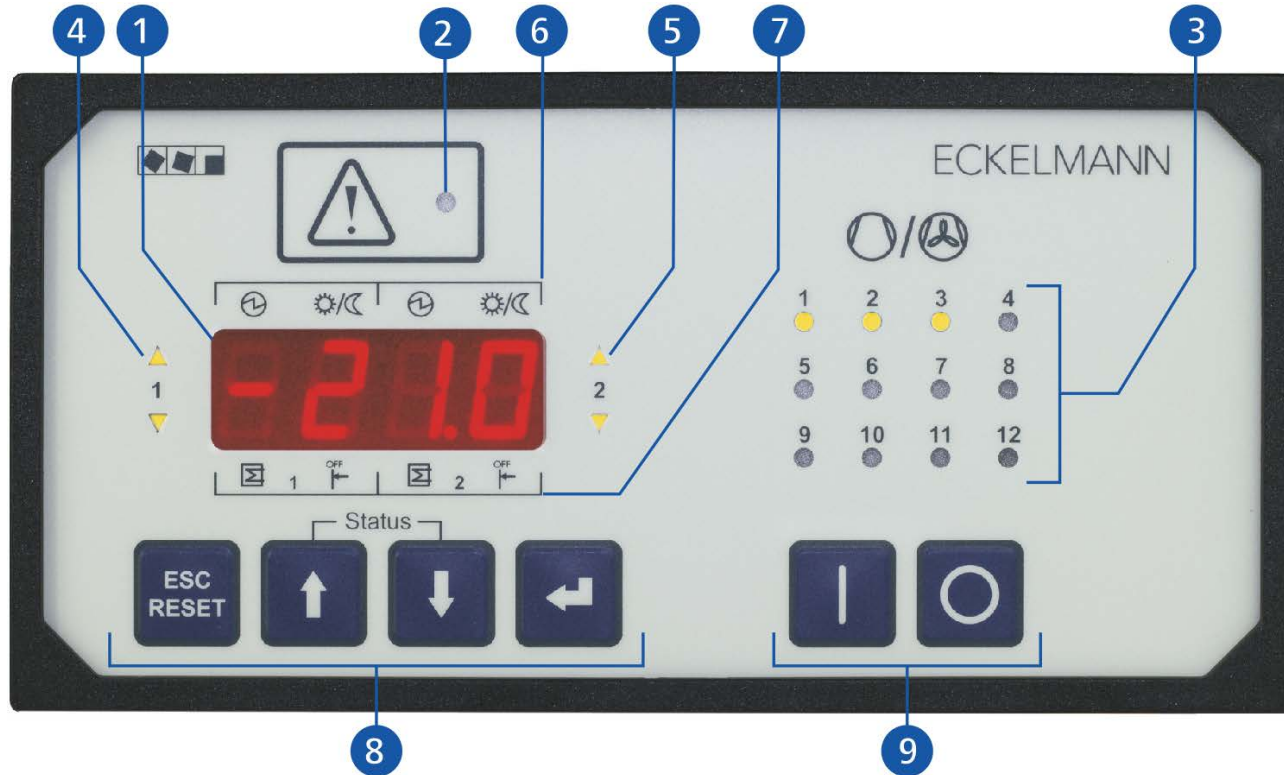


Quick Guide for VS 300 - Version V2.10

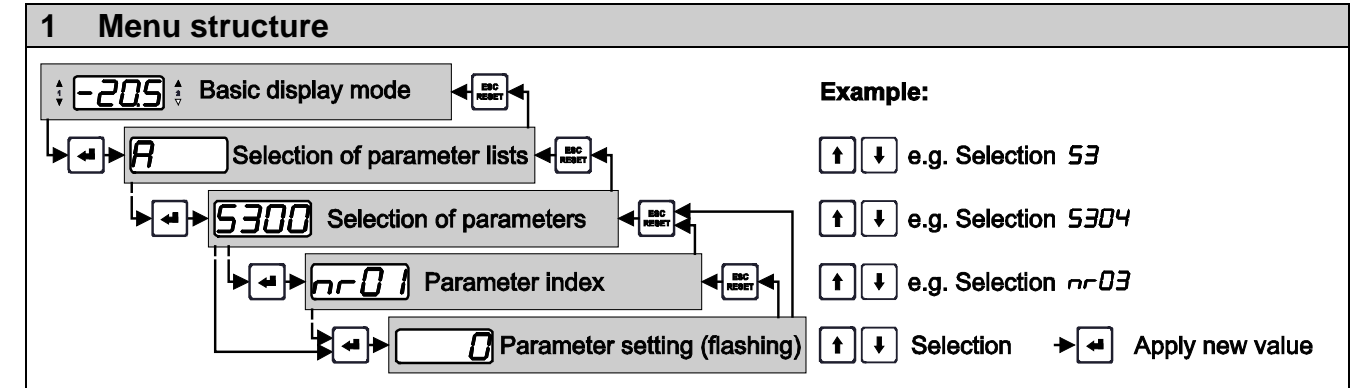


This Quick Guide does not replace the full User Guide for the VS 300. Make sure to read and observe the safety notes contained in the User Guide before starting and working with this product!

Legend: CL = Control loop

Display and LEDs	Function
1	Display: Shows actual values/setpoints, parameters, compressor/condenser numbers or messages.
2	Alarm/message LED (red): Flashes to alert to a message or fault
3	Operating and status indicators for relay stages (green) (4, 8 or 12 relay stages to show status of compressors/condensers assigned to control loops CL1 and CL2)
4 / 5	Trend LEDs: Flashes to indicate control loop active in display:
	Upper LED: Temperature/pressure above neutral zone ⇒ Load
	Both LEDs: Temperature/pressure within neutral zone
6 / 7	1. LED segment below/above symbol: Load shedding 2nd setpoint active Heat recovery mode Fast unload
	2. Relay stage indicators: Continuously lighted LEDs: Relay stages assigned to CL1 Flashing LEDs: Relay stages assigned to CL2

Control keys	Function in basic display mode	Function in parameter set mode
	- Reset messages - Delete message indication	- Cancel entry - Previous operating level
	- Change to other control loop CL1 active: (4) - Flashing CL2 active: (5) - Flashing	- Select parameters/parameter lists - Increase/decrease values
	- Start parameter setting (open parameter list selection)	- Entering of parameters - Next operating level
	On-off switch for external devices	



1.1 Basic display mode

Controller switches to basic display mode (CL1 temperature displayed, left trend LED(s) flashing) on power-up or if no entry is made for 5 minutes or when (repeatedly) pressing the key:

Reading of temperature [°C] / pressure [bar]:
 Temperature: Reading to one decimal place e.g.: -20.5
