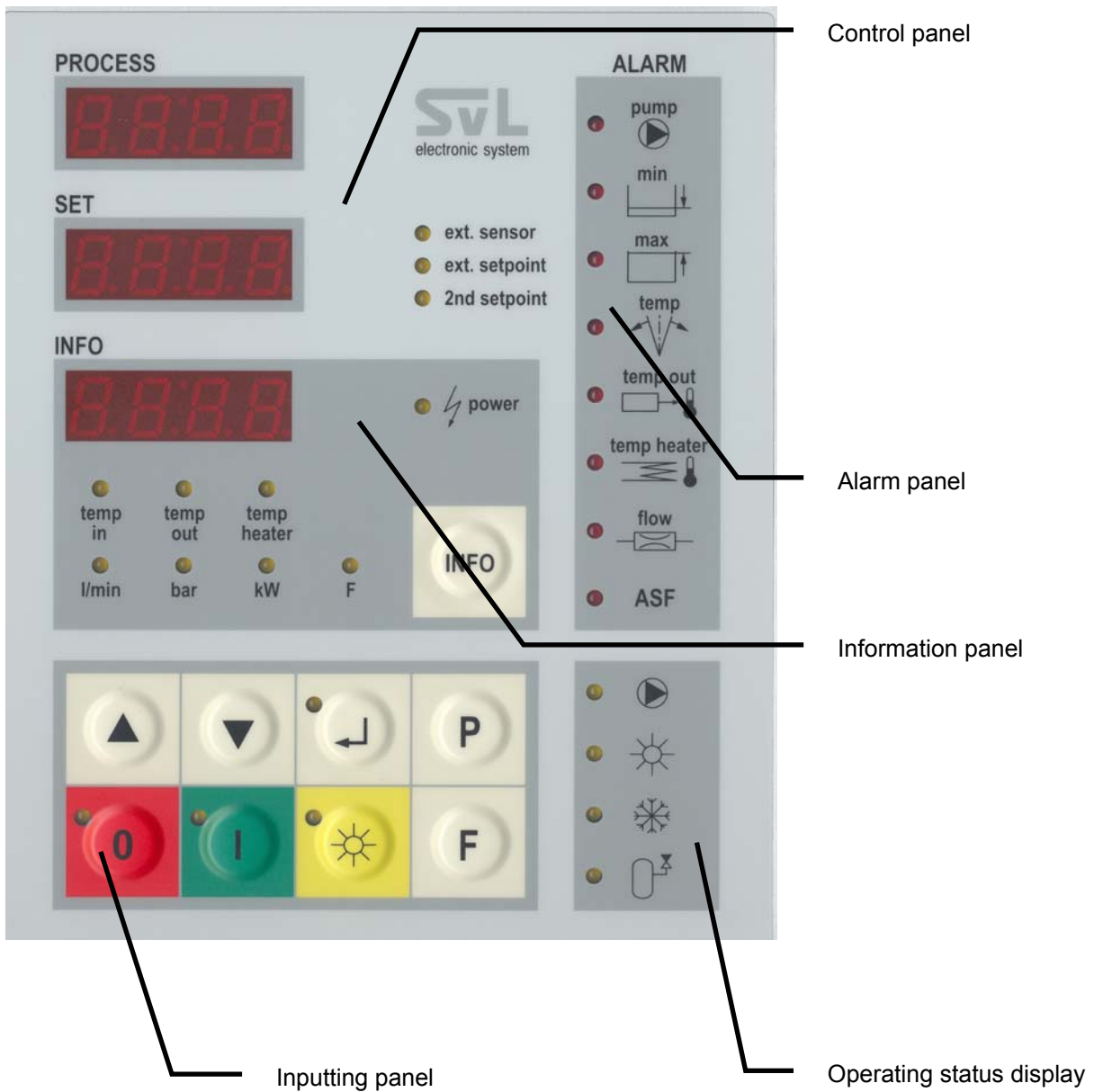


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1 SVL structuring



2 SVL 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. Value-alteration key

For increasing set-and parameter-values

Attention!

Confirm with "Enter ↵"!

2. Value-alteration key

For reducing the set- and parameter-values

Attention!

Confirm with "Enter ↵"!

3. Acknowledgement -/ canceling-key (Enter)

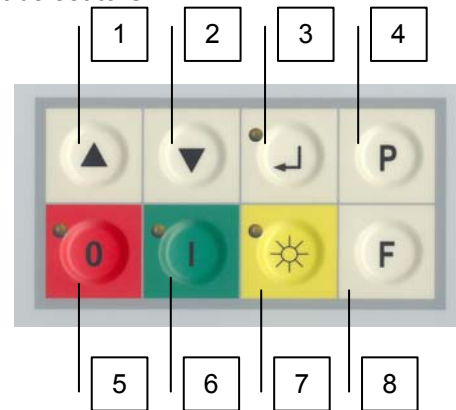
All alterations ▲ and ▼ must be confirmed! (Set-values and parameters)

Flashing yellow LEDs on selection keys must be confirmed:
OFF and direct. Flashing LED in panel: confirmation required!

