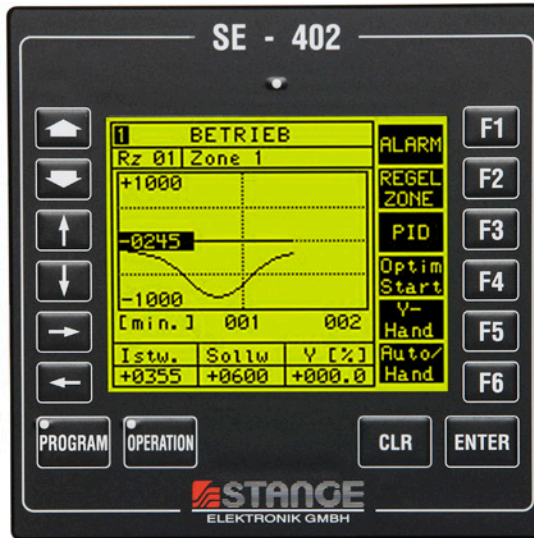


Program Controller SE-402

Universal Compact Automation Device for Periodical Processes



Program Controller SE-402 for small to medium-sized automation solutions

The SE-402 program controller is a universal compact automation device for periodic processes. The controller has been established and proven for small to medium-sized automation tasks for many years. A user friendly operating concept was developed for the SE-402 controller, regardless of its compact design and wide functionality.

In a consistently uniform and easy-to-use mode of operation, the user can optimally configure the instrument for the required automation task by using the integrated software function modules and additional hardware plug-in modules.

Functions are set-up by simple configuration options so that no knowledge of programming is necessary.

Access to the menu functions can be disabled in five levels and enabled by code entries. Digital and analogue inputs and outputs can be assigned without restricting the individual function.

For optimum adaptation to the respective commitment

task, the device contains an internal PLC. This function has access to all digital data without the need for external wiring. External plant control tasks can be taken over.

Application fields:

- Dryer
- Tempering furnaces
- Climate-/ cooling simulation chambers
- Laboratory furnaces
- Autoclaves
- ... and much more



Functions

- Easy menu guided configuration without programming knowledge
- Programmer with 4 set values, 12 digital tracks, 25 programs
- 2 (optional 4) control zones with 8 PID sets of parameters, 1 tolerance band and 2 limit values for each zone
- 16 alarms
- 4 formulas
- 8 tolerance bands, 8 limit values
- PLC with 1600 statements, 64 timers and 512 flags, programmable in STL
- Self-optimization function for determination of optimal PID control parameter (Xp, Tn, Tv)
- 5 login levels
- 2 analogue value multiplexer
- Configuration interface RS232
- BCD/binary decoder
Using the internal PLC function as BCD-, binary or "1 from n"- decoder, analogue values (set values, actual values, etc.) can be put out as function outputs. Two decoders can be configured; they are operated once per second.
- Humidity calculation
- Free linearization curves
With the actual value processing can be performed linearizations for all conventional thermocouples and Pt100. For other types of actual value sensors two linerization curves can be freely defined .
- Actual value correction: For each actual value, up to three correction points can be freely defined.
- Actual value filtering: False measured values can be filtered off with this function.
- Operator panels: Four universally configurable display pages with 10 data lines are available.
- Configuration software ECS View
Operation of programmer from PC, backup of configurations and programs.
Remote control via PC per modem.

