front panel:



Function:

The sequencer produces different output combinations that follow one another at timed intervals

Control inputs:

RES:	Reset	Return to step 0
STP:	Stop	Clock countdown is halted
TRG:	Trigger	Advances the program to the next step asynchronously

Keyboard:

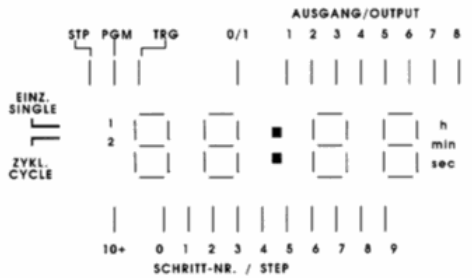
a) Operation: (varies according to selected operation mode)

- R... Reset to step 0 (both R-keys together) Program start at step 0
- S... Display of programmed time of current step
- E... Display of programmed times starting at step 0
- A... Exit from E-function (see key E): Program start or clearing at program stop

b) Programming: entry via P, S and E keys together

- S... Switches to next step, number, ...
- E... Accepts mode, time range, time, ...
- A... The original data are restored
- R... Exit from program (both R-keys together)

Meaning of displays:



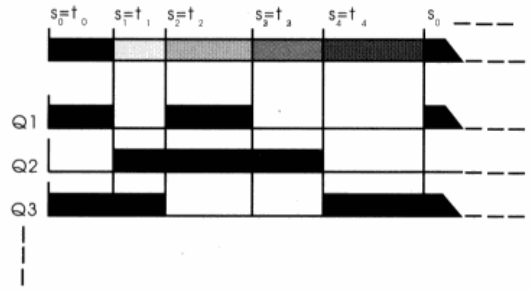
STP und TRG:	Display of control inputs
PGM:	Entry to programming
0/1:	Shows status of outputs (only when programming)

Operating instructions:

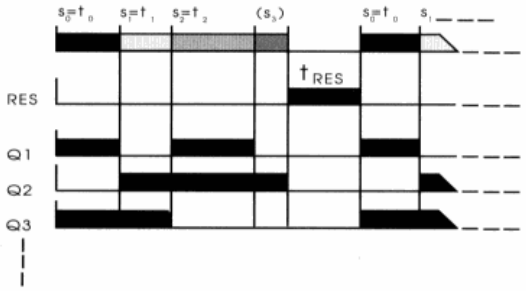
provided with each ***STEP-t***

Description of function and action of control inputs in STANDARD MODE (mode 0)

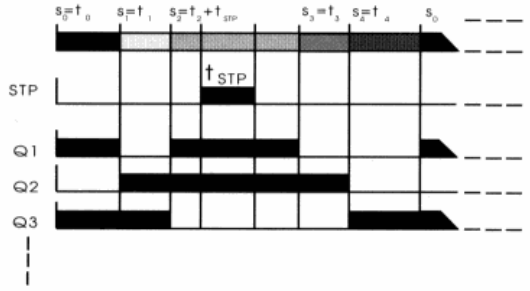
Description of function:



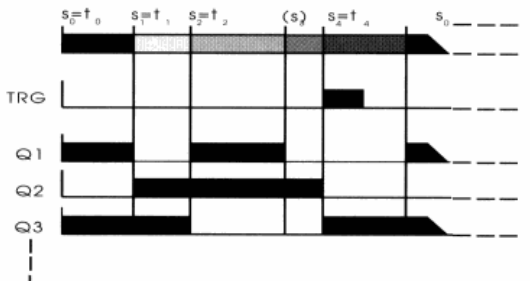
The electronic sequence controller can be operated in two different modes: single cycle or continuous cycle.
In single cycle mode, on completion of the last programmed step, the controller goes on hold, and can be restarted by pressing the RESET button or the RESET input and switching the supply voltage off and on.
In continuous cycle mode the controller starts operating from step 0 when the last programmed step has been completed.
The duration of each step is programmable (up to a max of 99 hr 59 min). The desired output mask can also be defined for each step. In any one step an output can only only be active or inactive. The output status cannot be changed during a step. In this case it must be broken down into 2 steps.



RESET input (RES):
If the RESET input is activated (closing connection to terminals Y-RES, rising edge) or the RESET button is pressed, the step in operation is immediately interrupted, and the clock time and all inputs are reset. Throughout the whole time that the RESET input is active, the controller is held in this configuration.
If the RESET input becomes inactive (opening connection to terminals Y-RES, falling edge), the sequence starts again at step 0.



STOP input (STP):
If the STOP input is activated (closing connection to Y-STP, rising edge), the clock time of the step in operation is immediately stopped, and holds in this position until the STOP input again becomes inactive (opening connection to terminals Y-STP, falling edge). The outputs are not affected by the STOP input.
e.g. duration (clock time) for step 2 = 65 sec.
The STOP input is pressed in step 2 after 29 sec.
After opening the STOP input, the remaining 36 sec of step 2 run on.



TRIGGER input (TRG):
If the TRIGGER input is activated, (closing connection to terminals Y-TRG, rising edge), the program is immediately advanced to the next step.
The TRIGGER input only operates on a rising edge, the falling edge (opening Y-TRG connection) has no effect on the sequence.
The whole sequence can be advanced independently of the clock in conjunction with the STOP input.