Fault-warnings must be canceled:

- a) Water: filmtemperature exeeded
- b) Oil: Oil-cracking temp. exeeded
"Max." -level monitoring

Please note: - When the key is being actuated, an illuminated ring circulates the "SET" –panel contour



4. 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.

Parameters of the individual levels can be accessed with the "P" –key.

5. OFF key

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

6. ON Button

system "working"; pump and controls "active";

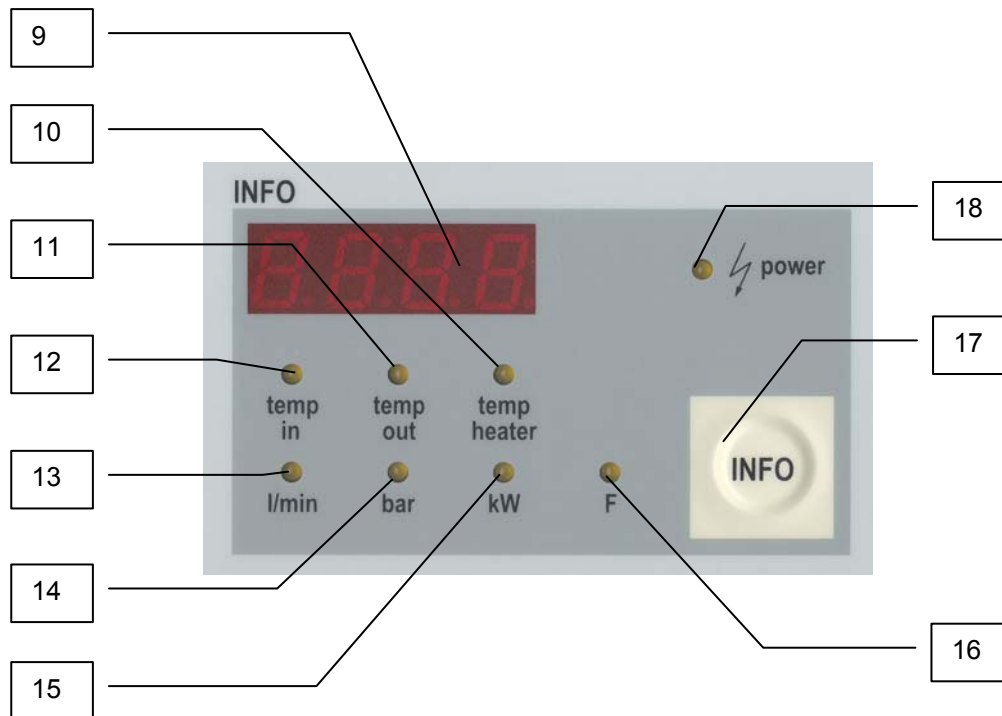
actuate this key, if "external" start applies; flashing LED shows readiness for start via terminal 82 + 83

7. Heating Switch

Turning heating ON and OFF (stored safe from power-cut)

8. F-Button Special-Functions Key

Selector switch for external control mode or drain function.
Activation must be confirmed with Enter. After activating, the LED F in the information field comes on.



2.2 Display - Information

9. Display

Display of parameter numbers
The value of the selected LED is shown in this display

10. Filmtemperature

Shining LED: the filmtemperature in the heater is shown in the display.

11. Pre-Run Temperature

Shining LED: the pre-run temperature of the unit is shown in the display

12. Return-Run Temperature

Shining LED: the return-run temperature of the unit is shown in the display

13. Flow-Rate (Option)

Shining LED: the flow-rate of the unit is shown in the display

14. Pressure (Option)

Shining LED: the pressure value of the unit is shown in the display

15. Actual Capacity (Option)

Shining LED: the actual heating or cooling capacity of the unit is shown in the display

16. F Special Function

Shining LED: external controlling is active

17. INFO-Button

Selection of: „temp in“, „temp out“, „temp heater“, „l/min“, „bar“ und „kW“

18. Power

Mains voltage is live



2.3 Control Panel

19. Display PROCESS

Display of pre-runt temperature's actual-value

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

20. Display SET

Display of the current or programmed set-values

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

Operating hours (in conjunction with "PROCESS")

21. LED external Sensor

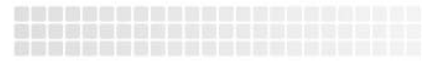
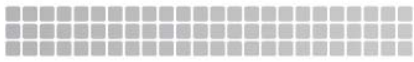
External temperature sensor active

