



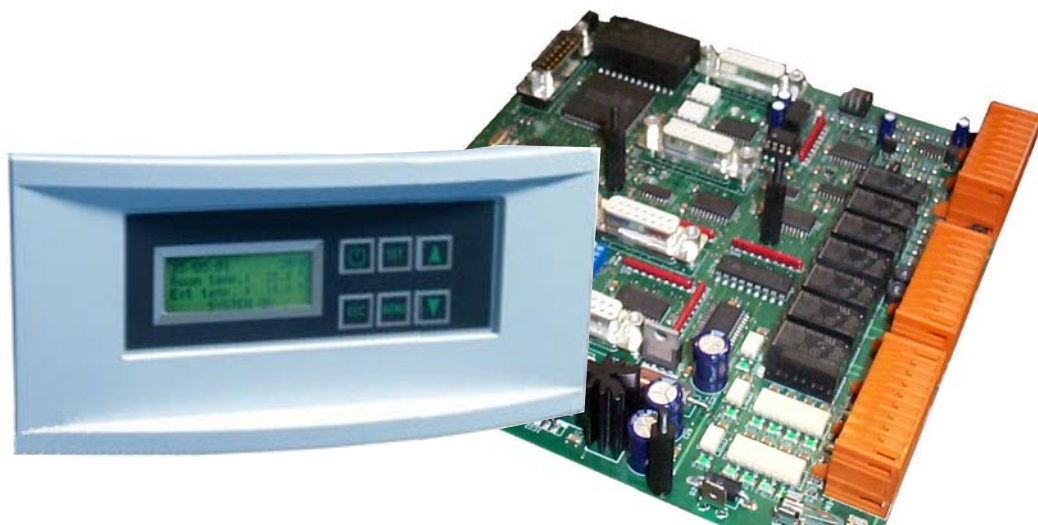
CompTrol 7000

INDEX 57

Issue 10.06

AIR CONDITIONING

MICROPROCESSOR



OPERATING INSTRUCTIONS

Contents

1. Presentation of the system.....	5
2. Hardware components.....	6
2.1 I/O controller (C7000 IOC)	6
2.1.1 Board design	6
2.1.2 Assignment - I/O controller.....	7
2.2 EDIO - extension board for digital in- and outputs.....	9
2.2.1 Board design	9
2.2.2 Assignment - EDIO1.....	10
2.2.3 Assignment - EDIO2.....	11
2.3 EAIO - extension board for analogous in- and outputs.....	12
2.3.1 Board design	12
2.3.2 Assignment - EAIO.....	13
2.4 EBUS-extension board for 2x RS485 bus	14
2.4.1 Board design	14
2.4.2 Assignment - EBUS.....	14
2.5 C7000 Advanced - Terminal (C7000 AT)	15
2.5.1 Board design	15
2.6 C7000 Plus - Terminal (C7000 PT2).....	16
2.6.1 Board design	16
3. Operator interface	17
3.1 Operational elements - C7000	17
3.2 Operational elements - C7000 Plus 2	19
3.3 Operational elements - C7000 Advanced.....	20
4. Bus communication	21
4.1 System architecture with the C7000.....	21
4.2 System architecture with the C7000 Plus.....	22
4.3 System architecture with the C7000 Advanced.....	23
4.4 Establishing the bus by a terminal program	24
4.4.1 Bus with C7000AT + IOC	25
4.4.2 Bus with C7000PT/PT2 + IOC	25
4.4.3 Special cases	25
5. Controller start.....	26
5.1 Start - C7000 Plus.....	26
5.2 Start - C7000 Advanced	27
6. Operation.....	31
6.1 Info level	31
6.1.1 Info commands - C7000	31
6.1.2 Info overview - C7000 Plus.....	31
6.1.3 Info overview - C7000 Advanced.....	32
6.2 Control level.....	38
6.2.1 Overview structure	38
6.2.2 Control commands - C7000	39
6.2.3 Control overview - C7000 Plus.....	40
6.2.4 Control overview - C7000 Advanced	42
6.3 Service level	62
6.3.1 Service overview - C7000 Plus	62
6.3.2 Service overview - C7000 Advanced	66
6.4 Default configurations.....	93
6.4.1 Preconfigurations	101

7. Alarm treatment	102
7.1 Alarm display	102
7.2 Possible Alarm texts	103
7.3 Component-related alarms	104
7.4 Alarm Reset	104
7.5 Alarm texts in the case of hardware errors	105
8. Configuration notes	106
8.1 Loading a new Software	107
8.1.1 Operation of the program "C7000-Service.exe"	108

This manual is based on the software versions IOC-V2.23 and AT-V0.90.

1. Presentation of the system

When we started the conception of the C7000 control system, we wanted to offer a maximum of operating safety for industrial applications combined with a versatility for the operator interface. The result was a trinity of interfaces with one controller. The C7000, the C7000 Plus and the C7000 Advanced.

Distributed intelligence in networking cells represents the most reliable system whenever operating safety is the target. This is exactly how the Stulz C7000 control system works, each A/C unit possesses its own controller while all controllers can be linked together in a bus system.

This way a natural redundancy is obtained which assures the system functions with the least expense. And we locate the intelligence there where it is needed, in the A/C unit without long cables to mess up the signals.

Whereas the C7000 Advanced provides the well known operating comfort - as did already the C6000 - the C7000 can bring to bear his advantages when it comes to modifications in the configuration of a large air conditioning system with several units. The C7000 Plus in comparison represents a cost-effective solution for smaller installations.

Its text-based display can certainly not compete with the graphical display of the C7000 Advanced, but the scrollable menus allow to pool many parameters in one menu, which is comfortable for the navigation.

The idea of the third interface was to use a device which is present everywhere, a computer. Using the screen of a Laptop or PC provides the best way of visualizing parameter settings. This is the most comfortable way of doing a component-related configuration.

Beyond the basic air conditioning functions, the C7000 control system provides some interesting features like an intelligent management of high/low pressure-alarms, a proportional fan speed control which opens a wide spectrum of applications and time-based functions like:

- week timer
- unit sequencing within definable unit groups

The heart of the C7000 control system is the C7000 I/O controller on which up to 4 EAIO/EDIO boards for additional in- and outputs can be perpendicularly plugged. The exploitation of the third dimension provides maximum accessibility and an easy board exchange in case of modifications.

The C7000 control systems manages 4 busses:

1. IIC-bus for the communication between the C7000 I/O controller and the EAIO/EDIO boards
2. RS485 IO-bus for the communication among the A/C units
3. RS485 BMS-bus for the communication with a building management system
4. RS485 Aux-bus for the communication with optional components capable for bus connection

For service purposes like software download and control via laptop a RS232 interface is located on the I/O controller the same as on the C7000 Advanced.

Analogous (A) and digital (D) in- and outputs

	A-IN	A-OUT	D-IN	D-OUT
IOC-board	5	4	11	7
EAIO-board	4	4	/	/
EDIO-board	/	/	8	6
Maximum equipment				
IOC + 4 EAIO	21	20	11	7
IOC + 4 EDIO	5	4	43	31

	Interfaces
IOC-board	2 x RS485 IO-bus, terminals 4 x IIC-Bus, SUB-D15 EBUS conn. SUB-D15 RS232, SUB-D9
EAIO-board	IIC-Bus, SUB-D15
EDIO-board	IIC-Bus, SUB-D15
EBUS-board	I/O board conn. SUB-D15 RS485 BMS-bus, terminals RS485 Aux.-bus, terminals
C7000AT-board	2 x RS485 IO-bus + BMS, terminals 2 x RS232 BMS + service, SUB-D9

2. Hardware components

2.1 I/O controller (C7000 IOC)

2.1.1 Board design



Technical Data:

Voltage supply:	24(±15%) VAC
Power consumption:	9,6 VA
Fuse:	2 A time-lag
Operating temp.:	5°C...40°C
Storage temp.:	-30°C...60°C

Onboard LEDs

The function of the digital inputs is displayed by green LEDs:

ON: voltage present

OFF: no voltage (alarm, failure)

The function of the digital outputs is displayed by red LEDs:

ON: relay active

OFF: relay passive

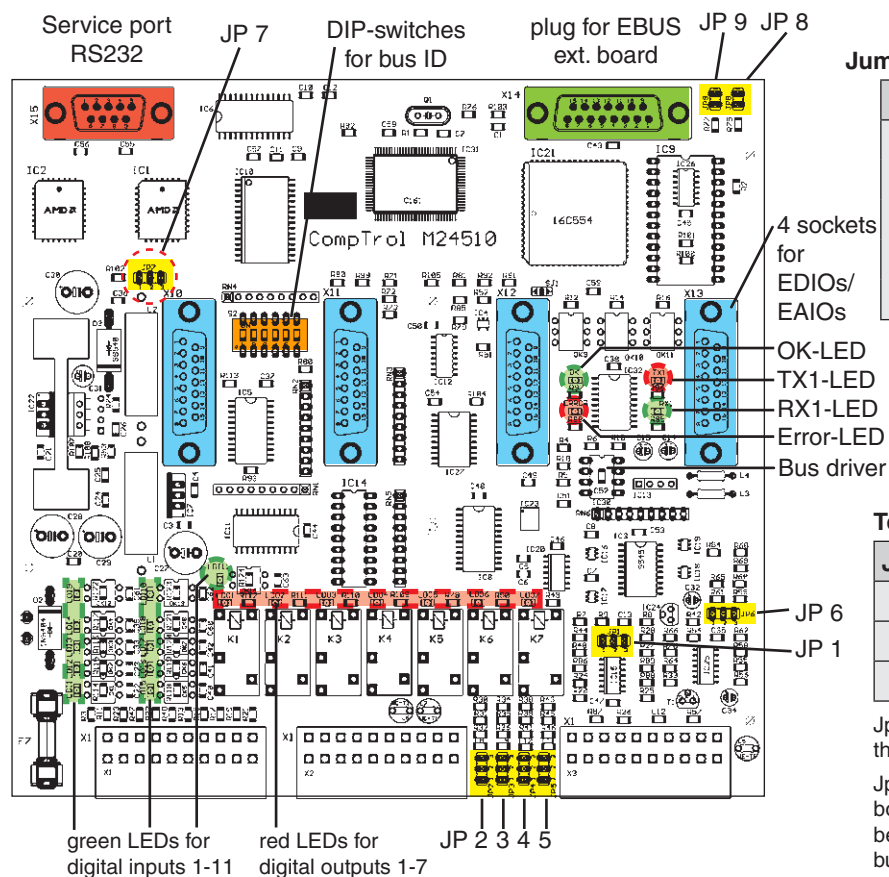
The OK-LED displays the I²C-bus clock.

The TX1/RX1-LEDs indicate data traffic on the I/O bus (port 1).

The Error-LED lights up at any time, when an alarm has occurred.

Pin position

1	10	21	30	41	50
11	20	31	40	51	60



Jumper setting depending on sensor types

	Jp n°	Pos.1-2	Pos.2-3
Analogous input	AIN 1	2	4-20mA
	AIN 2	3	
	AIN 3	4	
	AIN 4	5	
	AIN 5	6	PT1000
			PT100

Jumper for software download

Jp n°	Pos. 1-2	Pos. 2-3
7	operation	download

Termination jumper

Jp n°	Function, when set
1	I/O-bus Port 1 termin. (Pos.1-2)
8	EBUS Port 2 termination
9	EBUS Port 3 termination

Jp 1 has to be set, if the I/O controller represents the first or last unit in the I/O bus.

Jp8 and Jp9 have to be set, if no EBUS extension board is present. On the contrary, they have to be removed to enable the two extension RS485 busses on a plugged EBUS extension board.

2.1.2 Assignment - I/O controller

The assignment depends on the unit version (DX1, DX2, CW). A DX1-unit is an A/C unit with one refrigerant circuit, a DX2-unit is an A/C unit with two refrigerant circuits. A CW-unit is an A/C unit with one or two water circuits (CW/CW2-versions).

E.g.: ALD 351 GE2 -> DX1, ASU 332 ACW -> DX2, ASD 960 CW -> CW

Pin	Designation	DX1	DX2	CW
1	24VAC	Power supply	Power supply	Power supply
2	GND			
3	GND	Power supply C7000PT	Power supply C7000PT	Power supply C7000PT
4	Din 1	Fan failure	Fan failure	Fan failure
5	Din 2	Compressor failure	Compressor failure 1	Pump failure 1
6	Din 3	Low pressure	Low pressure 1	Chiller failure
7	Din 4	E-reheat failure 1-3	E-reheat failure 1-3	E-reheat failure 1-3
8	Din 5	Filter alarm	Filter alarm	Filter alarm
9	Din 6	Humidifier failure/ENS 20µS	Humidifier failure/ENS 20µS	Humidifier failure/ENS 20µS
10	Din 7	Water detection	Water detection	Water detection
11	Din 8	ext. alarm 1	Compressor failure 2	ext. alarm 1
12	Din 9	ext. alarm 2	low pressure 2	ext. alarm 2
13	Din 10	Remote on/off	Remote on/off	Remote on/off
14	Din 11	Fire stat	Fire stat	Fire stat
15	Dout 1 (NO)	enable fan	enable fan	enable fan
16	Dout 1 (COM)			
17	Dout 1 (NC)			
18	Dout 2 (NO)	Compressor	Compressor 1	Pump 2
19	Dout 2 (COM)			
20	Dout 2 (NC)			
21	Dout 3 (NO)	E-reheat 1	E-reheat 1	E-reheat 1
22	Dout 3 (COM)			
23	Dout 3 (NC)			
24	Dout 4 (NO)	E-reheat 2 / Hot gas reheat / HWR	E-reheat 2 / Hot gas reheat / HWR	E-reheat 2 or HWR
25	Dout 4 (COM)			
26	Dout 4 (NC)			
27	Dout 5 (NO)	Dehumidification or Hotgas-bypass	Dehumidification or Hotgas-bypass	on/off Humidifier or ENS
28	Dout 5 (COM)			
29	Dout 5 (NC)			
30	Dout 6 (NO)	Common alarm 1	Common alarm 1	Common alarm 1
31	Dout 6 (COM)			
32	Dout 6 (NC)			
33	Dout 7 (NO)	Louver	Compressor 2	Louver
34	Dout 7 (COM)			
35	Dout 7 (NC)			

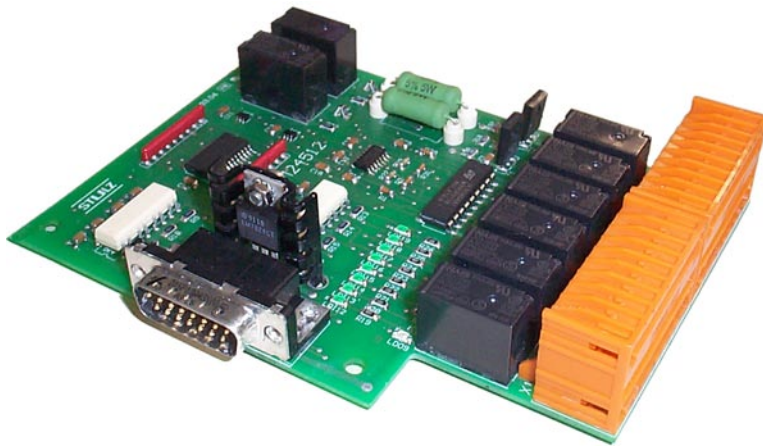
HWR - hot water reheat

Assignment - I/O controller (continued)

Pin	Designation	DX1	DX2	CW
36	+15V	active sensor 1	active sensor 1	active sensor 1
37	GND			
38	Ain 1	Room/return air temp.	Room/return air temp.	Room/return air temp.
39	Ain 2	Room/return air humidity	Room/return air humidity	Room/return air humidity
40	+15V	active sensor 2	active sensor 2	active sensor 2
41	GND			
42	Ain 3	Supply temperature	Supply temperature	Supply temperature
43	Ain 4	Supply humidity	Supply humidity	Supply humidity
44	+Ub	passive sensor 3 Water temperature (CW) Pt100 / 1000 3 or 4 conductors	passive sensor 3 Water temperature (CW) Pt100 / 1000 3 or 4 conductors	passive sensor 3 Water temperature 1 (CW) Pt100 / 1000 3 or 4 conductors
45	GND			
46	Ain 5			
47	GND			
48	Aout 1	Fan	Fan	Fan 1
49	GND			
50	Aout 2	GE/CW valve/pump 1 (GE) or actual temp.	GE/CW valve/pump 1 (GE) or actual temp.	CW valve/pump 1 or actual temp.
51	GND			
52	Aout 3	Humidifier/ENS or actual humidity	Humidifier/ENS or actual humidity	Humidifier/ENS or actual humidity
53	GND			
54	Aout 4	G-valve/pump 2 (G)	G-valve/pump 2 (G)	CW2-valve/pump 2
55	GND			
56	Port 1-H	RS485-I/O-bus	RS485-I/O-bus	RS485-I/O-bus
57	Port 1-L			
58	Port 1-H	RS485-I/O-bus	RS485-I/O-bus	RS485-I/O-bus
59	Port 1-L			
60	+15V	Power supply C7000PT	Power supply C7000PT	Power supply C7000PT
X10	SUB-D 15	Bus 3 I ² C EDIO1 (socket1)	Bus 3 I ² C EDIO1 (socket1)	Bus 3 I ² C EDIO1 (socket1)
X11	SUB-D 15	Bus 3 I ² C EDIO2 (socket2)	Bus 3 I ² C EDIO2 (socket2)	Bus 3 I ² C EDIO2 (socket2)
X12	SUB-D 15	Bus 3 I ² C EAIO1 (socket3)	Bus 3 I ² C EAIO1 (socket3)	Bus 3 I ² C EAIO1 (socket3)
X13	SUB-D 15	Bus 3 I ² C EDIO/EAIO (socket 4)	Bus 3 I ² C EDIO/EAIO (socket 4)	Bus 3 I ² C EDIO/EAIO (socket 4)
X14	SUB-D 15	EBUS exp. (plug)	EBUS exp. (plug)	EBUS exp. (plug)
X15	SUB-D 9	RS232 service port (plug)	RS232 service port (plug)	RS232 service port (plug)

2.2 EDIO - extension board for digital in- and outputs

2.2.1 Board design

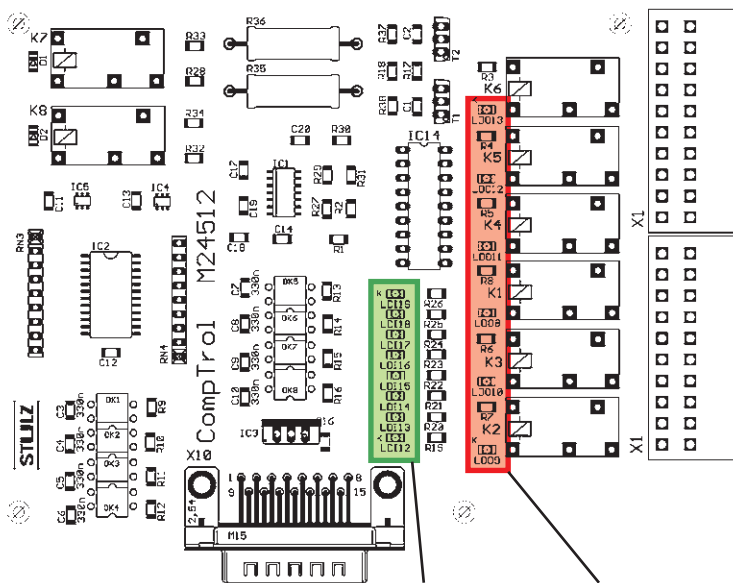


Technical Data:

Power consumption: 10,1 VA
 Operating temp.: 5°C...40°C
 Storage temp.: -30°C...60°C

Pin position

1	10	21	30
11	20	31	40



green LEDs for digital inputs 12-19 of the first EDIO-board
 red LEDs for digital outputs 8-13 of the first EDIO-board

Onboard LEDs

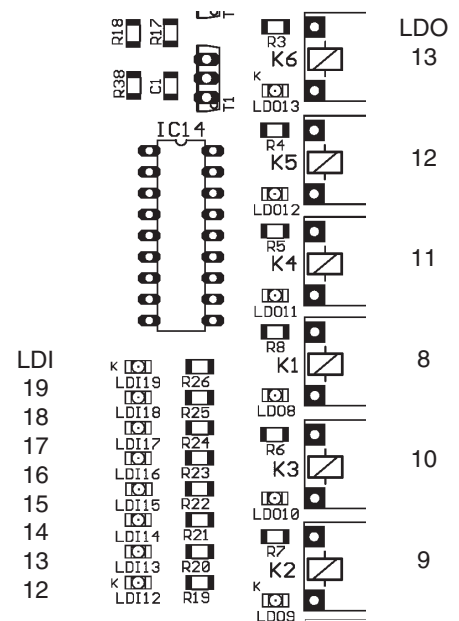
The function of the digital inputs is displayed by green LEDs:

ON: voltage present
 OFF: no voltage (alarm, failure)

The function of the digital outputs is displayed by red LEDs:

ON: relay active
 OFF: relay passive

enlarged section for onboard LEDs



2.2.2 Assignment - EDIO1

The assignment depends on the unit version (DX1, DX2, CW). Explanation see page 7.

Pin	Designation	DX1	DX2	CW
1	Din 12	UPS	UPS	UPS
2	Din 13	Pump 1(GE) failure	Pump 1(GE) failure	free
3	Din 14	Pump 2 (G) failure	Pump 2 (G) failure	Pump 2 failure
4	Din 15	Drycooler failure	Drycooler failure	free
5	Din 16	CW disable/DX enable or ext. alarm 3	CW disable/DX enable or ext. alarm 1	ext. alarm 3
6	Din 17	ext. alarm 4	ext. alarm 2	ext. alarm 4
7	Din 18	ENS 5µS	ext. alarm 3/ENS 5µS	ENS 5µS
8	Din 19	Phase control	Phase control	Phase control
9	Dout 8 (NO)	Pump 1 (GE)	Pump 1 (GE)	free
10	Dout 8 (COM)			
11	Dout 8 (NC)			
12	Dout 9 (NO)	Drycooler 1	Drycooler 1	free
13	Dout 9 (COM)			
14	Dout 9 (NC)			
15	Dout 10 (NO)	Drycooler 2 or winter operation	Drycooler 2 or winter operation	winter operation
16	Dout 10 (COM)	Drycooler 2 or winter/summer operation	Drycooler 2 or winter/summer operation	winter/summer operation
17	Dout 10 (NC)	Drycooler 2 or summer operation	Drycooler 2 or summer operation	summer operation
18	Dout 11 (NO)	Pump 2 (G)	Pump 2 (G)	Pump 2 (G)
19	Dout 11 (COM)			
20	Dout 11 (NC)			
21	Dout 12 (NO)	E-reheat 3	E-reheat 3	E-reheat 3
22	Dout 12 (COM)			
23	Dout 12 (NC)			
24	Dout 13 (NO)	Humidifier on/off /ENS	Louver	free
25	Dout 13 (COM)			
26	Dout 13 (NC)			
27	PWM1	electronical expansion valve	electronical expansion valve	free
28	GND			
29	PWM2	E-reheat 1 (proportional)	E-reheat 1 (proportional)	E-reheat 1 (proportional)
30	GND			
X10	SUB-D 15	Bus 3 I ² C (plug)	Bus 3 I ² C (plug)	Bus 3 I ² C (plug)

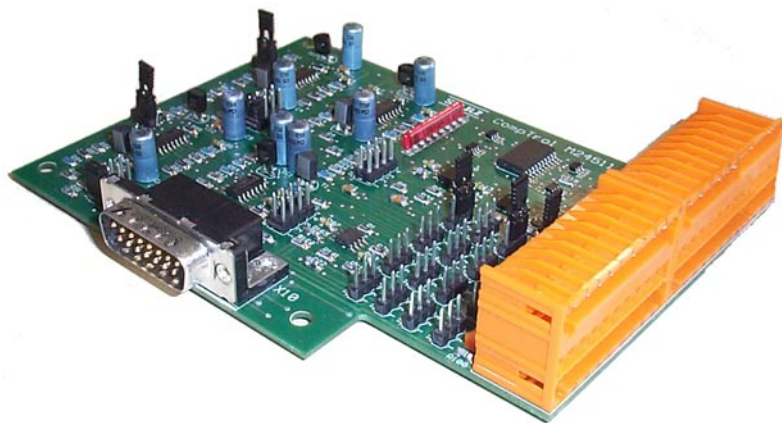
2.2.3 Assignment - EDIO2

The assignment depends on the unit version (DX1, DX2, CW). Explanation see page 7.

Pin	Designation	DX1	DX2	CW
1	Din 20	free	ext. alarm 4	free
2	Din 21	free	free	free
3	Din 22	Pump failure 3	Pump failure 3	free
4	Din 23	Pump failure 4	Pump failure 4	free
5	Din 24	free	free	free
6	Din 25	free	free	free
7	Din 26	free	free	free
8	Din 27	free	free	free
9	Dout 14 (NO)	Pump 3	Pump 3	free
10	Dout 14 (COM)			
11	Dout 14 (NC)			
12	Dout 15 (NO)	Pump 4	Pump 4	free
13	Dout 15 (COM)			
14	Dout 15 (NC)			
15	Dout 16 (NO)	free	Humidifier on/off /ENS	free
16	Dout 16 (COM)			
17	Dout 16 (NC)			
18	Dout 17 (NO)	Drycooler 3	Drycooler 3	free
19	Dout 17 (COM)			
20	Dout 17 (NC)			
21	Dout 18 (NO)	Drycooler 4	Drycooler 4	free
22	Dout 18 (COM)			
23	Dout 18 (NC)			
24	Dout 19 (NO)	free	free	free
25	Dout 19 (COM)			
26	Dout 19 (NC)			
27	PWM3	electronical expansion valve 2	electronical expansion valve 2	free
28	GND			
29	PWM4	free	free	free
30	GND			
X10	SUB-D 15	Bus 3 I ² C (plug)	Bus 3 I ² C (plug)	Bus 3 I ² C (plug)

2.3 EAIO - extension board for analogues in- and outputs

2.3.1 Board design

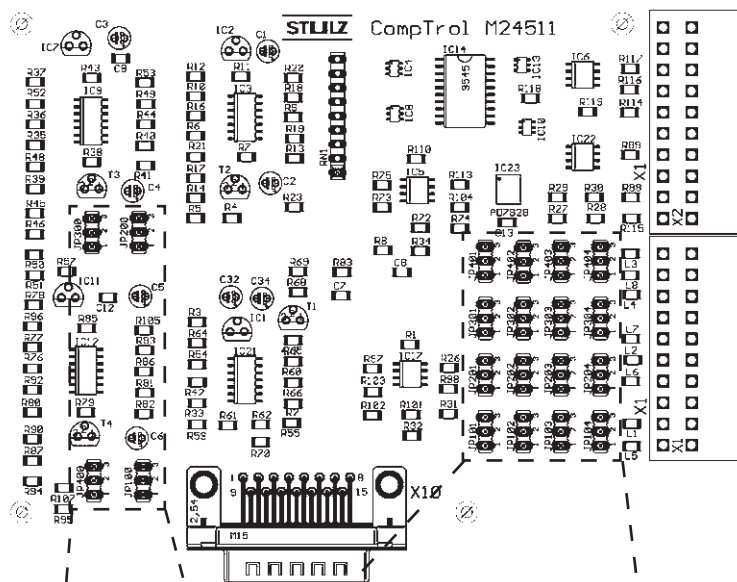


Technical Data:

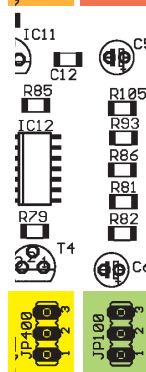
Power consumption:	10,1 VA
Operating temp.:	5°C...40°C
Storage temp.:	-30°C...60°C

Pin position

1	10	21	30
11	20	31	40



Jumper 100-400
(enlarged section)



corresp. input	Jumper 101-404 (enlarged section)
AIN 9	JP401, JP402, JP403, JP404
AIN 8	JP301, JP302, JP303, JP304
AIN 7	JP201, JP202, JP203, JP204
AIN 6	JP101, JP102, JP103, JP104

The EAIO-board is an extension board for analogues inputs and outputs. It can be plugged on the I/O controller board at any of the 4 sockets and will be recognized by the IOC due to a self test.

There are several jumpers on board - 5 for each input - which serve to adapt the board to different sensor types.

How to use the Jumper setting table:

- choose the analogous input at which you have connected a sensor.
- in the same line you can see the jumpers which relate to this input.
- in the lower part of the table you can read in each column the setting depending on the sensor type you connected.

Example:

You have connected a PT100 at AIN 8. The corresponding jumpers are 301-304, 300. Jumper 301,303,304 must be set on position 2-3, Jumper 300 on 1-2 and Jumper 302 not at all.

Table: Jumper setting

	Analogous input	Jumper designation				
		AIN 6	AIN 7	AIN 8	AIN 9	AIN 10
connected sensor type at anal. input	AIN 6	101	102	103	104	100
	AIN 7	201	202	203	204	200
	AIN 8	301	302	303	304	300
	AIN 9	401	402	403	404	400
	AIN 10	501	502	503	504	500
connected sensor type at anal. input	0-10V	1-2	2-3	1-2	1-2	0
	4-20mA	1-2	1-2	1-2	1-2	0
	PT100	2-3	0	2-3	2-3	1-2
	PT1000	2-3	0	2-3	2-3	2-3

2.3.2 Assignment - EAIO

The assignment depends on the unit version (DX1, DX2, CW). Explanation see page 7.

Pin	Designation	DX1	DX2	CW
1	+Ub/lb	universal sensor 4 Outside temperature	universal sensor 4 Outside temperature	universal sensor 4 Outside temperature
2	Ain 6			
3	GND			
4	GND			
5	+Ub/lb	universal sensor 5 Condensation pressure	universal sensor 5 Condensation pressure 1	universal sensor 5 Water temp. 2 (CW2)
6	Ain 7			
7	GND			
8	GND			
9	+Ub/lb	universal sensor 6 Evaporation pressure	universal sensor 6 Condensation pressure 2	universal sensor 6 - free -
10	Ain 8			
11	GND			
12	GND			
13	+Ub/lb	universal sensor 7 Water temp. (G)	universal sensor 7 Water temp. (G) or evapo- ration pressure 1	universal sensor 7 - free -
14	Ain 9			
15	GND			
16	GND			
17	Aout 5	Suction valve / compres- sor 1 or actual humidity	Suction valve / compres- sor 1 or actual humidity	actual humidity
18	GND			
19	Aout 6	actual temperature	Suction valve / compressor 2/ act. temp.	actual temperature
20	GND			
21	Aout 7	HWR valve	HWR valve	HWR-valve
22	GND			
23	Aout 8	EEV (with 0-10V) or proportional dehumidific.	EEV (with 0-10V) or proportional dehumidific.	proportional dehumidification
24	GND			
X10	SUB-D 15	Bus 3 I ² C (plug)	Bus 3 I ² C (plug)	Bus 3 I ² C (plug)

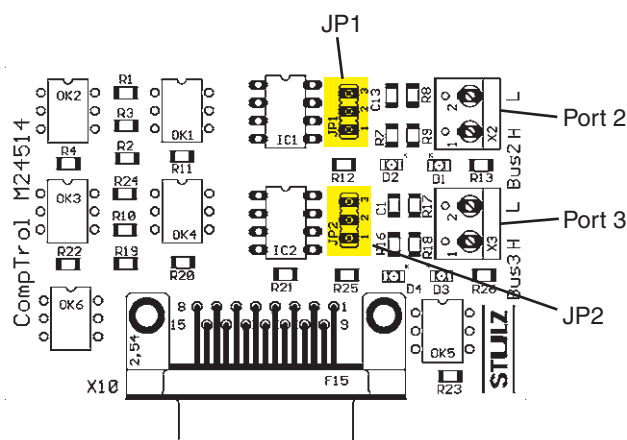
2.4 EBUS-extension board for 2x RS485 bus

2.4.1 Board design



Technical Data:

Power consumption: 11,3 VA
 Operating temp.: 5°C...40°C
 Storage temp.: -30°C...60°C



2.4.2 Assignment - EBUS

Pin	Designation	Function
1	Port 2-H	RS485 BMS-bus
2	Port 2-L	
1	Port 3-H	RS485 Aux-bus (e.g. EC-motor)
2	Port 3-L	
X10	SUB-D 15	EBUS extension (socket)

Termination jumper

Jp n°	Function in position 1-2
1	EBUS Port 2 termination
2	EBUS Port 3 termination

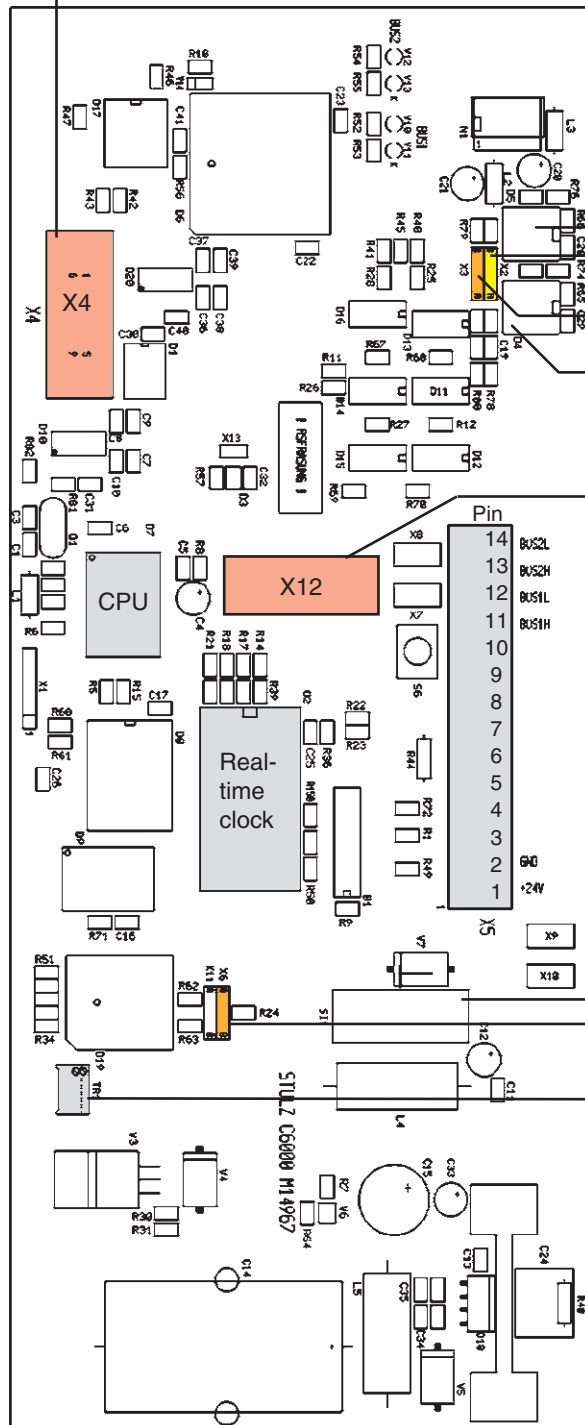
Jp 1 has to be set, if the A/C unit represents the first or last element in the BMS bus.

Jp 2 has to be set, if the A/C unit represents the first or last element in an Aux-bus.

