Operating Instructions

Single **SBC-**Control Systems

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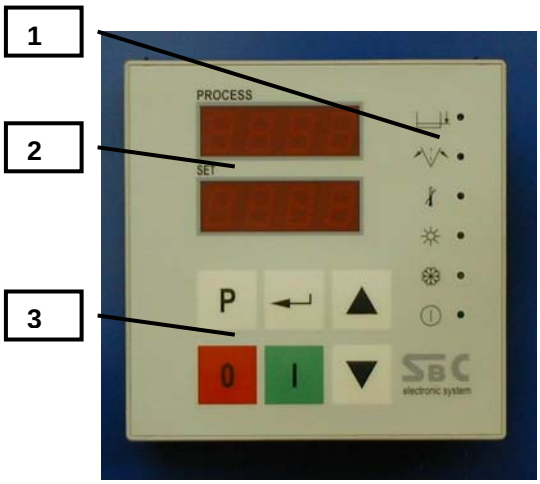
1 SBC 2.6 structuring



1. Alarm and Information panel
2. Control panel
3. Inputting panel

2 SBC 2.6 display- and control elements

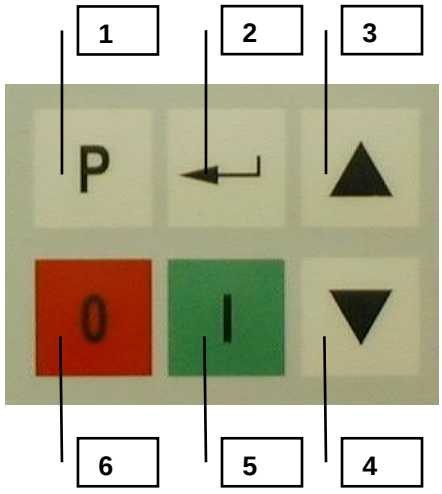
2.0 General

At parameter level and configuration level, the values can only be changed after releasing parameter C1 at configuration level. For this purpose, parameter C1 must be set to OFF.

2.1 Inputting Panel

1. P-Taste

Change-over switch



for accessing the individual processing levels:

working level: push the „P“ key

parameter level: push „P“ and „ENTER“ keys simultaneously

Configuration level: keep „P“ and „ENTER“ keys depressed simultaneously for about 4s.

2. Acknowledgement -/ canceling-key (Enter)

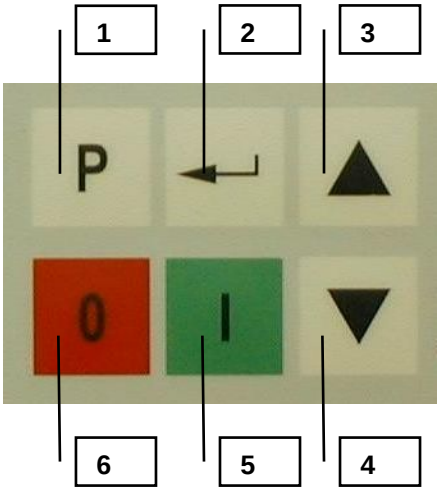
All alterations ▲ and ▼ must be confirmed!

(Set- values and parameters)

3. Value-alteration key

For increasing set-and parameter-values

Attention!
Confirm with "Enter ↵"!



4. Value-alteration key

For reducing the set- and parameter-values

Attention!
Confirm with "Enter ↵"!

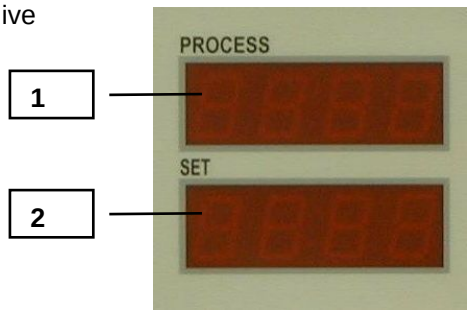
5. ON Button

system “working”; pump and controls “active”

