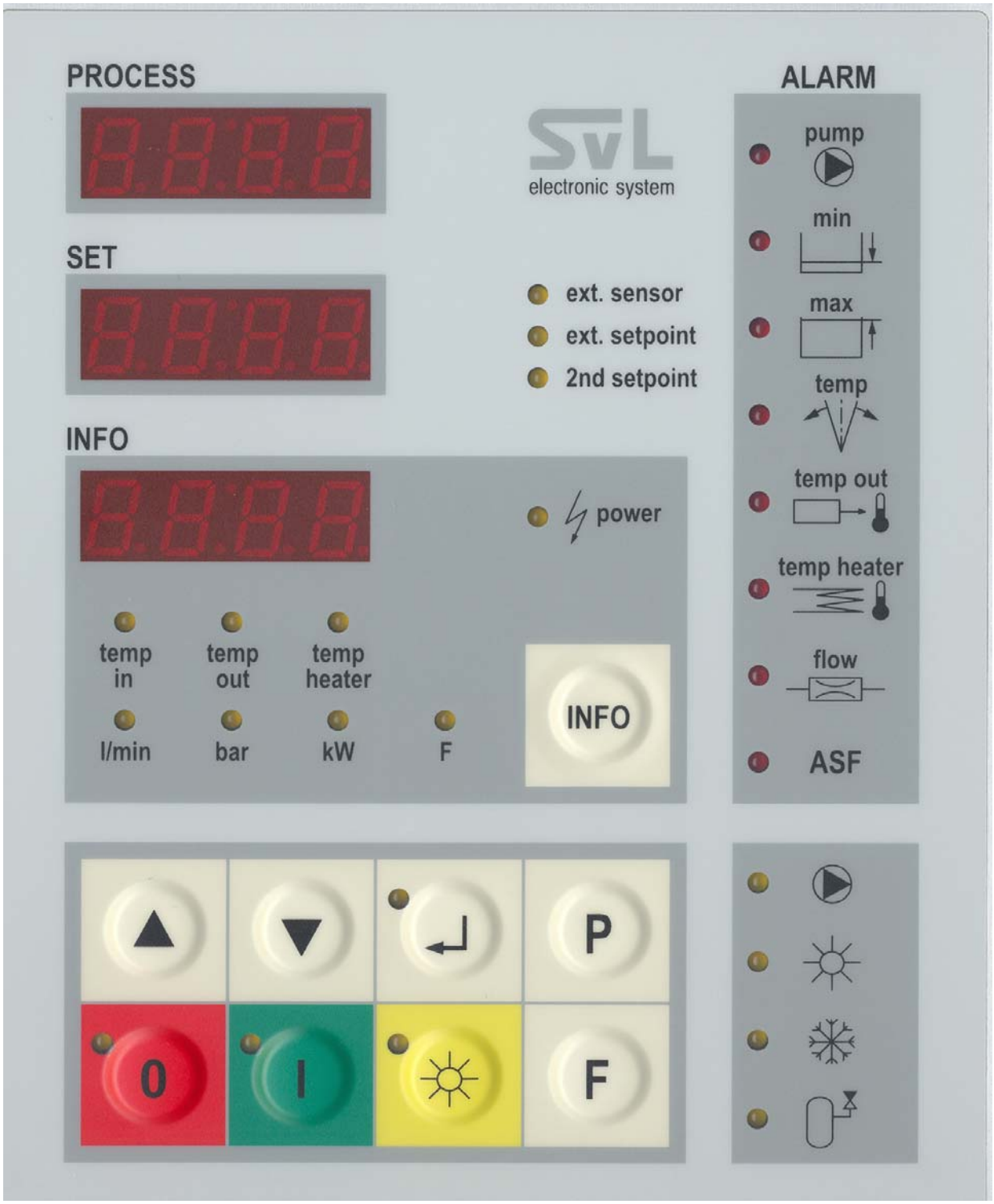
Operating Instructions
Single **"SVL -PB and SVL 10-PB**



SVL-Profibus_Englisch_V 52_04

73269 **Hochdorf** Ostring 17 - 19 Tel.: +49 71 53 / 30 09-0 Fax: +49 71 53 / 30 09 50
73269 Postfach 11 54 e-mail: info@single-temp.de internet: http://www.single-temp.de

List of contents

1 SVL structuring 3

2 SVL display- and control elements 4

2.0 General 4
2.1 Inputting Panel 4
2.2 Display - Information 6
2.3 Control Panel 8
2.4 Alarm Panel 9
2.4.1 Explanations to Alarm ASF 10
2.5 Operating Status Display 11

3 Parameter description 12

3.0 Working level 12
3.0.1 Calling-up the working level 12
3.0.2 Parameter description at working level 12
3.1 Parameter level 16
3.1.1 Calling-up the parameter level 16
3.1.2 Parameter description at parameter level 16
3.2 Configuration level 20
3.2.1 Calling up the configuration level 20
3.2.2 Parameter description at configuration level 20