2.5 C7000 Advanced - Terminal (C7000 AT)

2.5.1 Board design

RS232 - service port (SUB-D 9)



Technical Data:

Dimensions: 270 x 110 x 40 mm
 Voltage supply: 24(±15%) VAC
 Power consumption: 14 VA
 Fuse: 2 A time-lag
 Operating temp.: 5°C...40°C
 Storage temp.: -30°C...60°C

RS485 Driver for the BMS bus
 Jumper X2: bus termination for RS 485 I/O-bus
 Pos. A: set, Pos. B: not set
 Jumper X3: bus termination for RS 485 BMS-bus
 Pos. A: set, Pos. B: not set
 RS485 Driver for the IO bus

Position
 A B

RS232 - BMS port (SUB-D 9)

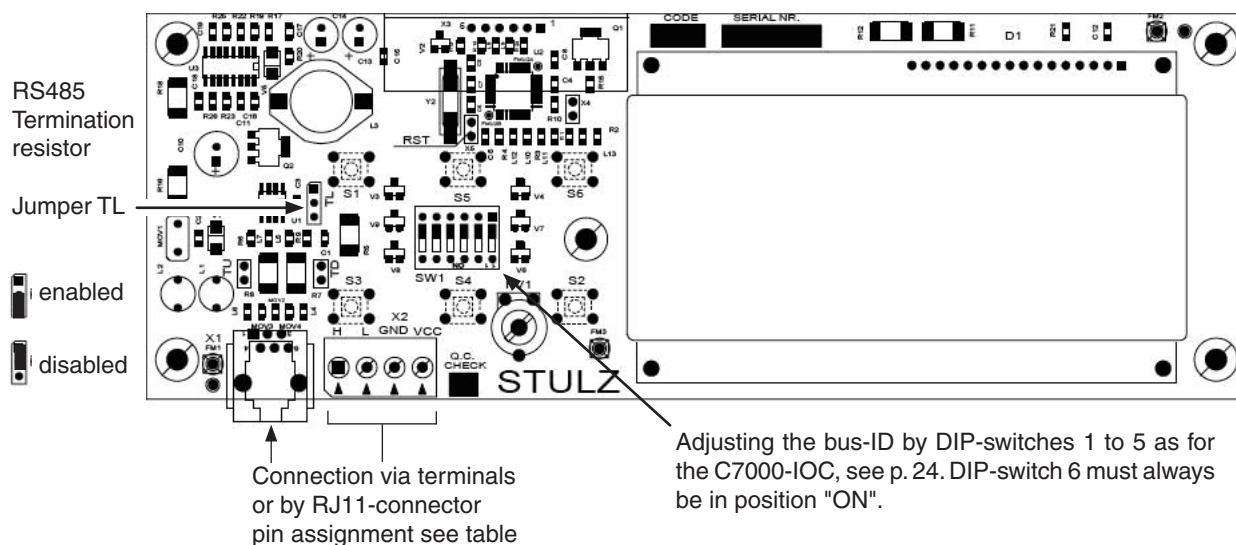
Pin	Designation	Function
14	Port 2-L	RS485 BMS-bus
13	Port 2-H	
12	Port 1-L	RS485 I/O-bus
11	Port 1-H	
10-3	free terminal	none
2	GND	Power supply
1	+24VAC	

Fuse T1A
 Jumper X6: Pos. A: Board in download mode

Contrast adjustment for display

2.6 C7000 Plus - Terminal (C7000 PT2)

2.6.1 Board design



The 4-line cable is connected at the I/O-controller at the terminals 3 (GND), 58 (port 1-H), 59 (port 1-L), 60 (+15V).

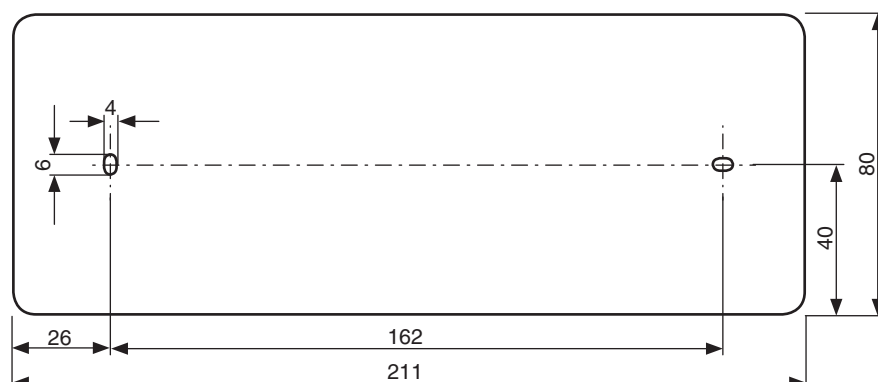
Pin	Designation	Colour	Function
1	GND	green	power supply
2	Port 1-H	brown	RS485 I/O-bus
3	9 - 32 VDC	yellow	power supply
4	Port 1-L	white	RS485 I/O-bus
-	PE	-	protected earth

The C7000 PT2 is equipped with a termination resistor, which can be activated by the jumper TL. This is required if the PT2 is installed at the first or last place of the bus.

Instead of the incorporated C7000 PT2 a remote controller C7000 PT2 can be connected. The remote controller is located in a plastic housing for wall installation and is available with two cable lengths 20m and 50m.



Dimensional drawing of the rear side (with fixing holes for wall installation)



3. Operator interface

3.1 Operational elements - C7000

The operational elements for the C7000 i.e. the I/O controller consist of the keyboard of your PC or laptop. You operate the C7000 by specified commands which follow an easily comprehensible syntax.

To establish the connection from your PC to the C7000 you need a 9-line cable with SUB-D 9 connectors at both ends (crossed type), which can be obtained as an option and a terminal program to run on your PC. You can download the terminal program "C7000-Service" from the Stulz website www.stulz.de. Connect the cable

at a serial port of your PC and at the service port X15 on the IOC. Start the terminal program.

You can now communicate with the connected I/O controller (ioc), in return the IOC sends the following prompt to your PC:

"ioc ##:>", where ## represents the bus id.

The commands can be classified into three major categories:

1. bus specific control commands
2. commands related to A/C unit components
3. commands concerning the whole A/C unit

1. bus command	2. component command	3. A/C unit command
<div>invite ##</div> <div>del ##</div> <div>iobus</div> <div>checkbus</div> <div>spreadbusconf</div>	<div>sensor 1</div> <div>comp 1</div> <div>suctionv 1</div> <div>gecwv</div> <div>gvalve</div> <div>drycool 1</div> <div>pump 1</div> <div>eheat 1</div> <div>gasheat</div> <div>pwwheat</div> <div>humi 1</div> <div>dehumi</div> <div>fan 1</div> <div>louver 1</div>	<div>equip</div> <div>is 1</div> <div>state</div> <div>ups</div> <div>wprg</div> <div>event</div> <div>log 1</div> <div>option</div> <div>exalarmin 1</div> <div>zone 1</div> <div>loaddefault dx1</div>

The commands on a lightgrey (yellow) background need no further parameters. The commands which are followed by a number need this number because there are several components of the same type.

Each command displays a detailed help for further parameters (if there are any) when it is followed by "h" like e.g. "comp h".

A command of the second (component command) or third category (A/C unit comm.) which is typed in without any parameters displays all the information about its subject (except "loaddefault ###" which is an execution command).

As the commands of the 2nd and 3rd category will be largely explained in the context of the description of the C7000 functions, only the bus commands need a further investigation on this page.

All bus commands except "iobus" are control commands and show neither help nor information but execute the command right after pressing the return/enter-key. The commands on a darkgrey (green) background need as sole parameter the bus id of the unit to which the corresponding command shall relate.

Now the bus commands in detail:

The `invite`-command plus bus id adds a bus participant with the corresponding bus id from the bus whereas the `del`-command plus bus id excludes the participant from the bus and sends the new io-bus configuration to all participants.

The `iobus` command edits the actually stored IO-bus-configuration.

The `checkbus` command checks every ID-address from 00 to 31 for the presence of a bus participant and updates the stored bus configuration this way.

The `spreadbusconf` -command serves to distribute the own bus configuration to all participants.

General

The counting of any digital or analogous in- or output begins with number 1. Despite this the digital/analogous in- or output 0 can be assigned to any component. This will allow the component to stay part of the configuration even if it does not take part in the control.

A double assignment of in- and outputs is not possible with the exception of in-/output 0 and the alarm priorities (relays).

If at unit start no valid configuration is found, the configuration for single refrigerant circuit-units DX1 is loaded. Please note that no year date below 2000 can be entered.

Whenever a parameter is expressed by a logical function, 0 means no, disabled, 1 means yes, enabled.

3.2 Operational elements - C7000 Plus 2



	=	On/off key
SET	=	Set key
	=	Up arrow key
	=	Down arrow key
MENU	=	Menu key
ESC	=	Escape key

On/off key	The A/C unit is switched on/off with this key.
SET key	You enter the submenus, access the change mode for parameters and confirm parameters with this key.
Up/Down arrow keys	You can scroll the menus and change parameters with these keys.
MENU key	With this key you access the log-in mode to start the communication between the terminal and the I/O controller of an A/C unit.
ESCApe key	You shift to the next menu one level above with this key.
Display	The display consists of 4 lines with 20 characters each. The headline always contains the menu name (except in the top level where it contains the version number) and the unit ID of the IOC.

Operation - Navigation through the menus

Three symbols help you to operate the terminal:

- - shows your current position
- + - indicates the parameters which can be modified
- ← - indicates the change mode of a parameter

With the arrow keys you select the submenu to which you want to come or the parameter you want to modify.

With the SET key you get into the submenu or into the parameter change mode.

To change the Set temperature in the right window, hold the Set key until the right arrow changes into a left arrow.

The parameter can now be changed with the arrow keys in steps of 0,1 Kelvin.

Press the SET key to confirm the modification.

Press the ESC key to leave the menu and return to the menu one level above.

```
V1.32           □ 27
Info
→Control
Service
```

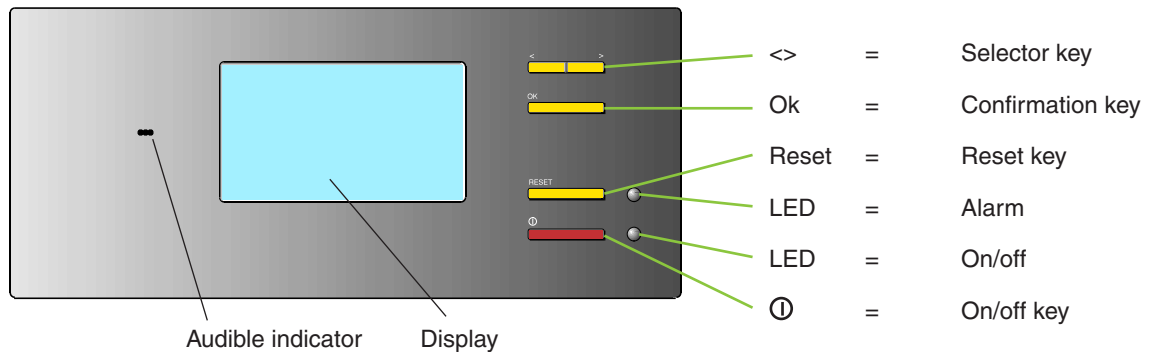
```
Control         □ 27
→Temperature
Humidity
Function
```

```
../Temperature  □ 27
→Set           22,0 °C
+Nightset      27,0 °C
+Room min      18,0 °C
```

```
../Temperature  □ 27
←Set           22,0 °C
+Nightset      27,0 °C
+Room min      18,0 °C
```

```
../Temperature  □ 27
→Set           24,0 °C
+Nightset      27,0 °C
+Room min      18,0 °C
```

3.3 Operational elements - C7000 Advanced



Selector key	You can select menus and change parameters with the selector key
Confirmation key	You acknowledge the functions/parameters selected with the selector key with the confirmation key
Reset key	Alarm signals are acknowledged with the reset key. Press it once to silence the alarm tone. Press it a second time to clear the alarm message (if the cause has been eliminated).
LED alarm	This LED display lights up in the event of an alarm.
LED on/off	This LED display lights up when the selected IOC is switched on.
On/off key	The selected A/C unit is switched on/off with this key.
Audible indicator	The audible indicator issues an alarm tone when an alarm has occurred.
Display	The display shows data, operating conditions and information for the operator's guidance.

Operation - Navigation through the menus

The principal keys to navigate in and across the menus are the selector key and the confirmation key, which have the function of the mouse for a PC. The cursor, to keep the analogy with a PC, is represented by the inverse display of a field content. This field may contain an expression, a number or a symbol.

There are two types of menus: Selection menus and parameter menus. In **selection menus** you can choose a menu point with the help of the selector key and after having pressed the confirmation key it will bring you to the next submenu. To get to the next menu on a level above there is a "Return"-field in the top left corner of every menu.

In **parameter menus**, which represent the end of a menu branch, you can select parameters with the selector key, but if you press the confirmation key, the parameter is displayed black on a clear background with a black frame and indicates this way the change mode. By the selector key you can change the parameter value. Pressing the confirmation key finishes the modification and displays the cursor inversely again.

In a few parameter menus, there is the comment "more" in the bottom frame line, which indicates that another window will be displayed after the last parameter. You can also reach this window by typing the selector key "<" when the cursor is on the field "return".

Selection menu

return	Control
Temperature	
Humidity	
Module functions	
Zone	
AT-Preferences	
Password	0000
STULZ	0 255 11:33

Parameter menu

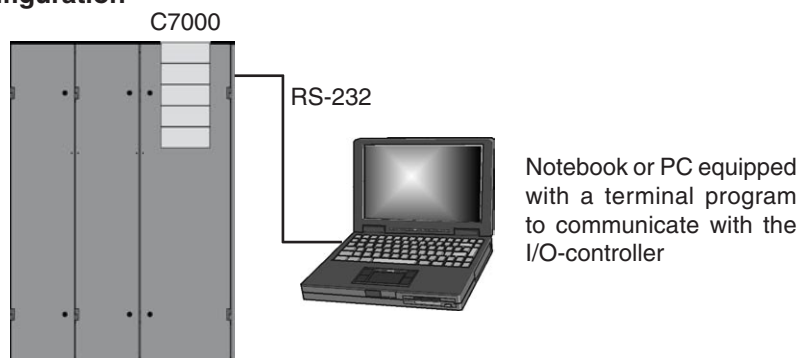
return	Temperature
SETPOINT	1 22°C 2 24°C
ROOM	MIN 18°C MAX 26°C
SUP. AIR	16°C 32°C
WATER	10°C 35°C
STULZ	5 255 18:55

return	Temperature
SETPOINT	1 22°C 2 24°C
ROOM	MIN 18°C MAX 26°C
SUP. AIR	16°C 32°C
WATER	10°C 35°C
STULZ	5 255 18:55

4. Bus communication

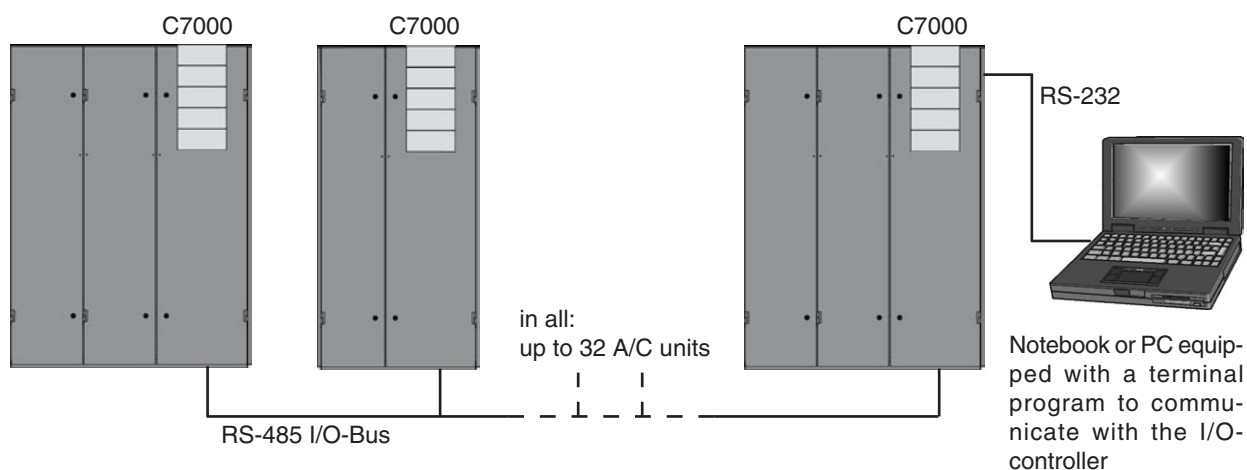
4.1 System architecture with the C7000

Minimum configuration

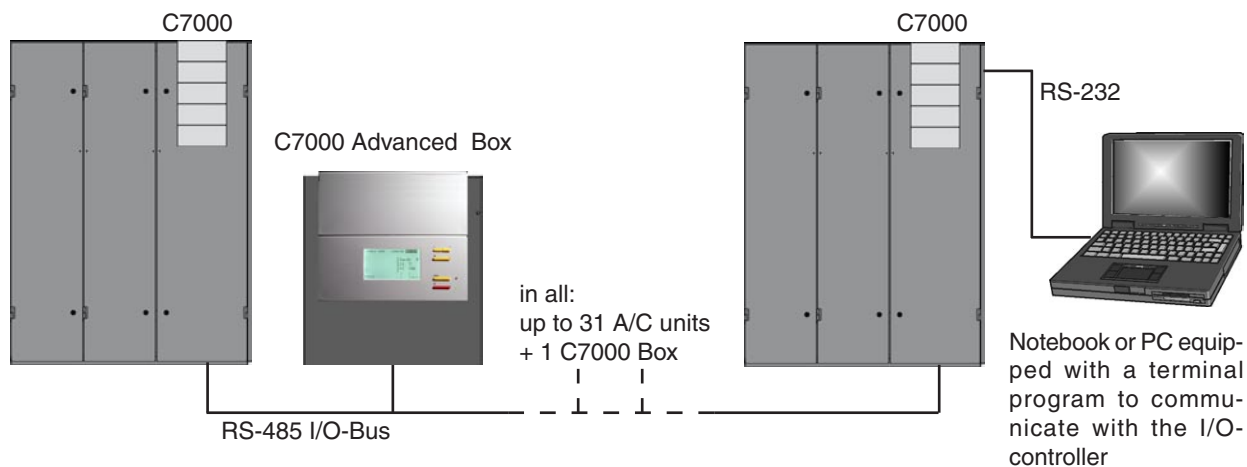


The basic configuration of the C7000 consists of an I/O controller. Everytime the name C7000 is used without any appendix like "Plus" or "Advanced" it refers to the I/O controller.

Maximum configuration

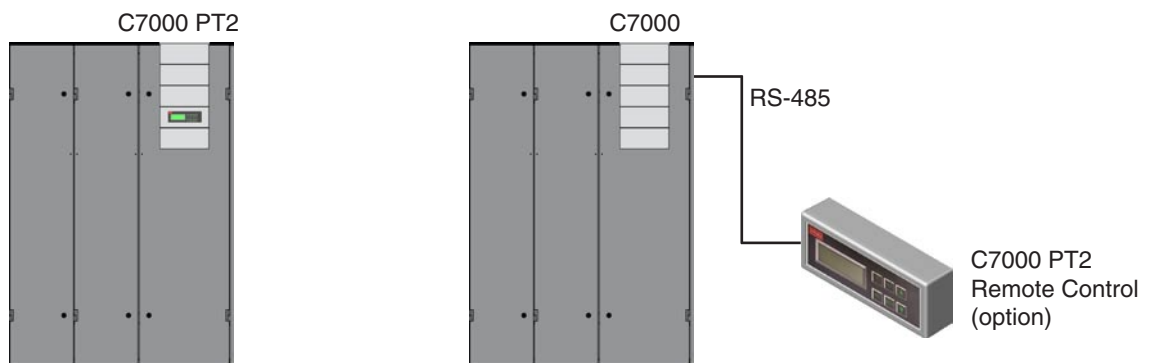


Up to 32 bus sharing units can be linked in a C7000 I/O bus system. The C7000 Advanced Box which serves to configure or to operate the A/C units equipped with an I/O controller also takes part in the RS-485 bus.

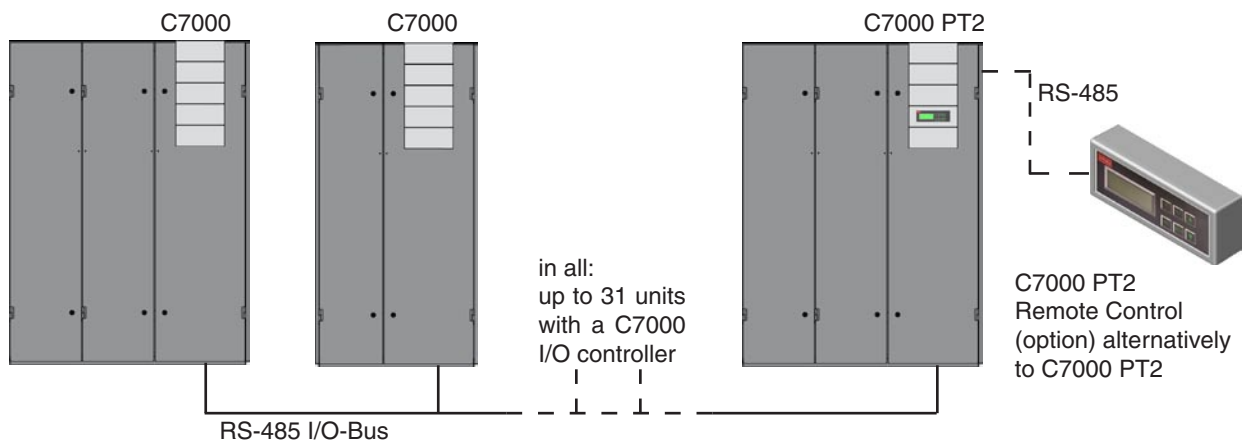


4.2 System architecture with the C7000 Plus

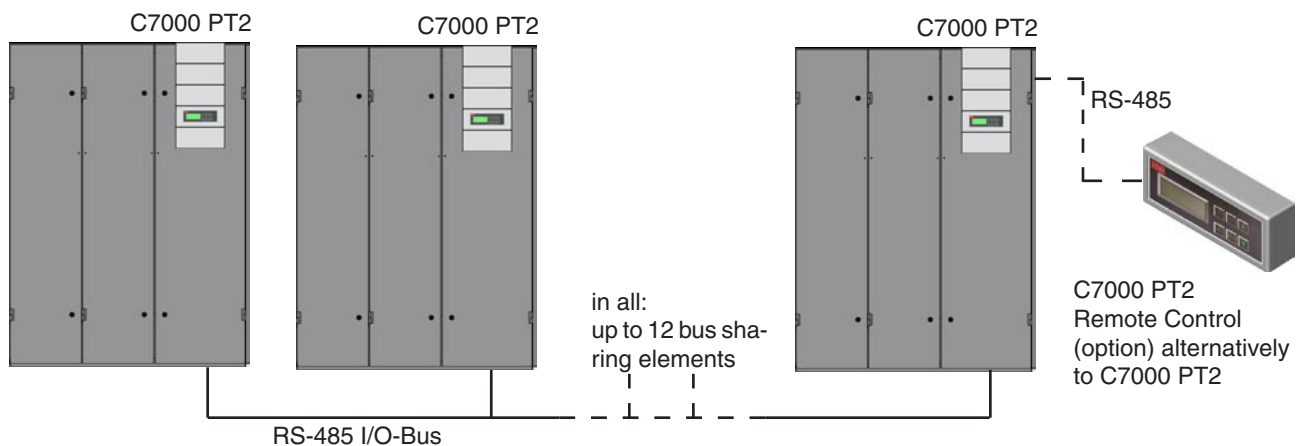
Minimum configuration



Maximum configuration



Maximum number of participants in connection with one PT2: 32
 e.g.: 1 A/C unit with 1 C7000 PT2 + 1 I/O controller and 30 A/C units with an I/O controller each.

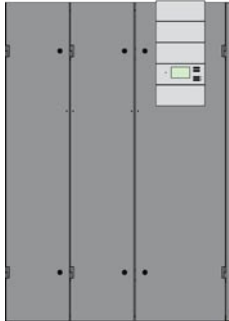


Maximum number of participants in connection with several PT2s: 12
 e.g.: 6 A/C units with 6 C7000 PT2s + 6 I/O controllers
 or: 1 A/C unit with 1 I/O controller + 10 C7000 PT2s + 1 C7000 AT

4.3 System architecture with the C7000 Advanced

Minimum configuration

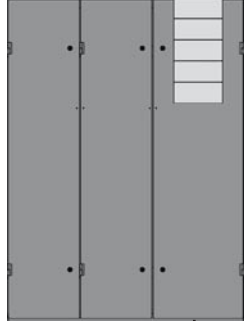
C7000 Advanced



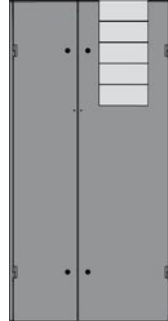
The minimum configuration consists of an A/C unit with a C7000 Advanced and an I/O controller.

Maximum configuration (concerning n° of A/C units)

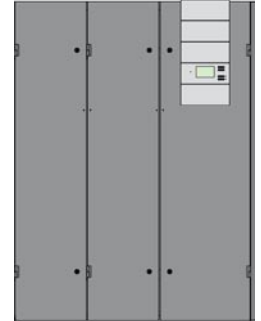
C7000



C7000



C7000 Advanced



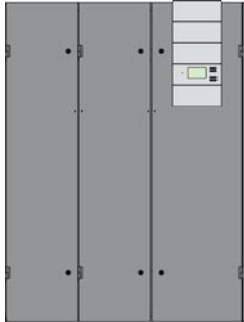
in all:
up to 31 units
with a C7000
I/O controller

RS-485 I/O-Bus

The maximum configuration in relation to the number of A/C units consists of 30 A/C units with an I/O controller and 1 A/C unit with a C7000 Advanced and an I/O controller which results in 32 bus sharing elements.

Maximum configuration (concerning the operational facilities & the n° of A/C units)

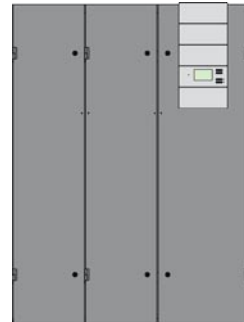
C7000 Advanced



C7000 Advanced



C7000 Advanced



in all:
up to 16 units
with a C7000
Advanced

RS-485 I/O-Bus

The maximum configuration in relation to the operational facilities and the number of A/C units consists of 16 A/C units with an I/O controller and a C7000 Advanced which also results in 32 bus sharing elements.

Maximum configuration (concerning the operational facilities)

C7000 Advanced



C7000 Advanced Box



C7000 Advanced Box



in all:
up to 30
C7000 boxes

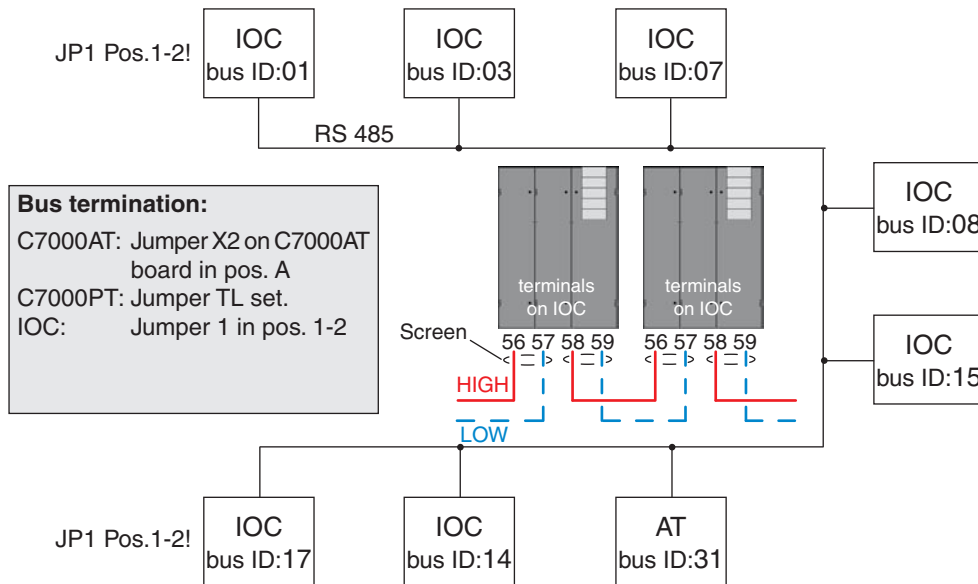
RS-485 I/O-Bus

The maximum configuration in relation to the operational facilities consists of 1 A/C unit with an I/O controller and a C7000 Advanced and 30 C7000 Boxes which results in 32 bus sharing elements.

4.4 Establishing the bus by a terminal program

One of the outstanding features of the C7000 is its facility for bus operation. All you need is a shielded cable with two lines twisted in pairs, which you have to connect from unit to unit at the terminals 56-59 of each I/O controller (IOC). In the example below the bus termination of the two units which form the end of the bus (IOC 01 and IOC 17) must be enabled.

The example of a RS485 bus shows a typical application with 7 IOCs and 1 C7000 AT.



The bus address or bus ID is adjusted with the dip-switches on the IOC. The table at the right shows the corresponding adjustment for all possible bus IDs. Please note that the counting begins with 0 and ends with 31. A "1" means dip-switch in "ON"-position. On a C7000 AT the bus-ID is adjusted in the global status line (see 5.2 Start - C7000 Advanced).

An IOC is delivered with the ID 01 as standard, a C7000 AT has the ID 31 as standard. After having provided all units (IOCs) with a different bus-ID, they must be declared as participants of the bus, for the bus exists up to now only physically. (see next page).

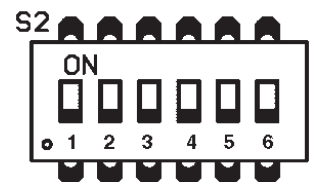
To control the presence of each bus member type `iobus` and you will see a list as follows:

ID	type	status	availability
00	unknown	passive	000
01	IO-controller	active	255
02	unknown	passive	000
03	IO-controller	active	me
...			

in short:

1. connect units by bus lines
2. set bus terminations (beginning/end)
3. adjust bus-IDs
4. generate bus configuration (declare participants)

Bus ID	DIP-switch				
	1	2	3	4	5
0	0	0	0	0	0
1	1	0	0	0	0
2	0	1	0	0	0
3	1	1	0	0	0
4	0	0	1	0	0
5	1	0	1	0	0
6	0	1	1	0	0
7	1	1	1	0	0
8	0	0	0	1	0
9	1	0	0	1	0
10	0	1	0	1	0
11	1	1	0	1	0
12	0	0	1	1	0
13	1	0	1	1	0
14	0	1	1	1	0
15	1	1	1	1	0
16	0	0	0	0	1
17	1	0	0	0	1
18	0	1	0	0	1
19	1	1	0	0	1
20	0	0	1	0	1
21	1	0	1	0	1
22	0	1	1	0	1
23	1	1	1	0	1
24	0	0	0	1	1
25	1	0	0	1	1
26	0	1	0	1	1
27	1	1	0	1	1
28	0	0	1	1	1
29	1	0	1	1	1
30	0	1	1	1	1
31	1	1	1	1	1



4.4.1 Bus with C7000AT + IOC

Configuration of the bus participants

1. configure the address of the bus participants with the DIP-switches or in the global status line at the AT.
2. declaration of the bus participants, there are 3 ways to do this :
 - a. Commute the DIP-switch 6 from an IOC in position ON and then in position OFF.
 - b. Mark all units from a C7000AT, this happens when you press the selector key ">" again, when the bus participant with the ID 31 is marked. Press the confirmation key "OK" and enter the "Service" password.
 - c. Connect a laptop on any IOC and enter the command `"invite me"` or `"invite ##"`, where ## represents the bus-ID of the IOC you are connected to. Then declare the other participants by using the command `invite ##` with each bus-ID of the connected elements.
3. Check the bus participants' presence in the overview on the display of the C7000AT or by the command `iobus`.

Deleting bus participants from the bus configuration

1. Delete the participant by typing the command `del ##` .

Adding bus participants to the bus configuration

1. Adjust a free bus-ID. If the participant, which shall be added, is an IOC, adjust the DIP-switches. If the participant, which shall be added, is a C7000AT, adjust the bus-ID in the global status line (see 5.2 Start - C7000 Advanced).
2. Declare the bus participant by the command `invite ##` with the adjusted bus-ID.

Address modification of participants

1. Delete the participant from the configuration.
2. IOC: change the dip-switch adjustment correspondingly. C7000AT: change the bus-ID in the global status line.
3. Declare the bus participant by the command `invite ##` with the adjusted bus-ID.

4.4.2 Bus with C7000PT/PT2 + IOC

Proceed as noted under item 4.4.1 with the restriction, that all actions have to be executed from the IOC. If you invite the bus participants automatically with DIP-switch 6 on the IOC board, the lowest available ID is assigned to the C7000PT (not for the C7000PT2, where the ID is assigned via DIP switches on the PT2 board).

4.4.3 Special cases

Adding a C7000PT to a consisting C7000AT + IOC-configuration

1. Invite the C7000PT from an IOC by typing the `"invite ## pt"`-command. ## stands for a free ID which you assign to the C7000 PT.

Adding a C7000AT to a consisting C7000PT + IOC-configuration

1. Invite the C7000AT from an IOC by typing the `"invite ##"`-command with the ID adjusted there.

Adding an IOC with unvalid bus configuration to a consisting C7000AT/C7000PT/IOC-configuration

1. Separate the new unit with unvalid configuration physically from the bus.
2. Delete the IOC with unvalid configuration from another IOC (with valid configuration) `del ##`.
3. Adjust a free address with the DIP-switches at the new IOC.
4. Delete the stored bus configuration of the new IOC (either each single address with `del ##` or globally with the command `checkbus`, this command scans the addresses and deletes every unit which is not present.)
5. Connect the new unit physically to the bus.
6. Invite the new IOC by another IOC by typing the `"invite ##"` command.

General Note:

If there is data traffic on the bus, a new unit can only be invited by a valid/active bus member (can be checked by send indication by red TX1-LED on the IOC board).

5. Controller start

5.1 Start - C7000 Plus

Due to the fact that the C7000 Plus has no key memory, all entries via the keypad can only be made in realtime. For this a special "Enter-mode" must be accessed whereas the normal state of the C7000 Plus is the "Locked mode" which is displayed by the message "LOCKED".

The symbol ☐ blinks alternatively with the symbol ■ and signifies this way that the keypad is online and is provided with actual data.

The number (e.g. 27) in the top right corner shows the bus-ID of the unit, which is actually responsible for the data communication with the keypad.

The displayed temperature is the actual temperature of the unit/zone 27. The same for the displayed humidity.

```

LOCKED                ☐ 27
24,1°C
45,3%rh
no alarm
  
```

To get into the Enter mode press the MENU-key until the following screen appears :

In the upper line the number of occurred alarms is displayed for the unit with the indicated bus-ID.

Change the bus-ID with the arrow keys according to your intention and confirm with the SET-key.

```

STULZ 7000            ☐ 01
+Alarm                --
->Login                01
  
```

Bus-ID

You will see the following screen:

```

V1.01                 ☐ 01
->Info
Control
Service
  
```

After 1 minute of no key activity the Enter mode is left and the keypad is again in its locked mode.

From the main menu you can reach the following menus :

```

Info                   ☐ 01
->Actual
Status
Runtimes
Events
Alarm
  
```

```

Control                ☐ 01
Password
0000
^
  
```

```

Service                ☐ 01
Password
0000
^
  
```

Enter each digit of the password with the arrow keys and jump to the next digit with the SET-key. After the last digit you will get to one of the following menus, if the password was right.

```

Control                ☐ 01
->Temperature
Humidity
Function
Day/Night
Preference
  
```

```

Service                ☐ 01
->Equipment
Gen Settings
Data
Manual oper
Default set
  
```

5.2 Start - C7000 Advanced

After having switched on the power supply of the C7000 Advanced the window at the right side will appear. On this window the maximum number of 32 bus participants (bus-ID 0 - 31) are displayed by symbols which are located in 8 columns and 4 lines. An I/O controller is displayed by a square frame with an indication of the local temperature and humidity in integer values. A grey frame signifies that the unit is in a stop state, a black frame indicates that the unit is in operation. An IOC symbol without measured values indicates that the IOC is not reachable; e.g. because it is switched off (no voltage) or due to a bus fault. The other symbols contain an abbreviation for the controller type: PT - C7000 Plus Terminal, PT2 - C7000 Plus Terminal2, AT - C7000 Advanced Terminal, ME - C7000AT at which these windows are actually displayed.

The bus-ID can be deducted from the location in the scheme. Line 1 contains the bus participants 0 - 7 from left to right, line 2: 8-15, line 3: 16-23, line 4: 24-31.

A space signifies that a unit with a corresponding bus-ID does not exist.

A symbol/unit which is selected, is displayed inversely. In the window on top of the page the C7000AT is selected. It appears inversely with white letters on a black background. In the window below, the C7000IOC is selected.

The **context status line** contains the bus-ID and the global address of the selected bus participant.

The **global status line** contains the Stulz logo, the bus-ID and global address of the AT from which you operate and the clock.

With the selector key you can choose the unit which you want to control. After having marked the last bus participant position 31 you get to the following display, with the selector key, where all units are marked. In this state you can switch on/off the whole system by the local on/off key.

If some units are in operation, all units are switched off if you press the on/off key. Then, with the second key activation all units are switched on.

If you press the OK-button when all positions are marked the checkbus function is carried out (after the request and entry of the service master password).

Getting further with the selector key brings you via the Stulz logo to the bus-ID of the AT which you have the possibility to adjust (after the request and entry of the service master password) and to the global address which cannot be adjusted here, for safety reasons.

Finally you can adjust the time by selecting the clock.