 Pressure: Reading to two decimal places e.g.: 11.50
 In sensor break or short circuit, display shows - - -

Change to other control loop

When a message is generated, the message code (E001 .. E246) is shown in the display (see **Parameter list F**)

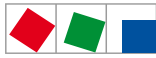
Press key to delete message indication.
 Fault report is repeated after about 10 seconds if fault/message is still in effect.

1.2 Selection of parameter lists

- Press key in basic display mode: ⇒
- Scroll with keys to select the parameter list wanted ⇒

A Actual Values	ONLY display of actual values / change of access level
51 Setpoints 1	Basic controller parameters
52 Setpoints 2	Auxiliary controller parameters
53 Setpoints 3	System configuration
54 Setpoints 4	Alarm priorities
55 Setpoints 5	Suction pressure shift / Additional Parameters
t Timer setpoints	Timers
C Check mode	Service mode: Manual actuation of outputs
F Fault messages	Process and system fault reports
- Press key to select the parameter list wanted.
- Press key (repeatedly) to return to basic display mode.





2 Startup – Main settings and parameters

- Set CAN bus address on decade switch at rear (only on VS 300 with CAN bus module)
NOTE: A unique address MUST be assigned to each CAN bus station: 101..109
- Set date and time (only on VS 300 without CAN bus module) See Parameter **5280 .. 5285**
- Configure controller See Parameter **5390**
- Set individual parameters
 - (Set control type for each CL) See Parameter **5300 / 5330** (CL1 / CL2)
 - System configuration/relay stage assignment See Parameter **5301 / 5331** (CL1 / CL2)
 - Set for LP/HP sensor characteristics See Parameter **5308 - 5309 / 5338 - 5339** (CL1 / CL2)
 - Configure 4 digital inputs See Parameter **5360 .. 5375**
 - Adjust setpoints See Parameter **5100 - 5102 / 5110 - 5112** (CL1 / CL2)
- Back up parameters See Parameter **5392**