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Technical Data Hardware	
Mechanical environment / ambient conditions	
Dimension (W x H x D)	144 x 144 x 220 mm + 60 mm for mating connector component
Front panel	foil keyboard, imprinted black and white
Operating temperature	+5 ... +45 °C
Humidity	max. 80 %, no condensation
Weight	approx. 3 kg
Power supply / power failure protection / real-time clock	
Input voltage	85 ... 264 V AC/50-60 Hz
Power consumption	30-40 VA (according to version)
Mains connection	non-heating appliance connector
Battery	lithium 3 V/1.2 Ah
Data protection period	≥ 4 years
Watchdog	
Watchdog relay switching capacity	28 V/250 mA
LCD display, monochrome (green/yellow) LCD with background lighting	
Display size	96 x 77 mm
Resolution	160 x 128 pixels
ADDA analogue input board (actual values)	
Number of actual value inputs	4
Board size	180 x 134 mm
Measuring rate per actual value	100 msec
Inputs	all thermocouples, 0 ... 10 V; 0 ... 20 mA and 4 ... 20 mA; Pt100 three-wire, Pt100 four-wire
Accuracy	maximum deviation for S, R +/-1.7 °C; for EL18 +/-2.5 °C; for the remaining thermocouples +/-1.0 °C; for 0..10 V +/-0.02 %; for 0(4) ... 20 mA +/-0.1 % for Pt100 better than 0.4 °C
Resolution	16 Bit (65536 steps)
Electrical isolation	yes, semiconductor relay multiplexer
Comparator point	incorporated into connector
Connections	VG plug-type connector with soldered terminals and screw terminals

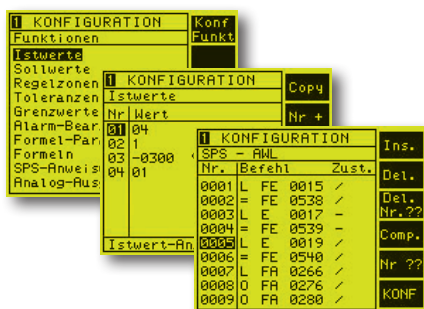
Functions	
Analogue and digital inputs and outputs	
Analogue inputs (actual values)	4, standard signal 0 ... 10V, 0(4) ... 20mA, THK, PT100
Analogue outputs	2 (option) 0 ... 10V, 0(4) ... 20mA (indicate range when ordering)
Digital inputs	16 (8 option)
Digital outputs	16 (8 option)

Functions	
Programmer	
Programs	25
Loops	8 per program
Set values	4
Digital tracks	12
Segments	50 per program maximum (maximum of 400 segments in the device)
Process steps	50 maximum, freely configurable
Controller	
Control zones	2 (optional 4)
Controller types	PID continuous action, 2-setpoint, 2-setpoint PID, 3-setpoint, 3-setpoint PID, 3-setpoint stepping (PI), configurable
PID parameters	8 sets of parameters (Xp, Tn, Tv) per control zone
Tolerance band	1 per control zone (+tolerance/-tolerance)
Limit values	2 limit values per control zone (high/low limit value)
Formula	
Formula	4, Operations: +, -, :, *, +, -, :, *
Tolerances	
Tolerances	8
Tolerance outputs	16 (1 for each plus-tolerance, 1 for each minus-tolerance)
Comparisons	Sv-Sv, Av-Av, formula value X-Sv, X-Av, X-X
Limit values	
Limit values	8
Possible values	Sv, Av, formula value X, variable value, controller actual value and set value
Alarms	
Alarms	16
Internal error alarms	20
Alarm priority levels	8
Alarm delays	8 (= priorities), 0.1 ... 99.9 sec, configurable
Alarm processing	1:1, binary or BCD, configurable
System alarm output	for visual and acoustic signal, acknowledgement of individual alarms selective
Analogue multiplexers	
MUX modules	2
Possible values	Sv, Av, formula value X, variable
Analogue inputs per MUX module	4
Internal PLC function	
Number of statements	1600 maximum
Programming by statement list	statement list (STL)
Possible commands	logical commands, timer commands (switch-on-, -off-delay, time impulse)
Number of timers	64
Number of flags	512
Cycle time	100 msec

Program Controller SE-402

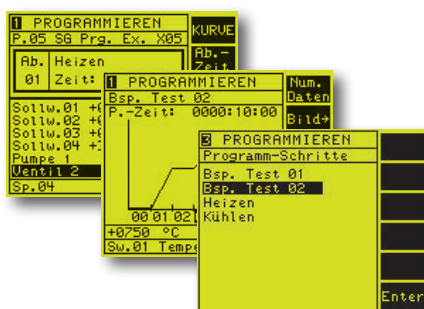
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Operation