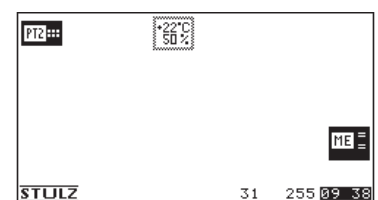
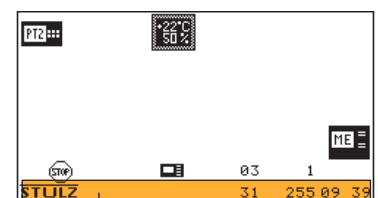
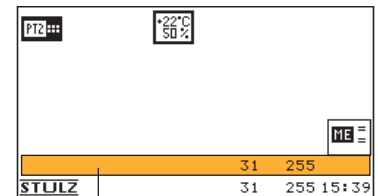
The following items can be adjusted in sequence:

- Year
- Month
- Day
- Hour
- Minute
- Second

return

YEAR	06
M	06
D	07
H	14
MIN	00
S	00

STULZ 31 255 14:00



If you select the C7000 AT for further adjustments and confirm with OK you will receive the following display with the menu ramification as shown below:

1. In the bms-menu you can adjust the global address of the C7000 AT, and an available interface on the C7000AT which can be either RS232 or RS485 the same as the protocol according to the BMS requirement.

```

return BMS
glob. address 255
Port          RS485
Protocol      --
Handshake     --
Baudrate      9600
STULZ        0 255 14 03
  
```

```

return Aux.
STULZ        5 5 11:55
  
```

```

P12... 22°C 50%
ME =
STULZ   31 255
        31 255 15:39
  
```

```

return BMS Aux. System
STULZ   00 255
        0 255 14 02
  
```

```

return System
Buzzer      -0-
Buzzertone  006
Temp.unit   °C
Languages
Info        14 04
  
```

3. In the system menu you can switch on (-1-) or off the alarm buzzer. Further you can adjust the buzzer pitch.

Menu item "Temp. unit" allows you to choose between degree Fahrenheit or degree Celsius.

In the menu item languages you can adjust the operator language.

The info submenu simply displays the software version of the C7000 AT.

```

return Languages
Display      English
Service      English
STULZ        31 255 15:42
  
```

```

return Info
C7000AT      0.90
hardware     0
STULZ        0 255 14:04
  
```

If you select an I/O controller you will receive the main menu as shown right with the possibility to choose one of the three submenus "Info", "Control" or "Service".

In the middle of the window the control type (Room or Supply air) is displayed and the corresponding actual values (Room or Supply air) below.

Below the actual values a symbol indicates, whether the unit runs in day or night operation. Day operation corresponds to operation at the first setpoint temperature. Night operation corresponds to operation at the second setpoint.



Day operation



Night operation

Stop states

The I/O-controller can be stopped by several functions or devices, which are displayed on the C7000 AT.



This symbol indicates, that the IOC has been stopped.

The following symbols, which appear besides on the right side, show the cause of the unit stop.



stopped by remote On/Off (remote switch connected to digital input 10)



stopped by PC (by BMS program)



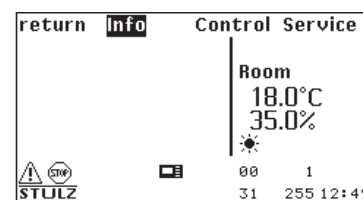
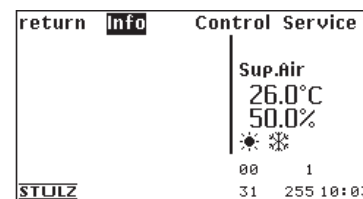
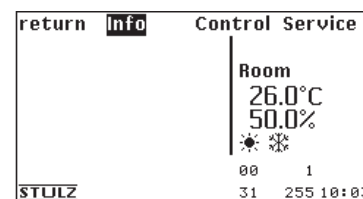
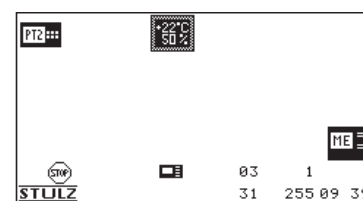
stopped by internal timer (week program)



stopped by the on/off-key at the C7000 AT or by the command "state stop" via the IOC service port.



stopped by the sequencing



Symbols for operating states

When the control is in operation, the following symbols indicate the unit status on the main menu. These symbols are not displayed in the submenus.



Cooling



Heating



Humidification



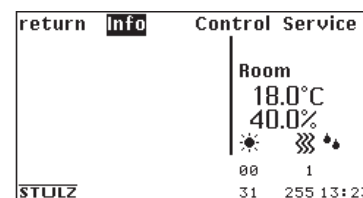
Dehumidification

Parameter values

Instead of numerical values two other displays are possible:

1. ??? - value requested at the IOC, without response yet

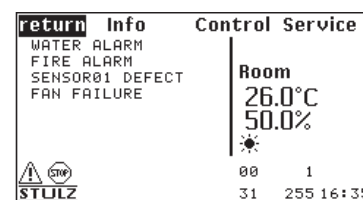
2. XXX - component not configured



Symbols for alarm messages



When an alarm has occurred the following symbol is displayed in the left bottom corner.



Passwords

To access the Control level and the Service level a password is required.

There are 4 passwords in total, a user-specific password for the Control- and Service level each and a master password for each level.

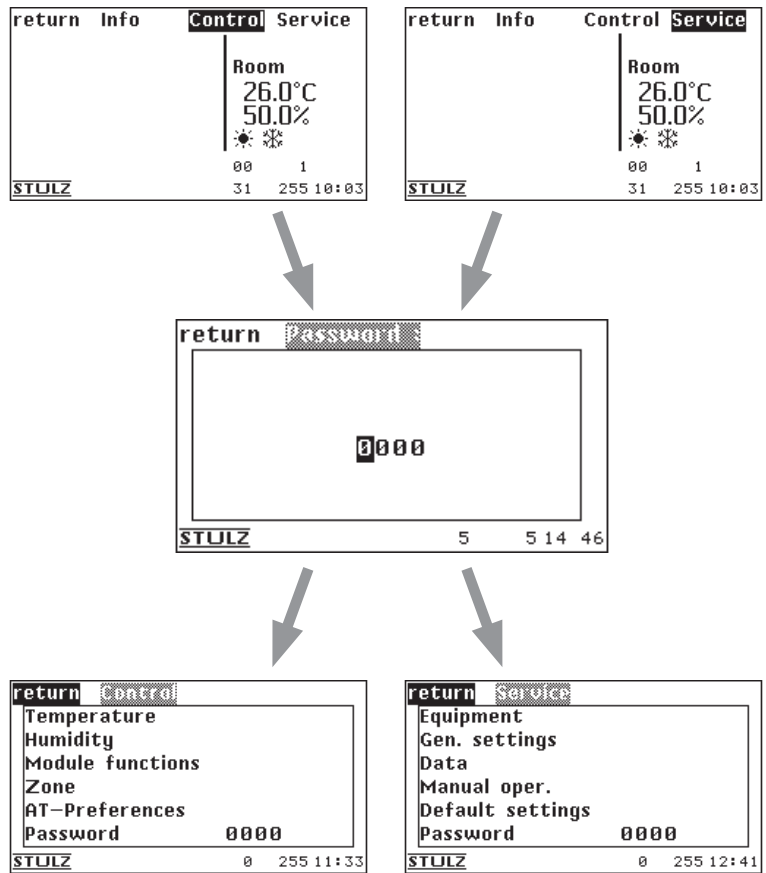
The user-specific password can be modified and is "0000" for both levels with the delivery. The master passwords are reserved for service staff and authorise to adjust the bus-ID and to execute the checkbus function at the C7000AT.

Entering the password

The digits can be modified by the selector key, after you have pressed the confirmation key. After the digit adjustment confirm with the confirmation key and pass over to the next digit with the selector key ">".

When you have reached the last digit at the right, you access the main menu of the Control resp. Service level by activating the selector key ">" (if the password was right).

There is no limitation for the number of attempts.



6. Operation

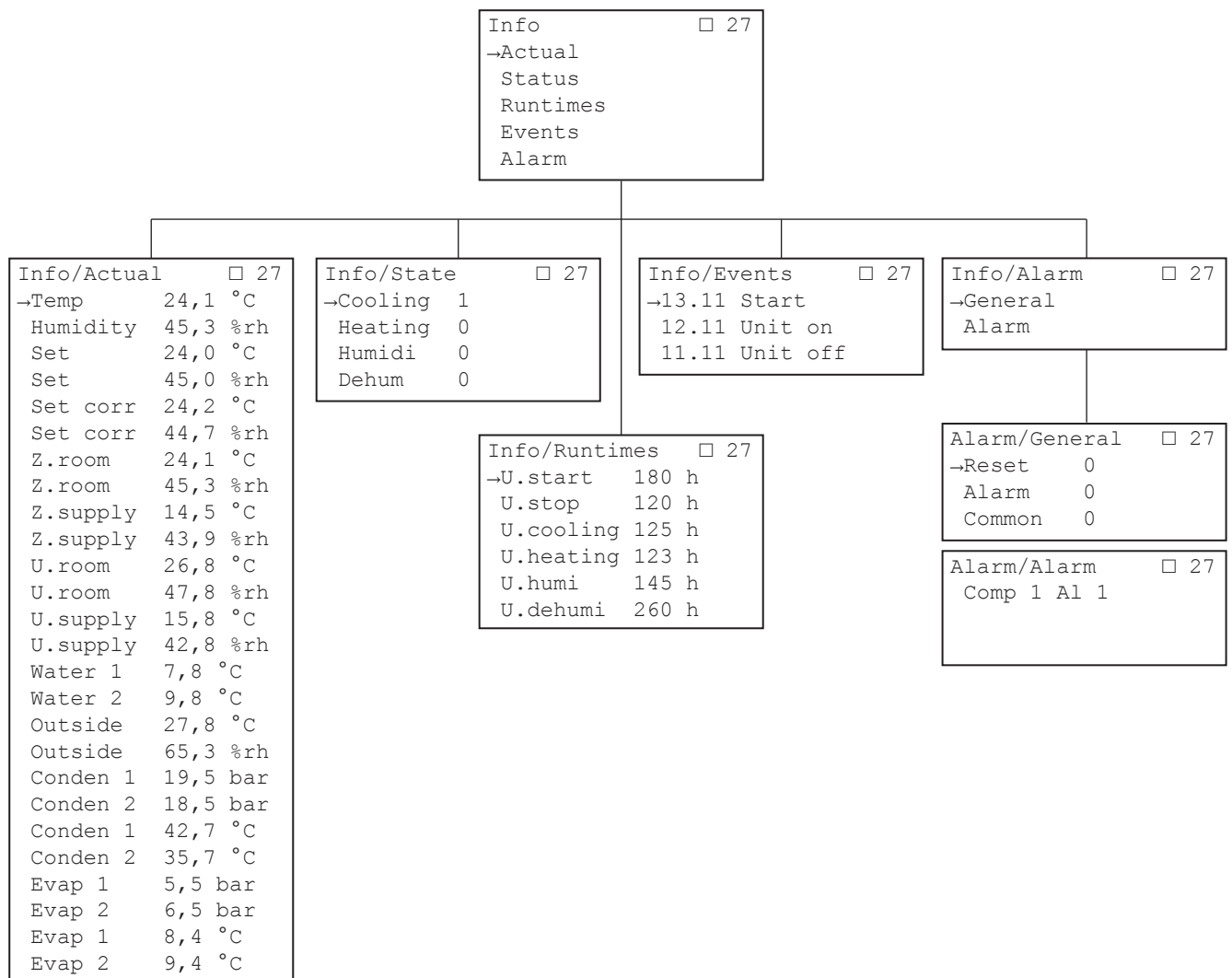
6.1 Info level

6.1.1 Info commands - C7000

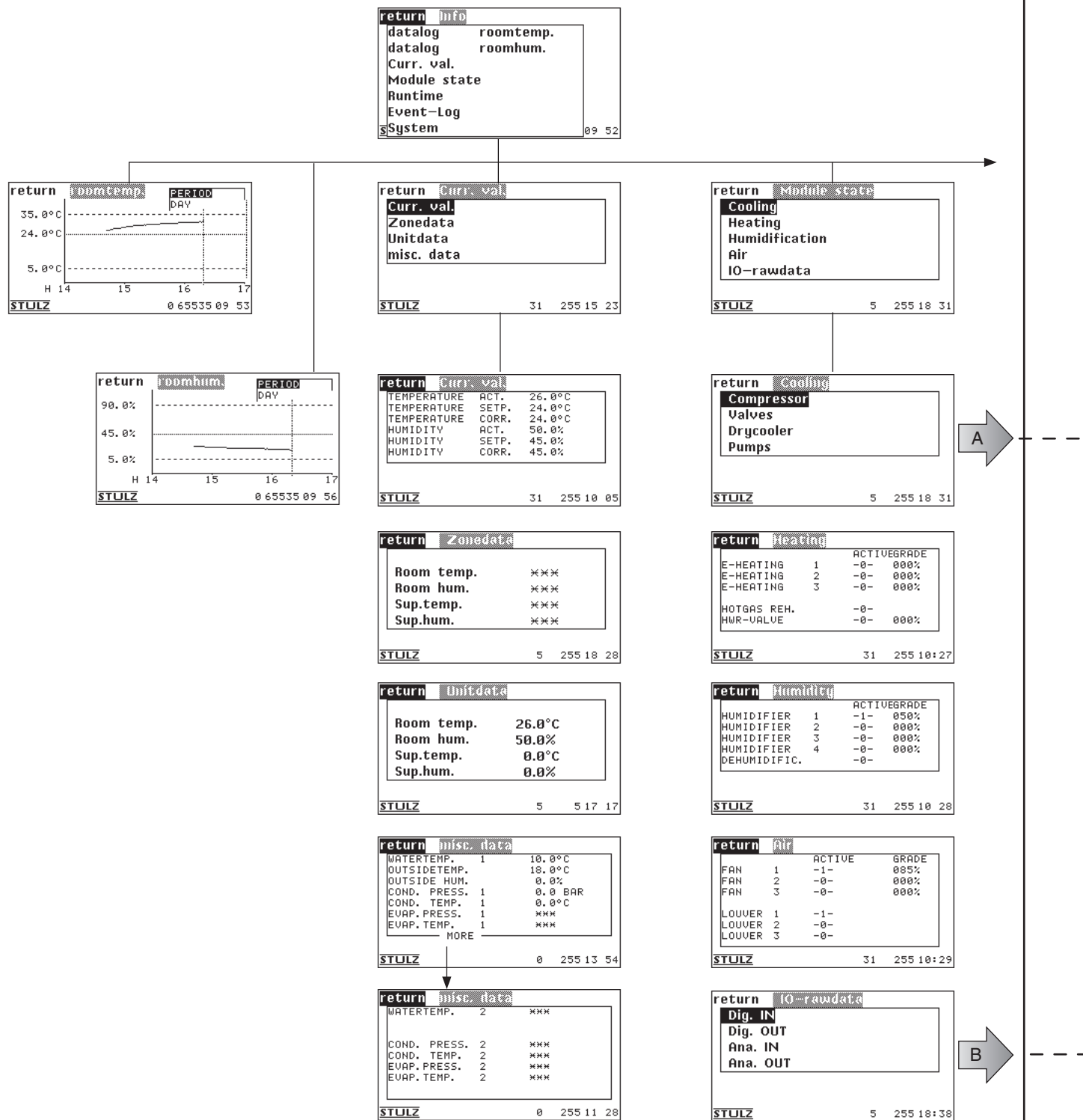
Generally each component- or A/C unit command which is entered without parameters only displays information without changing adjustments. However, the following commands give a general overview about the unit state and configuration.

- equip - shows the components and its number, also the extension cards (dig/ana)
- state - shows the unit- and functional (cooling, heating etc.) runtimes and the unit/component state
- is 1 - - setpoints, actual zone/unit values, limit values
- is 2 - - alarm delay, priority, common alarm assignment for each limit value alarm
- is 3 - - control type, sensor limitation values, cooling priority, winter operation, ups mode, outside temp. for condensation pressure reduction, gradient for press. reduction, winter start delay, bus/global address, temperature difference for overload activation, last service, service interval,
- assignment of in/outputs: common alarm, winter operation, remote on/off, ups operation, actual temp./humidity, CW cooling off
- wprg - shows the programmed timer function for the week
- events - shows all registered events (maximum 200, alarms & unit on/off)
- ups - shows the ups (uninterrupted power supply) configuration

6.1.2 Info overview - C7000 Plus



6.1.3 Info overview - C7000 Advanced



```

return Runtime
FUNCTION
COMPRESSOR
FAN
E-HEATING
PUMP
HUMIDIFIER
DRYCOOLER

STULZ 5 255 18:43

```

```

return Event-Log
EVENT M D H MIN
WATER ALARM 12,35 03:21
FIRE ALARM 12,21 35:52
SENSOR01 DEFECT 12,25 21:15
FAN FAILURE 12,26 22:05

STULZ 31 255 10:36

```

```

return System
Unit name
C7000IOC 2.23
hardware 0
Type DX

more
STULZ 0 255 11:30

```

```

return Runtime
UNIT 0H
STOPTIME 1H
COOLING 0H
HEATING 0H
HUMIDIFICATION 0H
DEHUMIDIFIC. 0H
FREECOOLING ***
MIXMODE ***

STULZ 0 65535 10 05

```

```

return System
EAIO 1
EDIO 1
EBUS --

OPTIONS ***

STULZ 0 255 11:31

```

```

return Runtime
COMPRESSOR 1 0 H
COMPRESSOR 2 0 H

STULZ 31 255 10:31

```

```

return Compressor
Compressor 1 -1-
Compressor 2 -1-

STULZ 31 255 10 09

```

```

return Runtime
FAN 1 1 H
FAN 2 1 H
FAN 3 1 H

STULZ 31 255 10:34

```

```

return Values
SUCTIONVALVE GRADE 000%
GE/CW VALVE 000%
S-VALVE 000%

STULZ 0 65535 09 59

```

```

return Runtime
E-HEATING 1 0 H
E-HEATING 2 0 H
E-HEATING 3 0 H

STULZ 31 255 11 50

```

```

return Drycooler
Drycooler 1 -0- *** speed
Drycooler 2 -0-
Drycooler 3 -0-
Drycooler 4 -0-

STULZ 0 65535 10:00

```

```

return Runtime
PUMP 1 1 H
PUMP 2 0 H
PUMP 3 0 H
PUMP 4 0 H

STULZ 31 255 11 50

```

```

return Pumps
ACTIVE GRADE
PUMP 1 -1- 030%
PUMP 2 -0- 000%
PUMP 3 -0- 000%
PUMP 4 -0- 000%

STULZ 31 255 11:54

```

```

return Runtime
HUMIDIFIER 1 23 H
HUMIDIFIER 2 0 H
HUMIDIFIER 3 0 H

STULZ 31 255 11 51

```

```

return D-IN
01 -0- -0- -0- -0-
05 -0- -0- -0- -0-
09 -0- -0- -0- -0-
13 -0- -0- -0- -0-
17 -0- -0- -0- -0-
21 -0- -0- -0- -0-
25 -0- -0- -0- -0-
MORE

STULZ 0 65535 10 01

```

```

return Runtime
DRYCOOLER 1 0 H
DRYCOOLER 2 0 H
DRYCOOLER 3 0 H
DRYCOOLER 4 0 H

STULZ 31 255 11 51

```

```

return Dig. OUT
01 *** *** *** ***
05 *** *** *** ***
09 *** *** *** ***
13 *** *** *** ***
17 *** *** *** ***
21 *** *** *** ***
25 *** *** *** ***
MORE

STULZ 5 255 18 39

```

```

return Ana. IN
01 *** *** *** ***
05 *** *** *** ***
09 *** *** *** ***
13 *** *** *** ***
17 *** *** *** ***
21 *** *** *** ***

STULZ 5 255 18 40

```

```

return Ana. OUT
01 *** *** *** ***
05 *** *** *** ***
09 *** *** *** ***
13 *** *** *** ***
17 *** *** *** ***

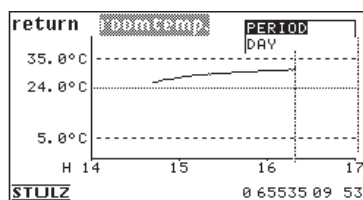
STULZ 5 255 18:41

```

C7000 Advanced

Data logger

Info



By the data logger you can save measured values or average values (zone data) calculated by the controller and have them displayed in the shape of a graphical curve so as to show the time course of these values.

Values of two different sensors can be simultaneously recorded.

You set the lapse of time which will be displayed. Further parameters (type of measured value and cycle) can be adjusted in the service menu.

You can choose among 5 different lapses of time: hour (adjusting this lapse displays the recent 3 hours), day, week, month and year.

The time lapse is displayed in horizontal direction, a vertical dashed line marks the actual time.

In the vertical direction the range of the measured value within the limit values (if existant for this type of value) is displayed. Two exterior dashed lines mark the limit values. An interior dotted line marks the set value, if existant.

The course of the measured value is displayed by a continuous line.

C7000

The corresponding commands:

	for data logger 1 each	Type.....:1 (Unit room temp)
log 1	- displays adjustments, number of data and date of recent and eldest value.	Store cycle.....:15 Min
log 1 1	- displays the 20 recent values as follows.	Number of values.:938
		Youngest.....:11.08.2004 15:33:00
		Eldest.....:01.08.2004 02:18:00
		0001. 11.08.2004 15:33:00 Room temperature 22,9°C
		0002. 11.08.2004 15:18:00 Room temperature 23,0°C
		0003. 11.08.2004 15:03:00 Room temperature 23,1°C
log 1 2	- edits the 20 last but one values (value 21 to 40 going from the actual point of time).	
log 1 72	- edits the eldest 20 values (value 1421 to 1440 going from the actual point of time).	
log 1 15.05.2006	- edits all values of this day as far as stored.	
log 1 1 13	- edits the values 1 to 13 going from the actual point of time.	
log 1 clear	- deletes all stored values.	

C7000 Advanced

Info

```

return Curr. val.
Curr. val.
Zonedata
Unitdata
misc. data
STULZ 31 255 15 23

```

```

return Curr. val.
TEMPERATURE ACT. 26.0°C
TEMPERATURE SETP. 24.0°C
TEMPERATURE CORR. 24.0°C
HUMIDITY ACT. 50.0%
HUMIDITY SETP. 45.0%
HUMIDITY CORR. 45.0%
STULZ 31 255 10 05

```

```

return Zonedata
Room temp. ***
Room hum. ***
Sup.temp. ***
Sup.hum. ***
STULZ 5 255 18 28

```

```

return Unitdata
Room temp. 26.0°C
Room hum. 50.0%
Sup.temp. 0.0°C
Sup.hum. 0.0%
STULZ 5 5 17 17

```

```

return misc. data
WATERTEMP. 1 10.0°C
OUTSIDETEMP. 18.0°C
OUTSIDE HUM. 0.0%
COND. PRESS. 1 0.0 BAR
COND. TEMP. 1 0.0°C
EVAP. PRESS. 1 ***
EVAP. TEMP. 1 ***
MORE
STULZ 0 255 13 54

```

```

return misc. data
WATERTEMP. 2 ***
COND. PRESS. 2 ***
COND. TEMP. 2 ***
EVAP. PRESS. 2 ***
EVAP. TEMP. 2 ***
STULZ 0 255 11 28

```

Current values

This window shows the actual values of the connected sensors the same as the setpoints adjusted at the controller. Furthermore the setpoints shifted by the controller (CORR.) are displayed. These setpoints are due to the week cycle program (see page 84) or by the sensor limitation control (see page 81). The shifted setpoints are priority setpoints.

Here you can see the measured values for the zone. These values represent an average value for each parameter, which is calculated of all sensors of the units which are assigned to the same zone.

These are the measured values for the unit.

These are several sensor values of the unit.

C7000 PT2

```

Info □ 27
→Actual
Status
Runtimes
Events
Alarm

```

visible window - display size

```

Info/Actual □ 27
→Temp 24,1 °C
Humidity 45,3 %rh
Set 24,0 °C
Set 45,0 %rh
Set corr 24,2 °C
Set corr 44,7 %rh
Z.room 24,1 °C
Z.room 45,3 %rh
Z.supply 14,5 °C
Z.supply 43,9 %rh
U.room 26,8 °C
U.room 47,8 %rh
U.supply 15,8 °C
U.supply 42,8 %rh
Water 1 7,8 °C
Water 2 9,8 °C
Outside 27,8 °C
Outside 65,3 %rh
Conden 1 19,5 bar
Conden 2 18,5 bar
Conden 1 42,7 °C
Conden 2 35,7 °C
Evap 1 5,5 bar
Evap 2 6,5 bar
Evap 1 8,4 °C
Evap 2 9,4 °C

```

The complete menu can be scrolled with the up and down arrow keys.

C7000 Advanced

Info

```

return Module state
Cooling
Heating
Humidification
Air
IO-rawdata
STULZ 5 255 18 31

```

```

return Cooling
Compressor
Valves
Drycooler
Pumps
STULZ 5 255 18 31

```

If your A/C unit is equipped with a heater, the operating state is displayed in this window. For proportional heaters the actual capacity is shown from 0-100%. For the hot water reheat the actual capacity is displayed in the shape of the opening degree of the HWR valve.

```

return Heating
E-HEATING 1 -0- 000%
E-HEATING 2 -0- 000%
E-HEATING 3 -0- 000%
HOTGAS REH. -0-
HWR-VALVE -0- 000%
STULZ 31 255 10:27

```

```

return Humidity
HUMIDIFIER 1 -1- 050%
HUMIDIFIER 2 -0- 000%
HUMIDIFIER 3 -0- 000%
HUMIDIFIER 4 -0- 000%
DEHUMIDIFIC. -0-
STULZ 31 255 10 28

```

```

return Air
FAN 1 -1- 085%
FAN 2 -0- 000%
FAN 3 -0- 000%
LOUVER 1 -1-
LOUVER 2 -0-
LOUVER 3 -0-
STULZ 31 255 10:29

```

```

return IO-rawdata
Dig. IN
Dig. OUT
Ana. IN
Ana. OUT
STULZ 5 255 18:38

```

Module state

Whereas the C7000 Plus displays the operating state of the superior functions, the C7000 Advanced gives a detailed representation of the components' operating states.

```

return Compressor
Compressor 1 -1-
Compressor 2 -1-
STULZ 31 255 10 09

```

```

return Values
SUCTIONVALVE GRADE 000%
GE/CW VALVE 000%
G-VALVE 000%
STULZ 0 65535 09 59

```

```

return Drycooler
Drycooler 1 -0- *** speed
Drycooler 2 -0-
Drycooler 3 -0-
Drycooler 4 -0-
STULZ 0 65535 10:00

```

```

return Pumps
PUMP 1 -1- 030% ACTIVE GRADE
PUMP 2 -0- 000%
PUMP 3 -0- 000%
PUMP 4 -0- 000%
STULZ 31 255 11:54

```

If your A/C unit is equipped with a humidifier, the operating state and the degree of steam production of the humidifier is displayed in this window.

In addition the display indicates whether the dehumidification is switched on or off.

The operating state of the fans with the actual speed from 0-100% is indicated in this window. If your A/C unit is equipped with louvers, -1- indicates that the louver is open.

```

return D-IN
01 -0- -0- -0- -0-
05 -0- -0- -0- -0-
09 -0- -0- -0- -0-
13 -0- -0- -0- -0-
17 -0- -0- -0- -0-
21 -0- -0- -0- -0-
25 -0- -0- -0- -0-
MORE
STULZ 0 65535 10 01

```

C7000 PT2

```

Info/State 27
->Cooling 1
Heating 0
Humidi 0
Dehum 0

```

In the following windows you can see the operating state of each component:

-0- means component is off.

-1- means component is on.

xxx means component does not exist.

This window displays the opening degree of the valves in a percentage from 0 to 100.

On/off state of the dry coolers

On/off state of the pumps + actual capacity in %, if the pumps are speed controlled.

This window (as the windows titled "Dig. OUT", "Ana. IN", "Ana. OUT") displays 0 or 1 for each digital input/output, which could be helpful for diagnosis purposes.

In the first line the inputs from 1 to 4 are displayed, in the second line the inputs from 5 to 8 etc.

	Display	Signification
D-IN	1	voltage present -> no alarm
D-OUT	1	relay activated -> component in service
A-IN	0-4095	0-20mA, 4-20mA, 0-10V corresp. to sensor type
A-OUT	0-4095	0-10V

C7000 Advanced

Info

```
return Runtime
FUNCTION
COMPRESSOR
FAN
E-HEATING
PUMP
HUMIDIFIER
DRYCOOLER
STULZ 5 255 18:43
```



```
return Runtime
UNIT 0H
STOPTIME 1H
COOLING 0H
HEATING 0H
HUMIDIFICATION 0H
DEHUMIDIFIC. 0H
FREECOOLING ***
MIXMODE ***
STULZ 0 65535 10 05
```

```
return Runtime
COMPRESSOR 1 0 H
COMPRESSOR 2 0 H
STULZ 31 255 10:31
```

```
return Runtime
FAN 1 1 H
FAN 2 1 H
FAN 3 1 H
STULZ 31 255 10:34
```

```
return Event-Log
EVENT M D H MIN
WATER ALARM 12,35 03:21
FIRE ALARM 12,21 35:52
SENSOR01 DEFECT 12,25 21:15
FAN FAILURE 12,26 22:05
STULZ 31 255 10:36
```

```
return System
Unit name C7000IOC 2.23
hardware 0
Type DX
more
STULZ 0 255 11:30
```

```
return System
EAIO 1
EDIO 1
EBUS --
OPTIONS ***
STULZ 0 255 11:31
```

Runtimes

The runtimes of the listed components are shown in hours in the following windows at the bottom of the page.

The functional runtimes in detail:

The unit runtime comprises all times when at least one component is operating.

The stoptime is counted when the unit is in local stop or timer stop or remote stop or bms-stop.

The cooling runtime is counted each time when cooling is requested.

The heating runtime is counted each time when heating is requested.

The humidification runtime is the total runtime of all humidifiers.

The dehumidification runtime is counted each time the solenoid valve for cutting a part of the evaporator is activated/closed or the fan speed is reduced for dehumidification reasons (DX-size 1 and all CW-units).

C7000 PT2

The functional runtimes include the same components as for the C7000 Advanced.

```
Info/Runtimes □ 27
→U.start 180 h
U.stop 120 h
U.cooling 125 h
U.heating 123 h
U.humi 145 h
U.dehumi 260 h
```

Event-Log

All alarm messages and events of one A/C unit are listed in this window. The messages contain the following information: alarm text, day and time. When the unit was started and stopped is also displayed.

Up to 200 events can be stored.

```
Info/Events □ 27
→13.11 Start
12.11 Unit on
11.11 Unit off
```

System

In this menu the software version, the hardware version and the unit type are displayed.

The field "more" shows that there is another window.

Here the number of connected EAIO-, EDIO- and EBUS-boards is indicated, the same as optional extensions of the software.

6.2 Control level

6.2.1 Overview structure

Having three different operator interfaces, the aim was to present the same function for each interface on one page, which is more comfortable for the operator, when there are different interfaces in one installation.

Due to the limited space which rested for the C7000 Advanced in combination with the complexity of the menu ramification, it was impossible to display entire menu branches on one page.

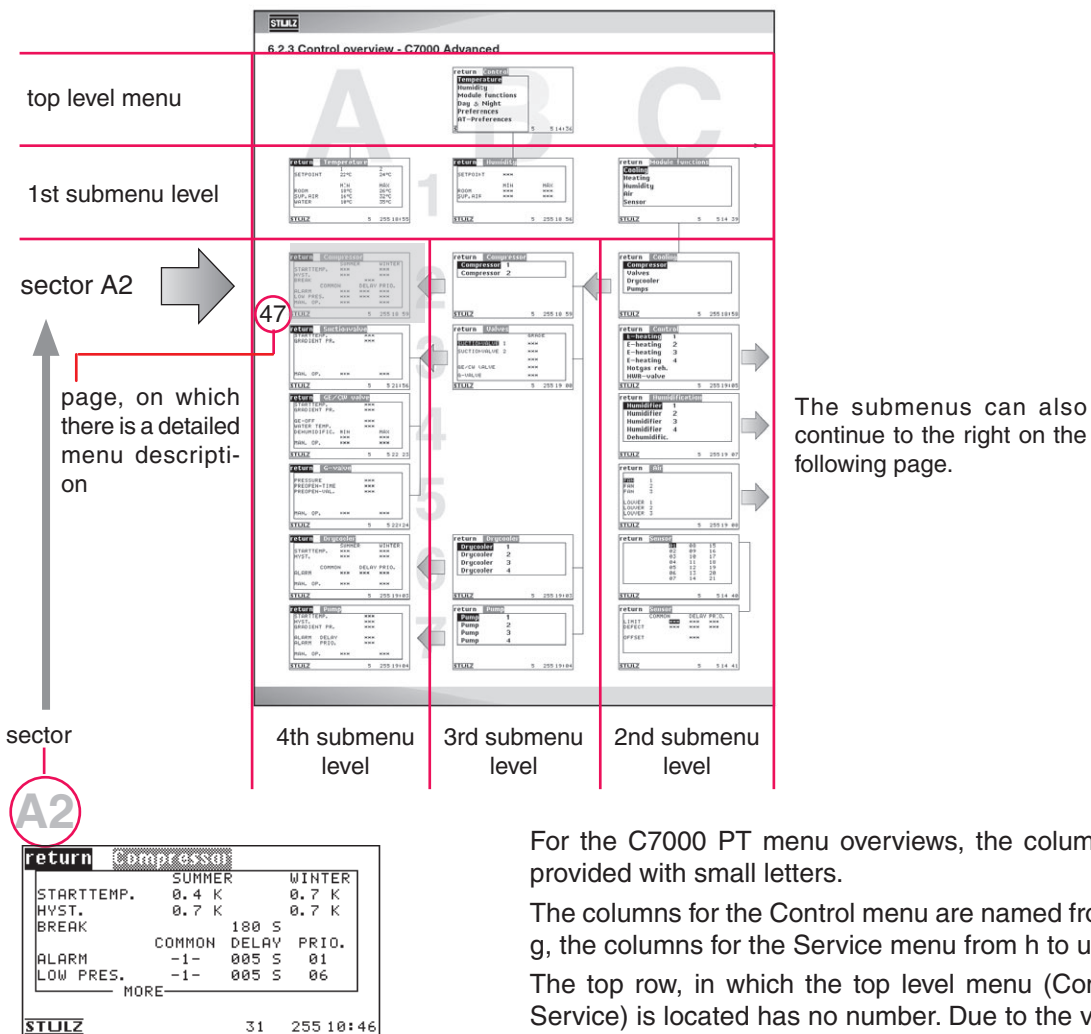
We therefore applied a city map screen on the Control and Service menu overview, consisting of columns and rows which serve to easily relocate submenus within the overview.

The columns for the Control menu are named from A to F, the columns for the Service menu from K to V.

On each page there is one top row without a number, which contains the top level menu and seven rows for the submenus which are named from 1 to 7.

There are up to 4 submenu levels. The first submenu level is horizontally located. All other submenu levels are vertically located. From the second submenu level on an arrow indicates the beginning of a new submenu.

On the pages which follow the overview, only the parameter menus are explained, these are normally the menus of the lowest submenu level.



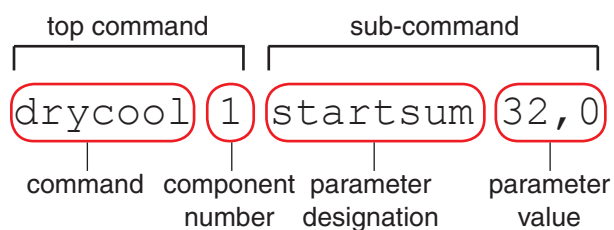
For the C7000 PT menu overviews, the columns are provided with small letters.

The columns for the Control menu are named from a to g, the columns for the Service menu from h to u.

The top row, in which the top level menu (Control or Service) is located has no number. Due to the variable menu size the height and number of rows (max. 1-5) also varies.