22. LED external Setpoint

External setpoint active

23. LED second Setpoint

Second setpoint active



2.4 Alarm Panel

abbreviation

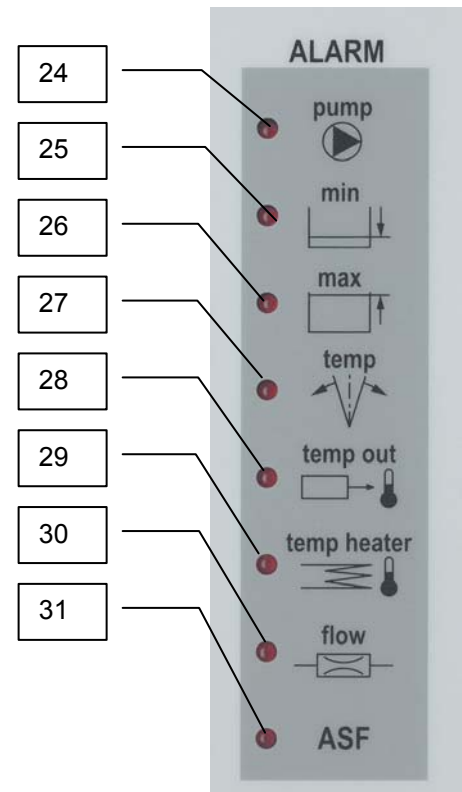
- LED alight
- * LED flashing

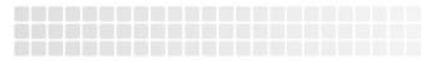
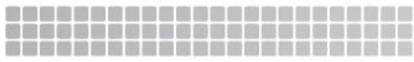
Fault

Cause

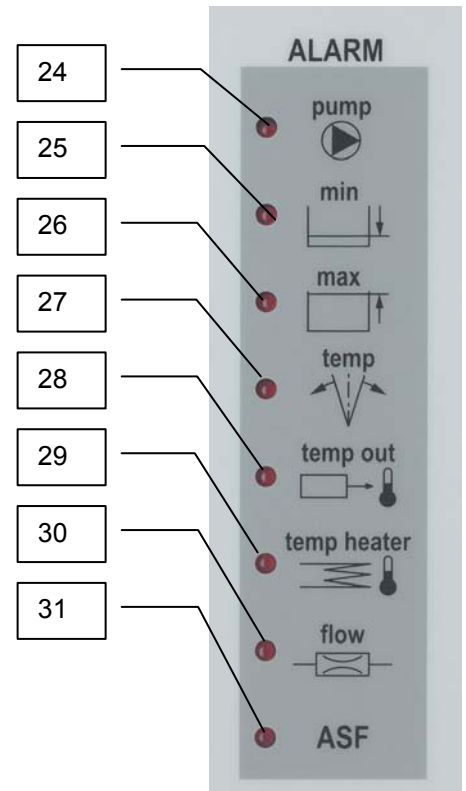
Rectification / explanation

24.	SVL 1 * Motor protection switch responded	Check and/or push motor protection switch
	SVL 10 ● wrong direction of rotation * Two-phasing	Swap phases on plug Check direction of rotation Check phases check supply-fuses
25.	● 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
	* filling active	With automatic filling, solenoid valve for filling is open
26.	* Expansion vessel overfilled	Only for units with heat-transfer oil as medium! Unit overfilled with oil External volume too large Once the fault has been rectified, cancel with "ENTER"
27.	* 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.





Fault	Cause	Rectification / explanation
28. *	Pre-run temperature up to limiting value Heating switches OFF	Check set limiting value; insufficient heat dissipation by consumer subsequent to cooling by 1-2 K, heating comes ON again
29. *	Oil-cracking temperature at set limiting value ⇒ Heating system switches OFF	Check the flow rate Too little heat-absorption from heater (poss. calcium deposits on heating-rod) Cancel by actuating the "ENTER" -key
30. •	No flow only on units equipped with flow monitor	No minimum flow Check flow (clean dirt-trap, if necessary)
31. •	Alarm special function Significance and explanation of the alarm special functions will be describes in Chapter 2.4.1	



2.4.1 Explanations to Alarm ASF

Display	Signifying	Rectification
<ul style="list-style-type: none"> • ASF alight * flashes 	In working level, although the external temperature probe is turned ON, it is not connected.	Connect the external temperature probe
<ul style="list-style-type: none"> • ASF alight * flashes 	Alarm values for Hi.P or Lo.P have been input in the working level	<ul style="list-style-type: none"> • Check the alarm values • Clean return-line dirt trap • Check pump.

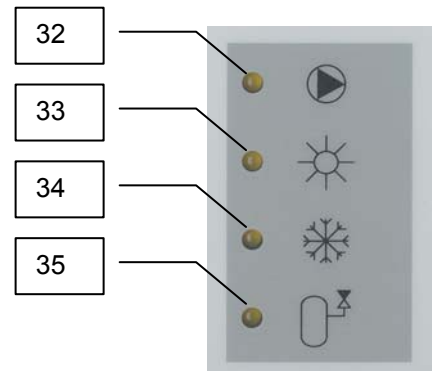
2.5 Operating Status Display

32. Pump on

33. Heating on

34. Cooling on

35. System shut-off to atmosphere.
Pressure build-up only possible with water operated units;
possible to achieve
operating temperatures above 95°C.