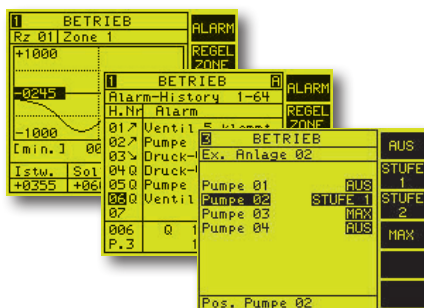
Configuration

- Menu-assisted configuration in tables (no programming knowledge necessary)
- Easy language switching by menu
- 5 operating levels
- Configurable texts and dimensions
- Configuration backup on PC
- Direct modem connection possible
- Hardware configuration (plug-in card)
- Configuration of all software function modules available in the device (actual-, set value, control zone, tolerances, limit values etc.)
- Configuration changes on the device during operation



Programs (Recipes)

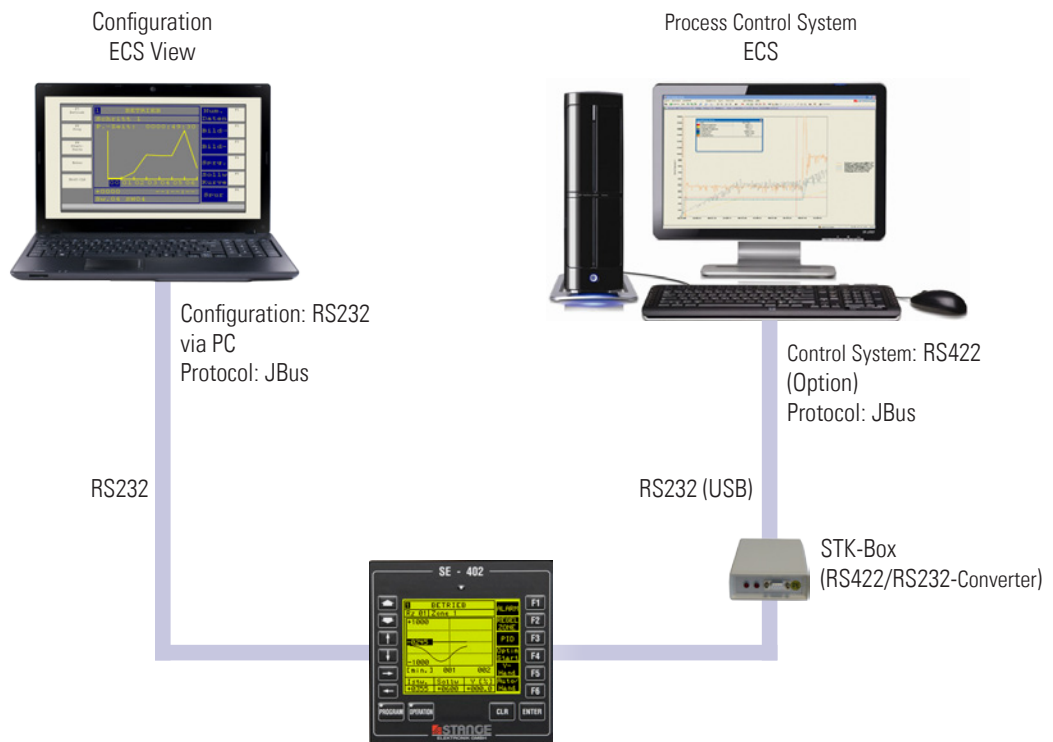
- 25 programs with up to 50 segments
- Configurable process steps
- Plain text descriptions for programs (up to 16 characters)
- Graphic representation of set value curves and control tracks
- Configurable program loops (8 loops per program)
- Test, modify, copy, delete programs



Operation

- Control zone overall display
- Graphic set/actual value comparison
- Numerical and graphic data display of set values and tracks
- Representation of actual values, limit values, tolerance values and formula values
- Plain text alarm display with history memory
- 4 operator panel display page (freely configurable display pages)
- Jump in the program
- Programming of an automatic program start
- Manual operation for set values and tracks even during program run
- Control parameter auto-optimization ("self-tuning")
- Manual operation mode for the manipulated variable Y ("Y-Man.")