6.2.2 Control commands - C7000

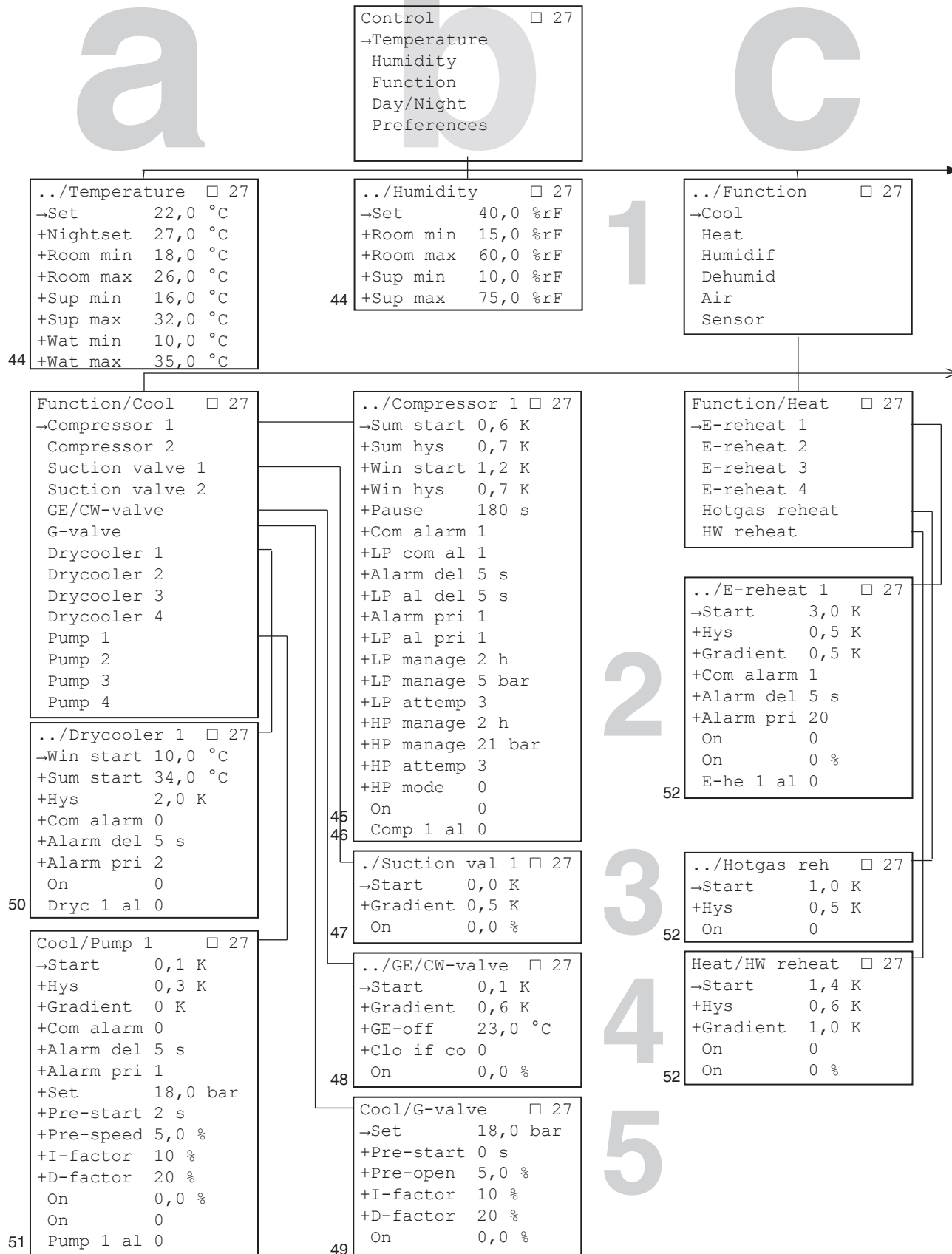
A typical control command is structured as follows:



Following a summary of the most frequent sub-commands:

<code>type 1/2/3..</code>	sets the type of control (mostly 1=2-point control, 2 = proportional)
<code>start #,#</code>	sets the startpoint (temperature or humidity according to the component)
<code>startsum #,#</code>	sets the summer operation startpoint
<code>startwin #,#</code>	sets the winter operation startpoint
<code>hys #,#</code>	sets the hysteresis (for on/off-controlled components)
<code>hyssum #,#</code>	sets the summer operation hysteresis
<code>hyswin #,#</code>	sets the winter operation hysteresis
<code>press #</code>	sets the pressure startpoint
<code>grad #,#</code>	sets the gradient (for proportionally controlled components)
<code>pretime #</code>	sets the pre-start time in seconds
<code>preopen #</code>	sets the pre-opening of a valve in %
<code>prespeed #</code>	sets the pre-speed of a fan or pump in %
<code>conf 0/1</code>	0 = deactivates a component from the configuration 1 = activates a component for the configuration
<code>ain #</code>	assigns the analogous input # to the component (sensor)
<code>din # / alarm #</code>	assigns the digital input # to the component related alarm
<code>aout #</code>	assigns the component to the analogous output #
<code>dout #</code>	assigns the component to the digital output #
<code>basicalarm 0/1</code>	0 = no common alarm when component alarm 1 = common alarm when component alarm
<code>alarmdelay #</code>	sets the alarmdelay in seconds
<code>alarmprio #</code>	assigns the alarm to alarm relay #
<code>runtime #</code>	sets the runtime in hours
<code>hand 0/1</code>	0 = disables manual operation, 1 = enables manual operation
<code>handon 0/1/#</code>	0/1/# = switches off/on the component in manual operation or sets a value in % for proportionally controlled components

6.2.3 Control overview - C7000 Plus



d e f g

←

../Day/Night	□ 27
→Day	0
+Hour	0
+Status	1

84

../Preferences	□ 27
→°C/°F	0
+Language	0

61

←

Function/Humid	□ 27
→Humidifier 1	
Humidifier 2	
Humidifier 3	

../Humidifier 1	□ 27
→Start	0,0 %rF
+Hys	10,0 %rF
+Gradient	10,0 %
+Com alarm 1	
+Alarm del 5 s	
+Alarm pri 6	
On	0
On	0 %
Humi 1 al 0	

53

Function/Dehum	□ 27
→Start	10,0 %rF
+Hys	5,0 %rF
+Stop	5,0 K
+Wat min	5,0 °C
+Wat max	14,0 °C
On	0

54

Function/Air	□ 27
→Fan 1	
Fan 2	
Fan 3	
Louver 1	
Louver 2	
Louver 3	

Air /Fan 1	□ 27
→nMax	85,0 %
+nMaxCW	85,0 %
+Starttemp	0,0 K
+Startspee	0,0 %
+Offset	0,0 %
+Min.speed	60,0 %
+Com alarm 1	
+Alarm del 2 s	
+Alarm pri 1	
+Co al fil 1	
+Aldel fil 20 s	
+Al pr fil 1	
+100% spee	5 s
+Pre-start	10 s
+Over-run	10 s
+Redu time	30 min
+Speed red	0,0 %
+Filter of	0,0 %
+Redu dehu	0,0 %
+Reduc UPS	0,0 %
On	0,0
On	0,0 %
Fan 1 al 0	
Filt 1 al 0	

56

57

Air/Louver 1	□ 27
→Pre-start	90 s
Open	0

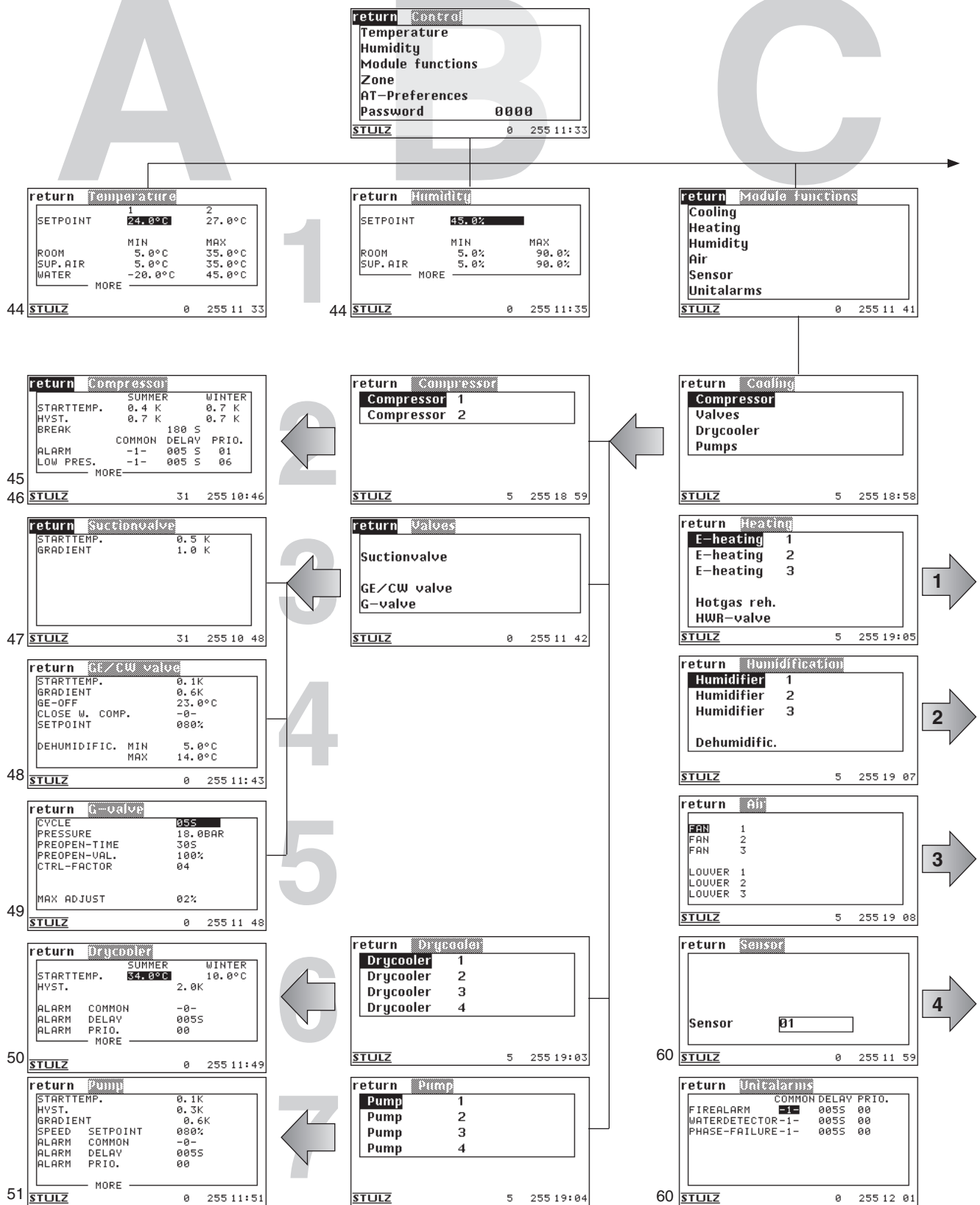
60

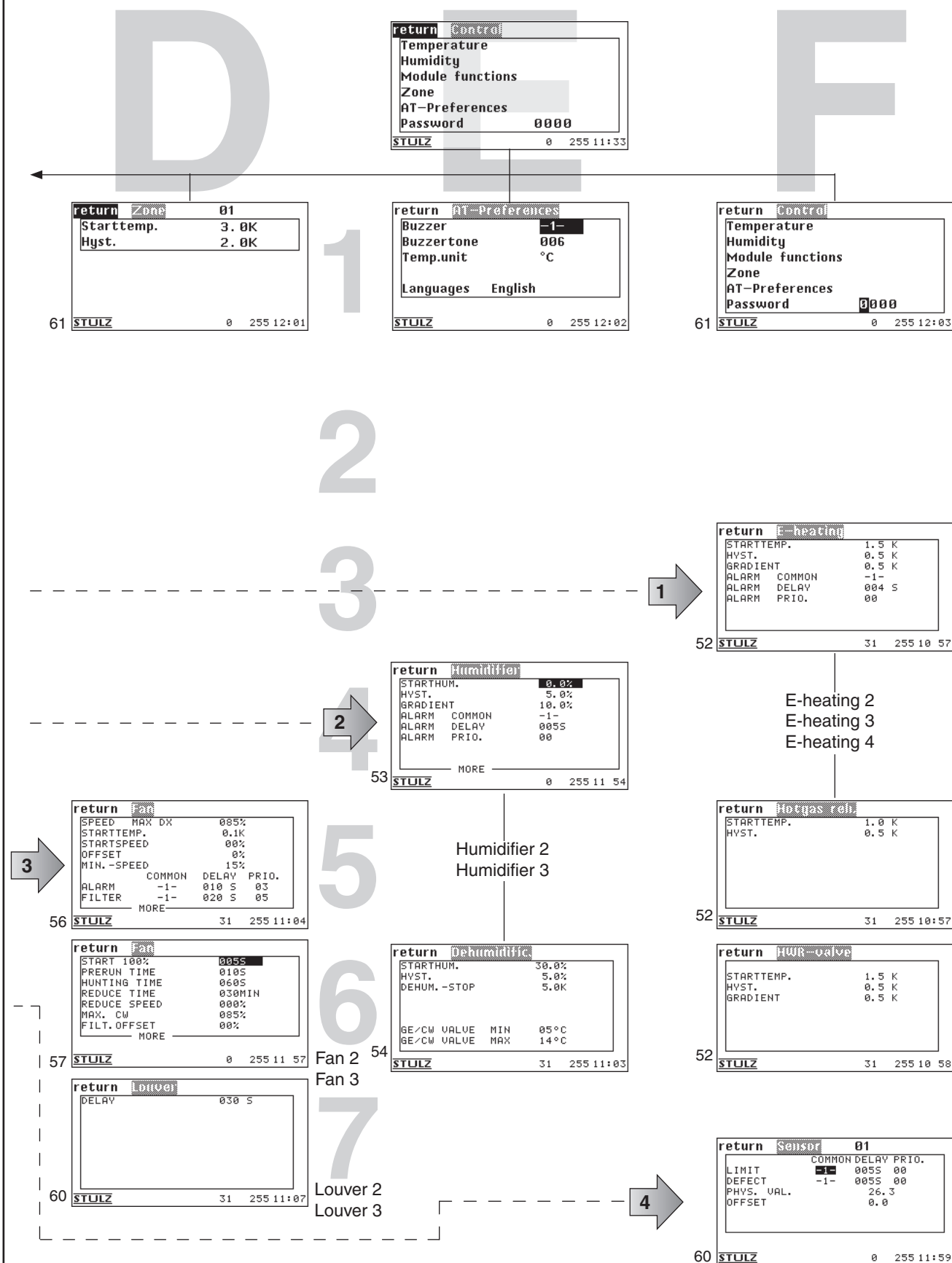
Function/Sensor	□ 27
→Sensor 1	
Sensor 2	
Sensor 3	
Sensor 4	
Sensor 5	
Sensor 6	
Sensor 7	
Sensor 8	
Sensor 9	
Sensor 10	
Sensor 11	
Sensor 12	
Sensor 13	
Sensor 14	
Sensor 15	
Sensor 16	
Sensor 17	
Sensor 18	
Sensor 19	
Sensor 20	
Sensor 21	

Sensor/Sensor 1	□ 27
→Com alarm 1	
+Alarm del 5 s	
+Alarm pri 1	
+Com al SF 1	
+Al del SF 5 s	
+Al pri SF 1	
+Adjust	0,0 °C
Actual	15,3 °C
Actual	8,9 mA
Sen 1 al 0	
Sen 1 Br 0	

60

6.2.4 Control overview - C7000 Advanced





C7000 Advanced

A1

Control

return Temperature		
SETPOINT	1 24,0°C	2 27,0°C
	MIN	MAX
ROOM	5,0°C	35,0°C
SUP. AIR	5,0°C	35,0°C
WATER	-20,0°C	45,0°C
	MORE	
STULZ	0	255 11 33

return Temperature		
ROOM	MIN	MAX
COMMON	-1-	-1-
PRIQ.	00	00
DELAY	0005	0305
SUP. AIR		
COMMON	-1-	-1-
PRIQ.	00	30
DELAY	0305	0005
STULZ	0	255 11:34

For the water limit alarm the following parameters:

- Common alarm
- Alarm priority
- Alarm delay

can only be adjusted by commands.

B1

return Humidity		
SETPOINT	45,0%	
	MIN	MAX
ROOM	5,0%	90,0%
SUP. AIR	5,0%	90,0%
	MORE	
STULZ	0	255 11:35

return Humidity		
ROOM	MIN	MAX
COMMON	-1-	-1-
PRIQ.	00	00
DELAY	0005	0305
SUP. AIR		
COMMON	-1-	-1-
PRIQ.	00	30
DELAY	0305	0005
STULZ	0	255 11 36

Setpoint & Limit Values

The first two items of the control menu concern the adjustment of setpoints and limit values. The limit values are decisive for the alarms "temp/humidity too high/low". Two temperature setpoints can be adjusted, setpoint 1 concerns the operation by day, whereas setpoint 2 concerns operation at night according to the week timer (page 84).

Following the limit values for the room air sensor, the supply air sensor and the water sensor. The "MIN" column contains the values for the lower temperature limit and the "MAX" column relates to the upper limits accordingly.

If e.g. the minimum room air temperature is passed under by the measured value, the alarm "Room temperature too low" is displayed.

In the following window you can adjust three parameters for the room temperature limit alarms and for the supply air temperature limit alarms each.

1. whether the corresponding alarm shall release a common alarm (1=yes).
2. the alarm priority, where the corresponding alarm is assigned to an alarm relay with this number (adjusted as alarm priority).
3. the alarm delay in seconds.

You adjust the same parameters for the air humidity. However no difference between day- and night setpoint is made.

C7000 PT2

a1

../Temperature	□ 27
→Set	22,0 °C
+Nightset	27,0 °C
+Room min	18,0 °C
+Room max	26,0 °C
+Sup min	16,0 °C
+Sup max	32,0 °C
+Wat min	10,0 °C
+Wat max	35,0 °C

b1

../Humidity	□ 27
→Set	40,0 %rF
+Room min	15,0 %rF
+Room max	60,0 %rF
+Sup min	10,0 %rF
+Sup max	75,0 %rF

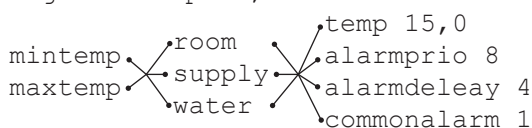
C7000

The corresponding commands:

Temperature

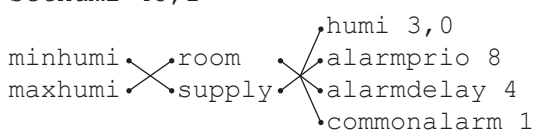
settemp 24,3

nightsettemp 27,0



Humidity

sethumi 45,1



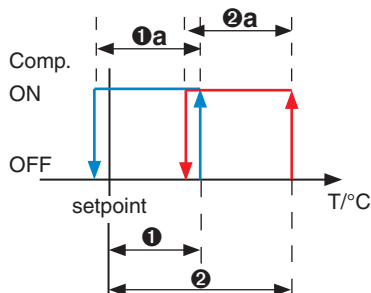
All combinations are possible.

C7000 Advanced

A2

Control

return Compressor			
	SUMMER	WINTER	
STARTTEMP.	0.4 K	0.7 K	
HYST.	0.7 K	0.7 K	
BREAK		180 S	
	COMMON	DELAY	PRIO.
ALARM	-1-	005 S	01
LOW PRES.	-1-	005 S	06
	MORE		
STULZ 31 255 10:46			

Cooling
Compressor (part 1)

The start temperature for the compressor is entered as a positive difference to the setpoint.

Two different start temperatures + hysteresis for summer and winter operation can be entered. (1, 1a, 2, 2a)

The compressor pause is entered in seconds and serves to increase the service life of the compressor by delaying the restart by the adjusted value. 3

You can adjust, if the compressor alarm releases a common alarm (0=no, 1=yes) 4 and, if the low pressure alarm starts a common alarm. 4a

The compressor alarm delay can be adjusted the same as the low pressure alarm delay. 5, 5a

Setting the priorities for the compressor alarm 6 and the low pressure alarm 6a means assigning the corresponding alarm to an alarm relay with the adjusted number.

C7000 PT2

b2

../Compressor 1 □ 27	
1	→Sum start 0,6 K
1a	+Sum hys 0,7 K
2	+Win start 1,2 K
2a	+Win hys 0,7 K
3	+Pause 180 s
4	+Com alarm 1
4a	+LP com al 1
5	+Alarm del 5 s
5a	+LP al del 5 s
6	+Alarm pri 1
6a	+LP al pri 1
	+LP manage 2 h
	+LP manage 5 bar
	+LP attemp 3
	+HP manage 2 h
	+HP manage 21 bar
	+HP attemp 3
	+HP mode 0
	On 0
	Comp 1 al 0

The surrounded numbers refer to the corresponding passages in the descriptive text. The items on a grey background concern the LP/HP alarm management and will be explained on the next page.

The operation status and the alarm status of the compressor are displayed in the last two lines.

C7000

The corresponding commands:

- | | |
|---------------------------|--------------------------|
| 1 comp 1 startsum 0,6 | 5 comp 1 alarmdelay 5 |
| 1a comp 1 hyssum 0,7 | 5a comp 1 alarmdelaylp 5 |
| 2 comp 1 startwin 1,2 | 6 comp 1 alarmprio 1 |
| 2a comp 1 hyswin 0,7 | 6a comp 1 alarmpriolp 1 |
| 3 comp 1 pause 180 | |
| 4 comp 1 commonalarm 1 | |
| 4a comp 1 commonalarmlp 1 | |

Times are entered in seconds.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

A2

Control

return Compressor	
LP-MANAGE	000 H
LP-MANAGE	5.0 BAR
RESTARTS	00
HP-MANAGE	000 H
HP-MANAGE	21.0 BAR
RESTARTS	00
MODE	0

STULZ

31 255 10 46

Cooling
Compressor (part 2)

The low pressure alarm can be managed in a way to avoid a premature and unnecessary service intervention.

If the LP switch releases, the compressor is stopped and restarted after the compressor pause ③ has elapsed. The LP alarm is inhibited during the winter start delay (see page 84).

If this happens at least the number of times you can adjust in "RESTARTS" ⑦b within a time you can adjust in the first line ⑦, the LP alarm is released and the compressor is definitely switched off. Using the optional LP-sensor you can adjust a threshold ⑦a which marks the lower limit for the permissible pressure range.

With a HP sensor (either part of G-valve or separate option) high pressure alarms can be equally managed for the same reasons as LP alarms.

If the threshold ⑧a of the HP is exceeded at least the number of times you can adjust in "RESTARTS" ⑧b within a time you can adjust in the fourth line ⑦, the HP alarm is released and the measure which you have adjusted in HP mode ⑨ is taken.

0: unit off

1: unit continues operation

C7000 PT2

b2

../Compressor 1 □ 27	
→Sum start	0,6 K
+Sum hys	0,7 K
+Win start	1,2 K
+Win hys	0,7 K
+Pause	180 s
+Com alarm	1
+LP com al	1
+Alarm del	5 s
+LP al del	5 s
+Alarm pri	1
+LP al pri	1
⑦ +LP manage	2 h
⑦a +LP manage	5 bar
⑦b +LP attemp	3
⑧ +HP manage	2 h
⑧a +HP manage	21 bar
⑧b +HP attemp	3
⑨ +HP mode	0
On	0
Comp 1 al	0

The surrounded numbers refer to the corresponding passages in the descriptive text. The items on a grey background have been explained on the previous page.

The operation status and the alarm status of the compressor are displayed in the last two lines.

C7000

The corresponding commands:

- ⑦ comp 1 lptime 2
- ⑦a comp 1 lppress 4,6
- ⑦b comp 1 lptries 6
- ⑧ comp 1 hptime 2
- ⑧a comp 1 hppress 21
- ⑧b comp 1 hptries 3
- ⑨ comp 1 hpmode 1

Times are entered in seconds.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

A3

Control

return Suctionvalve	
STARTTEMP.	0,5 K
GRADIENT	1,0 K

STULZ 31 255 10 48

Valves
Suction valve

The start temperature for the suction valve is entered as a positive difference to the room temperature setpoint. ❶

You can adjust a gradient, which determines the temperature range in which the valve opening increases from 0 to 100%. ❷

If the A/C unit is equipped with two refrigerant circuits, only the first refrigerant circuit can be equipped with a suction valve. Depending on how you choose the start points for the compressors you can exploit the proportional control range of the suction valve to a maximum. (see examples) The suction valve has a control range of 50% - 100% of the compressor cooling capacity.

The graphics A-C show for a DX2-unit how you obtain a double proportional control range by approaching the stop point of the 2nd compressor to the start point of the suction valve.

C7000 PT2

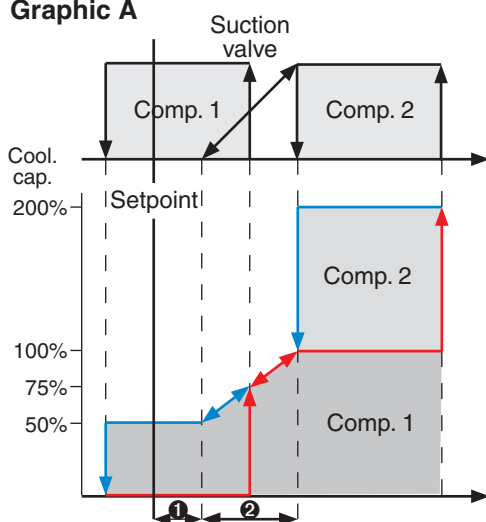
b3

./Suction val 1 <input type="checkbox"/> 27	
❶ →Start	0,0 K
❷ +Gradient	0,5 K
On	0,0 %

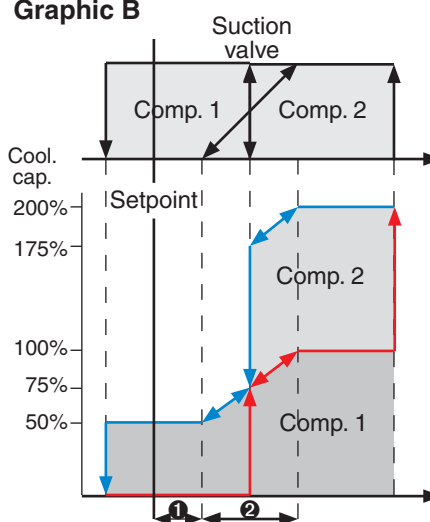
The surrounded numbers refer to the corresponding passages in the descriptive text.

The operation status/opening degree of the suction valve is displayed in the last line.

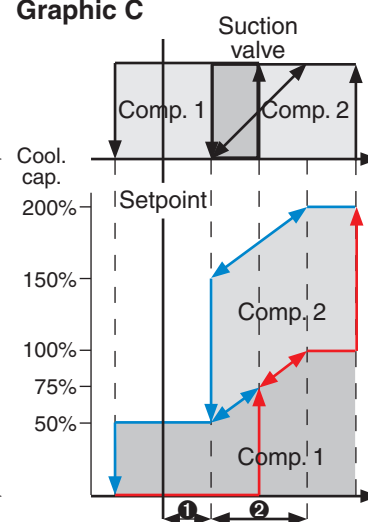
Graphic A



Graphic B



Graphic C



C7000

The corresponding commands:

- ❶ suctionv 1 start 0,2
- ❷ suctionv 1 grad 0,9

Times are entered in seconds.

The surrounded numbers refer to the corresponding passages in the descriptive text.

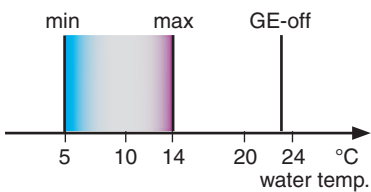
C7000 Advanced

A4

Control

return GE/CW valve	
STARTTEMP.	0.1K
GRADIENT	0.6K
GE-OFF	23.0°C
CLOSE W. COMP.	-0-
SETPOINT	080%
DEHUMIDIFIC. MIN 5.0°C	
MAX 14.0°C	
STULZ 0 255 11:43	

Dehumidification range



On the C7000AT you can adjust the water temperature limits for dehumidification here. However, this is also possible in the dehumidification menu.

Valves
GE-CW valve

The start temperature for the GE/CW valve is entered as a positive difference to the room temperature setpoint. ❶
For the GE/CW-valve you can adjust a gradient, which determines the temperature range in which the valve opening increases from 0 to 100%. ❷

With the GE-off value you determine a water temperature which establishes the limit for GE-operation. If this value is exceeded, the GE-operation is switched off by closing the valve and stopping the glycol pump. ❸

The actual water temperature is shown for a better orientation.

Additionally you can prevent mixed operation of Freecooling and compressor cooling by setting the "Close at comp" value to "1". (see Graphics below). ❹

C7000 PT2

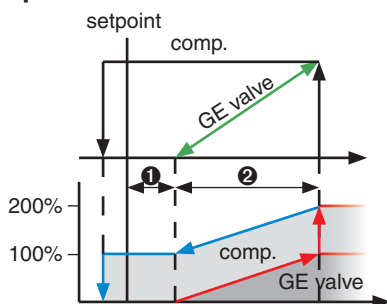
b4

../GE/CW-valve □ 27	
❶ →Start	0,1 K
❷ +Gradient	0,6 K
❸ +GE-off	23,0 °C
❹ +Clo if co 0	
On	0,0 %

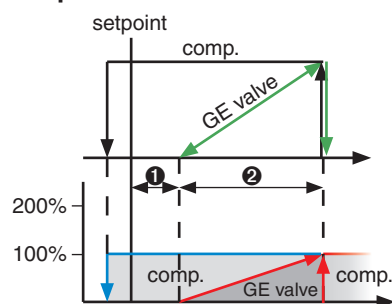
The surrounded numbers refer to the corresponding passages in the descriptive text.

The operation status of the GE/CW valve is displayed in the last line.

Graphic A "close at comp = 0"



Graphic B "close at comp = 1"



C7000

The corresponding commands:

- ❶ gecwv 1 start 0,2
- ❷ gecwv 1 grad 0,9
- ❸ gecwv off 22
- ❹ gecwv compoff 1

Times are entered in seconds.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

A5

Control

return	G-valve
CVCLE	055
PRESSURE	18.0BAR
PREOPEN-TIME	30S
PREOPEN-VAL.	100%
CTRL-FACTOR	04
MAX ADJUST	02%
STULZ	0 255 11 48

Valves

G-valve

The pressure setpoint is entered in the 2nd line and relates to the refrigerant condensation pressure in the condenser. ①

The pre-start serves to provide a sufficient flow for the heat absorbing medium and to pre-cool the heat absorbing medium. When compressor operation is requested, the G-valve opens and the compressor start is delayed by the pre-start time. ②

The pre-open value is the G-valve opening which should be obtained during the pre-start time. ③

To avoid a constant discrepancy from the set value there are three parameters, which imitate the behaviour of an integral control.

The control factor ④ is the decisive value, by which the extent of the control correction is adjusted in the way of calculating the actuating variable after the lapse of an adjustable control cycle ⑤ (0-10 sec) according to the following formula:

$$S_{\text{new}} = S_{\text{old}} - f \cdot (\text{set value} - \text{actual value})$$

S: actuating variable - here valve opening

f: control factor

Set value: condensation pressure

To avoid a drastical change you can adjust a maximum control correction ⑥ (0 - ±10%). This control correction relates to the old actuating variable in each cycle.

C7000 PT2

b5

	Cool/G-valve	□ 27
①	→Set	18,0 bar
②	+Pre-start	5 s
③	+Pre-open	50 %
④	+I-factor	10 %
⑤	+D-factor	20 %
	On	0,0 %

The surrounded numbers refer to the corresponding passages in the descriptive text.

The operation status of the G-valve is displayed in the last line.

C7000

The corresponding commands:

- ① gvalve press 18,4
- ② gvalve pretime 15
- ③ gvalve preopen 40
- ④ gvalve fact 2
- ⑤ gvalve concyc 5
- ⑥ gvalve maxc 5

Times are entered in seconds.

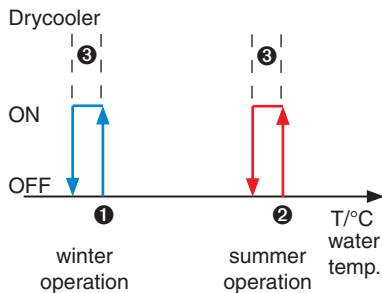
The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

A6

Control

return Drycooler		
STARTTEMP.	SUMMER	WINTER
HYST.	34,0 °C	10,0 °C
ALARM COMMON	-0-	
ALARM DELAY	0055	
ALARM PRIO.	00	
MORE		
STULZ 0 255 11:49		



return Drycooler	
CYCLE	055
CTRL-FACTOR	04
MAX ADJUST	02%
PRERUN SPEED	100%
STULZ 0 255 11:50	

Cooling
Drycooler

The start temperature for the drycooler is entered as an absolute value for the water temperature.

Two different start temperatures for summer and winter operation + hysteresis can be entered. ①, ②, ③

Note:

The summer/winter operation depends on the setting in the menu Service/General settings/control/parameters. (see page 82)

You can adjust, if the drycooler alarm releases a common alarm (0 = no, 1 = yes).

④ The drycooler alarm delay can be adjusted. ⑤

Setting the priority for the drycooler alarm ⑥ means assigning the alarm to an alarm relay with the adjusted number.

The parameters:

- control factor ⑦
- control cycle ⑧
- max. control correction ⑨
- pre-speed ⑩

are only necessary for the GE2p-control, which is explained in a separate manual.

C7000 PT2

a2

../Drycooler 1 □ 27	
①	→Win start 10,0 °C
②	+Sum start 34,0 °C
③	+Hys 2,0 K
④	+Com alarm 0
⑤	+Alarm del 5 s
⑥	+Alarm pri 2
	On 0
	Dryc 1 al 0

The surrounded numbers refer to the corresponding passages in the descriptive text.

The operation status and the alarm status of the drycooler are displayed in the last two lines.

C7000

The corresponding commands:

- | | |
|---------------------------|--------------------------|
| ① drycool 1 startwin 15,0 | ⑦ drycool 1 fact 3 |
| ② drycool 1 startsum 32,0 | ⑧ drycool 1 concyc 10 |
| ③ drycool 1 hys 3,0 | ⑨ drycool 1 maxc 4 |
| ④ drycool 1 commonalarm 1 | ⑩ drycool 1 prespeed 100 |
| ⑤ drycool 1 alarmdelay 3 | |
| ⑥ drycool 1 alarmprio 3 | |

Times are entered in seconds.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

A7

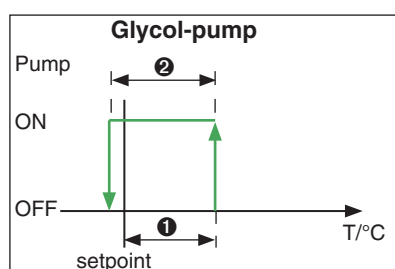
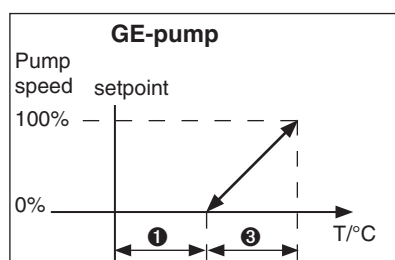
Control

```

return Pump
STARTTEMP. 0.1K
HVST. 0.3K
GRADIENT 0.6K
SPEED SETPOINT 000%
ALARM COMMON -0-
ALARM DELAY 0055
ALARM PRIO. 00
MORE
STULZ 0 255 11:51

return Pump
PRESSURE SETPOINT 18.0BAR
CYCLE 055
PREOPEN-TIME 0105
PREOPEN-VAL. 100%
CTRL-FACTOR 04
MAX ADJUST 02%
STULZ 0 255 11 52

```

Cooling
Pump

Depending on which pump type you have configured, different parameters are decisive. (see table 1)

The start temperature for the pump is entered as a positive difference to the room temperature setpoint. **1**

The corresponding hysteresis for the pump stop is only valid for pumps with on/off-control as the glycol pump. **2**

For speed controlled pumps you can adjust a gradient, which determines the range in which the pump speed increases from 0 to 100%. **3**

You can adjust, if the pump alarm releases a common alarm (0 = no, 1 = yes). **4**

The pump alarm delay can be adjusted in seconds. **5**

Setting the priority for the pump alarm **6** means assigning the corresponding alarm to an alarm relay with the adjusted number.

The pressure setpoint is entered in the 1st line and relates to the refrigerant condensation pressure in the condenser. **7**

The pump pre-start serves to pre-cool the heat absorbing medium. When compressor operation is requested, the G-pump starts and the compressor start is delayed by the pump pre-start time. **8**

The pre-speed is the G-pump speed which should be obtained during the pre-start time. **9**

The control factor **10a** is the decisive value, by which the extent of the control correction is adjusted in the way of calculating the actuating variable after the lapse of an adjustable control cycle **10b** (0-10 sec) according to the following formula:

$$S_{\text{new}} = S_{\text{old}} - f \cdot (\text{set value} - \text{actual value})$$

S: actuating variable - here pump speed

f: control factor

Set value: condensation pressure

To avoid a drastical change you can adjust a maximum control correction **10c** (0 - ±10%). This control correction relates to the old actuating variable in each cycle.

C7000 PT2

a4

```

Cool/Pump 1 □ 27
1 →Start 0,1 K
2 +Hys 0,3 K
3 +Gradient 0 K
4 +Com alarm 0
5 +Alarm del 5 s
6 +Alarm pri 1
7 +Set 18,0 bar
8 +Pre-start 2 s
9 +Pre-speed 5,0 %
10a +I-factor 10 %
10b +D-factor 20 %
On 0,0 %
On 0
Pump 1 al 0

```

The surrounded numbers refer to the corresponding passages in the descriptive text.