6. OFF key

All systems "OFF", LED is alight, for as long as voltage supply is live

2.2 Control Panel



1. Display PROCESS

Display of pre-runt temperature's actual-value

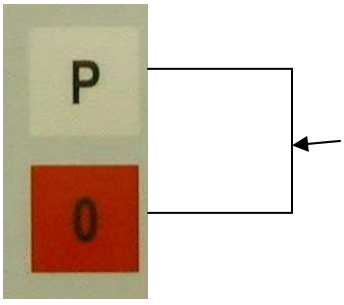
Display of parameter designation, when operating at working-, parameter- and configuration-level

2. Display SET

Display of the current or programmed set-values

Display of numerical values or parameter values when at working-, parameter- and configuration-level

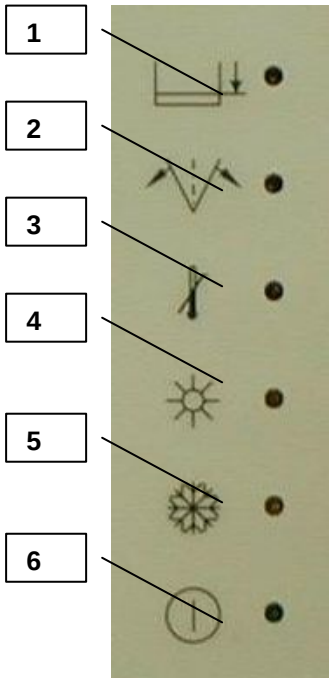
2.3 Drain function



The drain function is started
by pressing simultaneously the P and 0 keys.

2.4 Alarm Panel and Display - Information

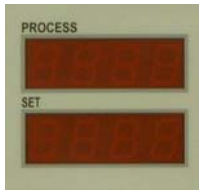
Fault / Operational status	Cause	Rectification / explanation
1	Minimum level not made	<u>Water:</u> with manual filling: replenish with heat transfer medium. With automatic filling: Open cooling water supply, wait till filled. <u>Oil:</u> Fill or replenish with oil
2	Limit-comparator outside band-spread limiting value exceeded	Not up to temperature, or outside band-spread (limit) Band-spread too narrow or limiting value made Turn OFF at working level, parameter AL, or set band-spread.
3	Pre-run temperature up to limiting value Heating switches OFF	Check set limiting value; insufficient heat dissipation by consumer subsequent to cooling by 5 K, heating comes ON again
4	Heating on	
5	Cooling on	
6	Temperature control unit ON	LED flashes when the temperature control unit is switched off via the pump after-run control.



3 Parameter description SBC 2.6

3.0 Working level

3.0.1 Calling-up the working level



This is how the working level is accessed.

Push button marked P

Individual parameters are accessed by pushing the button marked P

The PROCESS-display shows the parameter

The SET-display shows the parameter value

3.0.2 Parameter description at working level

Abbreviations:
MR-start = Measuring range start (minimum –30°C)
MR-end = Measuring range end (maximum +400°C)

Parameter	Set-values range		Signifying	SBC V2.6	
des.	start	end			
AL	OFF	OFF	Alarm outputs selected.	X	
	OFF, -99	100	Alarm output programmed as signal contact ❶ max. OFF-ON. The setting-value corresponds to the alarm's response value, relative to the setpoint-value.	X	
	MR-start	MR-end	Alarm output programmed as limiting contact ❷ max OFF-ON. The setpoint-value corresponds to the absolute response-value of the alarm.	X	
	OFF, 0	100	Alarm output programmed as limit comparator ❸ OFF-ON-OFF. The setpoint-value corresponds to the setpoint's tolerance-value.	X	
	OFF, -99	100	Alarm output, programmed as signal contact ❹ max. ON-OFF. The setting-value corresponds to the alarm's response value, relative to the setpoint-value.	X	
	MR-start	MR-end	Alarm output programmed as limiting contact ❺ max ON-OFF. The setpoint-value corresponds to the absolute response-value of the alarm.	X	
	OFF, 0	100	Alarm output programmed as limit comparator ⑥ ON-OFF-ON. The setpoint-value corresponds to the setpoint's tolerance-value.	X	

	OFF, 0	100	Alarm output programmed as limit comparator ❼ ON-OFF-ON (with stand-by response). The setpoint-value corresponds to the setpoint's tolerance-value. No alarm during initial start-up, until the input range is made.	X	