3 Parameter description

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

The INFO-display shows the parameter code



3.0.2 Parameter description at working level

Abbreviations:

MR-start = Measuring range start (minimum -30°C)

MR-end = Measuring range end (maximum $+400^{\circ}\text{C}$)

Parameter		Set-values range		Signifying	SVL-R8150
des.	Code	start	end		
					21
AL	A.2	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

Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		21
		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 ⑦ 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
SP2	A.3	MR-start	Set-value limiting	Programmed value corresponds to 2 nd set-value. Change-over to 2 nd set-value takes place via input-port S1 on SVL-1. and S4 on SVL-10 or else via parameter SET = SP.2 at working level Also refer to configuration level	X
AP.I	A.4	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	A.5	OFF=0	40	Aquatimer: setpoint-value corresponds to the max. permissible filling cycles after 1 hour of operation.	X
Cti	A.6	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
AFL	A.7	OFF, 1	600	Alarm Flow The set value corresponds to the required minimum figure. When dropping below this value, an alarm is generated.	X
LS	A.10	OFF	on	Turning the leak-stop mode ON and OFF ON means leak-stop mode turned ON OFF means leak-stop mode turned OFF Also refer to configuration level parameter E.LS	X
Pd.t	A.11	OFF; 1	500	Input of integration time for the capacity display	X

Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		21
niv	A.12	Hand	Auto	Hand = manual filling of the unit Auto = automatical filling of the unit Auto not possible at heat transfer units with oil	X
Chg	A.13	no.Ch	Chg	no.Ch mould draining not active Chg mould draining active. Only at units with mould draining! Change-over must be set free in the configuration level!	X
dir	A.14	indi	dir	indi Cooling via heat exchanger dir Cooling direct Direct cooling only possible at units with water Change-over must be set free in the configuration level!	X
C.OFF	A.15	OFF	Co.OF	OFF means, that the unit is turned OFF directly with the „0“ key. Co.OF means, that when pushing the "0" key, the unit is cooled down first, before it is turned OFF. (Pump lag control)	X
SEt	A.16	SP.1	SP.2	Change-over SP.1 = internal set-value active SP.2 = second set-value active	X
Adr	A.18	1	255	Inputting of unit addressing. If several units are operated by the same interface, different addresses must be input.	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

The INFO-display shows the parameter code



3.1.2 Parameter description at parameter level

Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		
					21
hL%	P.2	0	100	Limitation of regulation ratio for heating, in %.	X
cL %	P.3	0	100	Limitation of regulation ratio for cooling, in %	X
				Limitation of the regulation ratio is only required with an excessively oversized energy supply for the control system, or for turning-OFF the corresponding actuating output port (setting 0 %). It should be inoperative under normal circumstances (setting 100 %) Limitation of the regulation ratio becomes active, when the regulation ratio calculated by the controller is greater, than the max. permissible (limited) regulation ratio <u>Please note!</u> Limitation of regulation ratio is ineffective during the self-optimization phase.	
hp	P.4	OFF, 0.1	99.9	XP-Heating in % The control system's proportional range	X
hd	P.5	OFF, 1	200	TV-Heating in s. Derivative action time of the control system	X

Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		21
hl	P.6	OFF, 1	999	TN-Heating in s. Integral action (reset) time of the control system	X
cP	P.7	OFF, 0.1	99.9	XP-Cooling in % The control system's proportional range	X
cd	P.8	OFF, 1	200	TV-cooling in s. Derivative action time of the control system	X
cl	P.9	OFF, 1	999	TN-cooling in s. Integral action (reset) time of the control system	X
db	P.10	OFF, 0.1	10.0	Switching hysteresis between heating and cooling This parameter 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
hC	P.11	1	240	Heating switch-cycle time in s.	X
cC	P.12	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: <ul style="list-style-type: none"> • 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 • Continuous actuator output: Switch-cycle time 1 s 	

Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		21
SP.Hi	P.13	SP.Lo	MB-end	Upper setpoint limitation in °C. Here the final value for the setpoint setting range can be selected.	X
SP.Lo	P.14	MB-start	SP.Hi	Lower setpoint limit in °C. The start value of the setpoint adjustment range can be preselected here.	X
AF5	P.15	OFF, MB-start	MB-end	Oil-cracking temperature (filmtemperature) limiting value in °C	
SCL	P.16	OFF, 35	90	System Closed = system shut-off on units employable at > 90°C, the water system is shut-off to atmosphere. <u>Water:</u> Temperature selection for system shut-off in °C <u>Oil:</u> evacuation by vacuum only possible below the set SCL-value (CHANGE)	X
dt	P.17	OFF; 0,1	20,0	Delta-T-monitoring / delimitation inlet-/ return-temperature <u>Monitoring:</u> LED temp in and LED temp out are flashing <u>Delimitation:</u> LED temp in and LED temp out are flashing Variable is being turned OFF	X
C-F	P.19	C	0,1 C	Selection °C, °F or 1/10 °C	X

Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		21
ESL	P.20	= b	1.= b	<p>External Sensor Logic</p> <p>Selection facility for the settling performance, when an external thermocouple is employed</p> <p>= b during start-up phase and/or after setpoint alteration, the APE-limitation (band for internal temperature) always remains active</p> <p>1. = b during the start-up phase and/or after setpoint alteration, the internal temperature is allowed to exceed the band just once Band-limitation only becomes active, when setpoint = actual temperature</p>	X
OPt	P.21	OFF	on	<p>Turning self-optimization ON and OFF.</p> <p>ON = Self-optimization startet. The controller determines the optimum control parameters by closed-loop control. Also refer to Chapter 4 „Setting the closed-loop control parameters.</p>	X
Ab3	P.22	OFF 29	400	Limiting value zone 3 (return)	X
SP/	P.23	OFF_0,1	99,9	Set point ramp -rising	X
SP\	P.24	OFF_0,1	99,9	Set point ramp -falling	X
h				operating hours	X