The operation status and the alarm status of the pump are displayed in the last two/three lines.

Table 1

Pump type	G (1)	GE (2)	Glycol (3)
Start temp.		1	1
Hysteresis			2
Gradient		3	
Press. setpoint	7		
Pre-start	8		
Pre-speed	9		

C7000

The corresponding commands:

- 1** pump 1 start 0,1
- 2** pump 1 hys 0,7
- 3** pump 1 grad 0,6
- 4** pump 1 commonalarm 0
- 5** pump 1 alarmdelay 6
- 6** pump 1 alarmprio 3

- 7** pump 1 press 18,4
- 7a** pump 1 speed 96
- 8** pump 1 pretime 5
- 9** pump 1 prespeed 60
- 10a** pump 1 fact 2
- 10b** pump 1 concyc 5
- 10c** pump 1 maxc 5

Times are entered in seconds.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

F3 F5 F6 Control

```

return E-heating
STARTTEMP. 1.5 K
HYST.      0.5 K
GRADIENT   0.5 K
ALARM COMMON -1-
ALARM DELAY 004 S
ALARM PRIO. 00

```

STULZ 31 255 10 57

```

return Hotgas reh.
STARTTEMP. 1.0 K
HYST.      0.5 K

```

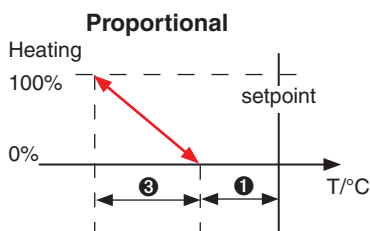
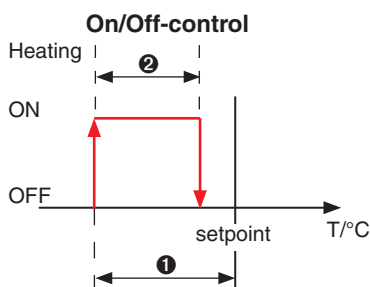
STULZ 31 255 10 57

```

return HW-reheat
STARTTEMP. 1.5 K
HYST.      0.5 K
GRADIENT   0.5 K

```

STULZ 31 255 10 58



Heating

E-heating/Hotgas reheat/Hot water reheat

Depending on which heating type you have configured, different parameters are decisive.

The start temperature for every heating is entered as a negative difference to the room temperature setpoint. ①

The hysteresis for the heating stop is only valid for heatings with on/off-control. ②

For proportional e-heatings/hot water reheats you can adjust a gradient, which determines the temperature range in which the heating capacity increases from 0 to 100%. ③

You can adjust, if the e-heating alarm releases a common alarm (0 = no, 1 = yes). ④

The e-heating alarm delay can be adjusted in seconds. ⑤

Setting the priority for the heating alarm ⑥ means assigning the corresponding alarm to an alarm relay with the adjusted number.

Only the first heating can be proportional. If this is the case and if there are several heatings (up to 4), only the start value and the gradient of the first heating are decisive for the control. Each time the proportional heating reaches 100% heating capacity another reheat is added and the first heating is reset to 0%. This way up to 4 individual heatings act as one proportional heating. (see right)

C7000 PT2

c2 c3 c4

```

../E-reheat 1 □ 27
① →Start      3,0 K
② +Hys        0,5 K
③ +Gradient   0,5 K
④ +Com alarm  1
⑤ +Alarm del  5 s
⑥ +Alarm pri  20
On      0
On      0 %
E-he 1 al 0

```

```

../Hotgas reh □ 27
① →Start      1,0 K
② +Hys        0,5 K
On      0

```

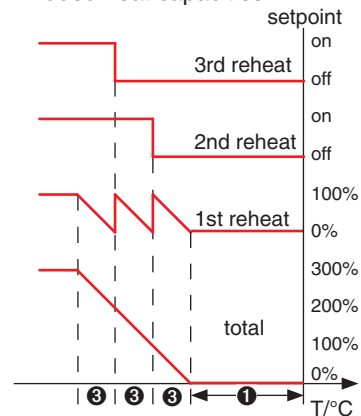
```

Heat/HW reheat □ 27
① →Start      1,4 K
② +Hys        0,6 K
③ +Gradient   1,0 K
On      0
On      0 %

```

The surrounded numbers refer to the corresponding passages in the descriptive text. The operation status and the alarm status of the reheats are displayed in the last lines.

Added heat capacities



C7000

The corresponding commands:

- ① eheat 1 start 0,2
- ② eheat 1 hys 0,7
- ③ eheat 1 grad 0,9
- ④ eheat 1 commonalarm 1
- ⑤ eheat 1 alarmdelay 3
- ⑥ eheat 1 alarmprio 3

- ① gasheat 1 start 1,3
- ② gasheat 1 hys 0,6

- ① pwwheat 1 start 1,3
- ② pwwheat 1 hys 0,6
- ③ pwwheat 1 grad 0,5

Times are entered in seconds.

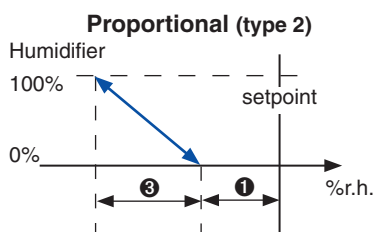
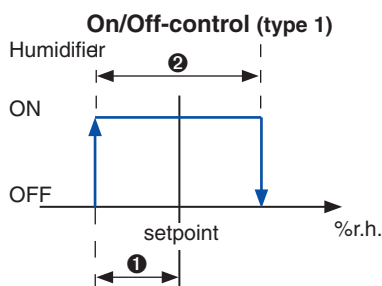
The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

E4

Control

return Humidifier	
STARTHUM.	0.0%
HYST.	5.0%
GRADIENT	10.0%
ALARM COMMON	-1-
ALARM DELAY	0055
ALARM PRIO.	00
STLILZ MORE 0 255 11 54	



return Humidifier	
CONDUCT.	COMMON DELAY PRIO.
05	-0- 300S 00
20	-1- 300S 00
STLILZ 0 255 11:54	

Humidification
Humidifier

Depending on which humidifier type you have, different parameters are decisive.

The start humidity for every humidifier is entered as a negative difference to the room humidity setpoint. **1**

The hysteresis for the humidifier stop is only valid for humidifiers with on/off-control. **2**

For proportional humidifiers you can adjust a gradient, which determines the humidity range in which the humidifying capacity increases from 0 to 100%. **3**

You can adjust, if the humidifier alarm releases a common alarm (0=no, 1=yes). **4**

The humidifier alarm delay can be adjusted in seconds. **5**

Setting the priority for the humidifier alarm **6** means assigning the corresponding alarm to an alarm relay with the adjusted number.

In the following window you can adjust the three parameters: common alarm **4a 4b**, alarm delay **5a 5b** and alarm priority **6a 6b** for the conductivity alarm at 5µS and at 20µS.

These alarms are available with the application of a conductivity measuring instrument, which is required to control the water conductivity for Ultrasonic humidifiers.

C7000 PT2

d2

./Humidifier 1 □ 27	
1 →Start	0,0 %rF
2 +Hys	10,0 %rF
3 +Gradient	10,0 %
4 +Com alarm	1
5 +Alarm del	5 s
6 +Alarm pri	6
On	0
On	0 %
Humi 1 al	0

The surrounded numbers refer to the corresponding passages in the descriptive text.

The operation status and the alarm status of the humidifier are displayed in the last lines.

C7000

The corresponding commands:

- | | |
|-------------------------------|----------------------------------|
| 1 humi 1 start 7,3 | 4a humi 1 commonalarm5 1 |
| 2 humi 1 hys 9,0 | 5a humi 1 alarmdelay5 6 |
| 3 humi 1 grad 10,0 | 6a humi 1 alarmprio5 5 |
| 4 humi 1 commonalarm 1 | 4b humi 1 commonalarm20 1 |
| 5 humi 1 alarmdelay 6 | 5b humi 1 alarmdelay20 6 |
| 6 humi 1 alarmprio 5 | 6b humi 1 alarmprio20 5 |

Times are entered in seconds.

The surrounded numbers refer to the corresponding passages in the descriptive text.

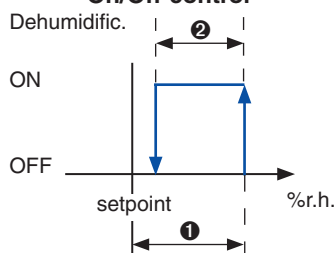
C7000 Advanced

E6

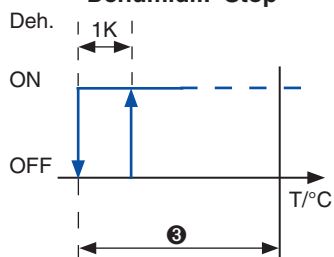
Control

return Dehumidific.			
STARTHUM.			30.0%
HYST.			5.0%
DEHUM. -STOP			5.0K
GE/CW VALVE MIN 05°C			
GE/CW VALVE MAX 14°C			
STULZ 31 255 11:03			

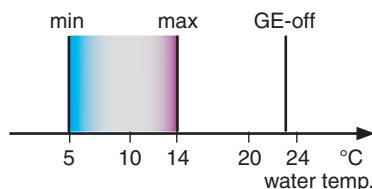
On/Off-control



Dehumidif. -Stop



Dehumidification range

Humidification
Dehumidification (Part 1)

The start humidity for dehumidification is entered as a positive difference to the room humidity setpoint. ❶

The hysteresis for the dehumidification stop is entered in the 2nd line. ❷

To avoid a feedback circle of dehumidification and cooling, where the sinking temperature arouses an increased relative humidity which entails again dehumidification, you can adjust a stop temperature, which is entered as a negative difference to the air temperature setpoint. ❸

With a fixed hysteresis of 1 Kelvin the dehumidification is switched on again, when the room temperature rises.

Adjusting the water temperature limits for the dehumidification refers to the possibility of dehumidifying the air by the free cooling coil with fan speed reduction. ❹ ❺

If the water temperature limits are exceeded, the controller commutes to dehumidification by compressor operation. see detailed description next page.

Note:

The dehumidification fan speed is adjusted in the Air/Fan-menu.

C7000 PT2

e2

	Function/Dehum	□ 27
❶	→Start	10,0 %rF
❷	+Hys	5,0 %rF
❸	+Stop	5,0 K
❹	+Wat min	5,0 °C
❺	+Wat max	14,0 °C
	On	0

The surrounded numbers refer to the corresponding passages in the descriptive text.

The operation status of the dehumidification is displayed in the last line.

C7000

The corresponding commands:

- ❶ dehum start 7,0
- ❷ dehum hys 7,0
- ❸ dehum stop 2,0
- ❹ dehum min 4
- ❺ dehum max 10

The surrounded numbers refer to the corresponding passages in the descriptive text.

Dehumidification (Part 2)

There two ways of realizing a dehumidification:

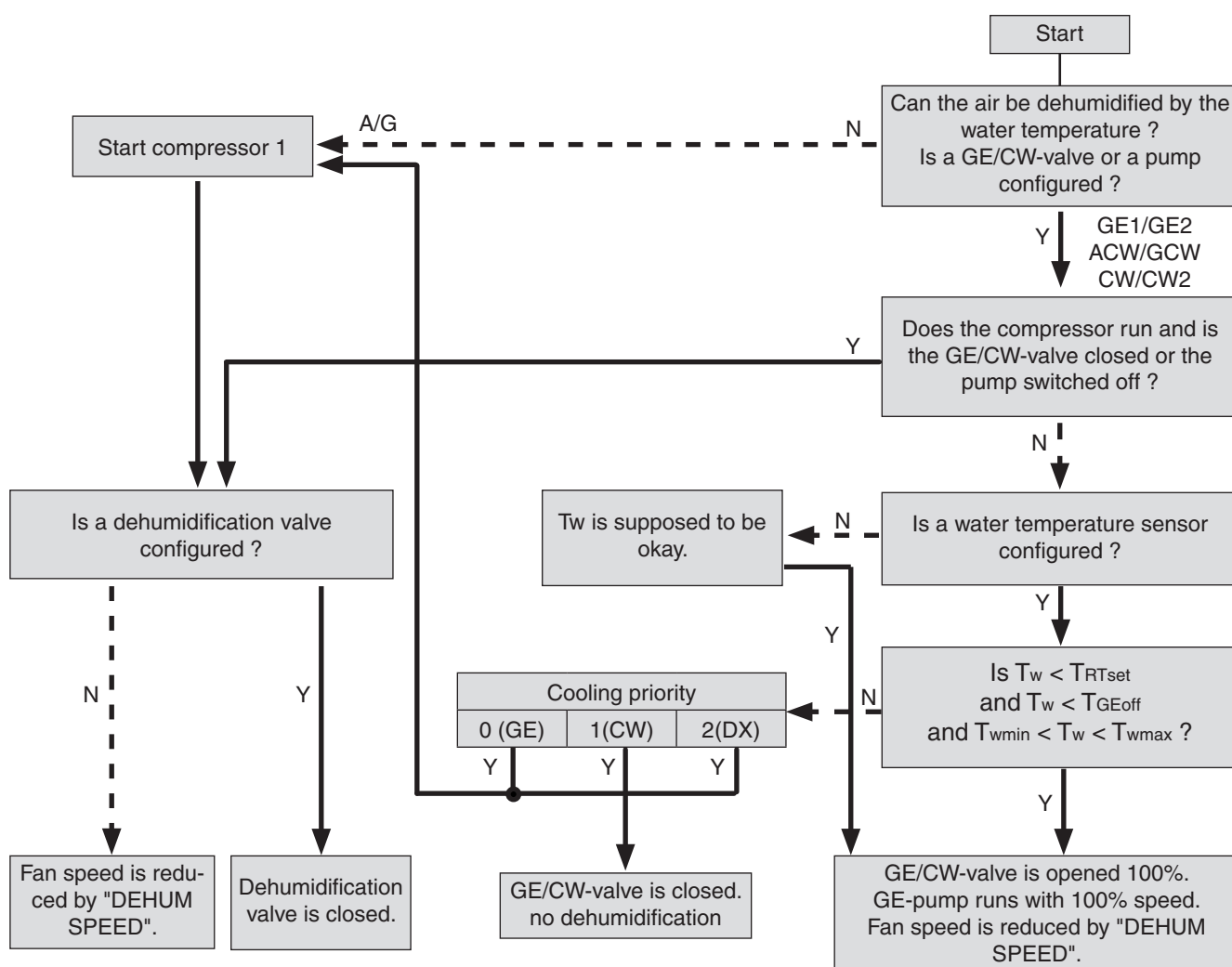
1. by reducing the fan speed, this is the only way of dehumidification for CW-units. 2. by shutting down a part of the evaporator via a solenoid valve.

The choice of the dehumidification type is made by the controller according to the following conditions: The priority lies on reducing the fan speed. This is the case for ACW/GCW/GE-units in mixed operation. Only if the compressor is actually in operation and if a dehumidification valve is present, the 2nd way of dehumidification is chosen. The two dehumidifying ways are never applied simultaneously. (see table 2)

The decision procedures of the controller are displayed in detail in the scheme below.

Table 2

Fan speed reduction	Dehum. valve
A, G, ACW, GCW, GE units without dehum. valve (e. g. CyberAir-size 1)	A,G units
ACW, GCW, GE units in mixed op. and 100% free cooling	ACW, GCW, GE units in 100% compressor operation
CW units	



Legend:

- T_w - Water temperature
- T_{RTset} - Room temperature set point
- T_{GEoff} - upper water temperature limit for GE-operation
- T_{wmin} - lower water temperature limit for dehumidification
- T_{wmax} - upper water temperature limit for dehumidification



C7000 Advanced

D5

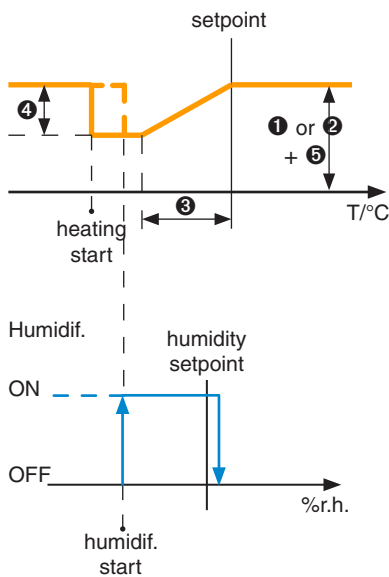
Control

return	Fan		
SPEED	MAX DX	085%	
STARTTEMP.		0.1K	
STARTSPEED		00%	
OFFSET		0%	
MIN.-SPEED		15%	
	COMMON	DELAY	PRI0.
ALARM	-1-	010 S	03
FILTER	-1-	020 S	05
	MORE		

STULZ

31 255 11:04

Fan speed



*In the C7000AT the CW-maximum speed is actually located in the sixth line of the second menu.

Air
Fan (Part 1)

The maximum fan speed can be set in accordance to the calculated required airflow. ①② Distinction DX/CW see the next but one page. *

The start temperature is entered as a negative difference to the air temperature setpoint. ③

The start fan speed is entered as a percentage of reduction from the maximum speed. ④

This reduced fan speed is gradually obtained with a decreasing temperature from the room temperature setpoint to the adjusted temperature difference ③ below the setpoint. However, when heating or humidification is requested, the airflow is increased to its original value.

The offset is used to adapt the airflow to unexpected conditions on the site (lower/higher pressure loss). ⑤

The minimum speed, which you can adjust here, can only be bypassed by the adjustment in "REDUCE SPEED". ⑥

You can adjust, if the airflow failure alarm releases a common alarm (0=no, 1=yes). ⑦

You can adjust, if the filter alarm starts a common alarm. ⑦a

The airflow alarm delay can be adjusted the same as the filter alarm delay. ⑧, ⑧a

Setting the priorities for the airflow alarm ⑨ and the filter alarm ⑨a means assigning the corresponding alarm to an alarm relay with the adjusted number.

C7000 PT2

f2

	Air /Fan 1	□ 27
①	→nMax	85,0 %
②	+nMaxCW	85,0 %
③	+Starttemp	0,0 K
④	+Startspee	0,0 %
⑤	+Offset	0,0 %
⑥	+Min.speed	60,0 %
⑦	+Com alarm	1
⑧	+Alarm del	2 s
⑨	+Alarm pri	1
⑦a	+Co al fil	1
⑧a	+Al del fil	20 s
⑨a	+Al pr fil	1
	+100% spee	5 s
	+Pre-start	10 s
	+Over-run	10 s
	+Redu time	30 min
	+Speed red	0,0 %
	+Filter of	0,0 %
	+Redu dehu	0,0 %
	+Reduc UPS	0,0 %
	On	0,0
	On	0,0 %
	Fan 1 al	0
	Filt 1 al	0

The surrounded numbers refer to the corresponding passages in the descriptive text.

The darkened items will be explained on the next page.

The operation status, the alarm status of the fan and the filter alarm status are displayed in the last lines.

C7000

The corresponding commands:

- | | |
|--------------------------|-----------------------------|
| ① fan 1 nmax 85 | ⑧ fan 1 alarmdelay 6 |
| ② fan 1 nmaxcw 90 | ⑧a fan 1 filteralarmdelay 6 |
| ③ fan 1 start 3 | |
| ④ fan 1 speed 15 | ⑨ fan 1 alarmprio 3 |
| ⑤ fan 1 offset -5 | ⑨a fan 1 filteralarmprio 4 |
| ⑥ fan 1 min 60 | |
| ⑦ fan 1 commonalarm 1 | |
| ⑦a fan 1 commonalarmfi 1 | |

Times are entered in seconds.

The surrounded numbers refer to the corresponding passages in the descriptive text.

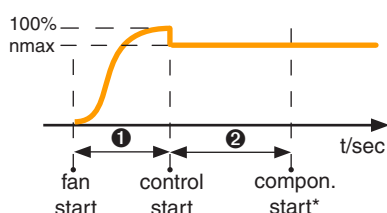
C7000 Advanced

D6

Control

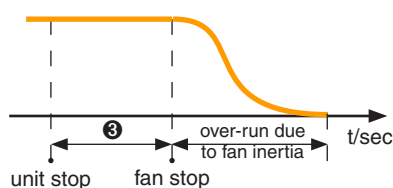
return	Fan
START 100%	0055
PRERUN TIME	0105
HUNTING TIME	0605
REDUCE TIME	030MIN
REDUCE SPEED	000%
MAX. CW	085%
FILT. OFFSET	00%
	MORE

Fan start phase

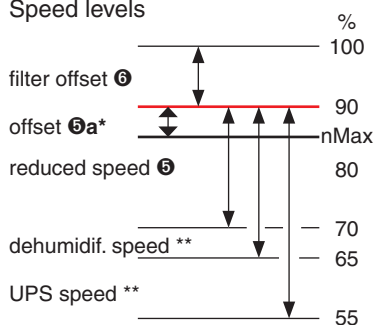


*start of all other control-relevant components except the glycol pump, which can be started earlier.

Fan stop phase



Speed levels



*this item refers to the previous page.

** these parameters are explained on the next but one page.

Air
Fan (Part 2)

With the parameter "START 100%" ① you adjust a time which must elapse before the control begins. This way an airflow alarm is avoided which could occur due to the fan inertia. During this time the fan is operated with 100% speed.

By the "PRERUN" parameter ② you adjust the delay for the inhibited start of all components, except the glycol pump, in relation to the control start with alarm monitoring. This way the Pre-run parameter has the effect of an A/C unit start delay. By different pre-runtimes for different units it is avoided that the most current consuming components start simultaneously and overcharge the power supply of the building.

The fan over-run time ("HUNTING TIME") ③, which you can adjust, serves to reject hot or cold air in the A/C unit and avoids an accumulation of heat at the reheat or of cold at the evaporator.

If during a time which you adjust with "REDUCE TIME" ④ no action (cooling, heating, humidification, dehumidification) has been taken, the fan speed is reduced by the percentage which you adjust with "REDUCE SPEED" ⑤.

The "FILTER OFFSET" ⑥ is entered as a positive difference to the maximum speed. If a filter alarm is released, the maximum speed will be increased by the filter offset in order to overcome the higher resistance of a clogged filter.

C7000 PT2

f2

Air /Fan 1	□ 27
→nMax	85,0 %
+nMaxCW	85,0 %
+Starttemp	0,0 K
+Startspee	0,0 %
+Offset	0,0 %
+Min.speed	60,0 %
+Com alarm	1
+Alarm del	2 s
+Alarm pri	1
+Co al fil	1
+Aldel fil	20 s
+Al pr fil	1
① +100% spee	5 s
② +Pre-start	10 s
③ +Over-run	10 s
④ +Redu time	30 min
⑤ +Speed red	0,0 %
⑥ +Filter of	0,0 %
⑦ +Redu dehu	0,0 %
⑧ +Reduc UPS	0,0 %
On	0,0
On	0,0 %
Fan 1 al	0
Filt 1 al	0

The surrounded numbers refer to the corresponding passages in the descriptive text.

The operation status, the alarm status of the fan and the filter alarm status are displayed in the last lines.

C7000

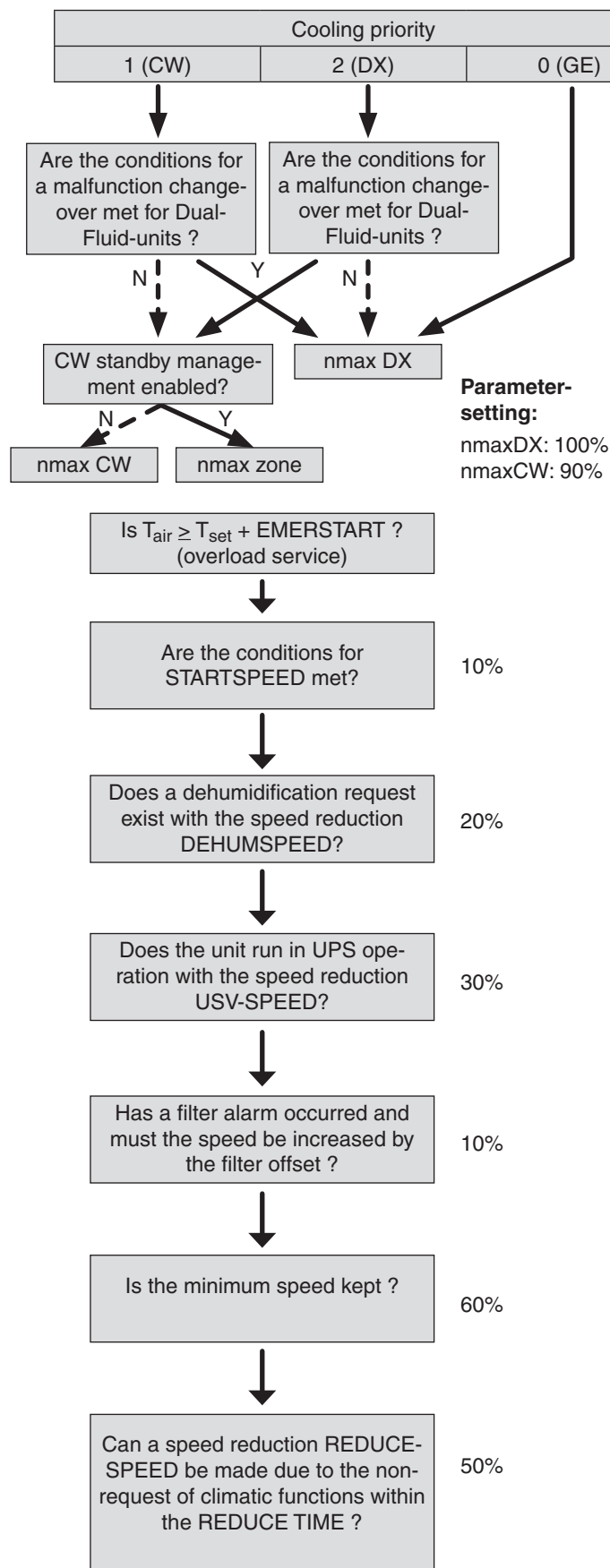
The corresponding commands:

- ① fan 1 100 5
- ② fan 1 pre 15
- ③ fan 1 after 20
- ④ fan 1 redtime 30
- ⑤ fan 1 redspeed 20
- ⑥ fan 1 filteroffset 15

Times are entered in seconds.
(except the reducing time which is entered in minutes)

The surrounded numbers refer to the corresponding passages in the descriptive text.

Fan (Part 3) - Calculating the fan speed



The following processes of decision are passed through by the controller for the fan speed calculation.

The fan speed $n_{\max DX}$ or $n_{\max CW}$ is chosen according to the cooling priority and the conditions for a malfunction change-over. (details for the cooling priority, see page 83)

Then 4 queries are passed, which entail a multiplication of the speed with a factor, if positively answered. Finally the algorithm checks whether the minimum speed is kept and whether the conditions for the REDUCE SPEED are kept, which can bypass the minimum speed as the sole reduction.

Example 1:

$n = n_{\max DX}$

supposing: condition not ok
 $n = n_{\max DX} = 100\%$

supposing: condition ok
 $n = 100\% \times (100\% - 10\%)$
 $n = 90\%$

supposing: condition ok
 $n = 90\% \times (100\% - 20\%)$
 $n = 72\%$

supposing: condition ok
 $n = 72\% \times (100\% - 30\%)$
 $n = 50,4\%$

supposing: condition ok
 $n = 50,4\% \times (100\% + 10\%)$
 $n = 55,44\%$

condition not ok
 because $n \leq 60\%$
 so $n = 60\%$

condition not ok
 because of dehumidific.
 $n = 60\%$

Example 2:

$n = n_{\max CW}$

supposing: condition not ok
 $n = n_{\max CW} = 90\%$

supposing: condition ok
 $n = 90\% \times (100\% - 10\%)$
 $n = 81\%$

supp.: condition not ok
 $n = 81\%$

supp.: condition not ok
 $n = 81\%$

supposing: condition ok
 $n = 81\% \times (100\% + 10\%)$
 $n = 89,1\%$

condition ok
 so $n = 89,1\%$

supposing: condition ok
 $n = 89,1\% \times (100\% - 50\%)$
 $n = 44,55\%$

Legend: \longrightarrow yes \dashrightarrow no \downarrow next step

C7000 Advanced

D6

Control

return Fan	
DEHUM. SPEED	00%
UPS-SPEED	00%
CYCLE	055
MAX. ADJUST	02%
CTRL-FACTOR	04
EMERG. START	0.7K
EMERG. END	2.0K
EMERG. SPEED	095%
STULZ	0 255 11:58

Air
Fan (Part 4)

The "DEHUM.SPEED" ❶ is entered as a negative difference in % to the maximum speed. This is the fan speed for the first way of dehumidification.

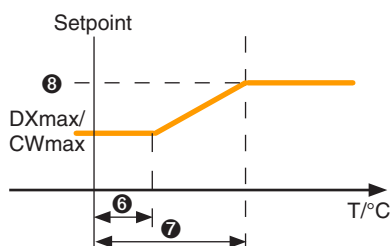
The "UPS SPEED" ❷ is also entered as a negative difference in % to the maximum speed. Receiving a UPS-signal the controller will apply this reduced speed for an emergency operation.

The parameters:

- control cycle ❸
- max. control correction ❹
- control factor ❺

are only necessary for the GE2p-control, which is explained in a separate manual.

Fan speed



If the A/C unit is operated during nominal operation with a low airflow, the fan speed can be raised, when the temperature setpoint is exceeded. The fan speed increase depends on the temperature difference to the setpoint.

For this you adjust a positive temperature difference ❸ to the setpoint, which represents the start point of the speed increase.

Then you adjust a maximum speed ❹ for the overload operation and another temperature difference ❼ to the setpoint, which marks the end of the proportional fan speed increase. Having attained the second temperature difference, the fan is operated with the maximum speed for the overload operation. This speed is kept even if the temperature continues to rise.

C7000 PT2

C7000

The corresponding commands:

- ❶ fan 1 dehum 25
- ❷ fan 1 ups 35
- ❸ fan 1 concyc 8
- ❹ fan 1 maxc 2
- ❺ fan 1 fact 2
- ❻ fan 1 emerstart 0,7
- ❼ fan 1 emerend 2,0
- ❽ fan 1 emermax 95

Times are entered in seconds.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

D7

Control

```

return Louver
DELAY 030 S
STULZ 31 255 11:07

```

Air
Louver

The pre-start serves to open the louver before the fan operation starts. This way a fan operation against a closed louver is avoided. ❶

C7000 PT2

f3

❶

```

../Louver 1 □ 27
→Pre-start 90 s
Open 0

```

The operation status of the louver is displayed in the last line.

C6

```

return Sensor
Sensor 01
STULZ 0 255 11:59

```

Function
Sensor

In combination with these alarms a common alarm can be released. ❶❷

The alarm delay for the limit alarm ❷ as for the sensor failure alarm ❸ is entered in seconds.

The limit value alarms ❸ can be assigned to an alarm relay as the sensor failure alarm ❸.

With the trim offset you can calibrate the sensor with the help of a reference thermometer. ❷

Compare the display of the PHYSICAL VALUE with the value of the reference thermometer.

g2

❶

❷

❸

❹

❺

❻

❼

```

Sensor/Sensor 1 □ 27
→Com alarm 1
+Alarm del 5 s
+Alarm pri 1
+Com al SF 1
+Al del SF 5 s
+Al pri SF 1
+Adjust 0,0 °C
Actual 15,3 °C
Actual 8,9 mA
Sen 1 al 0
Sen 1 Br 0

```

The actual values, the limit alarm status and the sensor failure alarm status are displayed in the last lines.

The surrounded numbers refer to the corresponding passages in the descriptive text.

F7

```

return Sensor 01
COMMON DELAY PRIO.
LIMIT 0055 00
DEFECT -1- 0055 00
PHYS. VAL. 26.3
OFFSET 0.0
STULZ 0 255 11:59

```

C7

```

return Unitalarms
COMMON DELAY PRIO.
FIREALARM 0055 00
WATERDETECTOR-1- 0055 00
PHASE-FAILURE-1- 0055 00
STULZ 0 255 12 01

```

Unit alarms

Concerning the unit alarms fire alarm, water alarm and phase failure three parameters can be adjusted for each alarm.

Release of a common alarm (0/1) ❶a, alarm delay ❷a and alarm relay assignment ❸a (named priority).

C7000

The corresponding commands:

❶ louver 1 pretime 100

❶ sensor 1 alarmprio 2

❷ sensor 1 commonalarm 1

❸ sensor 1 alarmdelay 7

❹ sensor 1 alarmpriobr 3

❺ sensor 1 commonalarmbr 1

❻ sensor 1 alarmdelaybr 8

❼ sensor 1 trim 22,3

If, instead of a temperature, the expression "reset" is entered, the sensor calibration is deleted.

❶a fire commonalarm 1
❷a water alarmdelay 7
❸a phase alarmprio 8

Times are entered in seconds.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

D1

Control

return	Zone	01
Starttemp.	3.0K	
Hyst.	2.0K	
STULZ 0 255 12:01		

Zone

The parameters:

- Start temperature ❶
- Hysteresis ❷

are only necessary for the GE2p-control, which is explained in a separate manual.

E1

return	AT-Preferences	
Buzzer	-1-	
Buzzertone	006	
Temp.unit	°C	
Languages	English	
STULZ 0 255 12:02		

AT-Preferences

The acoustic signal which resounds in the case of an alarm and the beep for pressing a key can be switched off (0=off, 1= on). The pitch of the buzzertone can be adjusted as desired.

Further on you can adjust the temperature display in °C or °F ❶.

The operator language ❷ can also be selected.

F1

return	Control	
Temperature		
Humidity		
Module functions		
Zone		
AT-Preferences		
Password	0000	
STULZ 0 255 12:03		

Password

At this menu item you can adjust the password for the control level. This password is "0000" as default setting.

C7000 PT2

e1

❸	../Preferences	□ 27
❹	→°C/°F	0
	+Language	0

The surrounded numbers refer to the corresponding passages in the descriptive text.

°Celsius is adjusted by 0, °Fahrenheit by 1.

You can choose between two languages: 0 for English, 1 for German

C7000

The corresponding commands:

- ❶ zone 1 gestart 3,0
- ❷ zone 1 gehys 2,0

- ❸ unit c / unit f

- ❹ language e / language g

c for °Celsius, f for °Fahrenheit
e for English, g for German

The surrounded numbers refer to the corresponding passages in the descriptive text.