Connection



Optional

Supplementary Equipment

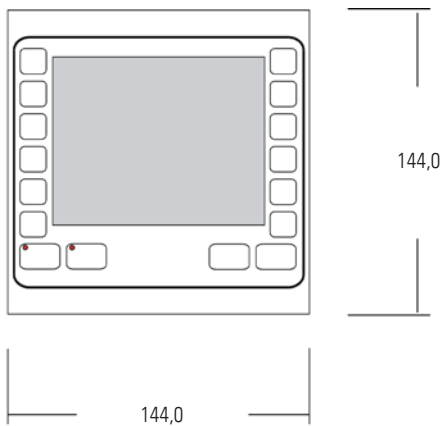
- DAC2-402 2 analogue outputs, with electrical isolation
0 ... 10V, 0 ... 20 mA, 4 ... 20 mA, resolution 12 Bit
- E8A8-402 8 digital inputs, 8 digital outputs (200mA maximum)
optocoupler 24 V DC
= total 16 digital inputs and 16 digital outputs in the device
- SI-JBUS-402 Computer interface (RS232, RS422)
for process control system connection (e.g. ECS)
- 4RZ-402 2 further control zones for a total of 4 (software upgrade)
- DIA402 Display/operating dialogue: Italian, Finnish, Swedish (Progr./Operation)
Device standard languages: German, English, French

Program Controller SE-402

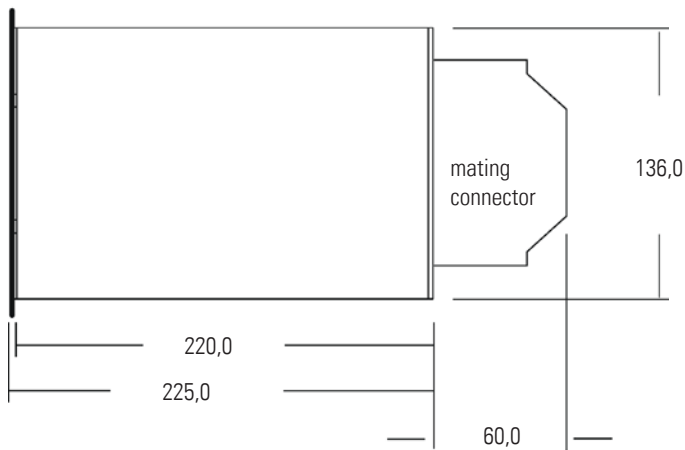
Universal Compact Automation Device for Periodical Processes

Dimension Diagram (mm)

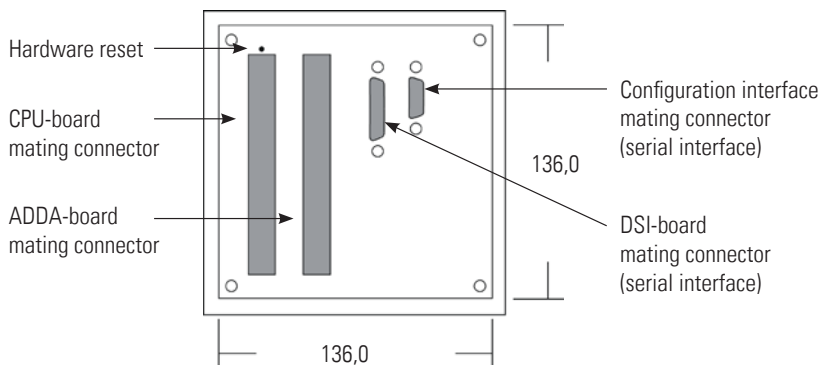
Front view



Side view



Rear view



Hardware Concept SE-402