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

The INFO-display shows the parameter code



3.2.2 Parameter description at configuration level

Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		
					21
LOC	C.1	OFF	ALL	Keyboard interlock <ul style="list-style-type: none"> • OFF= parameter values can be changed. • PC = Parameter level and configuration level barred. Parameters can only be viewed. • SP.t = setpoint-value can be altered. All functions keys are enabled, if not barred by the configuration level. • o.SP = all keys, except for „0“ and „I“ are barred; only the setpoint-value can be altered • ALL = complete keyboard interlocking; it is only possible to switch ON and OFF; no setpoint-value alteration possible! <p>Please note! When changing the LOC-parameters, ENTER must be kept depressed, until the moving illumination has passed-through for the second time (about 5 s)!</p>	X

Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		21
niv	C.3	on	LOC	Enabling the filling modes „AUTOMATIC/MANUAL“ <ul style="list-style-type: none"> • on = change-over facility of the key marked LEVEL is enabled • LOC = change-over facility of the key marked LEVEL is blocked. 	X
c60	C.4	OFF, 10	100	Enabling or locking the „C.OFF“-key – pump-lag control Parameternr. A.15 <ul style="list-style-type: none"> • OFF = „OFF“-key blocked • 10...100 °C = adjustable switch-OFF temp. 	X
cdi	C.5	OFF	on	Interlocking of the “Direct cooling” key (unit must be equipped with hydraulics) <ul style="list-style-type: none"> • on = change-over to direct cooling is enabled • OFF = key blocked, no direct cooling allowed 	X
c.S1	C.7	E.Co	SP.2	Configuration of input S1, terminals 81, 80 <u>Programming for E.Co.</u> If input-port S1, terminals 81, 80 on SVL, has been bridged by an external contact, SVL switches-over to external controller operation. Setting outputs „Heating“ and „Cooling“ are enabled. <u>Programming for SP.2</u> If input-port S1, terminals 81, 80 on SVL, has been bridged by an external contact, SVL switches-over to the 2 nd setpoint-value.	X
c.1	C.10	rEL	biS	Configuration of the “heating” output port <ul style="list-style-type: none"> • rEL = Relay-output • biS = bi-stable output port (0/18VDC) for SSR (terminals 62, 63) 	X

Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		21
C.FL	C.18	0,01	9,99	Calibration flow when employing flow-meters (other than Single DFG), frequency / volume (liters) can here be input. Paramter c.17 "FLO" must have been selected on CAL or dP.	X
Cd.F	C.20	0,00	9,99	Correction factor for flow metering in the "Oil" configuration	X
OF.F	C.21	OFF; 1	99	Offset for flowrate	X
F.dF	C.22	FLO	AU	Function of the flow monitor <ul style="list-style-type: none"> • FLO = Flow indication via contact S7 (Pin 79 and 81) • AL = Flow indication by volume determination and via parameter A.dF. The information is displayed in units of ltr/min • AU = Flow indication by volumetric flow determination and via parameter A.dF. The information is displayed in units of 1/10 volts. 	X

Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		21
A.dF	C.23	OFF; 1	999	Setting of minimum quantity for volumetric flow rate measurement	X
C.AL	C.24	OFF	7	Configuration of the alarm output port "out 4", terminals 10,11 <ul style="list-style-type: none"> • 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 In the ON-position, output port "out 4" is open In OFF-position, output-port "out 4" is closed	X
C.SA	C.25	oP	cL	Configuration group interrupt Terminals 10, 11 "out 4" only at SVL1 terminals 21, 22 "out 7" only at SVL 10 <ul style="list-style-type: none"> • oP = n/c contact • cL = n/o contact 	X
ChL	C.26	dd	Ldd	Change-logic configuration <p>The change-sequence will have to be preselected as a function of the unit's hydraulic and electrical specifications.</p> <ul style="list-style-type: none"> • dd = Mold evacuation by compressed air • LS = Mold evacuation by vacuum suction (Leak stop-function) • Ldd = at present as per dd 8-9 = Mold evacuation with compressed air, when units with "System shut-off in cooling water return" are employed, e.g. STW 1-HTK and STW 150/1-HK + HN	X

Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		21
E.LS	C.27	on	LOC	<p>Interlocking of "LS" leak-stop parameter at working level (when hydraulic prerequisite is missing).</p> <ul style="list-style-type: none"> ON = Changing of the "LS"-parameter enabled at working level. LOC = Changing of the „LS“-parameter blocked at working-level 	X
ASt	C.28	5 min	120	<ul style="list-style-type: none"> Aquatimer-Start-time (min) <p>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.</p>	X
E.F	C.29	on	CHG	<ul style="list-style-type: none"> on = button F on the operator panel can be pressed. LOC = button F on the operator panel is locked. CHG = mould draining over push button F 	X
EMO	C.30	OFF	on	<p>Restart lockout after power reset</p> <ul style="list-style-type: none"> off = Restart lockout not active on = Restart lockout active <p>Following a power reset, the control system stays turned OFF, to start with. Display "Info". "EMO" message – flashing. LED in the "O"-key flashes. All other displays – except for Power LED – are OFF. The control system can be turned ON with the following sequence. ENTER the "EMO"-message with the "O"-key. LED in "O"-key is now permanently alight. The "EMO"-message must then be deleted. Now the control system can be turned ON with the "I"-key.</p> <p>The "EMO" message can also be quitted by switching contact S8 ("ON" from external source) from closed to open.</p>	X

Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		21
OF1	C.31	OFF, -100	100	Temperature correction of the internal temperature probe in °C	X
OF3	C.33	OFF, -199	100	Temperature correction of the probe for return run temperature in °C	X
OF4	C.34	OFF, -100	100	Temperature correction of the probe for inlet temperature in °C	X
OF5	C.35	OFF, -100	100	Temperature correction of the probe for oil-cracking temperature in °C	X
OF6	C.36	OFF, 1	100	Duty cycle offset info for system output cooling. Use of the parameter: To equalize unsteadiness of a cooling valve, an offset (OFF-Set) can be entered here in %.	X
P.Fi	C.37	OFF, 0,1	60	Filter for stabilization of the actual-value display	X
Pro	C.38	OFF	St	Setting of the various interface protocols <ul style="list-style-type: none"> • OFF = interface mode turned OFF. Parameter Adr, b and For are without any significance • A = Arburg-protocol active • b = Dr. Boy-protocol active • E = Engel-protocol active • CП = Krauss Maffei-protocol active • St = SINGLE Standard-protocol active • Pb = Profibus active only at SVL with Profibus interface 	X

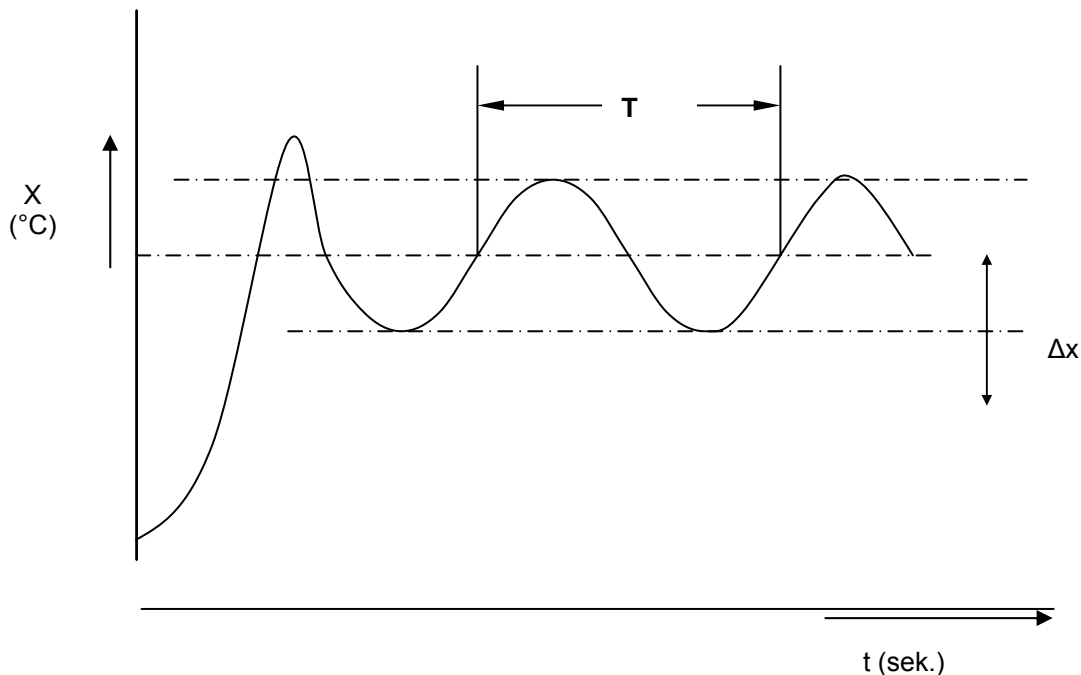
Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		21
b	C.39	OFF, 0.3	19.2	<p>This is where the transmission speed – Baudrate - of the interface is being programmed.</p> <p>Possible settings are as follows:</p> <ul style="list-style-type: none"> • OFF = no Baudrate set • 0.3 = 0.3 kBaud • 0.6 = 0.6 kBaud • 1.2 = 1.2 kBaud • 2.4 = 2.4 kBaud • 4.8 = 4.8 kBaud • 9.6 = 9.6 kBaud • 19.2 = 19.2 kBaud 	X
For	C.40	7E1	8n2	<p>Here the Interface's data format is being programmed.</p> <p>The data-format is comprised of:</p> <p>Data-bits, parity bit, stop bit.</p> <p>Possible settings are:</p> <p>7E1, 7o1, 7E2, 7o2, 7n2, 8E1, 8o1, 8n1, 8n2</p>	X
dn1	C.41	0	999	Here the first 3 digits of the equipment no. are programmed.	X
dn2	C.42	0	999	Here the last 3 digits of the equipment no. are programmed.	X
C.OFF	C.43	c.OFF	c.Gr	<p>Programming c.OFF After switch-off via the pump run-on control, 100% cooling is effective until cooling temperature is reached.</p> <p>Programming c.Gr After switch-off via the pump run-on control, the default cooling gradient is effective until the cooling temperature is reached.</p>	X