3 Enabling setpoint adjustment - Parameter A060

- Press key in basic display mode: ⇒ **A**
- Press key: ⇒ **A000**
- Scroll with keys to select Parameter **A060**: ⇒ **A060**
- Press key to change to entry mode: ⇒ **0** Display flashes!
- Press key to select Parameter "I": ⇒ **I** Display flashes!
0 = Display only (setpoint adjustment not enabled)
I = Setpoint adjustment enabled
10 = Superuser mode (access additional parameters)
- Press key to confirm entry ⇒ **A060**
- Press key: ⇒ **A**
- Press key: ⇒ Basic display mode

3.1 Actual value display and parameter setting - Parameter Lists A, S1 - 55, E and C

Setpoints are adjusted by the same pattern at every operating level. **Example:**

⇒ **A** ⇒ ⇒ e.g. **51** ⇒

⇒ **5100** ⇒ ⇒ e.g. **5110** ⇒

⇒ **-190** (e.g. current setpoint) ⇒ Change value ⇒ e.g. **-180** ⇒

Apply new value ⇒ ⇒ Return to basic display mode

3.2 Parameter groups – Parameter index

Certain parameters contain a group of setpoints (e.g. separate enabling for each relay stage). These parameters can be accessed under a parameter number. **Example:**

⇒ **A** ⇒ ⇒ e.g. **53** ⇒

⇒ **5300** ⇒ ⇒ e.g. **5304** ⇒ ⇒ **nr01** ⇒

Select relay number (01..12) ⇒ ⇒ **0** (Not enabled) **I** (Enabled)

Apply new value ⇒ ⇒ Return to basic display mode

4 First startup – Loading default settings

To load the default settings, simultaneously press and hold the , , and keys during power-up.

At first startup, the default settings for all parameters are loaded and all archives, messages and operating data (e.g. run times, starts, activity) are deleted!

5 Displaying fault messages

1. Basic display mode: Latest current message with message code (**E001 .. E246**) / Alarm/message LED flashes:

Example: **E051** + ⇒ Cancel display / Return to basic display mode.

If no message is current at the time or if no fault is then in effect, pressing the key cancels the message and deletes it from the fault memory.

2. Parameter List F (Message index/number in message memory):

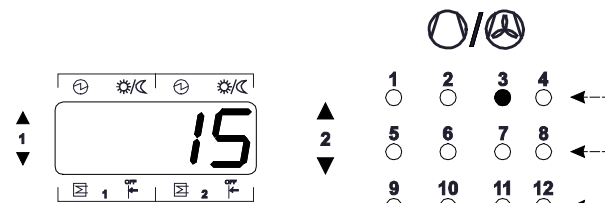
⇒ **A** ⇒ ⇒ **F** ⇒ ⇒ **F001** ONLY when message is current/not cancelled, otherwise **----** when no message present. By contrast with messages no longer effective, display flashes for messages that are still in effect!

Change to previous messages (**F002 .. max. F100**)

Example: **F002** ⇒ ⇒ **Message code (E001 .. E246** - see Parameter List 7.1 - Message Code)