6.3 Service level

6.3.1 Service overview - C7000 Plus

h

i

Service ☐ 27
 →Equipment
 Gen. settings
 Data
 Manual operation
 Defaultsetting

../Equipment ☐ 27
 →Cool
 Heat
 Humi
 Air
 Sensor
 Aux Ports

../Cool ☐ 27
 →Compressor 1
 Compressor 2
 Suction valve 1
 Suction valve 2
 GE/CW-valve
 G-valve
 Drycooler 1
 Drycooler 2
 Drycooler 3
 Drycooler 4
 Pump 1
 Pump 2
 Pump 3
 Pump 4

../Compressor 1 ☐ 27
 →Conf 0
 +Dig out 2
 +Alarm in 2
 +LP al in 3
 +Runtime 1535 h

70

../Suction val 1 ☐ 27
 →Conf 0
 +Ana out 4

71

../Heat ☐ 27
 →E-Heat 1
 E-Heat 2
 E-Heat 3
 E-Heat 4
 Hotgas reheat
 HW reheat

../E-Heat 1 ☐ 27
 →Conf 1
 +Type 0
 +Dig out 14
 +Alarm in 20
 +Runtime 0 h

74

../Hotgas reheat ☐ 27
 →Conf 0
 +Dig out 4

74

../Drycooler 1 ☐ 27
 →Conf 0
 +Dig out 8
 +Alarm in 12
 +Runtime 0 h

72

../GE/CW-valve ☐ 27
 →Conf 0
 +Ana out 1 2
 +Ana out 2 3
 +Dig in 0

71

../G-valve ☐ 27
 →Conf 0
 +Ana out 1

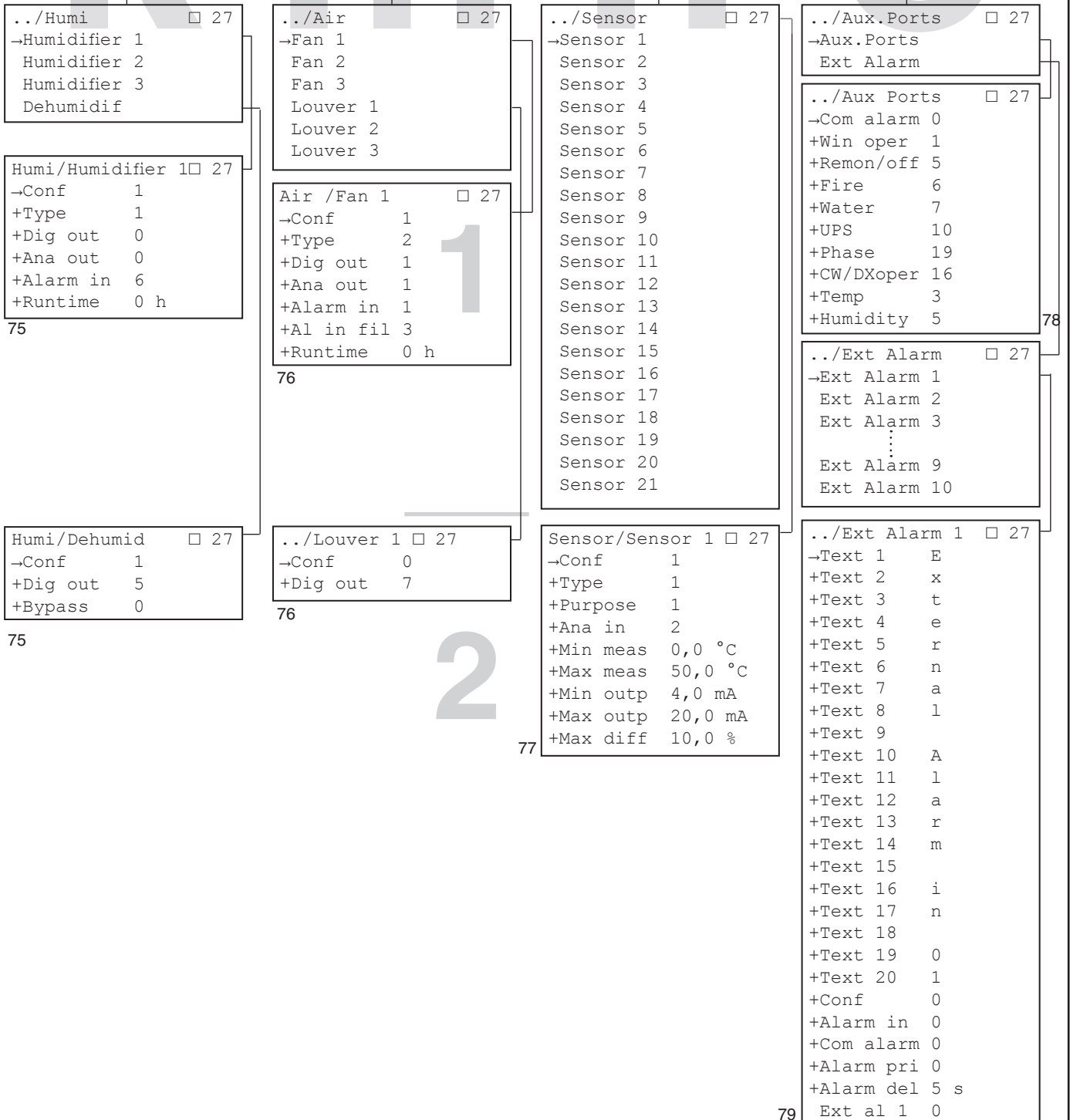
71

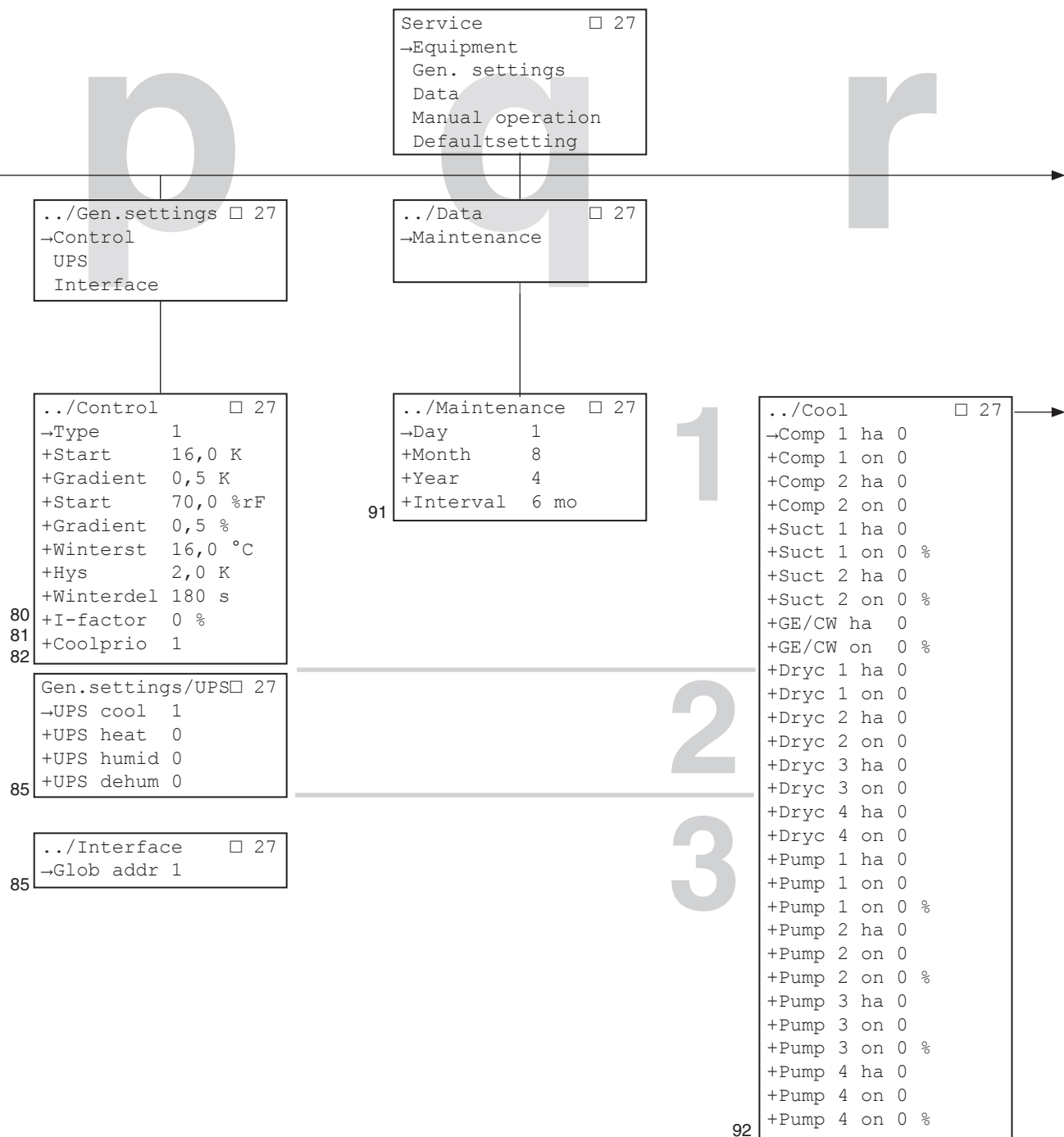
Cool/Pump 1 ☐ 27
 →Conf 1
 +Type 0
 +Dig out 10
 +Ana out 10
 +Alarm in 10
 +Runtime 0 h
 +Partner U 0
 +Partner P 0

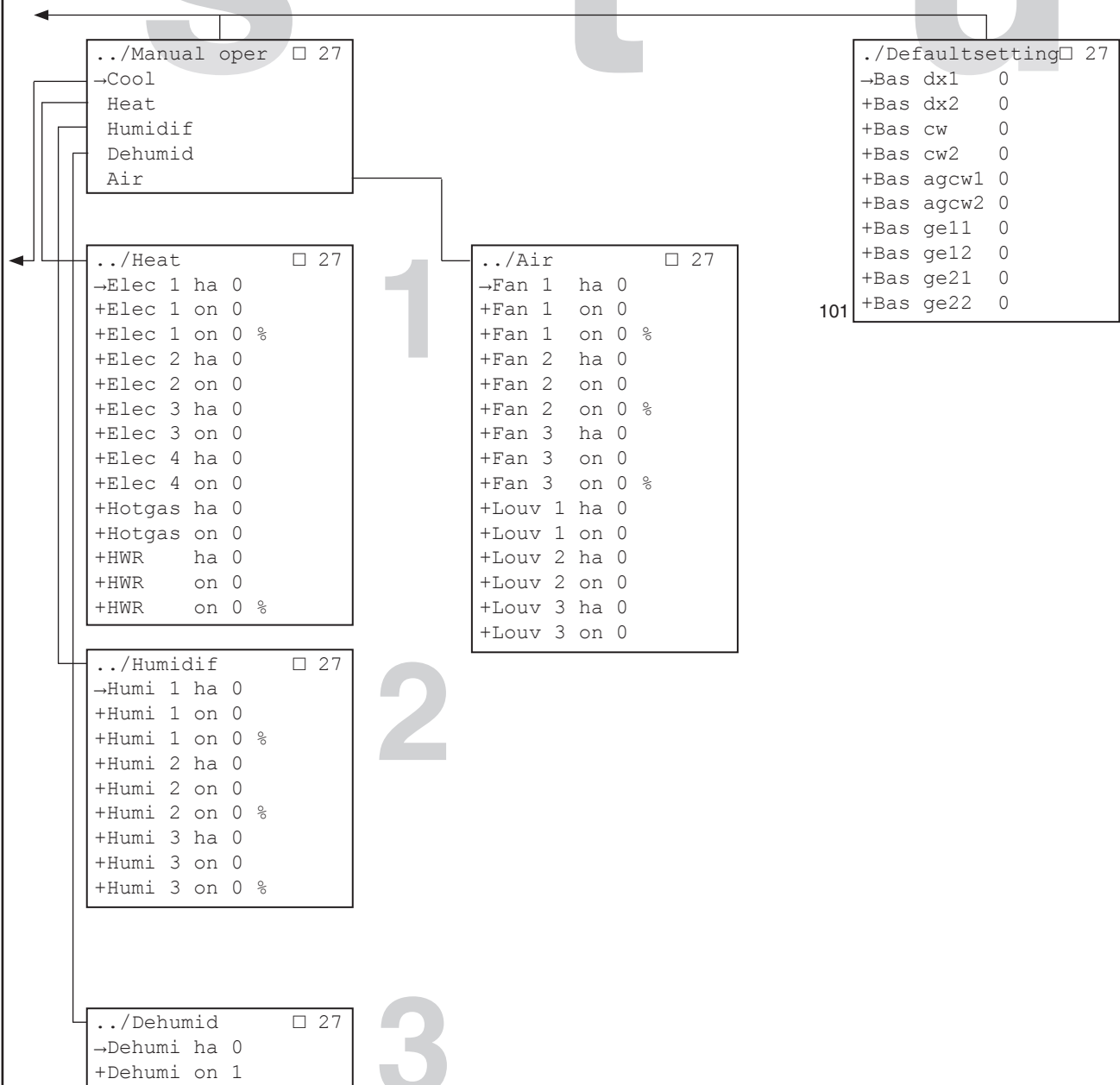
73

Heat/HW reheat ☐ 27
 →Conf 1
 +Type 0
 +Dig out 14
 +Ana out 8

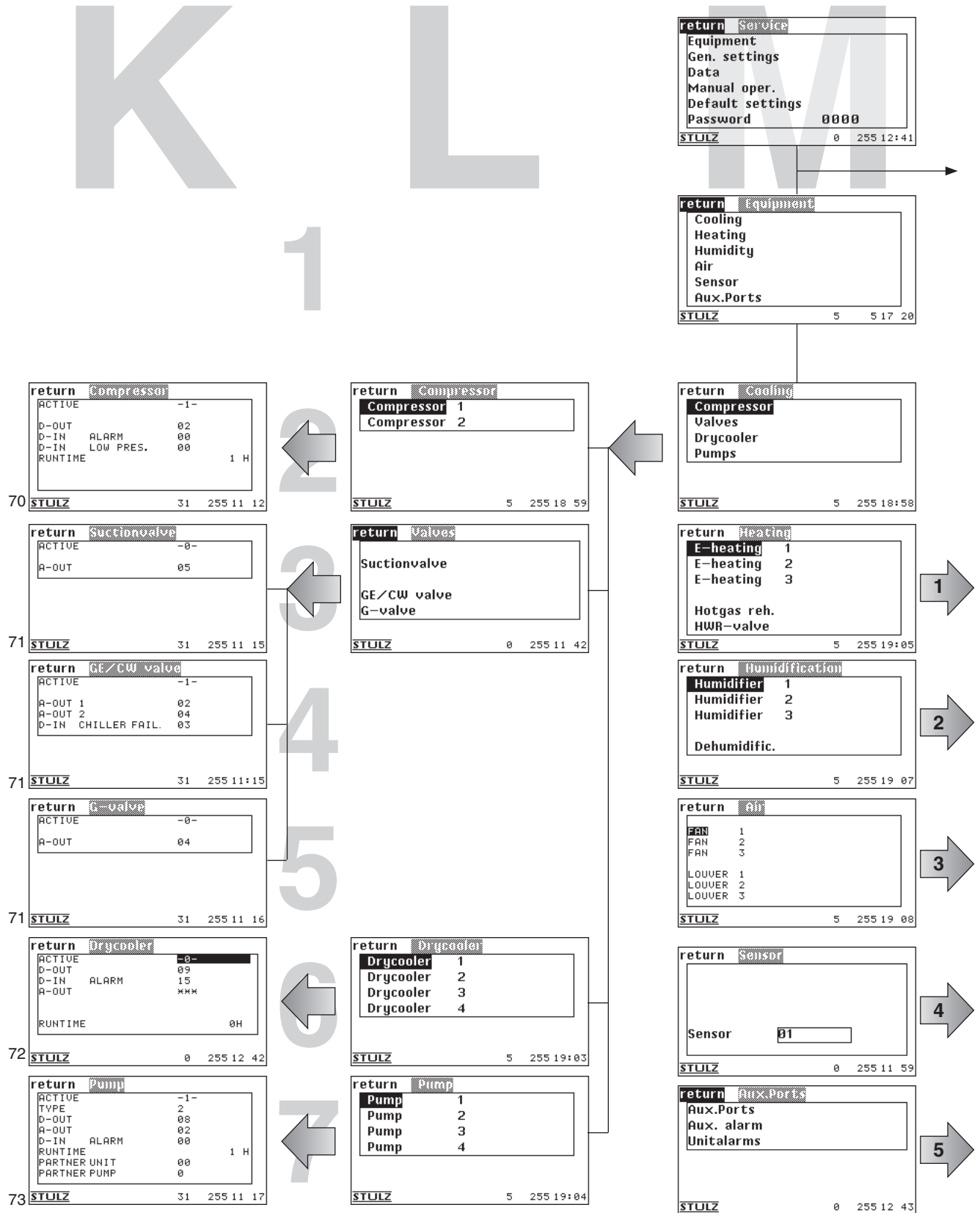
74

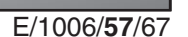






6.3.2 Service overview - C7000 Advanced





return Service
 Equipment
 Gen. settings
 Data
 Manual oper.
 Default settings
 Password 0000
 STULZ 0 255 12:41

return Gen. settings
 Control
 UPS
 Interfaces
 Sequencing
 STULZ 0 255 12:51

return Data
 Runtime
 datalog
 Maintenance
 STULZ 0 255 12:57

return Control
 Control type
 Parameters
 STULZ 5 5 17:52

return Control
 Control type
 Room
 Parameters
 STULZ 5 5 17:56

return Runtime
 FUNCTION
 COMPRESSOR
 FAN
 E-HEATING
 PUMP
 HUMIDIFIER
 DRYCOOLER
 STULZ 5 5 18:02

return UPS
 Cooling -1-
 Heating -0-
 Humidification -1-
 Dehumidific. -1-
 STULZ 31 255 11 34

return Parameters
 STARTTEMP. 16.0°C
 GRADIENT 5.0K
 STARTRUM. 70.0%
 GRADIENT 0.5%
 OVERLOADSTART 0.0K
 MORE
 STULZ 0 255 12 52

return datalog
 1
 TYPE ROOMTEMP. 0MIN
 PERIOD
 2
 TYPE ROOMHUM. 0MIN
 PERIOD
 STULZ 0 255 12:58

return Interfaces
 glob. address 1
 STULZ 0 255 12 53

return Parameters
 WINTER START 16.0°C
 HVST. 2.0 K
 WINTERDELAY 180 S
 INTEGRAL FACTOR 00%
 COOL. PRIO. 0
 STULZ 1 255 10 55

return Maintenance
 MAINT. INTERVALL 006MON
 LAST MAINT. 01.08.04
 MAINT. DONE
 STULZ 31 255 11 40

return Sequencing
 ZONE 01
 CYCLETIME 00 1H
 ERRORUNITS 00
 EMERTEMP 16.0°C
 MAX FANSPEED 067%
 TEST -0-
 CW-ENERGY-SAVE -0-
 STULZ 0 255 12:51

return Runtime
 UNIT RESET
 STOPTIME 2H
 COOLING 0H
 HEATING 0H
 HUMIDIFICATION 0H
 DEHUMIDIFIC. 0H
 FREECOOLING ***
 MIXMODE ***
 STULZ 0 255 12 56

return Runtime
 COMPRESSOR 1 RESET
 COMPRESSOR 2 RESET
 STULZ 31 255 11:36

return Runtime
 FAN 1 RESET
 FAN 2 RESET
 FAN 3 RESET
 STULZ 31 255 11 37

etc.

return Service

Equipment
Gen. settings
Data
Manual oper.
Default settings
Password 0000

STULZ 0 255 12:41

return Manual oper.

Cooling
Heating
Humidity
Air
Sensor
Aux.Ports

STULZ 0 255 12 59

return Default settings

ALL PARAMETERS WILL BE
SET TO A DEFAULT VALUE.
CHOOSE CONFIGURATION OR
-- TO ABORT.

STULZ 5 5 14 48

return Service

Equipment
Gen. settings
Data
Manual oper.
Default settings
Password 0000

101 STULZ 0 255 13 03

return Cooling

Compressor
Valves
Drycooler
Pumps

STULZ 5 255 18:58

return Manual oper.

COMPRESSOR	EN.	STATE
01	-0-	-1-
02	-0-	-1-

STULZ 31 255 16 22 92

return Manual oper.

E-HEATING	EN.	STATE
01	-1-	-1-
02	-1-	-0-
03	-0-	-0-

HOTGAS REH. -1- -1-
HWR HEATING -0- -0-

92 STULZ 31 255 16 33

return Manual oper.

	EN.	VALUE
SUCTIONVALUE	-0-	000%
GE/CW VALVE	-0-	000%
S-VALVE	-0-	000%

STULZ 31 255 16:27 92

return Manual oper.

HUMIDIFIER	EN.	STATE	VALUE
01	-1-	-1-	075%
02	-0-	-0-	000%
03	-0-	-0-	000%

DEHUMIDIFIC. -0- -0-

92 STULZ 31 255 11:43

return Manual oper.

DRYCOOLER	EN.	STATE
01	-1-	-1-
02	-1-	-0-
03	-0-	-0-
04	-0-	-0-

STULZ 31 255 16:29 92

return Manual oper.

FAN	EN.	STATE	VALUE
01	-1-	-1-	096%
02	-0-	-0-	000%
03	-0-	-0-	000%

LOUVER

01	-0-	-0-
02	-0-	-0-
03	-0-	-0-

92 STULZ 31 255 11 44

return Manual oper.

PUMPS	EN.	VALUE
01	-1-	060%
02	-1-	090%
03	-0-	000%
04	-0-	000%

STULZ 31 255 16 31 92

return Sensor

Sensor 01

STULZ 0 255 11 59

return Manual oper.

SENSOR	EN.	VALUE
01	-0-	0.0

STULZ 0 255 13 00 92

return Aux. alarm

Aux. alarm 01

STULZ 0 255 12:47

return Manual oper.

EXTERNER_ALARM_IN_01

ALARM	EN.	STATE
01	-0-	-0-

STULZ 0 255 13:02 92

C7000 Advanced

K2

Service

return Compressor			
ACTIVE		-1-	
D-OUT		02	
D-IN	ALARM	00	
D-IN	LOW PRES.	00	1 H
RUNTIME			
STULZ 31 255 11 12			

Cooling
Compressor

In the first line you add the compressor to the configuration by entering "1". With "0" you disable the compressor although all settings concerning the compressor are kept. ❶

You can determine a digital output for the compressor on/off signal. ❷

The digital input for the compressor alarm can be assigned in the third line. ❸

The digital input for the low pressure alarm can be assigned in the fourth line. ❹

The compressor runtime can be adjusted in the last line. ❺

C7000 PT2

i1

../Compressor 1 □ 27	
❶ →Conf	0
❷ +Dig out	2
❸ +Alarm in	2
❹ +LP al in	3
❺ +Runtime	1535 h

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000

The corresponding commands:

- ❶ comp 1 conf 1
- ❷ comp 1 dout 3
- ❸ comp 1 alarm 5
- ❹ comp 1 alarmlp 7
- ❺ comp 1 runtime 10

Times are entered in hours.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

K3

Service

return Suctionvalve	
ACTIVE	-0-
A-OUT	05
STULZ 31 255 11 15	

Valves
GE-CW valve

In the first line you add the suction valve to the configuration by entering "1". With "0" you disable the suction valve. ❶
With the parameter "A-OUT" you adjust the analogous output of the proportional signal for the suction valve. ❷

K4

return GE/CW valve	
ACTIVE	-1-
A-OUT 1	02
A-OUT 2	04
D-IN CHILLER FAIL.	03
STULZ 31 255 11:15	

GE/CW-valve

In the first line you add the GE/CW-valve to the configuration by entering "1". With "0" you disable the GE/CW valve. ❸
With the parameters "A-OUT 1" and "A-OUT 2" you adjust the first and second analogous output of the proportional signal for the GE/CW-valve. ❹❺ Two GE/CW-valves exist in A/C-units of the CW2-type only.
The digital input, which receives the signal for the commutation from output 1 to output 2, can be assigned in the last line. ❻
With the reception of the signal the alarm message "CHILLER FAILURE" is displayed.

K5

return G-valve	
ACTIVE	-0-
A-OUT	04
STULZ 31 255 11 16	

G-valve

In the first line you add the G-valve to the configuration by entering "1". With "0" you disable the G-valve. ❷
With the parameter "A-OUT" you adjust the analogous output of the proportional signal for the G-valve. ❸

C7000 PT2

i2

./Suction val 1 □ 27	
❶ →Conf	0
❷ +Ana out	4

i3

../GE/CW-valve □ 27	
❸ →Conf	0
❹ +Ana out 1	2
❺ +Ana out 2	3
❻ +Dig in	0

i4

../G-valve □ 27	
❷ →Conf	0
❸ +Ana out	1

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000

The corresponding commands:

- | | |
|---------------------|-----------------|
| ❶ suctionv 1 conf 1 | ❷ gvalve conf 1 |
| ❷ suctionv 1 aout 3 | ❸ gvalve aout 4 |
| ❸ gecwv conf 1 | |
| ❹ gecwv aout1 3 | |
| ❺ gecwv aout2 4 | |
| ❻ gecwv din 17 | |

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

K6

Service

return Drycooler	
ACTIVE	-0-
D-OUT	09
D-IN ALARM	15
A-OUT	***
RUNTIME	0H
STULZ 0 255 12 42	

Cooling
Drycooler

In the first line you add the drycooler to the configuration by entering "1". With "0" you disable the drycooler. ❶

With the parameter "D-OUT" you determine a digital output for the drycooler on/off signal. ❷

The digital input for the drycooler alarm can be assigned by the "D-IN" parameter. ❸

The drycooler runtime can be set in the last line. ❹

Note:

For the dry cooler control, the configuration of an outside temperature sensor and a water temperature sensor is required.

C7000 PT2

h3

	../Drycooler 1	<input type="checkbox"/> 27
❶	→Conf	0
❷	+Dig out	8
❸	+Alarm in	12
❹	+Runtime	0 h

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000

The corresponding commands:

- ❶ drycool 1 conf 1
- ❷ drycool 1 dout 10
- ❸ drycool 1 alarm 5
- ❹ drycool 1 runtime 150

Times are entered in hours.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

K7

Service

return	Pump
ACTIVE	-1-
TYPE	2
D-OUT	08
A-OUT	02
D-IN ALARM	00
RUNTIME	1 H
PARTNER UNIT	00
PARTNER PUMP	0
STULZ	31 255 11 17

Cooling
Pumps

By setting the parameter "ACTIVE" on 1 you add a pump to the configuration. With "0" you disable the pump. ❶

In the next line you determine which type the pump shall belong to (1 = G-pump, which conveys the medium through the condenser in a GE2-unit, 2 = GE-pump, which conveys the medium through the free cooling coil in a GE2-unit, 3 = Glycol-pump - all pumps for G-, GE1 units which are located outside the A/C unit). ❷

With the parameter "D-OUT" you determine a digital output for a glycol pump on/off signal. ❸

With the parameter "A-OUT" you adjust the analogous output of the proportional signal for a G/GE-pump. ❹

The digital input for the pump alarm can be assigned by the "D-IN" parameter. ❺

The pump runtime can be set in the next line. ❻

For glycol pumps you can enable a sequencing based on time and failure. With "partner unit" ❼ and "partner pump" ❽ you select the number of the 2nd pump and the ID of the unit from which this pump is controlled.

C7000 PT2

h4

	Cool/Pump 1	<input type="checkbox"/> 27
❶	→Conf	1
❷	+Type	0
❸	+Dig out	10
❹	+Ana out	10
❺	+Alarm in	10
❻	+Runtime	0 h
❼	+Partner U	0
❽	+Partner P	0

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000

The corresponding commands:

- ❶ pump 1 conf 1
- ❷ pump 1 type 2
- ❸ pump 1 dout 3
- ❹ pump 1 aout 4
- ❺ pump 1 alarm 3
- ❻ pump 1 runtime 60
- ❼ pump 1 partunit 17
- ❽ pump 1 partpump 1

Times are entered in hours.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

N1

Service

return E-heating	
ACTIVE	-1-
TYPE	1
D-OUT	03
D-IN ALARM	04
RUNTIME	0 H

STULZ 31 255 11:19

N2

return Hotgas reh.	
ACTIVE	-1-
D-OUT	04

STULZ 31 255 11:20

N3

return HWR-valve	
ACTIVE	-0-
TYPE	1
D-OUT	04
A-OUT	07

STULZ 31 255 11 20

Heating

E-heating/Hotgas reheat/Hot water reheat

By setting the parameter "ACTIVE" on 1 you add a reheat to the configuration. With "0" you disable the reheat. ❶

In the next line you determine the reheat type (1: reheat with on/off control, 2: reheat with proportional control). ❷

With the parameter "D-OUT" you determine a digital output for the reheat. As the proportional electric reheat is controlled by pulse width modulation, the reheat receives the control signal by the digital output. ❸

The digital input for the electric reheat alarm can be assigned by the "D-IN" parameter. ❹

The electric reheat runtime can be set in the last line. ❺

With the parameter "A-OUT" you adjust the analogous output of the proportional signal for the pww-valve of a pww-reheat. ❻

C7000 PT2

j2

.. /E-Heat 1 □ 27	
❶ →Conf	1
❷ +Type	0
❸ +Dig out	14
❺ +Alarm in	20
❻ +Runtime	0 h

j3

.. /Hotgas reheat □ 27	
❶ →Conf	0
❸ +Dig out	4

j4

Heat/HW reheat □ 27	
❶ →Conf	1
❷ +Type	0
❸ +Dig out	14
❹ +Ana out	8

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000

The corresponding commands:

- ❶ eheat 1 conf 1
- ❷ eheat 1 type 1
- ❸ eheat 1 dout 3
- ❺ eheat 1 alarm 7
- ❻ eheat 1 runtime 0

- ❶ gasheat 1 conf 1
- ❷ gasheat 1 dout 10

- ❶ pwwheat 1 conf 2
- ❷ pwwheat 1 type 1
- ❸ pwwheat 1 dout 5
- ❹ pwwheat 1 aout 8

Times are entered in hours.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

O1

Service

return Humidifier	
ACTIVE	-0-
TYPE	2
D-OUT	13
A-OUT	03
D-IN ALARM	00
RUNTIME	0 H
STULZ 31 255 11:22	

Humidification
Humidifier

By setting the parameter "ACTIVE" on 1 you add a humidifier to the configuration. With "0" you disable the humidifier. ❶

In the next line you determine the humidifier type (1: humidifier with on/off control, 2: humidifier with proportional control). ❷

With the parameter "D-OUT" you determine a digital output for an on/off humidifier. ❸

With the parameter "A-OUT" you adjust the analogous output of the proportional signal for a humidifier. ❹

The digital input for the humidifier alarm can be assigned by the "D-IN" parameter. ❺

The humidifier runtime can be set in the last line. ❻

O3

return Dehumidific	
ACTIVE	-1-
HG-BYPASS	-0-
D-OUT	05
STULZ 31 255 11 23	

Dehumidification

By setting the parameter "ACTIVE" on 1 you add a dehumidification valve to the configuration. With "0" you disable the dehumidification valve. ❶

With the parameter "D-OUT" you determine a digital output for the dehumidification (solenoid valve for partial evaporator cut-off). ❷

In the second line you can configure a hotgas bypass for the compressor by entering a "1". ❸

When dehumidification with compressor operation is requested, the hotgas bypass is closed, because the maximum refrigerant mass flow is needed for the effect of passing under the dew point.

This is also valid for dehumidification by compressor operation with fan speed reduction.

C7000 PT2

k1

Humi/Humidifier 1 □ 27	
❶ →Conf	1
❷ +Type	1
❸ +Dig out	0
❹ +Ana out	0
❺ +Alarm in	6
❻ +Runtime	0 h

k2

Humi/Dehumid □ 27	
❶ →Conf	1
❷ +Dig out	5
❸ +Bypass	0

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000

The corresponding commands:

- ❶ humi 1 conf 0
- ❷ humi 1 type 2
- ❸ humi 1 dout 11
- ❹ humi 1 aout 4
- ❺ humi 1 alarm 7
- ❻ humi 1 runtime 500
- humi 1 confcon 1

- ❶ dehumid confvalve 1
- ❷ dehumid dout 12
- ❸ dehumid confbypass 1

Configuration of a conductivity meter by commands only.

Times are entered in hours.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

P1

Service

return	Fan	
ACTIVE	-1-	
TYPE	2	
D-OUT	01	
A-OUT	01	
D-IN	ALARM	00
D-IN	FILTER	00
RUNTIME		2 H
STULZ	31	255 11:24

Air
Fan

By setting the parameter "ACTIVE" on 1 you add a fan to the configuration. With "0" you disable the fan. ❶

In the next line you determine the fan type (1: fan with on/off control, 2: EC-fan with proportional speed control). ❷

With the parameter "D-OUT" you determine a digital output for an on/off fan. ❸

With the parameter "A-OUT" you adjust the analogous output of the proportional signal for a speed controlled fan. ❹

The digital input for the airflow alarm can be assigned by the "D-IN" parameter. ❺

The digital input for the filter alarm can be assigned by the "D-IN FILTER" parameter. ❻

The fan runtime can be set in the last line. ❼

C7000 PT2

m1

	Air /Fan 1	□ 27
❶	→Conf	1
❷	+Type	2
❸	+Dig out	1
❹	+Ana out	1
❺	+Alarm in	1
❻	+Al in fil	3
❼	+Runtime	0 h

P3

return	Louver	
ACTIVE	-0-	
D-OUT	07	
STULZ	31	255 11:25

Louver

By setting the parameter "ACTIVE" on 1 you add a louver to the configuration. With "0" you disable the louver. ❸

With the parameter "D-OUT" you determine a digital output for the louver. ❹

m2

	../Louver 1	□ 27
❸	→Conf	0
❹	+Dig out	7

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000

The corresponding commands:

- | | |
|-----------------------|--------------------|
| ❶ fan 1 conf 1 | ❸ louver 1 conf 1 |
| ❷ fan 1 type 1 | ❹ louver 1 dout 11 |
| ❸ fan 1 dout 11 | |
| ❹ fan 1 aout 11 | |
| ❺ fan 1 alarm 2 | |
| ❻ fan 1 filteralarm 6 | |
| ❼ fan 1 runtime 120 | |

Times are entered in hours.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

N6

Service

return	Sensor	01
ACTIVE		-1-
TYPE		1
PURPOSE		01
A-IN		01
VALUE	MIN	MAX
PHYS. VAL.	4,0	20,0
TOLERANCE	0,0	50,0
		010%
STULZ	31	255 11:25

PURPOSE:

- 1 - room temperature
- 2 - room humidity
- 3 - supply temperature
- 4 - supply humidity
- 5 - water temperature 1
- 6 - water temperature 2
- 7 - outside temperature
- 8 - outside humidity
- 9 - condensation temperature 1
- 10 - condensation temperature 2
- 11 - condensation pressure 1
- 12 - condensation pressure 2
- 13 - evaporation temperature 1
- 14 - evaporation temperature 2
- 15 - evaporation pressure 1
- 16 - evaporation pressure 2

Sensors of the purpose 9, 10, 13 - 16 are not used up to now.

For these sensors and for the sensor condensation pressure (11 and 12) no average value is calculated.

Equipment
Sensor

By setting the parameter "ACTIVE" on 1 you add a sensor to the configuration. With "0" you disable the sensor. ①

In the next line you determine the sensor type (1: current, 2: voltage, 3: PT100, 4: PT1000, 5: KTY81-121). ②

With the parameter "PURPOSE" you specify for what the sensor is used ③. see left.

With the parameter "A-IN" you adjust the analogous input for the proportional sensor signal. ④

The following 5 items serve to calibrate the sensor. The minimum measure value (phys. value) ⑤ is assigned to the minimum output (value). ⑦

The maximum measure value (phys. value) ⑥ is assigned to the maximum output (value). ⑧

The unit of the adjusted measure value depends on the sensor purpose (1-16). The unit of the adjusted output depends on the sensor type (1-5).

If there are more than two sensors with the same purpose, an average value is calculated. In the last line you can adjust a maximum difference to the average value. ⑨ If the maximum difference is exceeded, the alarm "Sensor ## excess" is released.

C7000 PT2

n2

	Sensor/Sensor 1	□ 27
①	→Conf	1
②	+Type	1
③	+Purpose	1
④	+Ana in	2
⑤	+Min meas	0,0 °C
⑥	+Max meas	50,0 °C
⑦	+Min outp	4,0 mA
⑧	+Max outp	20,0 mA
⑨	+Max diff	10,0 %

The surrounded numbers refer to the corresponding passages in the descriptive text.

You need two water temperature sensors for:

1. GCW-units with dry coolers

Water temperature 1 is always the temperature for the CW-circuit.

Water temperature 2 is the cooling water temperature, by which the dry coolers are controlled.

2. CW2-units

Water temperature 1 is always the temperature for the CW-valve which is active, when no change-over has taken place (no voltage at DIN 3).

Water temperature 2 is the temperature for the second CW-valve, which is active after a change-over.

C7000

The corresponding commands:

- | | |
|-------------------|--------------------------|
| ① sensor 1 conf 1 | ⑤ sensor 1 minmeas -20,0 |
| ② sensor 1 type 3 | ⑥ sensor 1 maxmeas 40,0 |
| ③ sensor 1 use 5 | ⑦ sensor 1 minout 0,0 |
| ④ sensor 1 ain 3 | ⑧ sensor 1 maxout 9,0 |
| | ⑨ sensor 1 div 20 |

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

O5

Service

return	Aux.Ports		
	D-OUT	D-IN	A-OUT
COMMONALARM	06		
WINTERMODE	10		
REMOTE CONTACT		10	
FIREALARM		11	
WATERDETECTOR		07	
UPS		12	
	MORE		
STULZ	5	5 17:37	

Equipment
Aux. Ports/Aux. Ports

This window serves to adjust digital in- and outputs for non-component-related alarms or messages.

In detail you can adjust the digital output for the common alarm ① and for the wintermode ②. The wintermode signal can be forwarded to a BMS system.

Following you can adjust the digital inputs for the remote contact ③, the fire alarm ④, the water detector ⑤, which creates the water alarm and for the ups operation ⑥.

P5

return	Aux.Ports		
	D-OUT	D-IN	A-OUT
PHASE-FAILURE		19	
CW-DX-MODE		16	
TEMPERATURE			03
HUMIDITY			05
STULZ	31	255 11:29	

In the following window you can assign the digital inputs for the phase failure alarm ⑦ and for the external cooling priority ⑧. (see page 83)

Further you can determine the analogous outputs for the external use of the actual temperature ⑨ and the actual humidity ⑩.

O7

return	Unitalarms		
	D-IN		
FIREALARM	00		
WATERDETECTOR	00		
PHASE-FAILURE	00		
STULZ	0	255 12:48	

Aux. Ports/Unit alarms

In this window you can assign digital inputs to unit alarms. The fire alarm ④, the water detector ⑤, which creates the water alarm and the phase failure alarm ⑦.