4 Setting the closed-loop control parameters 30

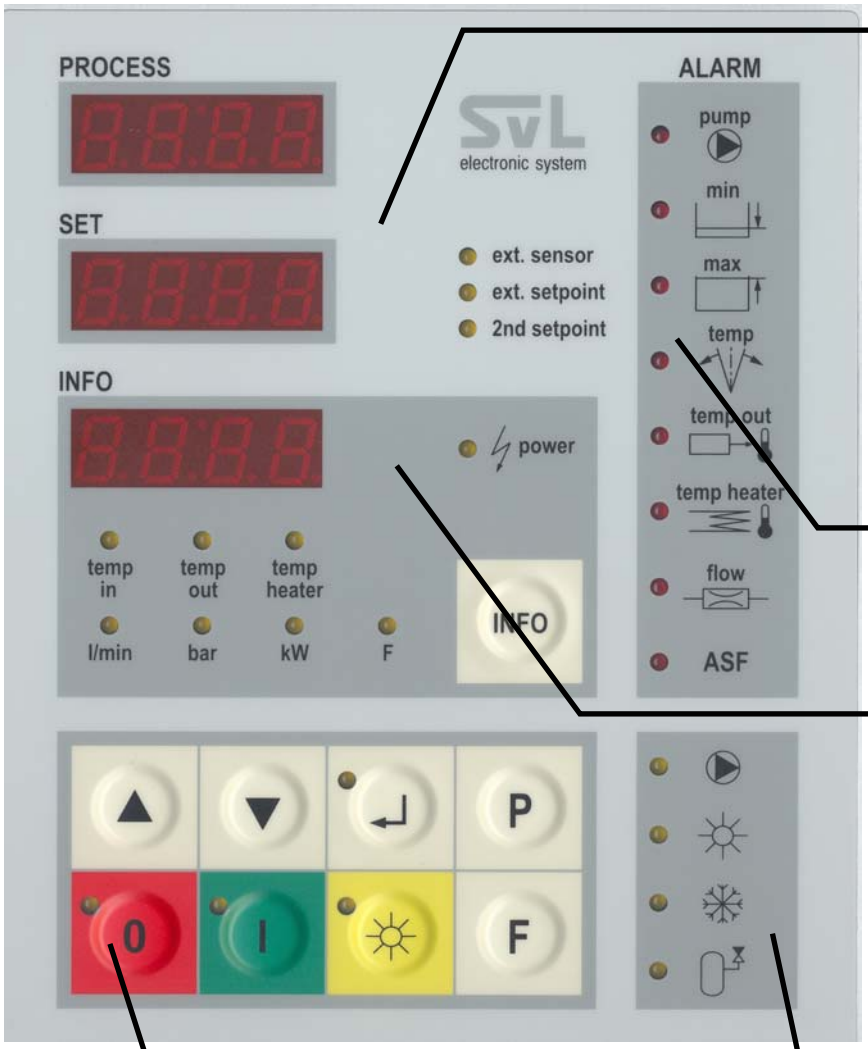
4.0 Characteristics determining by the closed-loop control system 30
4.1 Self optimization 31

5 Significance of the alarm configuration 32

6 Connecting diagram SVL 1 and 10 33

6.0 Connecting diagram R 8150-1 33
6.1 Connecting diagram R 8150-10 33

1 SVL structuring



Control panel

Alarm panel

Information panel

Inputting panel

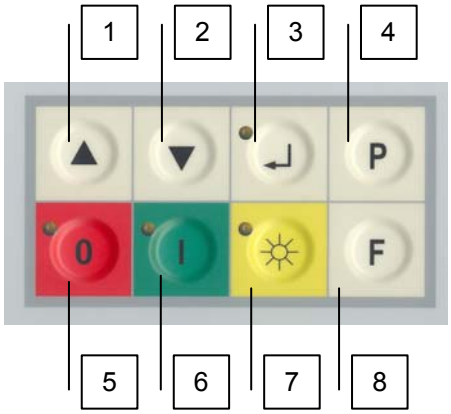
Operating status display

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”;potential-free contact of 25+26 (only SVL 10)

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

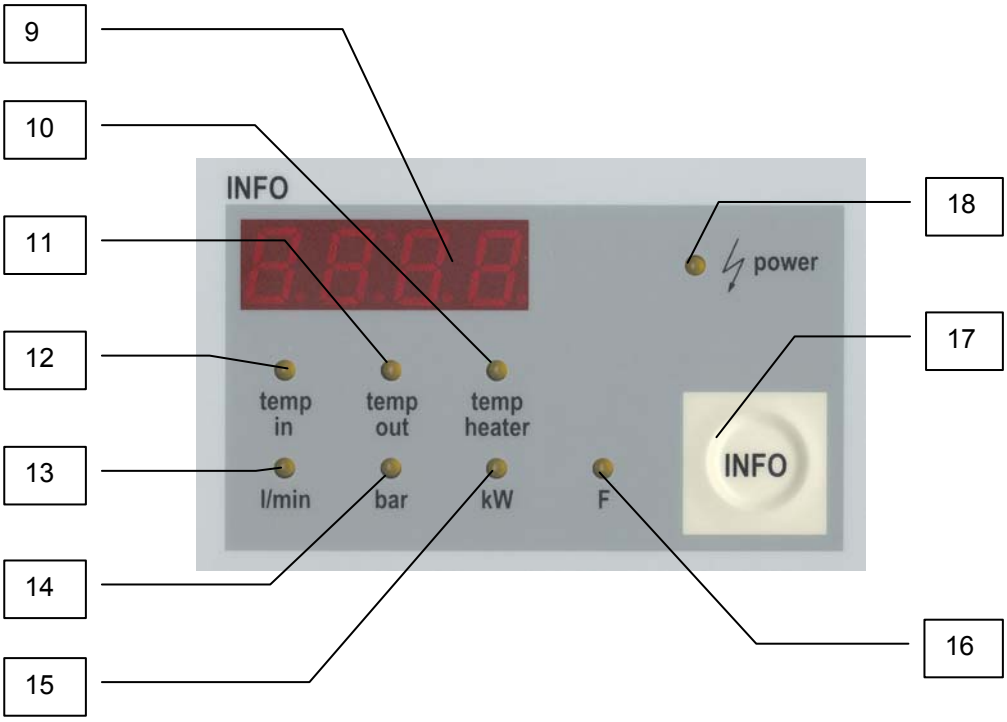
On heat-balancing units with interface change-over to “Remote operation”