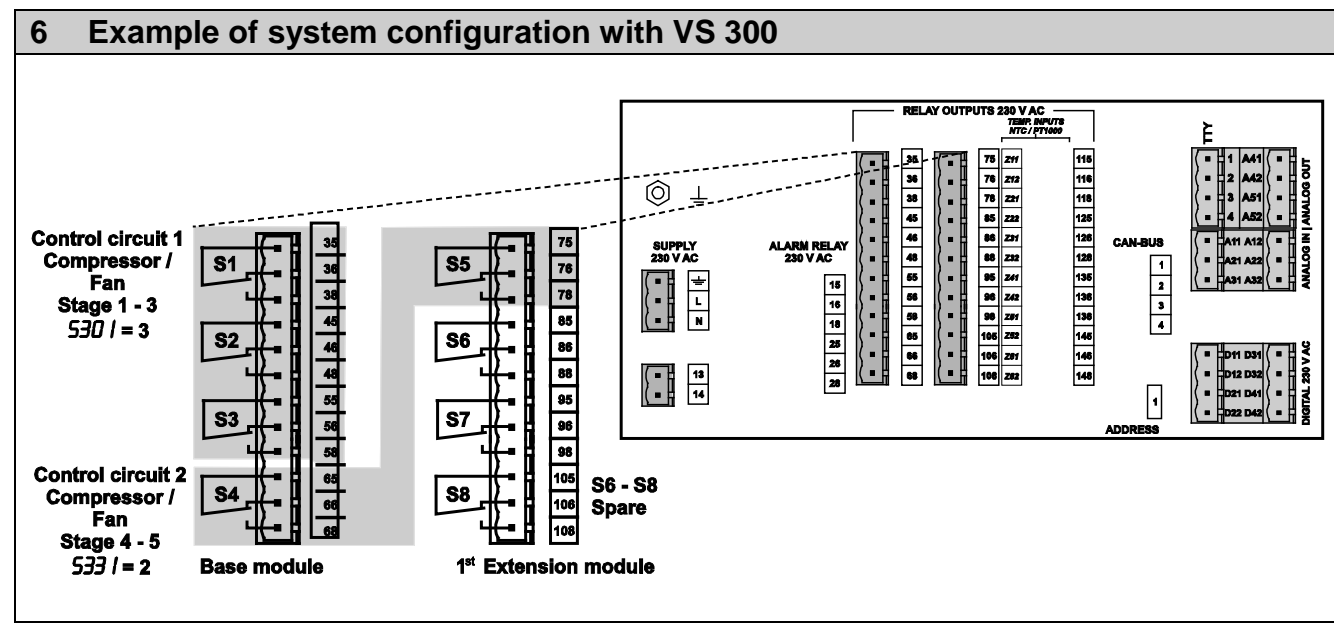
Example: **E051** ⇒ View additional message details:
 Message details are indicated by the Status LEDs of the relay stages (LED 1..12) for support.

Example: Display shows day date (15) of time stamp in:



Status-LEDs of the relay stages:

- (1) Message code: **E001 .. E246**
- (2) Message status: **0: Not enabled / 1: Enabled**
- (3) Time stamp in: **Day**
- (4) Time stamp in: **Month**
- (5) Time stamp in: **Year**
- (6) Time stamp in: **Hour**
- (7) Time stamp in: **Minute**
- (8) Time stamp go: **Day**
- (9) Time stamp go: **Month**
- (10) Time stamp go: **Year**
- (11) Time stamp go: **Hour**
- (12) Time stamp go: **Minute**





7.1 Message code E 001 .. E 246 - System and process fault alarms (see also - 6 Display of fault alarms)			
CL1 / CL2	Description	CL1 / CL2	Description
E004 .. E010	Intern fault alarms – Please contact service organization!	E209	Low pressure in CL1 (LT1, NT1 or HP1)
...		E210	Low pressure in CL2 (LT2, NT2 or HP2)
E050	First start with default parameters	E211	Pressure sensor measuring loop fault in CL1
E051	Restart following power failure	E212	Pressure sensor measuring loop fault in CL2
E180	Service mode active	E222	No Load Level CL1
E181	Fast unload active in CL1/CL2	E223	No Load Level CL2
E182	Load shedding active in CL1/CL2	E224	No UA 300 found with refrigeration point control
E203	Parameters changed for pressure sensors	E240	Setpoint adjusted
E207	High pressure in CL1 (LT1, NT1 or HP1)	E241	Controller configuration changed
E208	High pressure in CL2 (LT2, NT2 or HP2)	E243 .. E246	Digital alarm input 1..4 active

7.2 Parameter List A System data actual values					
CL1	CL2	Description	Limits	Dim.	Visible / Condition
A000	A010	Actual value Pressure	Limits vary with controller configuration and operating mode	bar	All times
A001	A011	Setpoint Pressure		bar	Parameter set for 1 stage in CL1: S301 >0 or Parameter set for 1 stage in CL2: S331 >0
A002	A012	Actual value Temperature		°C	
A003	A013	Setpoint Temperature		°C	
...	...				

7.3 Parameter List A System data common actual values					
CL1 / CL2	Description	Limits	Dim.	Visible / Condition	
A030 .. A033	Status digital input E1..E4		-	All times	
A034 .. A035	Status alarm output A1 and A2				
A060	Password entry, change of access level	0: No setpoint adjustment 1: Setpoint adjustment enabled 10: Superuser mode	-		

7.4 Parameter List S / Main setpoints								
Day operation		Description	Night operation		Limits	Dim.	Visible / Condition	
CL1	CL2		CL1	CL2				
S100	S110	1st setpoint t	S102	S112	2nd setpoint t	-50..45	°C	Parameter set for 1 stage in CL1: S301 >0 or Parameter set for 1 stage in CL2: S331 >0
...				