Parameter		Set-values range		Signifying	SVL-R8150
Des.	Code	Start	End		21
Conf	C.45	3P	2PC	Control response configuration 3P 3-point controller heating/cooling 2PC 2-point controller cooling	X
C.ut	C.47	OFF	Proc	Options for the 0-10V temperature input "OFF" = not in use "t.in" = return sensor "Proc" = control sensor in supply line	X
Ut.Lo	C.48	0	Ut.Hi	0-10V temperature input, lower voltage limit	X
Ut.Hi	C.49	Ut.Lo	10	0-10V temperature input, upper voltage limit	X
C.dF	C.50	U.dF	dp	Flow sensor options "U.dF" = sensor with linear voltage signal for flow "dp" = differential pressure sensor	X
dF.Lo	C.51	0	dF.Hi	0-10V flow input, lower voltage limit	X
dF.Hi	C.52	dF.Lo	10	0-10V flow input, upper voltage limit	X
FL.Lo	C.53	0	FL.Hi	Scaling of the lower flow voltage range in ltr./min.	X
FL.Hi	C.54	FL.Lo	999	Scaling of the upper flow voltage range in ltr./min.	X

4 Setting the closed-loop control parameters

4.0 Characteristics determining by the closed-loop control system

Where the control-system's time-response is unknown, and if the control circuit can be rendered unstable for a short time, the controller will be run at $x_p = 0$ (ON-OFF, without time-response). The control parameters are determined as follows from the resultant vibration response:



T = Vibration duration

Δx = Vibration amplitude of the actual-value

Delay-time : $T_u = \frac{1}{4} * T$

Derivative action time : $T_v = \frac{4}{10} * T_u$

Integral-action time : $T_n = 5 * T_v$

Proportional range : $x_p = \frac{\Delta x * 2}{\text{Meßbereichsumfang}} * 100\%$

Measuring range volume SVL: 430 K

We recommend, that the proportional range for „cooling“ is set for twice the value.

4.1 Self optimization

The optimization algorithm determines the system-characteristics by closed-loop control. It also calculates the feedback-parameters (X_p , T_v , T_n , - valid across a wide range) plus the operating cycle time ($C = 0,3 \times T_v$) of a PD/I-controller.

If the controller is being operated as a "heating-OFF-cooling"-controller, then the parameter-values determined under "heating" will be accepted for "cooling".

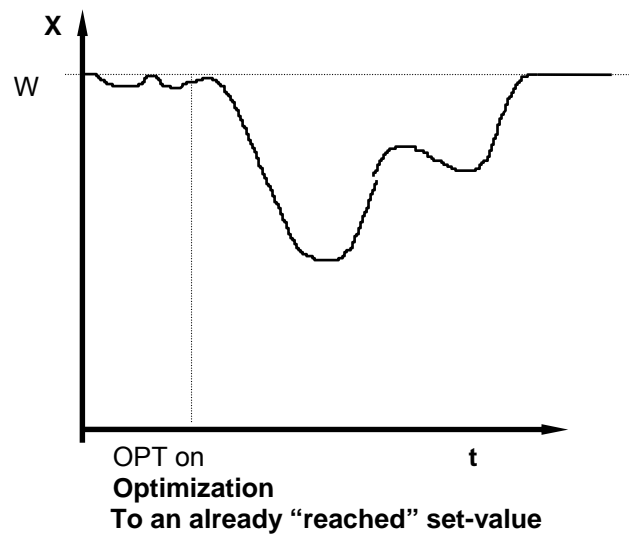
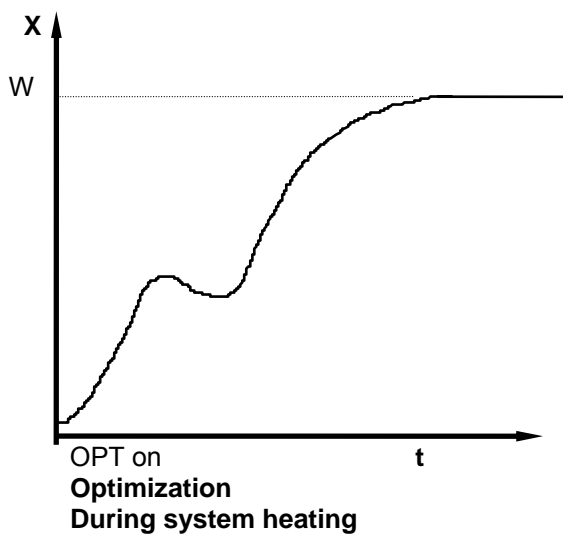
During start-up, optimization is carried out shortly before the input set-value. This must amount to at least 5 % of the measuring range volume. During optimization at an already reached set-value, the temperature is initially dropped by about 5% of the measuring range, in order to record the system amplification at its optimum.