With connection for “external controllers”, change-over to “external control”

Interlocked through configuration “C7”

Must be acknowledged with “ENTER” after activation

2.2 Display - Information



9. Display

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

10. Filmtemparature

Shining LED: the filmtemperatur 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 controling 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 esternal Setpoint

External setpoint active

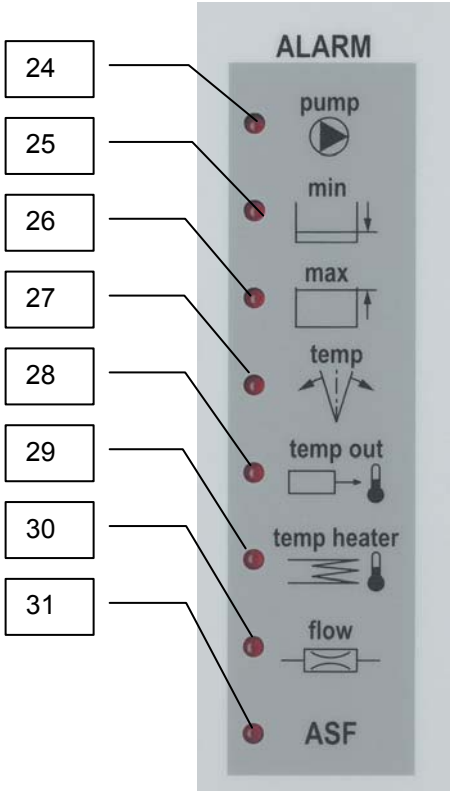
23. LED second Setpoint

Second setpoint active

2.4 Alarm Panel

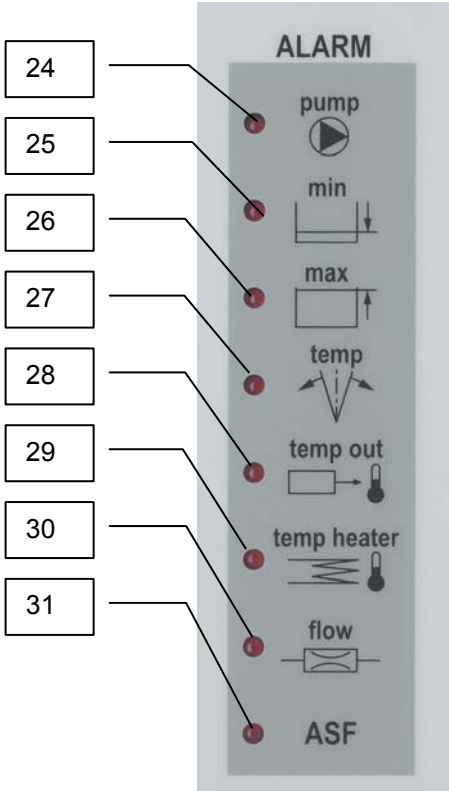
abbreviation

● 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	Swap phases on plug Check direction of rotation
	✸	Two-phasing	Check phases check supply-fuses
25.	●	Minimum level not made	Water: with manual filling: replenish with heat transfer medium. With automatic filling: Open cooling water supply, wait till filled. Oil: 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 execeeded	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.

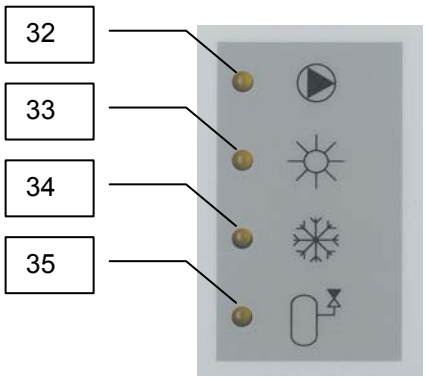
Fault		Cause	Rectification / explanation
28.	✸	Pre-run temperature up to limiting value Heating switches OFF	Check set limiting value; insufficient heat dissipation by consumer subsequent to cooling by 1-2 K, heating comes ON again
29.	✸	Oil-cracking temperature at set limiting value ⇨Heating system 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
● ASF alight ✸ ext. sensor flashes	In working level, although the external temperature probe is turned ON, it is not connected.	Connect the external temperature probe
● ASF alight ✸ bar flashes	Alarm values for Hi.P or Lo.P have been input in the working level	• 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