C7000 PT2

o1

	../Aux Ports	□ 27
①	→Com alarm	0
②	+Win oper	1
③	+Remon/off	5
④	+Fire	6
⑤	+Water	7
⑥	+UPS	10
⑦	+Phase	19
⑧	+CW/DXoper	16
⑨	+Temp	3
⑩	+Humidity	5

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000

The corresponding commands:

- | | |
|------------------|------------------|
| ① calarm dout 7 | ⑦ phase din 19 |
| ② winter dout 17 | ⑧ cwoff din 16 |
| ③ remote din 11 | ⑨ curtemp aout 3 |
| ④ fire din 12 | ⑩ curhumi aout 5 |
| ⑤ water din 8 | |
| ⑥ ups din 13 | |

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

P6

Service

```

return Aux. alarm 01
  EXTERNER_ALARM_IN_01
  ACTIVE          -0-
  D-IN            00
  COMMONALARM     -0-
  PRIO.           00
  DELAY           0055
STULZ            0 255 12:48

```

Equipment
Aux. Ports/Aux. Alarm

In the first line you can type in the alarm text which you want to be displayed in case of the alarm. ❶

By setting the parameter "ACTIVE" on 1 you add an external alarm to the configuration. With "0" you disable the ext. alarm. ❷

With the parameter "D-IN" you adjust the digital input for the alarm signal. ❸

You can adjust, if the external alarm releases a common alarm (0= no, 1 = yes). ❹

Setting the priority for the external alarm ❺ means assigning the alarm to an alarm relay with the adjusted number.

The external alarm delay can be adjusted. ❻

C7000 PT2

o2

```

❶ ../Ext Alarm 1  □ 27
→Text 1      E
+Text 2      x
+Text 3      t
+Text 4      e
+Text 5      r
+Text 6      n
+Text 7      a
+Text 8      l
+Text 9
+Text 10     A
+Text 11     l
+Text 12     a
+Text 13     r
+Text 14     m
+Text 15
+Text 16     i
+Text 17     n
+Text 18
+Text 19     0
+Text 20     1
❷ +Conf      0
❸ +Alarm in  0
❹ +Com alarm 0
❺ +Alarm pri 0
❻ +Alarm del 5 s
  Ext al 1  0

```

The surrounded numbers refer to the corresponding passages in the descriptive text.

The alarm text can only be vertically edited. Each letter must be entered line by line. The text can have 20 characters. The last line displays the actual alarm status.

C7000

The corresponding commands:

- ❶ exalarmin 1 text xxx123
- ❷ exalarmin 1 conf 1
- ❸ exalarmin 1 alarm 11
- ❹ exalarmin 1 commonalarm 0
- ❺ exalarmin 1 alarmprio 9
- ❻ exalarmin 1 alarmdelay 6

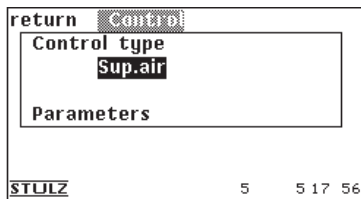
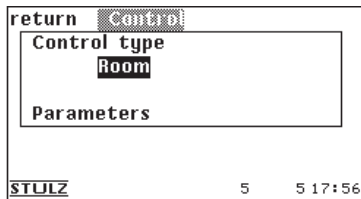
Times are entered in seconds.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

R2

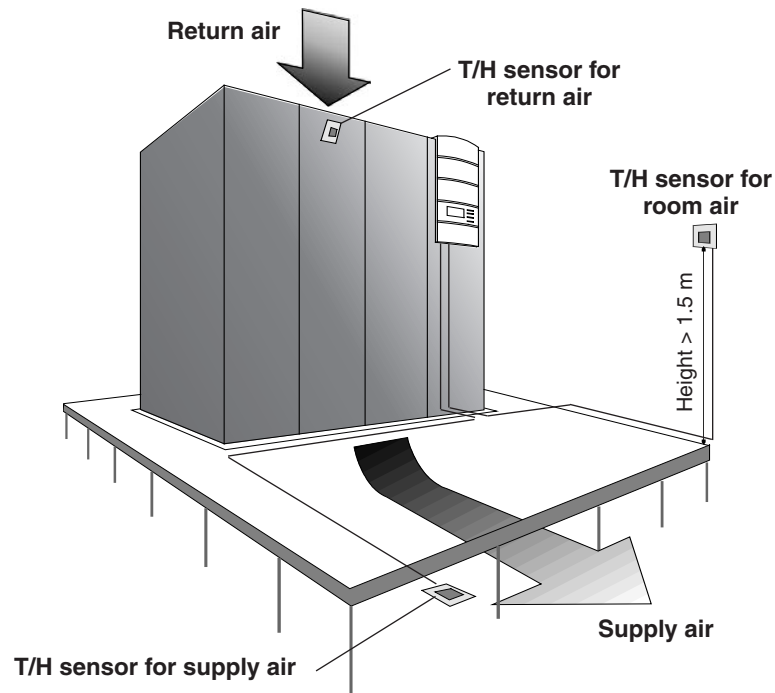
Service

Gen. settings
Control

Here you can choose the control type. The display of the actual values changes corresponding to the above adjusted type of control (Room / Sup.Air). ❶

The room air control is the standard control. The temperature/humidity sensor is placed in the return air intake and the C7000 controls in accordance with the setpoints set in the "Control/temperature/humidity" menu. The limit values of room air are monitored.

An external T/H sensor is required for supply air control. The control takes place for the room air control in accordance with setpoints for the supply air set in the "Control/temperature/humidity" menu. The limit values of the supply air are monitored.



C7000 PT2

p1

❶	../Control	□ 27
	→Type	1
	+Start	16,0 K
	+Gradient	0,5 K
	+Start	70,0 %rF
	+Gradient	0,5 %

The surrounded numbers refer to the corresponding passages in the descriptive text.

Four different control types can be chosen by entering the corresponding number:

- 1: room air
- 2: supply air
- 3: room air with supply air limitation
- 4: supply air with room air limitation

The sensor should be positioned depending on the space available, thermal load distribution and selected type of control. The maximum distance to the C7000 IOC is 20m.

C7000

The corresponding commands:

- ❶ control 2
- ❷ lim temp 16,3
- ❸ grad temp 0,6
- ❹ lim humi 75,0
- ❺ grad humi 0,6

Four different control types can be chosen by entering the corresponding number:

- 1: room air
- 2: supply air
- 3: room air with supply air limitation
- 4: supply air with room air limitation

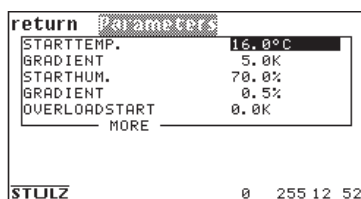
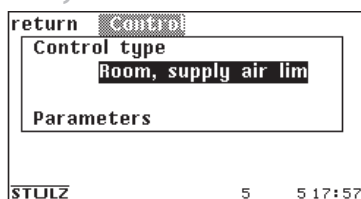
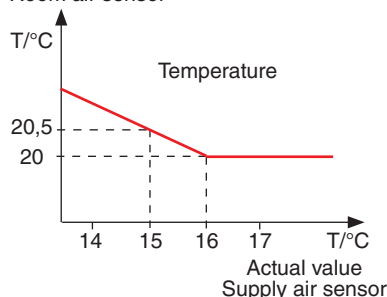
The surrounded numbers refer to the corresponding passages in the descriptive text.

See next page for explanation of the commands ❷ - ❺.

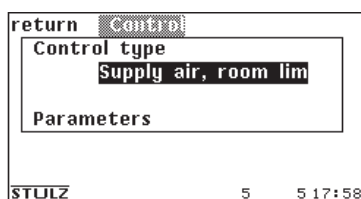
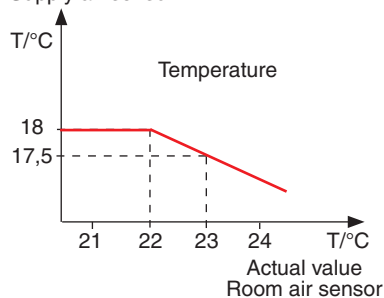
C7000 Advanced

R2, R3

Service

Setpoint
Room air sensor

Example (temperature):
 $20,5 = 20 + 0,5 \cdot (16 - 15)$

Setpoint
Supply air sensor

Example:
 $17,5 = 18 + 0,5 \cdot (22 - 23)$

Gen. settings
Control/Parameters

With the room control with supply air limitation the control takes place via the T/H sensor in the return air intake and via a second T/H sensor in the supply air. Primarily the control takes place as for room air control, only if the measured supply air temperature exceeds the start temperature ② the temperature setpoint is shifted. The extent of the setpoint increase is determined by a factor which you enter, as a gradient ③, in the menu.

The relationship, according to which this happens, is made clear by the graph opposite. A steep gradient drastically corrects the failure to meet the supply air temperature, but has the risk that the control circuit starts to hunt.

With humidity control the setpoint shift takes place in the opposite direction. If the adjusted starting humidity ④ is exceeded by the measured supply air humidity, the setpoint is reduced. You can also enter a gradient factor ⑤ for this. The relationship is shown in the graph opposite.

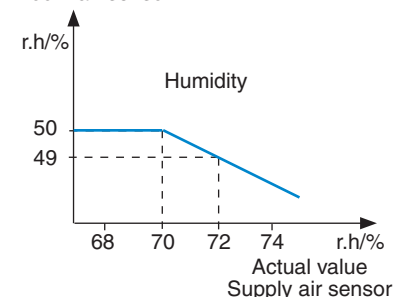
$$\text{New setpoint} = \text{old setpoint} + \text{gradient} \cdot (\text{start value} - \text{actual value})$$

C7000 PT2

p1

①	→Type	1
②	+Start	16,0 K
③	+Gradient	0,5 K
④	+Start	70,0 %rF
⑤	+Gradient	0,5 %

The surrounded numbers refer to the corresponding passages in the descriptive text.

Setpoint
Room air sensor

Example (humidity):
 $49 = 50 + 0,5 \cdot (70 - 72)$

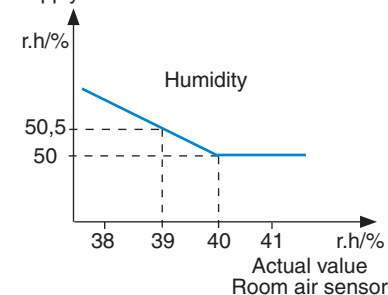
The supply air control with room air limitation is based on the same control principle as the supply-air limited room air control. Only here the setpoint shift works in the opposite direction, because it works on the basis that the supply air is colder than the return air.

If the room temperature exceeds the start temperature entered, the temperature setpoint is reduced.

If the room humidity drops below the starting humidity entered, the humidity setpoint is increased.

The limit values of all four input variables are monitored for room air control with supply air limitation and for supply air control with room air limitation.

- Room air temperature
- Room humidity
- Supply air temperature
- Supply air humidity

Setpoint
Supply air sensor

Example:
 $50,5 = 50 + 0,5 \cdot (40 - 39)$

C7000 Advanced

R3

Service

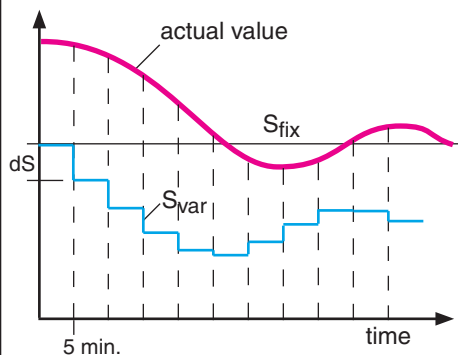
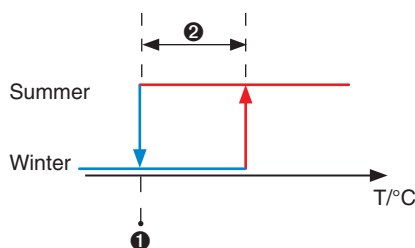
return Parameters	
STARTTEMP.	16.0°C
GRADIENT	5.0K
STARTRUM.	70.0%
GRADIENT	0.5%
OVERLOADSTART	0.0K
MORE	

STULZ 0 255 12 52

R4

return Parameters	
WINTER START	16.0°C
HYST.	2.0 K
WINTERDELAY	180 S
INTEGRAL FACTOR	00%
COOL. PRIO.	0

STULZ 1 255 10 55



$$Svar_{n+1} = Svar_n + dS \quad \text{with}$$

$$dS = (S_{fix} - \text{actual value}) \times \text{integral factor}$$

S_{fix} represents the fixed setpoint which is adjusted in the menu Control/Temperature.

Gen. settings

Control/Parameters (Part 2)

The controller offers the possibility to have start a stand-by unit when an adjustable positive temperature difference to the air temperature setpoint is achieved. This difference can be adjusted by the parameter "Loadstart" ⑥. The adjustment 0.0K disables this function.

When the temperature difference is obtained the A/C unit, so far as it is defined as standby unit, will be started. The sequencing function is not influenced by this.

The outside temperature ① for the commutation from summer to winter operation is decisive for the drycooler and compressor control. With this hysteresis ② the winter operation changes to summer operation.

The winter operation is shut down, if the outside temperature falls beneath -30°C or if an outside temp. sensor breakdown is detected. An alarm "Outside temperature sensor defect" is not displayed.

The winter start delay ③ inhibits the low pressure monitoring on alarm conditions for an adjustable time in 0-255 seconds, which is relevant for the compressor operation.

You can determine an integral factor ④ for the air temperature control to avoid a control discrepancy which is characteristic for P-controllers. In this case a variable setpoint $Svar$, which is recalculated every 5 minutes is decisive for the control. This variable setpoint is calculated by adding the setpoint alteration dS to the previous setpoint.

The values for the integral factor can be varied between 0 and 80%. A low value should be used to start with in order to prevent the control system from oscillating. 10% are recommended and can stepwise be increased to find out the limit of safe control.

For details of the cooling priority ⑤ see next page.

C7000 PT2

p1

../Control		□ 27
→Type	1	
+Start	16,0 K	
+Gradient	0,5 K	
+Start	70,0 %rF	
+Gradient	0,5 %	
① +Winterst	16,0 °C	
② +Hys	2,0 K	
③ +Winterdel	180 s	
④ +I-factor	0 %	
⑤ +Coolprio	1	

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000

The corresponding commands:

- ① sumwin start 16,0
- ② sumwin hys 2
- ③ winterdelay 180
- ④ integral 10
- ⑤ coolingprio 1
- ⑥ load 2,5

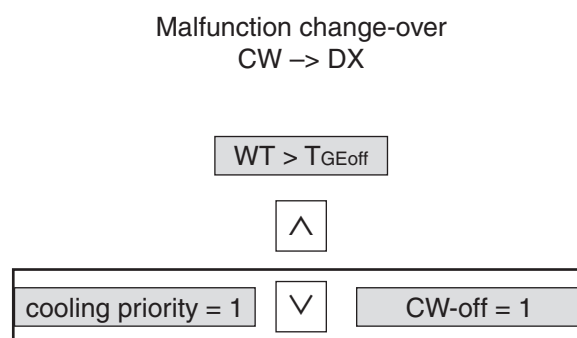
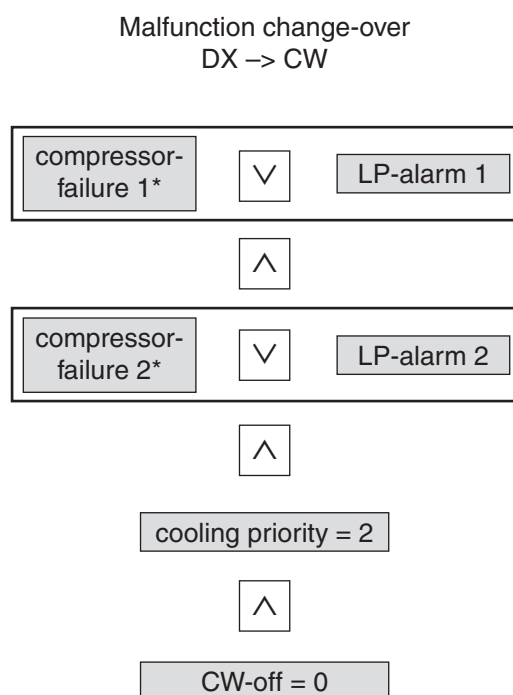
Gen. setting Control/Parameter (Part 3)

Cooling priority

The cooling priority determines the overriding cooling circuit for units with two different cooling systems. The parameters 0, 1, 2 can be adjusted.

- 0 - no priority, this is the adjustment for GE-systems, where a mixed operation of both systems is possible.
- 1 - CW, means, that chilled water cooling is prior at ACW/GCW-units.
- 2 - DX, means, that compressor cooling is prior at ACW/GCW-units.

The diagram below displays the conditions for a malfunction change-over at Dual-Fluid-units (units with two different cooling systems).



- WT - water temperature 1
- TGEoff - upper water temperature limit for GE-operation
- CW-off - digital input (pre-set DIN16) to enable DX-operation or to disable CW-operation(see page 80)

^ - logic operation AND

∨ - logic operation OR

*HP-alarm or compressor failure

For a better understanding:

The OR-operations are horizontally located.
The AND-operations are vertically located.

C7000 Advanced

Day & Night

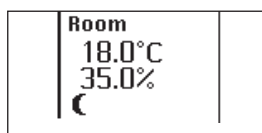
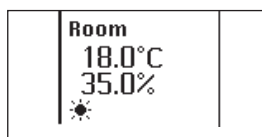
Service

return	Day & Night
MO	0022222211111111111222
TU	0022222211111111111222
WE	0022222211111111111222
TH	0022222211111111111222
FR	0022222211111111111222
SA	0022222211111111111222
SU	0000002222222222222222
	0 6 12 18 24 HOUR
STULZ	5 255 18 42

Display in the main menu when the timer program is executed:

display:

- | | |
|--------------------------------|---|
| 1. A/C unit off | 0 |
| 2. A/C unit on with setpoint 1 | 1 |
| 3. A/C unit on with setpoint 2 | 2 |



Up to now this function is available by commands only.

The week timer is based upon two different temperature setpoints which you have already adjusted in the control/temperature menu. Setpoint 1 is represented by a thick line, setpoint 2 by a dotted line. For each hour of each day of the week you choose among three settings:

C7000 PT2

d1

../Day/Night	<input type="checkbox"/> 27
→Day	0
+Hour	0
+Status	1

Day:

- 0 = monday
- 1 = tuesday
- 2 = wednesday
- 3 = thursday
- 4 = friday
- 5 = saturday
- 6 = sunday

Hour:

- 0 = from 0:00 to 0:59
- 1 = from 1:00 to 1:59
- 2 = etc.

Status:

- 0 = A/C unit off
- 1 = A/C unit on with setpoint 1
- 2 = A/C unit on with setpoint 2

C7000

The corresponding commands:

wprg mo 12 0

sets the timer stop mode for monday from 12:00 to 12:59

Day:

- mo = monday
- tu = tuesday
- we = wednesday
- th = thursday
- fr = friday
- sa = saturday
- su = sunday

Hour:

- 0 = from 0:00 to 0:59
- 1 = from 1:00 to 1:59
- 2 = etc.

Status:

- 0 = A/C unit off
- 1 = A/C unit on with setpoint 1
- 2 = A/C unit on with setpoint 2

C7000 Advanced

Q3

Service

return	UPS	
Cooling	-1-	
Heating	-0-	
Humidification	-1-	
Dehumidific.	-1-	
STULZ	31	255 11 34

Gen. settings
UPS

This window serves to determine the air conditioning functions in case of operation with Uninterrupted Power Supply. If the controller receives the signal at its digital input for UPS operation, all the functions which are enabled by "1" will be admitted, whereas the functions with a "0" will be disabled.

Please note that also the fan speed will be reduced to a pre-adjusted value in case of UPS-operation. see page 59.

Q4

return	Interfaces	
glob. address	1	
STULZ	0	255 12 53

Interfaces

In this window you adjust the global address in a range from 1 to 255. This address is decisive for the communication with a BMS.

C7000 PT2

p2

	Gen.settings/UPS	27
➊	→UPS cool	1
➋	+UPS heat	0
➌	+UPS humid	0
➍	+UPS dehum	0

The surrounded numbers refer to the corresponding passages in the descriptive text.

p3

../Interface	27
→Glob addr	1

C7000

The corresponding commands:

- ➊ ups cool 1
- ➋ ups heat 0
- ➌ ups humi 0
- ➍ ups dehum 0
- ➎ globadr 231

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

Q5

Service

Gen. settings
Sequencing

return	Sequencing
ZONE	01
CYCLETIME	1H
ERRORUNITS	00
EMERTEMP	16.0°C
MAX FANSPEED	067%
TEST	-0-
CW-ENERGY-SAVE	-0-
STULZ	0 255 12:51

The zone concept based on the idea to obtain a homogeneous room climate within a determined space by distributed generation of conditioned air. Within a zone only one room temperature exists which is calculated as the average value of all connected room temp. sensors of the units in operation.

The same for the room humidity, supply tem-

perature and supply humidity. However the set values can be individually adjusted for each unit. If at all they should only slightly vary.

There are two zone specific functions:

1. sequencing
2. CW standby management

1. Sequencing

Within a zone you can have a unit sequencing with change-over dependent on time and failure.

The following parameters must be specified for this:

①. Unit assignment

A zone is defined by the assignment of units. Maximum 32 zones can be defined with the adjustments from 1 to 32. Zone 0 means that the unit is assigned to no zone. The assignment is made individually for each unit.

②. Standby units

When a sequencing shall take place the zone must contain at least one standby unit. This setting must be made for each unit/IOC by means of the ON/OFF-button on the C7000AT.

③. Number of defective units (errorunits) (zone parameter)

The entry is optional. If the number, adjusted here, is reached, the emergency operation will be put into force.

④. Emergency temperature (zone parameter)

This temperature is the new setpoint when emergency operation is enabled.

Time dependent changeover

The cycletime ⑤ determines the lapse of time after which a changeover will periodically take place. This means that the standby status is changed over the units one by one. With the setting 0 (hrs) no sequencing is made.

Setting the cycletime causes the sequencing start after the sequencing menu has been left.

To let the standby units (set under item ②) participate in the sequencing, they have to be locally switched on by means of the ON/OFF-button on the C7000AT. For this the corresponding unit must be selected in the bus overview window.

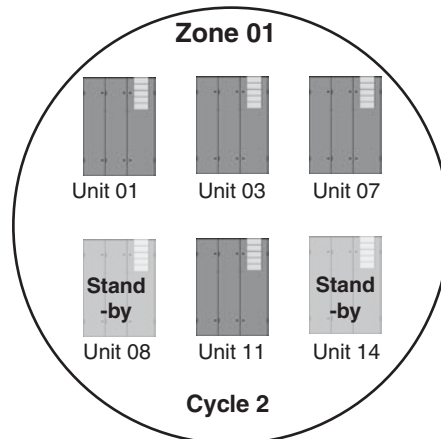
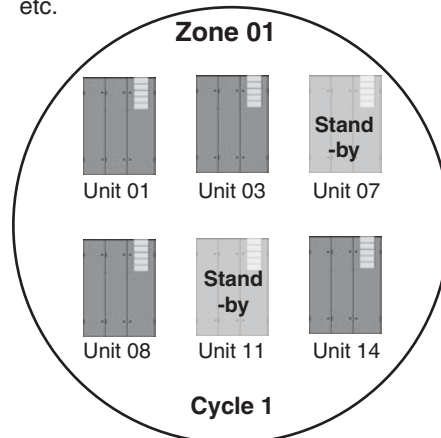
Enabling the test sequencing ⑥ with the fixed cycletime of 5 minutes helps you to check the sequencing function.

Time dependent change-over

(normal sequencing)

e. g. with 2 standby units:

1. cycle unit 07, 11 standby
 2. cycle unit 08, 14 standby
 3. cycle unit 11, 01 standby
- etc.



C7000

The corresponding commands:

- | | |
|------------------------|---|
| ① zone 1 + 7 | assigns unit 7 to zone 1 |
| zone 1 - 7 | deletes unit 7 from zone 1 |
| ② zone 1 unit 3 0 | puts unit 3 into standby |
| zone 1 unit 3 1 | switches unit 3 on |
| ③ zone 1 emernum 3 | |
| ④ zone 1 emertemp 15,7 | |
| ⑤ zone 1 seqtime 10 | |
| ⑥ zone 1 test 1 | en- (1) or disables (0) test sequencing |

Times are entered in hours.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

Failure dependent change-over

Definition of valid alarms for one zone

For each zone any number out of 26 alarms in total can be defined as valid alarms. If such an alarm occurs the corresponding unit is switched off and notified as defective.

By the default setting all 26 alarms are defined as valid alarms. The alarm „unit not available“ can not be deleted from the alarm list. This alarm is always part of the valid alarms and appears in case of a bus failure or when the unit has locally been switched off.

Valid alarms:

--.Not available	01.Local stop
02.Compressor lowpressure	03.Compressor Failure
04.E-heating Failure	05.Humidifier Failure
06.Humidifier 5uS	07.Humidifier 20uS
08.Fan error	09.Filter clogged
10.External alarm	11.Pump Failure
12.Drycooler Failure	13.Water detector
14.Roomtemp too high	15.Roomhumidity too high
16.Supplytemp too high	17.Supplyhumidity too high
18.Roomtemp too low	19.Roomhumidity too low
20.Supplytemp too low	21.Supplyhumiduty too low
22.Watertemp too high	23.Watertemp too low
24.Fire/smoke detector	25.Sensor Failure
26.Sensor broken	

After the failure of a unit a standby unit is switched on. With the switching on of the last available standby unit the time dependent sequencing is interrupted.

When the previously adjusted number of defective units in one zone is reached the emergency operation is enabled and this for all zones.

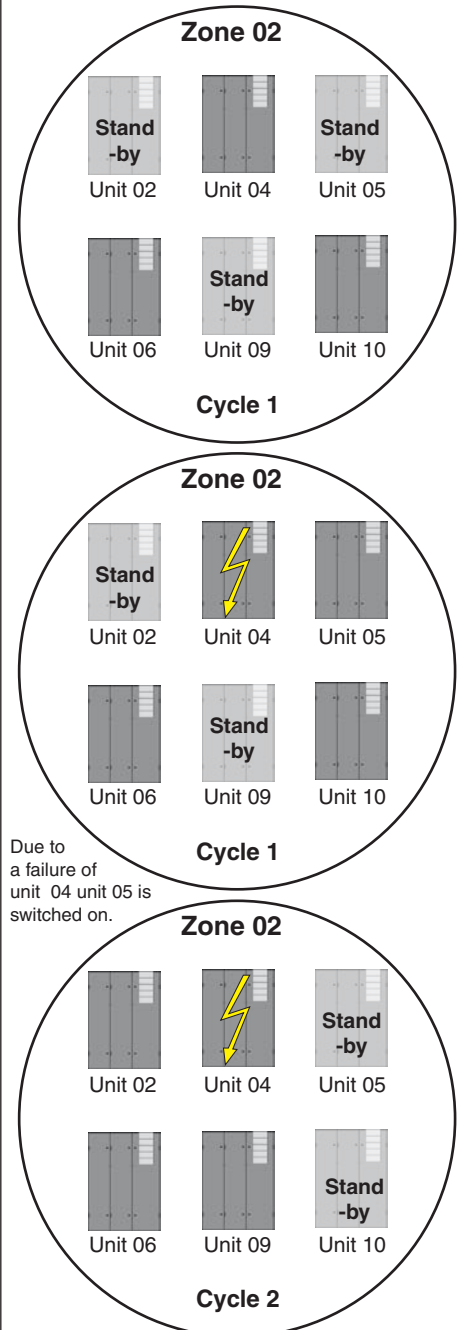
Emergency operation means that the emergency temperature of the triggering zone is accepted as the new temperature set value for all the zones.

The number of defective units is independent on the number of standby units which have been started. I.e. even if the failing unit capacity of one zone is completely equalled by the start of standby units, the defective units are counted as lacking.

To start an emergency operation just when the 100% unit capacity (without standby units) is reached no more the adjusted number of defective units should be higher than the number of a zone's standby units.

For safety reasons, valid alarms can only be configured by commands.

Failure dependent change-over



C7000

The corresponding commands:

zone 1 alarm 2 0	deletes valid alarm 2
zone 1 alarm 2 1	adds alarm 2 as valid alarm
zone 1 alarm h	displays list of all available alarms

Example for a Sequencing configuration:

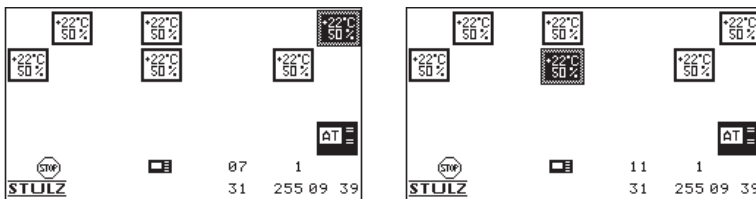
C7000 Advanced

The zone shown on the right is to be configured.

- All alarms shall remain valid.
- The number of defective units shall be 3.
- The emergency temperature shall be 17°C.
- The sequencing cycle shall be 5 hours.

1. Determinating the standby units in the general overview

Select the units one by one and set the operating status by means of the ON/OFF switch at the C7000AT. A locally stopped unit is counted as a standby unit with the beginning of the sequencing.



IOC 07 operating status: Stop

IOC 11 operating status: Stop

2. Unit assignment

Now the units 01, 03, 07, 08, 11 and 14 are assigned to zone 01. This must be done separately for each unit in the menu "Service/Gen. settings/Sequencing".

3. Number of defective units

With the unit assignment of the last unit, in this menu, also the settings can be made which concern the zone in total.

The number of defective units is part of these adjustment.

4. Emergency temperature

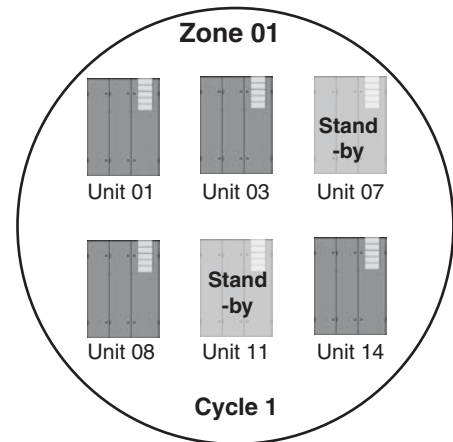
Set the emergency temperature to 17°C.

5. Sequencing cycle

Entering the sequencing cycle starts the sequencing. The controller checks the actual ON/OFF-status of each unit which belongs to zone 01 and interprets the switched off units as standby units.

6. Switching on the standby units

The standby units 07 and 11 must now be selected in the overview and be switched on by the ON/OFF switch at the C7000AT. However they remain switched off as standby units.



C7000

At the configuration by the terminal program the sequence is different. First assign the units to the zone, then set the standby units.

```
zone 1 + 1
zone 1 + 3
zone 1 + 7
zone 1 + 8
zone 1 + 11
zone 1 + 14
```

```
zone 1 unit 7 0
zone 1 unit 11 0
```

```
zone 1 emernum 3
zone 1 emertemp 17
zone 1 seqtime 5
```

Switching on the standby units belatedly is not necessary here.

C7000 Advanced

Q5

Service

return	Sequencing
ZONE	01
CVCLETIME	1H
ERRORUNITS	00
EMERTEMP	16.0°C
MAX FANSPEED	067%
TEST	-0-
CW-ENERGY-SAVE	-0-
STULZ	0 255 12:51

2. CW Standby Management

The CW standby management can be carried out with CW units and Dualfluid units with CW cooling priority. The basic idea is to share the heat load permanently with as many as possible units in order to reduce the fan speed of all units and thus to save energy. For this the provided standby units must constantly take part in the cooling process. The total airflow is below the airflow which is possible at most and is equalled in case of failure of one or more units by increasing the fanspeed of the remaining units.

By "MAXFANSPEED" ⑧ you adjust the fan speed which is to be kept in the zone when all units are running. By "CW-ENERGY-SAVE" ⑨ the CW-standby management is enabled and in the same moment all standby units of the zone are switched on. Both parameters are related to the zone and have only to be adjusted at one unit of the zone.

The table beside displays how many units in a zone are necessary to keep the total airflow at the indicated fan speed in the left column, when "f" units have failed.

This correlation is represented by the following formula.

$$n \geq f \cdot \left(\frac{100}{100 - nMax} \right)$$

nMax / %	n - units		
	f = 1	f = 2	f = 3
60	3	5	8
65	3	6	9
70	4	7	10
75	4	8	12
80	5	10	15
85	7	14	20
90	10	20	30

An A/C unit is switched off as defective unit if a valid alarm occurs at this unit, in the same way as for the sequencing.

When a Dualfluid unit changes over to DX operation due to a fault like a water temperature exceeding the GE-off limit (see page 83), this unit applies the nMaxDX fan speed which is higher than the MAXFANSPEED of the CW standby management.

The fan speed of the other units is not affected by this.

C7000

The corresponding commands:

- ⑧ zone 1 nmax 85
- ⑨ zone 1 cwmode 1

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

R5-R7

Service

return	runtime	
UNIT		RESET
STOPTIME		2H
COOLING		0H
HEATING		0H
HUMIDIFICATION		0H
DEHUMIDIFIC.		0H
FREECOOLING	***	
MIXMODE	***	

STULZ 0 255 12 56

return	runtime	
COMPRESSOR	1	RESET
COMPRESSOR	2	RESET

STULZ 31 255 11:36

return	runtime	
FAN	1	RESET
FAN	2	RESET
FAN	3	RESET

STULZ 31 255 11 37

return	runtime	
E-HEATING	1	RESET
E-HEATING	2	RESET
E-HEATING	3	RESET

STULZ 31 255 11:37

return	runtime	
PUMP	1	RESET
PUMP	2	RESET
PUMP	3	RESET
PUMP	4	RESET

STULZ 31 255 11:38

return	runtime	
HUMIDIFIER	1	RESET
HUMIDIFIER	2	RESET
HUMIDIFIER	3	RESET

STULZ 31 255 11:38

Data
Runtime

This summary of runtimes exists only for the C7000 Advanced. Being an exact copy of the homonymous branch in the Info menu, the Service Runtime menus provide the possibility to reset the runtimes.

In contrast to the C7000 I/O controller and the C7000 Plus, you can reset the runtimes of the global unit functions in the C7000 Advanced.

return	runtime	
DRYCOOLER	1	RESET
DRYCOOLER	2	RESET
DRYCOOLER	3	RESET
DRYCOOLER	4	RESET

STULZ 31 255 11:39

C7000 PT2

The runtimes can be reset in the component-related submenus of the Service/equipment menu.

C7000

The corresponding commands:

- ① comp 1 runtime 0
- ② fan 1 runtime 0
- ③ eheat 1 runtime 0
- ④ pump 1 runtime 0
- ⑤ humi 1 runtime 0
- ⑥ drycool 1 runtime 0

Times are entered in hours.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

S3

Service

```

return data log
1
TYPE      ROOMTEMP.    0MIN
PERIOD
2
TYPE      ROOMHUM.     0MIN
PERIOD
STULZ      0  255 12:58

```

TYPE (for C7000 command) :

- 1 - unit room temperature
- 2 - unit room humidity
- 3 - unit supply temperature
- 4 - unit supply humidity
- 5 - water temperature 1
- 6 - outside temperature
- 7 - outside humidity
- 8 - condensation pressure 1
- 9 - condensation temp. 1
- 10 - evaporation pressure 1
- 11 - evaporation temp. 1
- 12 - zone room temperature
- 13 - zone room humidity
- 14 - zone supply temperature
- 15 - zone supply humidity

Data
Data logger

Here you can adjust the basic conditions for the data logger.

To this belongs sensor type ❶ and cycle ❷, the interval in which measure values of the corresponding sensor are stored.

Each data logger can store 1440 datapoints maximum. The 1441st datapoint deletes the first datapoint etc.. If you adjust a cycle of 1 minute you obtain a graphic for a lapse of time of 1440 minutes which corresponds exactly to 24 hours. With a cycle of 2 minutes, datapoints for a lapse of 2 days are stored etc..

Regarding the fact that the graphic represents a width of 180 pixels, we recommend to choose the cycle depending on the lapse of time (Info menu) to be represented.

Lapse (Info menu)	Cycle
- Hour	1 Min.
- Day	8 Min.
- Week	60 Min.
- Month	240 Min.
- Year	2880 Min.

C7000 PT2



At the modification of a parameter (type or cycle) all data of the corresponding data logger is deleted.

S4


Maintenance

```

return Maintenance
MAINT. INTERVAL 006MON
LAST MAINT.      01.08.04
MAINT. DONE
STULZ          31  255 11 40

```

This functionality helps you to maintain the A/C unit in a good condition by monitoring the service intervals.