7.5 Parameter List S2 Basic parameter setpoints								
Day operation		Description	Night operation		Limits	Dim.	Visible / Condition	
CL1	CL2		CL1	CL2				
S204	S244	Neutral zone 1st setpoint	S214	S254	Neutral zone 2nd setpoint	1..10	K	Parameter set for 1 stage in CL1: S301 >0 or Parameter set for 1 stage in CL2: S331 >0
S205	S245	Control constant 1st setpoint	S215	S255	Control constant 2nd setpoint			
...				

7.6 Parameter List S2 Basic parameter setpoints – Day and night operation						
RK1	RK2	Description	Limits	Dim.	Visible / Condition	
S220	S260	Basic load time	3..250	Sek.	Parameter set for 1 stage in CL1: S301 >0 or Parameter set for 1 stage in CL2: S331 >0	
S221	S261	Variable load time				
S222	S262	Basic unload time				
S223	S263	Variable unload time				
S224	S264	High starts limiting	4..60	1/h		
S225		Temperature t_max in CL1 for alarm "High pressure in CL1 (E207)"	-30..55	°C		
	S265	Temperature t_max in CL2 for alarm "High pressure in CL2 (E208)". When high temperature disabling is enabled (S343=1), stages are disabled in CL1 when temperature rises above this value.	-20..55	°C		
	S266	Temperature in CL1 for resetting alarm "High pressure in CL1 (E207)". When high temperature disabling is enabled (S343=1), stages in CL1 are re-enabled when temperature drops below this value.	-35..48	°C		
S227	S267	Temperature in CL1/CL2 below which alarm "Low pressure in CL1/CL2 (E209/E210)" is generated. When low temperature disabling is enabled (S314=1 / S344=1), stages of CL1/CL2 are shed when temperature drops below this level (LP control only).	-50..20	°C		
...	...					
S230	S270	Delay for alarm "Low pressure CL1/CL2"	0..60	Min.		
S231	S271	Delay for alarm "High pressure CL1/CL2"				
S232	S272	Cycle time for base load rotation	5..720 oder ---	Min.	Parameter set for 1 stage in CL1: S301 >0 or Parameter set for 1 stage in CL2: S331 >0	
S233	S273	Switching mode	0: Fixed switching sequence 1: According to run times			
...	...					

7.7 Parameter List S2 Common setpoints						
CL1 / CL2	Description	Limits	Dim.	Visible / Condition		
S280	Current time Hour	0..23	Hour	All times		
S281	Current time Minute	0..59	Min.			
S282	Current date Day	1..31	Day			
S283	Current date Month	1..12	Month			
S284	Current date Year	1900..2155	Year			
S285	Daylight saving time change adjustment	0: No adjustment 1: Adjustment enabled	-			
...						



7.8 Parameter List 53 System configuration setpoints					
CL1	CL2	Description	Limits	Dim.	Visible / Condition
S300	S330	Control type	0: Step control 1: Speed control 2: Combined control	-	Parameter set for 1 stage in CL1: S301 >0 or Parameter set for 1 stage in CL2: S331 >0
S301	S331	No. of base load stages	S300/S330=0: 0 .. max S300/S330=1: 1 or 2 S300/S330=2: min. 2 .. max	-	All times
S302	S332	No. of capacity stages per base load stage	S300/S330=0: 1..3 S300/S330=1: = 1 S300/S330=2: = 1	-	Parameter set for 1 stage in CL1: S301 >0 or Parameter set for 1 stage in CL2: S331 >0
S303	S333	No of capacity-controlled base load stages	S300/S330=0: 0..[S301 / S331] S300/S330=1: = 0 S300/S330=2: = 0	-	
S304.1.. S304.12	S334.1.. S334.12	Enable/disable relay stages 1 to max. 4/8/12 (depending on configuration)	0: Disabled 2: With 1 load stage 1: Enabled 3: With 2 load stages	-	
S305	S335	No. of disabled relays on load shedding	0..3	-	
S306	S336	Refrigerant type	0=R22, 1=R502, 2=R134a, 3=R404A, 4=R402A, 5=R717, 6=R1270, 7=R507, 8=R407C, 9=R410A, 10=R290, 11=R744, 12=R407F, 13=R422A, 14=R422D, 15=R408A, 16=R407D, 17=R407A, 18=R427A, 19=R438A, 20=R152a, 21=R170, 22=R600, 23=R600a, 24=R449A, 25=R450A, 26=R448A, 27=R455A, 28=R447B, 29=R1234ze, 30=R1233zd, 31=R1234yf	-	
S308	S338	Sensor parameter setting: Pressure at 4 mA	0,0..2,0	bar	
S309	S339	Sensor parameter setting: Pressure at 20 mA	8,0..60,0	bar	
...	...				
	S343	Enable high temperature disabling CL2	0: Disabled 1: Enabled	-	Parameter set for 1 stage in CL2: S331 >0 and CL2 must be HP controller
S314	S344	Enable low temperature disabling CL1 / CL2	0: Disabled 1: Enabled	-	Parameter set for 1 stage in CL1: S301 >0 and CL1 must not be HP controller or Parameter set for 1 stage in CL2: S331 >0 and CL2 must not be HP controller
...	...				