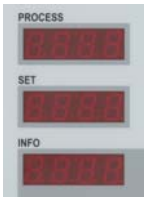
3.0 Working level

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°C)

Parameter		Set-values range		Signifying	SVL-R8150	
des.	Code	start	end		1	10
AL	A.2	OFF	OFF	Alarm outputs selected.	X	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	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	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	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	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	X

Parameter		Set-values range		Signifying	SVL-R8150	
Des.	Code	Start	End		1	10
		OFF, 0	100	Alarm output programmed as limit comparator ❻ ON-OFF-ON. The setpoint-value corresponds to the setpoint's tolerance-value.	X	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	X
SP2	**A.3**	MR-start	Set-value limiting	Programmed value corresponds to 2nd set-value. Change-over to 2nd 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	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	X
Ati	**A.5**	OFF=0	40	Aquatimer: setpoint-value corresponds to the max. permissible filling cycles after 1 hour of operation.	X	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	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
Hi.P	**A.8**	OFF, 0,1 bar	25 bar	High pressure alarm Input for pressure monitoring - upper value (max. pressure) set value (in bar) with ▲ or ▼and confirm with "ENTER"		X
Lo.P	**A.9**	OFF, 0,1 bar	25 bar	Low pressure alarm Input for pressure monitoring - lower value (min. Pressure) set value (in bar) with ▲ or ▼ and confirm with "ENTER"		X

Parameter		Set-values range		Signifying	SVL-R8150	
Des.	**Code**	**Start**	**End**		**1**	**10**
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	X
Pd.t	**A.11**	OFF; 1	500	Input of integration time for the capacity display		X
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	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	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	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	X
SEt	**A.16**	SP.1	SP.E	Change-over SP.1 = internal set-value active SP.2 = second set-value active SP.E = external set-value active		X
SEt	**A.16**	SP.1	SP.2	Change-over SP.1 = internal set-value active SP.2 = second set-value active	X	
E.Sn	**A.17**	OFF	on	Change-over on = External sensor active OFF = Internal sensor 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	X

AL 2	**A.19**	OFF	OFF	Alarm output OFF.	X	X
		OFF, -99	100	Alarm output programmed as signal contact ❶ max. OFF-ON. The setting value corresponds to alarm trip threshold relative to the setpoint.	X	X
		MB start	MB end	Alarm output programmed as limit contact ❷ max OFF-ON. The setting value corresponds to the absolute alarm trip value.	X	X
		OFF, 0	100	Alarm output programmed as limit comparator ❸ OFF-ON-OFF. The setting value corresponds to the setpoint tolerance.	X	X
		OFF, -99	100	Alarm output programmed as signal contact ❹ max. ON-OFF. The setting value corresponds to the alarm trip value relative to the setpoint.	X	X
		MB start	MB end	Alarm output programmed as limit contact ❺ max ON-OFF. The setting value corresponds to the absolute alarm trip value.	X	X
		OFF, 0	100	Alarm output programmed as limit comparator ❻ ON-OFF-ON. The setting value corresponds to the setpoint tolerance.	X	X
		OFF, 0	100	Alarm output programmed as limit comparator ❼ ON-OFF-ON (with standby response). The setting value corresponds to the setpoint tolerance. During first start-up, no alarm is generated until set range is reached.	X	X

Note: parameter A.19 is only displayed in operating mode 2PC.

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		1	10
Y%	P.1	Setting not possible: display only!.		Heating at + prefix Cooling at – prefix The currently calculated degree of actuation is shown on the regulation ratio display. It cannot be altered. Display is in percent of installed heating- or cooling-operation capacity.	X	X
hL%	P.2	0	100	Limitation of regulation ratio for heating, in %.	X	X
cL %	P.3	0	100	Limitation of regulation ratio for cooling, in %	X	X
				Limitation of the regulation ratio is only required with an excessively overdimensioned 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	X
hd	P.5	OFF, 1	200	TV-Heating in s. Derivative action time of the control system	X	X

Parameter		Set-values range		Signifying	SVL-R8150	
Des.	**Code**	**Start**	**End**		**1**	**10**
hI	**P.6**	OFF, 1	999	TN-Heating in s. Integral action (reset) time of the control system	X	X
cP	**P.7**	OFF, 0.1	99.9	XP-Cooling in % The control system's proportional range	X	X
cd	**P.8**	OFF, 1	200	TV-cooling in s. Derivative action time of the control system	X	X
cI	**P.9**	OFF, 1	999	TN-cooling in s. Integral action (reset) time of the control system	X	X
db	**P.10**	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	X
hC	**P.11**	1	240	Heating switch-cycle time in s.	X	X
cC	**P.12**	1	240	Cooling switch-cycle time in s.	X	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 • Continuous actuator output: Switch-cycle time 1 s		