Parameter	**Set-values range**		**Signifying**	**SBC V2.6**	
des.	**start**	**end**			
AP.I	MR-start	MR-end	Programmed value corresponds to the response temperature of the inlet-temperature limitation. If up to end of measuring range is programmed, the value end of measuring range + 5 °C is displayed.	X	
Ati	OFF=0	40	Aquatimer: setpoint-value corresponds to the max. permissible filling cycles after 1 hour of operation.	X	
Cti	OFF, 10	900	Change time; evacuation / vacuum time on units with automatic mold draining. Setpoint -value corresponds to the compressed-air assisted evacuation time or else the vacuum-time in seconds.	X	
LS	OFF	on	Turning the leak-stop mode ON and OFF ON means leak-stop mode turned ON OFF means leak-stop mode turned OFF **his parameter is displayed only with the 2C, t.95 and C.Oil operating mode selected-**	X	
AL 2	OFF	OFF	Alarm output OFF.		
	OFF, -99	100	Alarm output programmed as signal contact max. OFF-ON. The setting value corresponds to alarm trip threshold relative to the setpoint. **This parameter is displayed only with the 2C operating mode selected.**		
niv	Hand	Auto	**Hand** = manual filling of the unit **Auto** = automatical filling of the unit **Auto** not possible at heat transfer units with oil	X	
Adr	1	255	Inputting of unit addressing. If several units are operated by the same interface, different addresses must be input. **Only for units with interface**!	X	

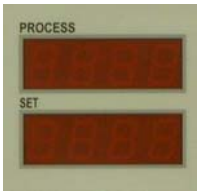
3.1 Parameter level

3.1.1 Calling-up the parameter level

How to get into the parameter level

Push buttons P and ↵ simultaneously

Individual parameters are accessed by pushing the button marked P



The PROCESS-display shows the parameter

The SET-display shows the parameter value

3.1.2 Parameter description at parameter level

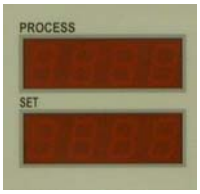
Parameter	Set-values range		Signifying	SBC V2.6	
Des.	**Start**	**End**			
hP	OFF, 0.1	99.9	XP-Heating The control system's proportional range	X	
hd	OFF, 1	200	TV-Heating in s. Derivative action time of the control system	X	
hI	OFF, 1	999	TN-Heating in s. Integral action (reset) time of the control system	X	
cP	OFF, 0.1	99.9	XP-Cooling The control system's proportional range	X	
cd	OFF, 1	200	TV-cooling in s. Derivative action time of the control system	X	
cI	OFF, 1	999	TN-cooling in s. Integral action (reset) time of the control system	X	
db	OFF, 0.1	10.0	Switching hysteresis between heating and cooling This paramater is used for increasing the set-value (switching point) for cooling by the value entered. That way, possibly too frequently occurring switching changes between heating- and cooling modes can be prevented. Simultaneous switching of heating and cooling can be ruled out generally. Settings are in °C.	X	

Parameter	Set-values range		Signifying	SBC V2.6	
Des.	**Start**	**End**			
hC	1	240	Heating switch-cycle time in s.	X	
cC	1	240	Cooling switch-cycle time in s.	X	
			The control element's maximum switching frequency is determined with the assistance of the switch-cycle time. This is the period, during which the controller carries out one **ON** and one **OFF** switching action. We recommend the following settings: • Relay-setting outputs with downstream installed contactors; switching cycle > 10 s • Bi-stable voltage output ports for actuating Solid State Relays (SSR): Switch-cycle time 1 ... 10 s		
SPH	SPL	MB-end	Upper setpoint limitation in °C. Here the final value for the setpoint setting range can be selected.	X	
SPL	MB-start	SPH	Lower setpoint limit in °C. The start value of the setpoint adjustment range can be preselected here.	X	
SCL	OFF, 35	90	**S**ystem **Cl**osed = system shut-off on units employable at > 90°C, the water system is shut-off to atmosphere.		
C-F	C	0,1 F	Selection °C, °F or 1/10 °C	X	
OPt	OFF	on	Turning self-optimization ON and OFF. ON = Self-optimization startet. The controller determines the optimum control parameters by closed-loop control.	X	
Sd	0.5	10	**Switching hysteresis for 2C mode** **Programmed value acts symmetrically to required value setting**		
h			operating hours		