The optimization algorithm can be triggered at any time by selecting OPT=ON, and then actuating the "ENTER" button.

During the optimizing process, the word "OPT" is shown in the set-value display alternately with the set-value.

With 3-point controllers (heating-OFF-cooling), temperature-lowering is speeded-up by switching COOLING on for a brief period.

Once the feedback parameters have been calculated, the controller matches the actual-value to the current setpoint.

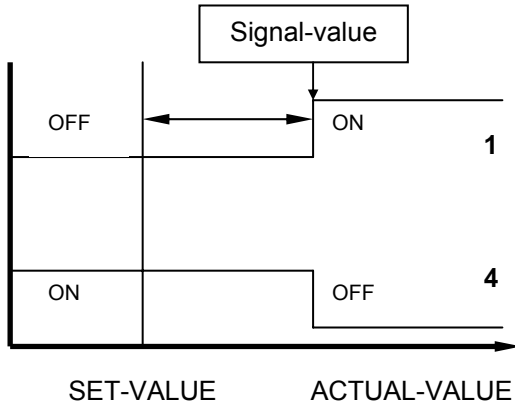


The optimizing process can be aborted, by selecting OPT=OFF, then actuating the "ENTER"-key.

5 Significance of the alarm configuration

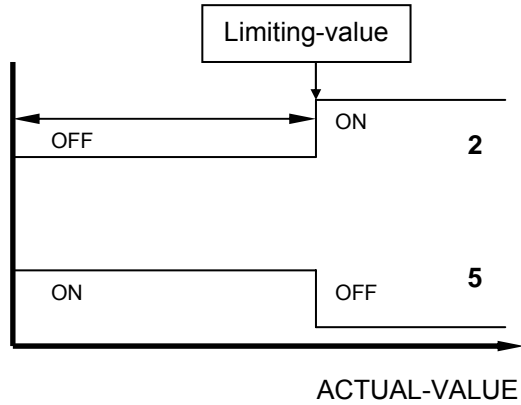
Signal contacts are input and displayed as a function of the set-value selected.

Switching performance: **Configuration:**



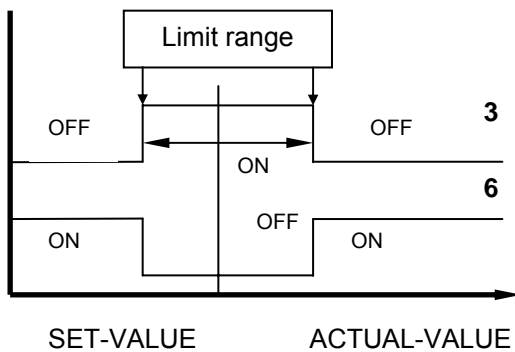
Limiting contacts are input and displayed as absolute values.

Switching performance: **Configuration:**



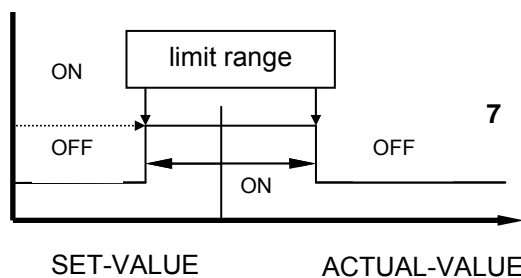
The limit comparator is input and displayed as a function of the set-value selected. The input value is effective below and above the set-value.

Switching performance: **Configuration:**



The alarm relay of limit comparators with readiness performance is being energized, once the controller is turned ON. It is de-energized, when the actual-value has made the OK-zone and has passed out of it again.

Switching performance: **Configuration:**



6 Connecting diagram SVL 21

6.0 Connecting diagram R 8150-21

	N	2
OUT 3	ventilating / venting	3
OUT 5	Pump	4
COM	OUT 3,5,6,8	5
OUT 6	filling	6
OUT 8	System closed	7
OUT 9	draining / leak-stop	8
		9
OUT 4	Alarm	10
		11
OUT 2	cooling	12
		13
OUT 1	heating	14
		15

71	TxD out	A	TxD out	RxTx P	H
72	TxD in		RxD out	Controlsignal	
73	RxD out		RxD in	+5V	
74	GND	GND	GND	GND	GND
75	Level max	S6			
76	Level min	S5			
77	+ 24 V	S5, S6			
78	motor protection	S9			
79	flow watchdog	S7			
80	ext. Controller	S1			
81	+ 24 V	S1, S7, S9			
82	ON external	S8			
83	+ 24 V				

60	Configuration water / oil	S2
61	+ 24 V	
62	heating -	OUT 1.1
63	heating +	
64	filmttemperature	GND
65	tenperature	Pt 100
66	Pre run	GND
67	tenperature	Pt 100
68	Closed-loop	GND
69	control	Pt 100
6A	return run	GND
6B	temperature	Pt 100

85	+5V	VFS
86	GND	
87	Flow metering input	0 - 10V
88	Sensor input	0 - 10V