Parameter		Set-values range		Signifying	SVL-R8150	
Des.	**Code**	**Start**	**End**		**1**	**10**
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	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	X
AF5	**P.15**	OFF, MB-start	MB-end	Oil-cracking temperature (filmtemperature) limiting value in °C		
SCL	**P.16**	OFF, 35	90	**S**ystem **Cl**osed = system shut-off on units employable at > 90°C, the water system is shut-off to atmosphere. Water: Temperature selection for system shut-off in °C Oil: evacuation by vacuum only possible below the set SCL-value (CHANGE)	X	X
dt	**P.17**	OFF; 0,1	20,0	Delta-T-monitoring / delimitation inlet-/ return-temperature Monitoring: LED temp in and LED temp out are flashing Delimitation: LED temp in and LED temp out are flashing Variable is beeing turned OFF	X	X
SEn	**P.18**	Pt	4,20	Sensor selection for the external temperature probe • Pt = external probe PT 100 • FE = external probe Fe-CuNi type L • ni = external probe NiCr-Ni type K • 0.20 = external probe 0 to 20 mA recorded via external 1 Ohm resistance. • 4.20 = external probe 4 to 20 mA recorded via external 1 Ohm resistance.		X
C-F	**P.19**	C	0,1 C	Selection °C, °F or 1/10 °C	X	X

Parameter		Set-values range		Signifying	SVL-R8150	
Des.	Code	Start	End		1	10
ESL	**P.20**	= b	1.= b	**E**xternal **S**ensor **L**ogic Selection facility for the settling performance, when an external thermocouple is employed = b during start-up phase and/or after setpoint alteration, the APE-limitation (band for internal temperature) always remains active 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		X
OPt	**P.21**	OFF	on	Turning self-optimization ON and OFF. 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.	X	X
Ab3	**P.22**	OFF 29	400	Limiting value zone 3 (return)	X	X
SP/	**P.23**	OFF_0,1	99,9	Set point ramp -rising	X	X
SP	**P.24**	OFF_0,1	99,9	Set point ramp -falling	X	X
Hy.Hi	**P.25**	0,5	10,0	Cooling OFF hysteresis	X	X
Hy.Lo	**P.26**	0,5	10,0	Cooling ON hysteresis	X	X
h				operating hours	X	X

Note: parameters P.25 and P.26 are only displayed in operating mode 2PC.

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**		**1**	**10**
LOC	**C.1**	OFF	ALL	Keyboard interlock • 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 keyborad interlocking; it is only possible to switch ON and OFF; no setpoint-value alteration possible! **<u>Please note!</u>** When changing the LOC-parameters, ENTER must be kept depressed, until the moving illumination has passed-through for the second time (about 5 s)!	X	X

Parameter		Set-values range		Signifying	SVL-R8150	
Des.	**Code**	**Start**	**End**		**1**	**10**
AP.E	**C.2**	OFF, 1	100	Closed-loop controlled multi-switching sequence = =setting output limitation with "External temperature probe" = active! Value corresponds to the temperature difference in K to the programmed setpoint-value. An actuating output limitation for „heating “ and „cooling“ ensues. OFF = no access to the actuating outputs heating and cooling **Attention!** Please note: parameter "ESL" at parameter level !! **<u>Example:</u>** 5 K programmed. If the actual-value exceeds the programmed setpoint-value by 5 K, the heating output will be turned OFF. Should the actual-value drop below the programmed setpoint-value by 5 K, cooling will be turned OFF. This ensures continuous monitoring of the inlet temperature as a function of the setpoint-value. (Cascade closed-loop control)		X
niv	**C.3**	on	LOC	Enabling the filling modes „AUTOMATIC/MANUAL“ • on = change-over facility of the key marked LEVEL is enabled • LOC = change-over facility of the key marked LEVEL is blocked.	X	X
c60	**C.4**	OFF, 10	100	Enabling or locking the „C.OFF“-key – pump-lag control Parameternr. A.15 • OFF = „OFF“-key blocked • 10...100 °C = adjustable switch-OFF temp.	X	X
cdi	**C.5**	OFF	on	Interlocking of the “Direct cooling” key (unit must be equipped with hydraulics) • on = change-over to direct cooling is enabled • OFF = key blocked, no direct cooling allowed	X	X

Parameter		Set-values range		Signifying	SVL-R8150	
Des.	**Code**	**Start**	**End**		**1**	**10**
Ph	**C.6**	OFF	on	Rotational field identification phase testing This parameter allows rotary field- and/or phase falure identification to be turned ON or OFF • ON = phasene identification active • OFF = phase identification turned OFF		X
c.S1	**C.7**	E.Co	E.SE	Configuration of input-port 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 E.SE</u> If input-port S1, terminals 81, 80 on SVL, has been brigded by an external contact, SVL switches-over to external temperature probe.		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 brigded 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 brigded by an external contact, SVL switches-over to the 2nd setpoint-value.	X	
c.S3	**C.8**	bL	ALL	Configuration of input port S3, terminals 47, 48 • bL = „almost empty –signal“ for float switch with preliminary signal regarding medium-level information • PC to ALL = Keyboard interlocking via external potential-free contact or key-switch. Configuration of locking-mode as per LOC parameter.		X