3.2 Configuration level

3.2.1 Calling up the configuration level

How to get admitted to the configuration level:



Setting keys P and ↵ simultaneously (about 4s), until LOC parameter appears in the PROCESS-display

Individual parameters are accessed by pushing the button marked P

The PROCESS-display shows the parameter

The SET-display shows the parameter value

3.2.2 Parameter description at configuration level

Parameter	Set-values range		Signifying	SBC V2.6	
Des.	**Start**	**End**			
LOC	OFF	PC	Keyboard interlock • OFF= parameter values can be changed. • PC = Parameter level and configuration level barred. Parameters can only be viewed.	X	
C.Co	t.95	C.Oil	Selection of operating mode t.95 = Temperature control units up to 90°C t.150 = Temperature control unit up to 150°C and higher 2C = Refrigerator C.Oil = Heat transfer units up to 300°C	X	
C.AL	OFF	7	Configuration of the alarm • OFF = Alarm has been turned OFF • 1 = Signal contact OFF-ON • 2 = Limiting contact OFF-ON • 3 = Limit comparator OFF-ON-OFF • 4 = Signal contact ON-OFF • 5 = Limiting contact ON-OFF • 6 = Limit comparator ON-OFF-ON • 7 = Limit comp. with stand-by response	X	

Parameter	Set-values range		Signifying	SBC V2.6	
Des.	**Start**	**End**			
C.SA	oP	cL	Configuration group interrupt • oP = n/c contact • cL = n/o contact	X	
ASt	5 min	120	• Aquatimer-Start-time (min) Aquatimer (filling-impulse-counter) becomes active following the time set in the "ASt". Previously not monitored random filling cycles. Renewed start of the "AST" time, following the On/Off.	X	
EMO	OFF	on	Restart lockout after power reset • off = Restart lockout not active • on = Restart lockout active Following a power reset, the control system stays turned OFF, to start with. Display "Info". "EMO" message – flashing.	X	
OF1	OFF, -100	100	Temperature correction of the internal temperature probe in °C	X	
Pro	OFF	A	Setting of the various interface protocols • OFF = interface mode turned OFF • A = Arburg-protocol active • E = Engel- protocol active	X	
tty	20nA	422	Setting and preselecting the physical interface 422 = RS 485 - 4-wire 20nA = TTY 20mA current loop	X	
PS1	0	999	The set parameters are stored by inputting a secret code. **In preparation**	X	
C.60	OFF, 10	100	Release or locking of the software key pump timer control If the “0” key is pressed, it is cooled down to the set temperature and the device is switched off. • **“OFF”** = **“OFF”** key is locked • **10...100 °C = adjustable cut-out temperature**	X	

4 Connecting diagram SBC 2.6

Interface option!	St3 PIN	
RS 485 GND	1	
RS 485 IN-B	2	
RS 485 IN-A	3	
TTY 20 mA +	4	
TTY 20 mA -	5	
RS 485 OUT-B	6	
RS 485 OUT-A	7	
	8	

	St1 PIN		
draining	17		
System closed/leak-stop	15	16	Pilot contact - heating
Pump	13	14	filling
heating	11	12	cooling
motor protection	9	10	flow watchdog
Level min	7	8	Level max.
Pt 100 control	5	6	Pt 100 Temperature monitoring
	3	4	
0 V	1	2	24 V

	ST2 PIN		
Group alarm	3		Normally open contact
	2		Opener
	1		Two-way contact

5 Technical Data SBC2.6

Power supply	*24*	*Volt*	*0,1*	*A*
Actual value acquisition	*Pt 100 two-wire lead*			
	Resolution		*0,1 K*	
	Data sampling		*0,1 s*	
	Measuring range		-30°C to +400°C	
Inputs	*24*	*Volt*		
	Operating point		*11 Volt*	
	Input current		*2 mA*	
Outputs	*24*	*Volt*		
	0,5	*A*		
	2	*A max*		
	SMD fuse		*4A*	
	Short-circuit-proof, suitable for inductive loads			
Relay	*1*	Two-way contact		
	250	*VAC*		
	3	*A*		
	cos phi	*1*		