7.9 Parameter List 53 System configuration common setpoints							
CL1 / CL2				Description	Limits	Dim.	Visible / Condition
E1	E2	E3	E4				
S360	S364	S368	S372	Function of digital input E1..E4	0: Off 4: Register alarm 1: Fast unload 5: Heat rec. mode 2: Load shedding 6: Safety loop 3: Setpoint toggle	-	All times
S361	S365	S369	S373	Assignment of digital input E1..E4	0: To CL1 1: To CL2 2: To both control loops	-	Parameter set for 1 stage in one of the two control loops: S301 >0 or S331 >0
S362	S366	S370	S374	Polarity of digital input E1..E4	0: Low active 1: High active	-	All times
S363	S367	S371	S375	Alarm delay for digital input E1..E4	0..60	Sek.	
S376				Number of internal alarm relay	0..2	-	
...				

7.10 Parameter List 53 System configuration common setpoints			
CL1 / CL2	Description	Limits	Visible / Condition
S390	Selection of controller configuration: NT = Normal-temp. refrig. (Compressor control) LT = Low-temp. refrig. (Compressor control) HP = High pressure (Fan control)	0: CL1=LT / CL2=LT 4: CL1=NT / CL2=HP 1: CL1=LT / CL2=NT 5: CL1=HP / CL2=HP 2: CL1=LT / CL2=HP 6: CL1=NT / CL2=LT 3: CL1=NT / CL2=NT	Requires "Superuser Mode" access rights (Parameter A060 = 10)
S392	Parameter backup	0: No 1: Back up parameters	
...			

7.11 Parameter List 54 Alarm priority setpoints			
CL1 / CL2	Description	Limits	Visible / Condition
S400	Alarm priority: High pressure CL1	-- : Alarm not registered 0 : Only entered in message list 1 : Alarm priority 1 2 : Alarm priority 2	All times
S401	Alarm priority: High pressure CL2		
S402	Alarm priority: Low pressure CL1		
S403	Alarm priority: Low pressure CL2		
S404	Alarm priority: Pressure measuring loop CL1		
S405	Alarm priority: Pressure measuring loop CL2		
S409	Alarm priority: Service mode active		
S410	Alarm priority: Load shedding		
S411	Alarm priority: Fast unload		
...			
S418 .. S421	Alarm priority. Digital input E1..E4		
S422	Alarm priority: Sensor type change		
...			
S433	Internal error		

7.12 Parameterliste 55 Suction pressure shift / Additional Parameters					
CL1	CL2	Description	Limits	Dim.	Visible / Condition
S500	S550	Suction pressure shift mode CL1/CL2	0: No shift 1: Shift by refrigeration point	-	Minimum of one stage must be defined in CL: CL1: S301 > 0 CL2: S331 > 0 Control loop must be low-pressure loop (LT or NT)
S501	S551	Maximum load level for to shift CL1/CL2	70..10	%	
S502	S552	Minimum load level for to shift CL1/CL2	10..60	%	
S503	S553	Increment CL1/CL2	0,0..10,0	K	
S504	S554	Time interval to shift CL1/CL2	1..20	Min.	

Legend: CL = Control