Parameter		Set-values range		Signifying	SVL-R8150	
Des.	**Code**	**Start**	**End**		**1**	**10**
c.S4	**C.9**	SP.2	SP.E	Configuration of input-port S4, terminals 45, 46 • SP.2 = Change-over facility to 2nd setpoint-value through external, potential-free contact. • SP.E = change-over facility to external setpoint-value programming Activation via potential-free contact on terminals 45, 46.		X
c.1	**C.10**	rEL	biS	Configuration of the “heating” output port • rEL = Relay-output • biS = bi-stable output port (0/18VDC) for SSR (terminals 62, 63)	X	
c.1	**C.10**	rEL	A.4	Configuration of the heating output port • rEL = Relay-output • biS = bi-stable output port (0/18VDC) for SSR (terminals 62, 63)rEL = Relais-Ausgang • A.0 = continuous (steady) output 0-20 mA (terminals 49, 50) • A.4 = Steady output 4-20 mA (terminals 49, 50)		X
c.2	**C.11**	rEL	A.4	Configuration of the “cooling” output port • rEL = Relay-output • biS = bi-stable output port (0/18VDC) for SSR (terminals 49, 50) • A.0 = continuous (steady) output 0-20 mA (terminals 49, 50) • A.4 = Steady output 4-20 mA (terminals 49, 50)		X
c.12	**C.12**	on.c	Et.c	Configuration of output port “out 12” • on.c = normally open (n/o) contact for signal, when system turned on • Et.c = n/o contact for signal when changing-over to extrnal controller or else to remote-operation The signal can be accessed on terminals 25, 26 .		X

Parameter		Set-values range		Signifying	SVL-R8150	
Des.	**Code**	**Start**	**End**		**1**	**10**
out	**C.13**	0	4	Configuration of the actual-value output port • 0 = 0...20 mA / 0...10 VDC • 4 = 4...20 mA / 2...10 VDC		X
in	**C.14**	i.0	U.10	Configuration of the setpoint-value input port • i.0 = 0...20 mA • i.4 = 4...20 mA • U.10 = 0...10 VDC		X
C.oE	**C.15**	C.oS+80	MB-end	Scaling of the measuring range's end for the actual-value output-port and setpoint-value inputting <u>Example:</u> C.oE has been programmed at 200°C The analog signal 10 VDC or 20 mA corresponds to the programmed value of 200 °C		X
C.oS	**C.16**	MB-start	Co.E-80	Scaling the start of the measuring range for the actual-value output-port and set-value inputting <u>Example:</u> C.oS has been programmed at 0 °C. The analog signal 0/2 VDC or 0/4 mA corresponds to the programmed value of 0 °C		X

Parameter		Set-values range		Signifying	SVL-R8150	
Des.	**Code**	**Start**	**End**		**1**	**10**
FLO	**C.17**	OFF	dP	Flow-meter selection (Series without DFG) hydraulic option must be available • OFF = no flow monitoring • 60.0 = size I with place after decimal pt. display (1l) • 60 = size I max. 60 liters 200 = size II max. 200 liters • 400 = size III max. 400 liters • CAL = value can be calibrated freely via parameter C.FL (C.21) • dP = volumetric flow metering by differential pressure measurement		X
C.FL	**C.18**	0,01	9,99	**C**alibration **f**low 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
C.P	**C.19**	0,0	25	**C**alibrating **P**ressure This parameter allows the input signal ($0\text{-}10V_{DC}$) for pressure (terminal 57/58) to have the respective pressure end-value allocated to it – e.g. 6,0 bar for $10V_{DC}$ or 10,0 bar for $10V_{DC}$		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 • **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**		**1**	**10**
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 • 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	X
AL.OC	**C._ _**	oP	cL	Configuration limit comparator Terminals 10, 11 “out 4” • oP = n/c contact • cL = n/o contact		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 • oP = n/c contact • cL = n/o contact	X	X
ChL	**C.26**	dd	Ldd	Change-logic configuration The change-sequence will have to be preselected as a function of the unit’s hydraulic and electrical specifications. • 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	X

Parameter		Set-values range		Signifying	SVL-R8150	
Des.	**Code**	**Start**	**End**		**1**	**10**
E.LS	**C.27**	on	LOC	Interlocking of “LS” leak-stop parameter at working level (when hydraulic prerequisite is missing). • ON = Changing of the “LS”-parameter enabled at working level. • LOC = Changing of the „LS“-parameter blocked at working-level	X	X
ASt	**C.28**	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	X
E.F	**C.29**	on	CHG	• 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	X
EMO	**C.30**	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. 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. The "EMO" message can also be quitted by switching contact S8 (*"ON" from external source*) from closed to open.		