Description of operating modes 0 to 7

Description of operating modes 0 to 7:

Basically 4 different modes of operation (modes 0 to 3) can be selected, which can be enhanced with the extended STOP function (modes 4-7)

Standard mode, mode 0 (4):

The program starts at the beginning after connecting the supply voltage (see description of function). Fully compatible with ***step-t*** version I.

No voltage protection, mode 1 (5):

If the supply voltage is interrupted during the program sequence the step in operation at that point is stored together with the step time. On restoration of voltage the program automatically restarts at this point. Only available in ***step-t*** version II.

External start on connection the supply voltage, mode 2 (6):

In contrast to mode 0 (or 4), there is no automatic start when the supply voltage is switched on. The start can be effected by means of the RESET or TRIGGER inputs /buttons A, R. Only available in ***step-t*** version II.

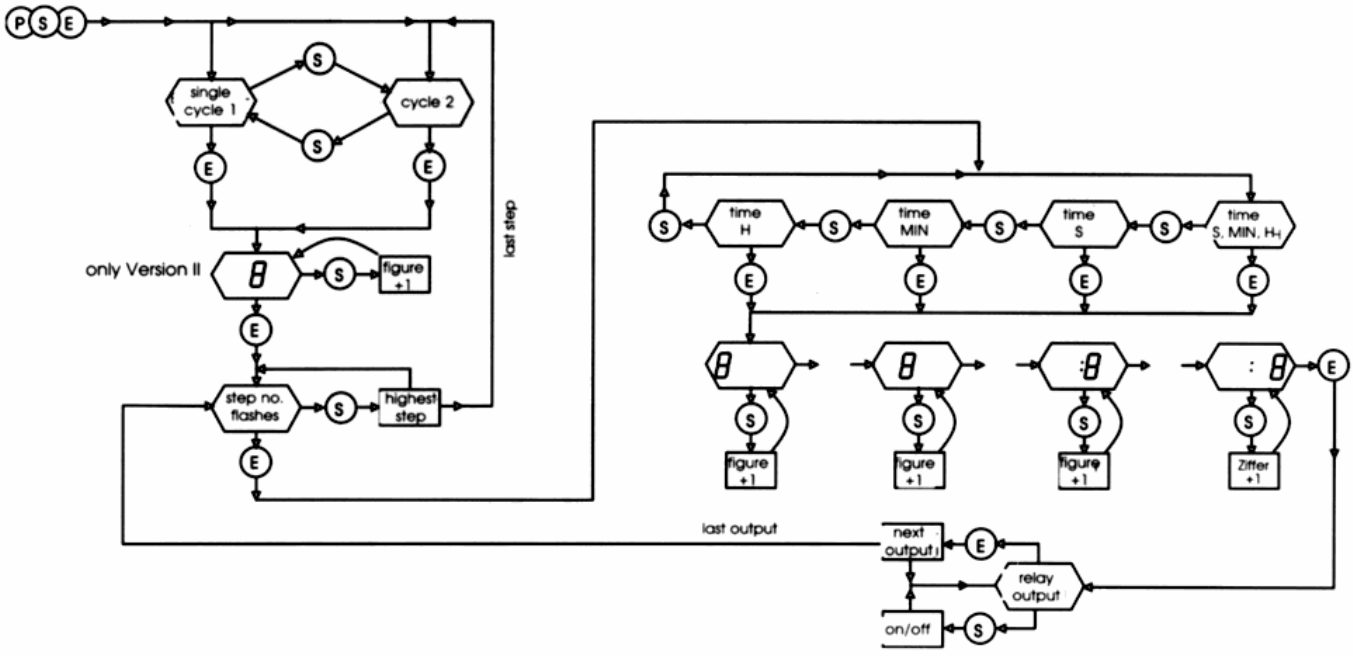
No voltage protection with external start, mode 3 (7):

Corresponds to mode 1 (5) where there is no automatic advance at the interrupted step aon restoration of voltage.
Depending on the control inputs or buttons being used, the program can be continued at the interrupted step (TRIGGER, button A) or started at the beginning of the program (RESET, button R). Only available in ***step-t*** version II.

Extended STOP function, modes 4 to 7:

The operation modes 4 to 7 basically correspond to modes 0 to 3: e.g. mode 5 = no-voltage protection (mode 1) + extended STOP function.
If the STOP input is activated and the ***step-t*** is then connected to the supply voltage, then a specific step can be triggered (TRG), without any programmed ouputs becoming connected. The program can be started by opening the STOP input. The extended STOP function always operates after restoration of voltage and can thus also be used with no-voltage failure.
In operation the STOP input fulfils its normal function, i.e the clock is halted and the outputs remain connected.
Only available in ***step-t*** version II.

Programming chart:



Current status of controller

displays action if the button concerned is pressed

button .... is pressed

General:

Button A and E in programming define the step just displayed as the last, any subsequent steps already programmed
are cancelled. Exit from programming is effected with both R buttons. By pressing the A button when step editing the
original data of the step can be retrieved.