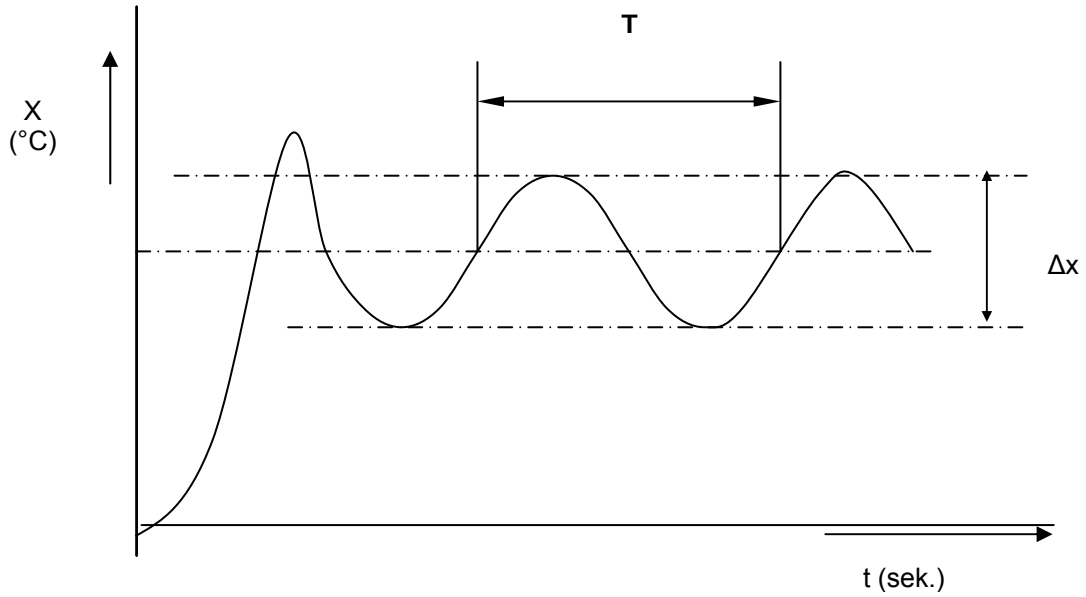
Parameter		Set-values range		Signifying	SVL-R8150	
Des.	**Code**	**Start**	**End**		**1**	**10**
OF1	**C.31**	OFF, -100	100	Temperature correction of the internal temperature probe in °C	X	X
OF2	**C.32**	OFF, -100	100	Temperature correction of the external temperature probe in °C		X
OF3	**C.33**	OFF, -199	100	Temperature correction of the probe for return run temperature in °C	X	X
OF4	**C.34**	OFF, -100	100	Temperature correction of the probe for inlet temperature in °C	X	X
OF5	**C.35**	OFF, -100	100	Temperature correction of the probe for oil-cracking temperature in °C	X	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	X
P.Fi	**C.37**	OFF, 0,1	60	Filter for stabilization of the actual-value display	X	X
Pro	**C.38**	Pb.d	PP.d	Setting of the various interface protocols • Pb.d = Profibus active only at SVL with Profibus interface	X	X

Parameter		Set-values range		Signifying	SVL-R8150	
Des.	**Code**	**Start**	**End**		**1**	**10**
b	**C.39**	ndt		No settings possible.	X	X
dn1	**C.41**	0	999	Here the first 3 digits of the equipment no. are programmed.	X	X
dn2	**C.42**	0	999	Here the last 3 digits of the equipment no. are programmed.	X	X
C.OFF	**C.43**	c.OFF	c.Gr	Programming c.OFF After switch-off via the pump run-on control, 100% cooling is effective until cooling temperature is reached. Programming c.Gr After switch-off via the pump run-on control, the default cooling gradient is effective until the cooling temperature is reached.	X	X
Conf	**C.45**	3P	2PC	Control response configuration 3P 3-point controller heating/cooling 2PC 2-point controller cooling	X	X
PS1	**C.46**	0	999	The set parameters are stored by inputting a secret code.	X	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 xp = 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 : $Tu = \frac{1}{4} * T$

Derivative action time : $Tv = \frac{4}{10} * Tu$

Integral-action time : $Tn = 5 * Tv$

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

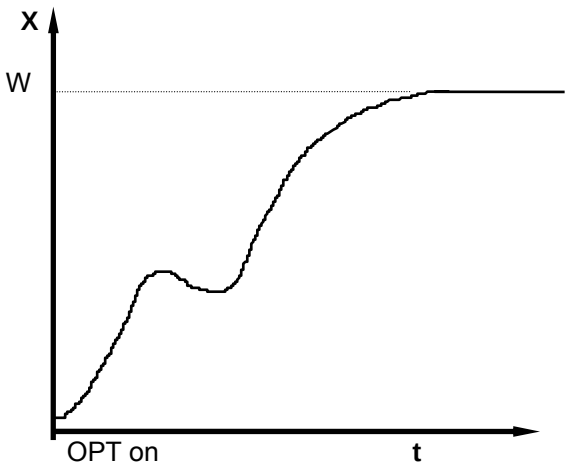
Measuring range volume SVL: 430 K

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

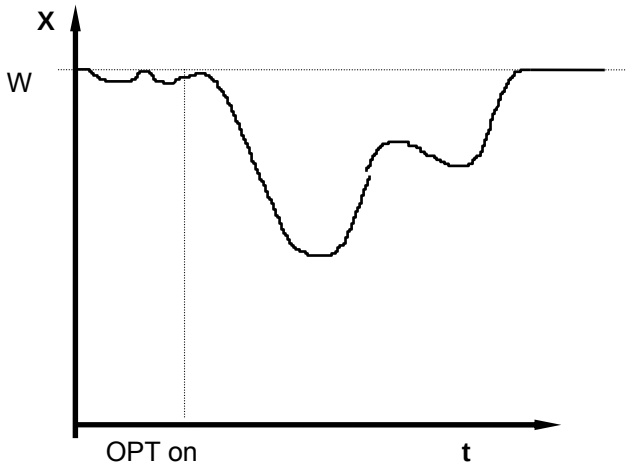
4.1 Self optimization

The optimization algorithm determines the system-characteristics by closed-loop control. It also calculates the feedback-parameters (Xp, Tv, Tn, - valid across a wide range) plus the operating cycle time (C = 0,3 x Tv) 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 aready 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.



Optimization
During system heating



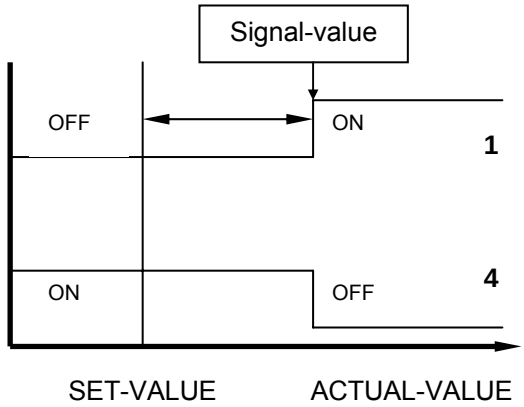
Optimization
To an already “reached” set-value

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

5 Significance of the alarm configuration

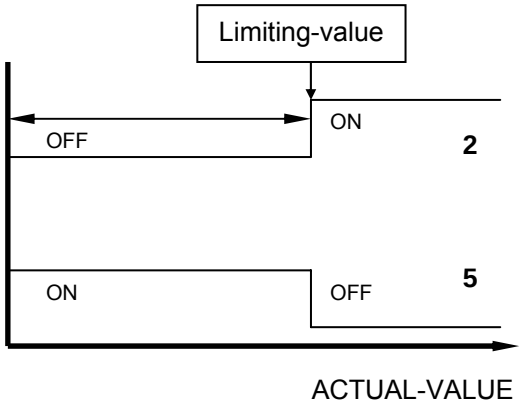
Signal contacts are input and displayed as a function of the set-value selected.

Switching performance: **Configuration:**



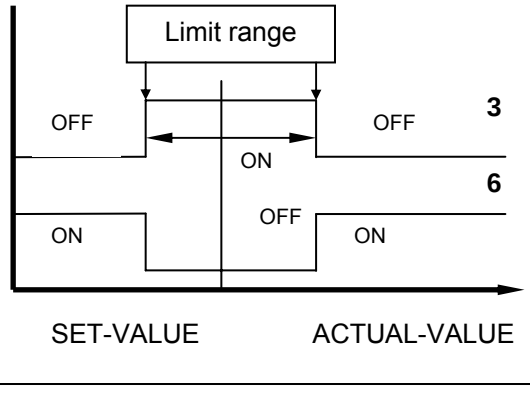
Limiting contacts are input and displayed as absolute values.

Switching performance: **Configuration:**



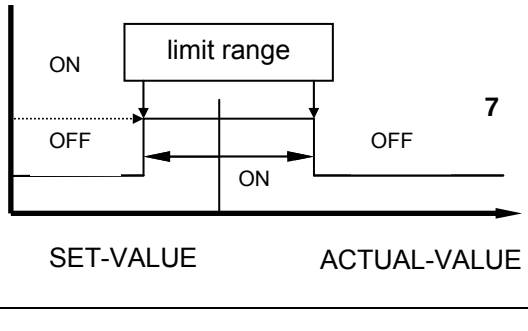
The limit comparator is input and displayed as a function of the set-value selected. The input value is effective below and above the set-value.

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 1 and 10

6.0 Connecting diagram R 8150-1

	L	1
	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

70	RxD in	B	TxD in	RxTx N	L
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	filmtemperature	GND
65		Pt 100
66	Pre run tenmperature	GND
67		Pt 100
68	Closed-loop control	GND
69		Pt 100
6A	return run temperature	GND
6B		Pt 100

6.1 Connecting diagram R 8150-10

L2	Phase	18
L3	Phase	19
		20
OUT 7	Group alarm	21
		22
OUT 11	oil-cracking alarm / unlocking	23
		24
OUT 12	ON / S1 active	25
		26
OUT 13	Alarms active during:limiting value-returnline; min.volume;ΔT-Inlet-, returnline; pressure, min / max;2. Limit Soll/Ist	27
		28

41	Actual-value output port	bridge 10 V
42		0/4..20 mA; 0..10 V
43	keyboard interlock	S 10
44		+24 V S 10
45	2. Set-value / external set-value active	S 4
46		+24 V S 4
47	Almost empty	S 3
48		+24 V S 3
49	continuosly/logical +	heating/cooling
50	continuosly/logical -	heating/cooling

54	flow sensor DFG	+	
55		GND	
56	+24 V Output	supply current DFG	Change-over with Jumper
57	Pressure	10 V	
58	GND pressure/flow	GND	
59	flow	10 V	
90	free		
91	external set-value	GND	
92		0...10 V	
93		0/4...20 mA	
94	external sensor	GND	-
95		+	+
96			
		thermocouple	resistance thermometer	Current signal with termination resistance of 1 OHM