In case the service interval is expired the message "service required" in combination with the symbol  is displayed in the standard window.

In the first line you enter the service interval you consider as suitable. Possible values are 0-12 months, with 0 months you avoid the monitoring ❷.

If you are on the field "MAINT. DONE" and you press the OK-key, you confirm the executed maintenance ❶. The controller then sets the actual date in the middle line and saves it.

q1

```

../Maintenance  27
❸ →Day         1
❹ +Month       8
  +Year        4
  +Interval     6 mo

```

A confirmation of the executed maintenance as in the C7000 AT is not possible here, for this you must manually enter the actual date in the first three lines.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000

The corresponding commands:

- ❶ log 1 cycle 15 The first numeral designates the number of the data logger (1 or 2).
- ❷ log 1 type 2 The second numeral stands for:
 - the cycle in minutes
 - the measure values listed left top.

- ❸ service 1 ← By "1" you confirm the execut-
- ❹ service int 4 ed maintenance.

Times are entered in hours.

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000 Advanced

U2-U5

Service

return	Manual oper.	
COMPRESSOR	EN.	STATE
01	-0-	-1-
02	-0-	-1-

STULZ 31 255 16 22

return	Manual oper.	
SUCTION	EN.	VALUE
VALUE	-0-	000%
GE/CW	VALUE	-0-
G-VALUE	-0-	000%

STULZ 31 255 16:27

return	Manual oper.	
DRYCOOLER	EN.	STATE
01	-1-	-1-
02	-1-	-0-
03	-0-	-0-
04	-0-	-0-

STULZ 31 255 16:29

return	Manual oper.	
PUMPS	EN.	VALUE
01	-1-	060%
02	-1-	090%
03	-0-	000%
04	-0-	000%

STULZ 31 255 16 31

T3-T5

return	Manual oper.	
E-HEATING	EN.	STATE
01	-1-	-1-
02	-1-	-0-
03	-0-	-0-
HOTGAS REH.	-1-	-1-
HWR HEATING	-0-	-0-

STULZ 31 255 16 33

return	Manual oper.	
HUMIDIFIER	EN.	STATE
01	-1-	-1-
02	-0-	-0-
03	-0-	-0-
DEHUMIDIFIC.	-0-	-0-

STULZ 31 255 11:43

return	Manual oper.	
FAN	EN.	STATE
01	-1-	-1-
02	-0-	-0-
03	-0-	-0-
LOUVER		
01	-0-	-0-
02	-0-	-0-
03	-0-	-0-

STULZ 31 255 11 44

Manual Operation

The manual operation menu consists of two columns of parameters which are decisive for the operation.

In the first column (titled EN.) you enable the manual operation of the listed component by setting the parameter to "1". ❶

The second column (titled STATE) displays the actual state of the component. After you have enabled the man. op. in the first column, you can switch on/off the component itself. ❷

For proportionally controlled components you can enter a percentage in the second column (titled VALUE) which corresponds to an opening degree for a valve or a capacity for any other component.

Components which exist either with on/off control or with proportional control have both columns (STATE and VALUE). But only the corresponding parameter can be changed.

Sensors and external alarms can be simulated by the manual operation for the purpose of testing the controller function.

When the man. op. menu is left (e.g. when the main menu of the service level is reached again), the manual operation of each component is disabled and the controller takes over the control again.

U6-U7

return	Manual oper.	
SENSOR	EN.	VALUE
01	-0-	0.0

STULZ 0 255 13 00

return	Manual oper.	
EXTERNAL_ALARM_IN_01	EN.	STATE
ALARM	-0-	-0-

STULZ 0 255 13:02

C7000 PT2

r1, s1-3, t1

- 27
- ❶ →Comp 1 ha 0
 - ❷ +Comp 1 on 0
 - +Comp 2 ha 0
 - +Comp 2 on 0
 - +Suct 1 ha 0
 - +Suct 1 on 0 %
 - +Suct 2 ha 0
 - +Suct 2 on 0 %
 - +GE/CW ha 0
 - +GE/CW on 0 %
 - +Dryc 1 ha 0
 - +Dryc 1 on 0
 - +Dryc 2 ha 0
 - +Dryc 2 on 0
 - +Dryc 3 ha 0
 - +Dryc 3 on 0
 - +Dryc 4 ha 0
 - +Dryc 4 on 0
 - +Pump 1 ha 0
 - +Pump 1 on 0
 - +Pump 1 on 0 %
 - +Pump 2 ha 0
 - +Pump 2 on 0
 - +Pump 2 on 0 %
 - +Pump 3 ha 0
 - +Pump 3 on 0
 - +Pump 3 on 0 %
 - +Pump 4 ha 0
 - +Pump 4 on 0
 - +Pump 4 on 0 %

The surrounded numbers refer to the corresponding passages in the descriptive text.

C7000

The corresponding commands:

- ❶ comp 1 hand 1
- ❷ comp 1 handon ❸

sensor 1 handon 25
sensor 1 hand 1

← Instead of 0/1 for "off/on" you can enter a percentage from 0 to 100 if the component is proportionally controlled.



When the fan is switched off, any other component is electrically blocked and can not be started.

The surrounded numbers refer to the corresponding passages in the descriptive text.

6.4 Default configurations

Unit parameters	Range	Value
System name	20 characters	System name
Unit name	20 characters	Unit name
Unit ID	0 - 255	13
Global address	0 - 37000	1
Local stop	0 - 1	1
Monitoring stop	0 - 1	0
Sequencing stop	0 - 1	0
Terminal language	0: English 1: German	1
PT language		1
Temperature unit	0: °C 1: °F	0
Temperature setpoint	5 - 35	24°C
Temperature setpoint, night	5 - 35	27°C
Humidity setpoint	5 - 90	45% r. h.
Winter start delay	0 - 300	180 s
Summer/winter change-over	5 - 35	16°C
Summer/winter hysteresis	1 - 9,9	2 K
Cooling priority	0: GE 1: CW 2: DX	0
Overload	0 - 9,9	0,0 K
Integral factor	0 - 10	0%
Output D common alarm	0 - 31	6
Output D winter operation	0 - 31	0
Input D remote on/off	0 - 43	0
Input D CW stop	0 - 43	0
Type of control	1 - 4	1
Limiting control - start temperature	0 - 40	16°C
Limiting control - temp. gradient	0 - 20	0,5 K
Limiting control - humidity start	0 - 90	70% r.h.
Limiting control - humidity gradient	0 - 20	0,5%
Unit runtime	0 - 4294967295*	0 h
Stop time	0 - 4294967295	0 h
Cooling runtime	0 - 4294967295	0 h
Heating runtime	0 - 4294967295	0 h
Humidification runtime	0 - 4294967295	0 h
Dehumidification runtime	0 - 4294967295	0 h
Last service - day	1 - 31	1
Last service - month	1 - 12	8
Last service - year	0 - 255	4
Service interval	0 - 20	6
UPS - input D	0 - 43	0
UPS - cooling admitted	0 - 1	1
UPS - heating admitted	0 - 1	1
UPS - humidification admitted	0 - 1	1
UPS - dehumidification admitted	0 - 1	1

* 232 - 1 = 4294967295

Zone parameters	Range	Value
Zone	1 - 32	0
Sequencing time	0 - 65535	0 h
Test sequencing	0 - 1	0
Valid alarms	1 - 26	all valid
Number of defective units	0 - 32	0
Emergency temperature	0 - 40	16°C
Zone fan speed nMax	60 - 100	85%
CW standby management	0 - 1	0

The parameter "zone" is not a zone parameter but can be adjusted separately for each unit.
Due to his context he is displayed in this table.

General alarms

Alarms	Range	Fire	Water	Phase
Alarm input D	0 - 43	0	0	0
Alarm priority	0 - 31	0	0	0
Common alarm	0 - 1	1	1	1
Alarm delay	0 - 100	5 s	5 s	5 s

Limit alarms

	Room temperature		Supply temperature		Water temperature	
	min	max	min	max	min	max
Value	5°C (0-20)	35°C (15-40)	5°C (0-20)	35°C (15-40)	-20°C (-20-30)	45°C (10-50)
Alarm delay	30 s (0-300)	30 s (0-300)	30 s (0-300)	30 s (0-300)	30 s (0-300)	30 s (0-300)
Alarm priority	0 (0-31)	0 (0-31)	0 (0-31)	0 (0-31)	0 (0-31)	0 (0-31)
Common alarm	1	1	1	1	1	1

	Room humidity		Supply humidity	
	min	max	min	max
Value	5%h.r (0-50)	90%h.r (50-100)	5%h.r (0-50)	90%h.r (50-100)
Alarm delay	30 s (0-300)	30 s (0-300)	30 s (0-300)	30 s (0-300)
Alarm priority	0 (0-31)	0 (0-31)	0 (0-31)	0 (0-31)
Common alarm	1	1	1	1

The values in brackets display the range.

Week program

Hour	Range	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
monday	0 - 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
tuesday	0 - 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
...
sunday	0 - 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Data logger

	Data logger 1	Data logger 2
Data number	0 (0 - 1440)	0 (0 - 1440)
Interval	0 min (0 - 60000)	0 min (0 - 60000)
Type	1 (1 - 15)	1 (1 - 15)

Components

Compressor

	Range	Compressor 1	Compressor 2
Summer start	0 - 9,9	0,4 K	0,6 K
Summer hysteresis	0 - 9,0	0,7 K	0,7 K
Winter start	0 - 9,9	0,7 K	0,9 K
Winter hysteresis	0 - 9,0	0,7 K	0,7 K
Component configured	0 - 1	0	0
Output D	0 - 31	2	7
Alarm input D	0 - 43	2	8
Alarm priority	0 - 31	0	0
Common alarm	0 - 1	1	1
Alarm delay	0 - 100	5 s	5 s
Alarm input LP	0 - 43	3	9
Alarm priority LP	0 - 31	2	2
Common alarm LP	0 - 1	1	1
Alarm delay LP	0 - 100	5 s	5 s
LP management time	0 - 100	0 h	0 h
LP management press.	0 - 10	5 bar	5 bar
LP management restart	0 - 10	0	0
HP management time	0 - 100	0 h	0 h
HP management press.	0 - 35	21 bar	21 bar
HP management restart	0 - 10	0	0
HP management mode	0 - 1	0	0
Pause	10 - 1000	180 s	180 s
Runtime	0 - 4294967295	0 h	0 h

Valves

	Suction valve 1	Suction valve 2
Start	0 K (0 - 9,9)	0,4 K (0 - 9,9)
Gradient	0,5 K (0,5 - 9,9)	0,5 K (0,5 - 9,9)
Component configured	0	0
Output A	5 (0 - 20)	6 (0 - 20)

	GE/CW-Valve
Start	0,1 K (0 - 9,9)
Gradient	0,6 K (0,5 - 9,9)
Component configured	0
Output A 1	2 (0 - 20)
Output A 2	4 (0 - 20)
Input D	0 (0 - 43)
GE-off	23°C (0 - 50)
Setpoint	95% (50 - 100)

	G-Valve
Pressure setpoint	18 bar (5 - 25)
Component configured	0
Control cycle	5 s (1 - 10)
Max. alternation	2% (1 - 10)
Control factor	4 (1 - 10)
Output A	4 (0 - 20)
Pre-open time	30 s (0 - 255)
Pre-opening	100 (0 - 100)

Drycooler

	Range	Drycooler 1	Drycooler 2	Drycooler 3	Drycooler 4
Winter start	5 - 35	10°C	11°C	12°C	13°C
Summer start	10 - 50	34°C	35°C	36°C	37°C
Stop hysteresis	1 - 9,9	2 K	2 K	2 K	2 K
Component configured	0 - 1	0	0	0	0
Output D	0 - 31	9	10	17	18
Alarm input D	0 - 43	15	15	15	15
Alarm priority	0 - 31	0	0	0	0
Common alarm	0 - 1	0	0	0	0
Alarm delay	0 - 100	5 s	5 s	5 s	5 s
Pre-open time	0 - 20	10 s	0 s	0 s	0 s
Preliminary speed	50 - 100	100%	0%	0%	0%
Control cycle	1 - 10	1 s	0 s	0 s	0 s
Max. alternation	1 - 10	2%	0%	0%	0%
Control factor	1 - 10	4	0	0	0
Runtime	0-4294967295	0 h	0 h	0 h	0 h

Pumps

	Range	Pump 1	Pump 2	Pump 3	Pump 4
Type	1 - 3	2	1	3	3
Start	0 - 9,9	0,1 K	0,1 K	0,1 K	0,1 K
Stop hysteresis	0 - 9,9	0,3 K	0,3 K	0,3 K	0,3 K
Gradient	0,5 - 20	0,6 K	0,6 K	0,6 K	0,6 K
Pressure setpoint	0 - 30	18 bar	18 bar	18 bar	18 bar
Component configured	0 - 1	0	0	0	0
Partner unit	0 - 31	0	0	0	0
Partner pump	0 - 4	0	0	0	0
Speed setpoint	50 - 100	95%	95%	95%	95%
Output D	0 - 31	8	11	14	15
Output A	0 - 20	2	4	0	0
Alarm input D	0 - 43	13	14	22	23
Alarm priority	0 - 31	0	0	0	0
Common alarm	0 - 1	0	0	0	0
Alarm delay	0 - 100	5 s	5 s	5 s	5 s
Pre-open time	0 - 20	10 s	10 s	10 s	10 s
Preliminary speed	0 - 100	100%	100%	100%	100%
Control cycle	1 - 10	5 s	5 s	5 s	5 s
Max. alternation	1 - 10	2%	2%	2%	2%
Control factor	1 - 10	4	4	4	4
Runtime	0 - 4294967295	0 h	0	0	0

Reheats

	Range	electr. reheat 1	electr. reheat 2	electr. reheat. 3	electr. reheat 4
Type	1 - 2	1	1	1	1
Start	0 - 9,9	1,5 K	2 K	2,5 K	3 K
Stop hysteresis	0 - 9,9	0,5 K	0,5 K	0,5 K	0,5 K
Gradient	0,5 - 9,9	0,5 K	0,5 K	0,5 K	0,5 K
Component configured	0 - 1	0	0	0	0
Output D	0 - 31	3	4	12	15
Alarm input D	0 - 43	4	4	4	23
Alarm priority	0 - 31	0	0	0	0
Common alarm	0 - 1	1	1	1	1
Alarm delay	0 - 100	4 s	4 s	4 s	4 s
Runtime	0 - 4294967295	0 h	0 h	0 h	0 h

	Range	Hot water reh.
Type	1 - 2	1
Start	0 - 9,9	1,5 K
Stop hysteresis	0 - 9,9	0,5 K
Gradient	0,5 - 9,9	0,5 K
Component configured	0 - 1	0
Output D	0 - 31	4
Output A	0 - 20	7

	Range	Hot gas reheat
Start	0 - 9,9	1,0 K
Stop hysteresis	0 - 9,9	0,5 K
Component configured	0 - 1	0
Output D	0 - 31	4

Humidifiers

	Range	Humidifier 1	Humidifier 2	Humidifier 3
Type	1 - 2	2	2	2
Start	0 - 20	0 %r.h.	0 %r.h.	0 %r.h.
Stop hysteresis	0 - 20	5 %r.h.	5 %r.h.	5 %r.h.
Gradient	0,5 - 20	10	10	10
Component configured	0 - 1	0	0	0
Conductivity meter conf.	0 - 1	0	0	0
Output D	0 - 31	13	0	0
Output A	0 - 20	3	6	7
Alarm input D	0 - 43	6	6	6
Alarm priority	0 - 31	0	0	0
Common alarm	0 - 1	1	1	1
Alarm delay	0 - 100	5 s	5 s	5 s
Alarm input D 5μS	0 - 43	0	0	0
Alarm priority 5μS	0 - 31	0	0	0
Common alarm 5μS	0 - 1	0	0	0
Alarm delay 5μS	0 - 1000	300 s	300 s	300 s
Alarm input D 20μS	0 - 43	6	6	6
Alarm priority 20μS	0 - 31	0	0	0
Common alarm 20μS	0 - 1	1	1	1
Alarm delay 20μS	0 - 1000	300 s	300 s	300 s
Runtime	0 - 4294967295	0 h	0 h	0 h

Dehumidifier

	Range	Dehumidifier
Start	0 - 100	10 %r.h.
Stop hysteresis	0 - 30	5 %r.h.
Dehumidification stop	0 - 10	5 K
Dehumidif. valve conf.	0 - 1	0
Bypass valve conf.	0 - 1	0
Output D	0 - 31	5
min water temp.	0 - 50	5°C
max water temp.	0 - 50	14°C

Fans

	Range	Fan 1	Fan 2	Fan 3
Type	1 - 2	2	2	2
Speed nMax	40 - 100	85%	85%	85%
Speed CW nMax	40 - 100	85%	85%	85%
Offset	-10 - 10	0%	0%	0%
Pre-start	0 - 100	10 s	10 s	10 s
Overrun	0 - 100	60 s	60 s	60 s
Start temperature	0 - 9,9	0 K	0 K	0 K
Start speed	0 - 10	0 %	0 %	0 %
100% start time	0 - 100	5 s	5 s	5 s
Reduction time	30 - 120	30 min	30 min	30 min
Reduction speed	0 - 100	0 %	0 %	0 %
Dehumidific. reduction	0 - 20	0 %	0 %	0 %
UPS reduction	0 - 20	0 %	0 %	0 %
Filter offset	0 - 10	0 %	0 %	0 %
Minimum speed	0 - 100	70 %	70 %	70 %
Output D	0 - 31	1	2	9
Output A	0 - 20	1	0	0
Alarm input D	0 - 43	1	2	15
Alarm priority	0 - 31	0	0	0
Common alarm	0 - 1	1	1	1
Alarm delay	0 - 100	10 s	10 s	10 s
Filter alarm input D	0 - 43	5	5	3
Filter alarm priority	0 - 31	0	0	0
Filter common alarm	0 - 1	1	1	1
Filter alarm delay	0 - 100	20 s	20 s	20 s
Emergency start	0 - 9,9	0 K	0 K	0 K
Emergency speed	0 - 100	0 %	0 %	0 %
Control cycle	0 - 10	5 s	0 s	0 s
Max. alternation	0 - 10	2 %	0 %	0 %
Control factor	0 - 10	4	0	0
Component configured	0 - 1	1	0	0
Runtime	0 - 4294967295	0 h	0 h	0 h

Louver

	Range	Louver 1	Louver 2	Louver 3
Pre-start	0 - 180	90 s	90 s	90 s
Output D	0 - 31	7	10	18
Component configured	0 - 1	0	0	0

Sensors

	Range	Sensor 1	Sensor 2	Sensor 3	Sensor 4
Purpose	1 - 16	1	2	3	4
Input A	1 - 21	1	2	3	4
Type	1 - 5	1	1	1	1
Component configured	0 - 1	1	1	1	1
Min. measure value	-50 - 100	0°C (-50 - 100)	0%r.h (0 - 100)	0°C (-50 - 100)	0%r.h (0 - 100)
Max. measure value	-50 - 100	50°C (-50 - 100)	100%r.h (0 - 100)	50°C (-50 - 100)	100%r.h (0 - 100)
Min. output value	0 - 20	4 mA (0 - 20)	4 mA (0 - 20)	4 mA (0 - 20)	4 mA (0 - 20)
Max. output value	0 - 20	20 mA (0 - 20)	20 mA (0 - 20)	20 mA (0 - 20)	20 mA (0 - 20)
Max. difference	0 - 100	10%	10%	10%	10%
Limit - alarm priority	0 - 31	0	0	0	0
Limit - common alarm	0 - 1	1	1	1	1
Limit - alarm delay	0 - 100	5 s	5 s	5 s	5 s
Failure - alarm priority	0 - 31	0	0	0	0
Failure -common alarm	0 - 1	1	1	1	1
Failure - alarm delay	0 - 100	5 s	5 s	5 s	5 s
Offset	-10,0 - 10,0	0°C	0% r.h.	0°C	0% r.h.

	Range	Sensor 5	Sensor 6	Sensor 7	Sensor 8
Purpose	1 - 16	5	7	11	12
Input A	1 - 21	5	6	7	8
Type	1 - 5	1	2	1	1
Component configured	0 - 1	1	1	1	1
Min. measure value	-50 - 100	-50°C (-50 - 100)	-20°C (-50 - 100)	0 bar (0 - 35)	0 bar (0 - 35)
Max. measure value	-50 - 100	50°C (-50 - 100)	40°C (-50 - 100)	30 bar (0 - 35)	30 bar (0 - 35)
Min. output value	0 - 20	0 mA (0 - 20)	0 V (0 - 20)	4 mA (0 - 20)	4 mA (0 - 20)
Max. output value	0 - 20	20 mA (0 - 20)	10 V (0 - 20)	20 mA (0 - 20)	20 mA (0 - 20)
Max. difference	0 - 100	10%	10%	10%	10%
Limit - alarm priority	0 - 31	0	0	0	0
Limit - common alarm	0 - 1	1	1	1	1
Limit - alarm delay	0 - 100	5 s	5 s	5 s	5 s
Failure - alarm priority	0 - 31	0	0	0	0
Failure -common alarm	0 - 1	1	1	1	1
Failure - alarm delay	0 - 100	5 s	5 s	5 s	5 s
Offset	-10,0 - 10,0	0°C	0°C	0 bar	0 bar

Sensors (continued)

	Range	Sensor 9 - 21
Purpose	1 - 16	0
Input A	1 - 21	0
Type	1 - 5	0
Component configured	0 - 1	0
Min. measure value	-50 - 100	0
Max. measure value	-50 - 100	0
Min. output value	0 - 20	0
Max. output value	0 - 20	0
Max. difference	0 - 100	10%
Limit - alarm priority	0 - 31	0
Limit - common alarm	0 - 1	1
Limit - alarm delay	0 - 100	5 s
Failure - alarm priority	0 - 31	0
Failure -common alarm	0 - 1	1
Failure - alarm delay	0 - 100	5 s
Offset	-10,0 - 10,0	0

External alarms

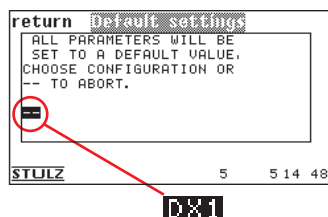
	Range	External alarm 1	External alarm 2	...	External alarm 10
Component configured	0 - 1	0	0	...	0
Input D	0 - 43	0	0	...	0
Alarm priority	0 - 31	0	0	...	0
Common alarm	0 - 1	0	0	...	0
Alarm delay	0 - 100	5 s	5 s	...	5 s
Alarm text	20 characters	Externer_Alarm_in_01	Externer_Alarm_in_02	...	Externer_Alarm_in_10

Actual value output

	Range	Actual value output 1	...	Actual value output 4
Purpose	1 - 16	1	...	1
Min. limit value	-50 - 100	0°C	...	0°C
Max. limit value	-50 - 100	50°C	...	50°C
Output A	0 - 20	0	...	0

6.4.1 Preconfigurations

U1



10 default configurations for different unit cooling systems are stored in the I/O controller.

Unit type	DX	GE1	GE2	AGCW	CW
1 circuit	dx1	ge11	ge21	agcw1	cw
2 circuits	dx2	ge12	ge22	agcw2	cw2

The table contains the parameters for the IOC-command.

C7000 PT:

C7000 command:

loaddefault dx1

u1

```
./Defaultsetting 27
→Bas dx1 0
+Bas dx2 0
+Bas cw 0
```

Setting the value to 1 loads the corresponding default configuration.

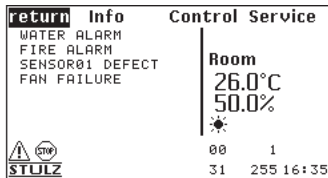
The following table displays the differences in relation to the default settings when a pre-configuration is selected.


	DX1	DX2	CW	CW2	AG/CW1	AG/CW2	GE1-1	GE1-2	GE2-1	GE2-2
Compressor 1 conf.	1	1			1	1	1	1	1	1
Compressor 2 conf.		1				1		1		1
Sensor 5 configured					1	1	1	1	1	1
Sensor 6 configured							1	1	1	1
Sensor 7 configured							1	1	1	1
Sensor 8 configured								1		1
Pump 1 configured									1	1
Pump 2 configured									1	1
Deshum. configured	1	1			1	1	1	1	1	1
GE/CW valve conf.			1	1	1	1	1	1		
G valve conf.							1	1		
Dehum. reduction			20%	20%	20%	20%	20%	20%	20%	20%
Input D GE/CW valve				3						
Cooling priority					1	1				

7. Alarm treatment

7.1 Alarm display

C7000 AT

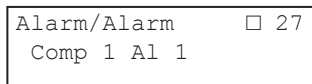
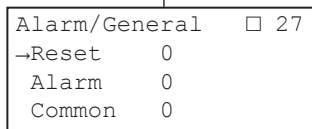
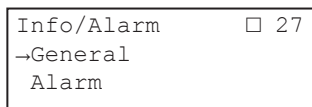


The alarm messages are displayed in the standard window of each unit with IOC. At the same time the symbol  in the left bottom indicates that an alarm has occurred.

An alarm tone proves the presence of an alarm independantly of the actual menu window of the C7000AT.

Attention: The alarm tone can be disabled. (see page 28)

C7000 PT



At the C7000 PT the alarm display is passive and is located in the Info-level. In the menu Info/Alarm/General you can see, whether an alarm has occurred and whether a common alarm has been released. This is separately indicated by a "1".

In the menu Info/Alarm/Alarm a dynamic list of all alarms is shown and constantly updated.

If it is an alarm which is related to a component, the alarm is equally displayed in the component menus of the Control level.

C7000

„state“

Unit:Running

- Runtime:32167 min
- Stoptime:2167 min

Cooling:active (15356 min)
- Compressor 1:1
- CW/GE-valve:66 %

Heating:not active (3472 min)

Humidification:active (9265 min)
- Humidificator 1:31 %

Dehumidification:not active (28 min)

Alarms:

- Common alarm
- Drycooler 1
- Sensor break 11

The alarm display in the command level is passive. This means that you have to type in the command "state" to see the occurred alarms.

7.2 Possible Alarm texts

Cause	Alarm message	Effect
LP switch/LP threshold passed under	LOW PRESSURE 1	Compressor 1 off, comp. 2 on, if present
HP switch/HP threshold exceeded Internal compressor power switch	COMP 1 FAILURE/HP	Compressor 1 off, comp. 2 on, if present
LP switch/LP threshold passed under	LOW PRESSURE 2	Compressor 2 off, compressor 1 on
HP switch/HP threshold exceeded Internal compressor power switch	COMP 2 FAILURE/HP	Compressor 2 off, compressor 1 on
Temperature switch/heating MCB	E-HEAT # FAILURE	Heating # off
Humidifier MCB	HUMIDIFIER # FAIL	Humidifier # off
Airflow differential switch	AIRFLOW FAILURE #	all components off
Filter differential switch	FILTER ALARM	no direct effect*
External alarm signal	EXTERNAL ALARM #	no direct effect*
Conductivity >5µS	HUMIDIFIER # 5µS	no direct effect*
Conductivity >20µS	HUMIDIFIER # 20µS	Ultrasonic humidifier off
Glycol pump MCB	GLYCOL PUMP # FAILURE	Compressors & pump off
G-Pump MCB	G-PUMP FAILURE	Compressors & pump off
GE-Pump MCB	GE-PUMP FAILURE	Compressors & pump off
Drycooler # MCB	DRYCOOLER # FAIL	Compressor, pump & drycooler # off
Water detector	WATER ALARM	Humidifier, dehumidification off
Return air temp. > limit value	RETURN AIR TEMP TOO HIGH	no immediate effect
Return air humidity > limit value	RETURN AIR HUM TOO HIGH	no immediate effect
Supply air temp. > limit value	SUPPLY AIR TEMP TOO HIGH	no immediate effect
Supply air humidity > limit value	SUPPLY AIR HUM TOO HIGH	no immediate effect
Water temp. > limit value	WATER TEMP TOO HIGH	no immediate effect
Return air temp. < limit value	RETURN AIR TEMP TOO LOW	no immediate effect
Return air humidity < limit value	RETURN AIR HUM TOO LOW	no immediate effect
Supply air temp. < limit value	SUPPLY AIR TEMP TOO LOW	no immediate effect
Supply air humidity < limit value	SUPPLY AIR HUM TOO LOW	no immediate effect
Water temp. < limit value	WATER TEMP TOO LOW	no immediate effect
Fire/smoke detector	FIRE ALARM	all components off
Tolerance exceeded	SENSOR # EXCESS	faulty sensor # excluded
Measured voltage/current out of defined range	SENSOR # DEFECT	faulty sensor # excluded

stands for a number.

* the corresponding alarm can be configured to release a common alarm which can control further equipment by a digital output.

** the alarm text can be configured.

7.3 Component-related alarms

The table shows the main components with their standard alarm input and the possible alarms.

DX/DX2-unit:

Component	Alarm input	on board	Alarm
Compressor 1	DIN 2	IOC	COMP 1 FAILURE/HP
	DIN 3	IOC	LOW PRESSURE 1
Compressor 2	DIN 8	IOC	COMP 2 FAILURE/HP
	DIN 9	IOC	LOW PRESSURE 2
Fan	DIN 1	IOC	AIRFLOW FAILURE 1
	DIN 5	IOC	FILTER 1 ALARM
E-heating	DIN 4	IOC	E-HEAT # FAILURE
Steam-Humidifier	DIN 6	IOC	HUMIDIFIER 1 FAIL
GE-pump	DIN 13	EDIO 1	GE-PUMP 1 FAILURE
G-pump	DIN 14	EDIO 1	G-PUMP FAILURE
Drycooler	DIN 15	EDIO 1	DRYCOOLER 1 FAIL

CW/CW2-unit:

Component	Alarm input	on board	Alarm
Fan	DIN 1	IOC	AIRFLOW FAILURE 1
	DIN 5	IOC	FILTER 1 ALARM
E-heating	DIN 4	IOC	E-HEAT 1 FAILURE
Steam-Humidifier	DIN 6	IOC	HUMIDIFIER 1 FAIL
Pump 1	DIN 2	IOC	PUMP 1 FAILURE
Pump 2	DIN 14	EDIO 1	PUMP 2 FAILURE
ext. Chiller	DIN 3	IOC	CHILLER FAILURE

7.4 Alarm Reset

C7000 AT

The alarms are reset by pressing the RESET-key. Pressing it once mutes the alarm tone. Pressing it again resets all alarms. However, if the alarm cause has not been eliminated, the alarm will appear again.

Alarms can either be reset in the standard window for each single unit or in the bus configuration overview by marking all bus participants for all units.

C7000 PT

Alarm/General	<input type="checkbox"/> 27
→Reset	0
Alarm	0
Common	0

The alarms are reset in the menu Info/Alarm/General, by entering a "1" in the line "Reset".

C7000

The alarms for one unit are reset with the command "alarmreset".

7.5 Alarm texts in the case of hardware errors

C7000 AT

These alarms are edited in the shape of numeral codes by the terminal program:

Numeral code	Signification
000	Erase sector 6 flash 2 error
001	Write in sector 6 flash 2 error
002	Erase sector 7 flash 2 error
003	Write in sector 7 flash 2 error
004	Read of digital input error
005	Write of digital output error
006	Read of analogous input error
007	Write of analogous output error
008	Digital extension card error
009	Cannot select extension port
010	Analogous extension card error
011	Analogous extension card: cannot read input
012	Analogous extension card: cannot set output

8. Configuration notes

First steps after the reception of a new software

1. Load software on IOC, resp. on C7000AT. (see 4.5 Loading a new software)
2. Check bus configuration (configuration is kept after loading the software)
3. Load a default configuration according to the unit type (see 6.4.1 pre-configurations)
4. Check the equipment by command "equip".
5. Configure additional components.

At the C7000AT and C7000PT you can do this in the Service-level in the submenus of the menu point "Equipment". Part of the configuration is the activation of the component, the allocation of an output for the component control and eventually the assignment of an alarm input.

Possible maximum equipment according to unit type

Component	A	G	GE1	GE2	ACW	GCW	CW	CW2	max.
Louver	1	1	1	1	1	1	1	1	3
Fan	1	1	1	1	1	1	1	1	3
Compressor	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2			2
Suction valve	1	1	1	1	1	1			2
Hotgas-Bypass	1	1	1	1	1	1			1
Dehum.valve	1	1	1	1	1	1			1
G-valve		1	1			1			1
GE/CW-valve			1		1	1	1	1 (2)*	1
G-pump				1					1
GE-pump				1					1
Glycol pump		1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	2
Drycooler		1 - 4	1 - 4	1 - 4		1 - 4			4
E-Heating	1 - 4	1 - 4	1 - 4	1 - 4	1 - 4	1 - 4	1 - 4	1 - 4	4
Hotgas reheat	1	1	1	1	1	1			1
PWW-reheat	1	1	1	1	1	1	1	1	1
Humidifier	1 - 3	1 - 3	1 - 3	1 - 3	1 - 3	1 - 3	1 - 3	1 - 3	3
Conductivity meter	1	1	1	1	1	1	1	1	1

* Only one GE/CW-valve can be configured, but 2 analogous outputs are available.
For both valve the same parameters are valid.

The following components can only be configured in a single quantity.
Please note that the commands do not require a specification of quantity.

Hotgas-Bypass	dehumi confbypass 1
Dehumidif. valve	dehumi confvalve 1
G-valve	gvalve conf 1
GE/CW-valve	gecwv conf 1
Hotgas reheat	gasheat conf 1
PWW-reheat	pwwheat conf 1
Conductivity meter	humi 1 confcon 1

Further components

Component	max.
Sensor	21
external alarm	10

8.1 Loading a new Software

For a C7000-control system there are two different softwares. The essential control software, which contains also the commands for the command level and the menu structure of the C7000 PT, is located in the Flash-EPROM on the IOC-board. The second software contains the menu structure of the C7000AT and is located in the EPROM of the C7000AT board.

The control parameters in the IOC are resistant and do not have to be re-entered after loading the software. This is also the case for the IO bus configuration of the C7000AT.

For loading a software in the flash-EPROM of the IOC you must connect the service port of the IOC to a serial interface of your PC/Laptop by means of a RS232 modem connection.

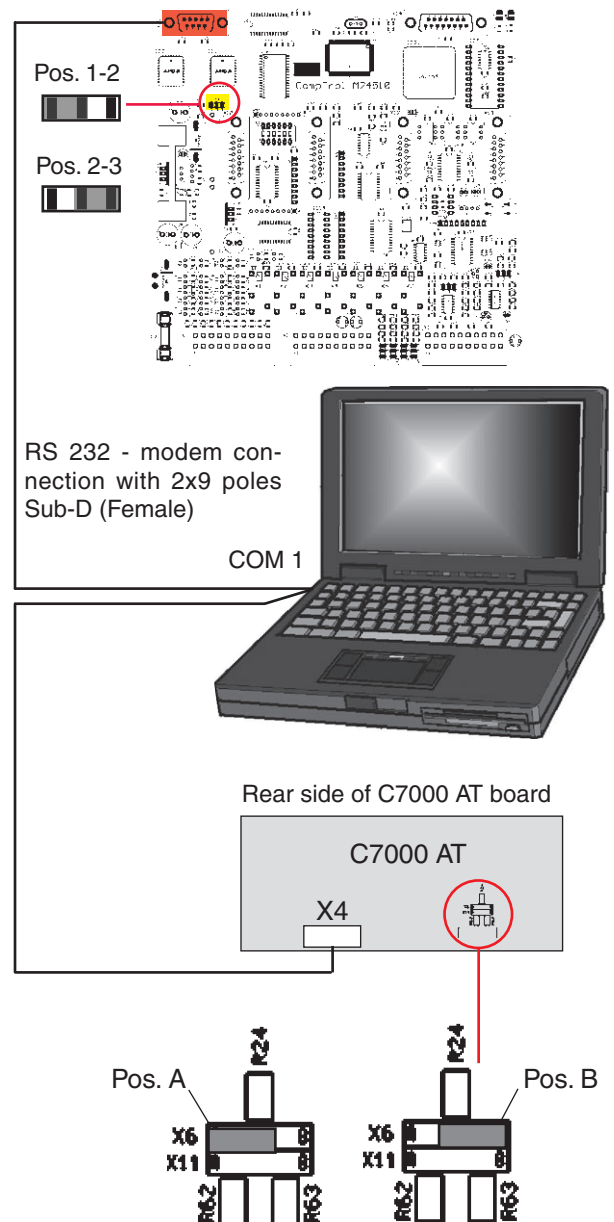
Switch off the master switch. Set the jumper JP7 to position 2-3. The master switch must then be switched on again. The IOC is now in the „download“-mode. Start the program "C7000-Service.exe" on your PC. This program can be downloaded from the Stulz-website.

After the new software has been loaded, the master switch must be switched off and the jumper JP7 must be set in the position 1-2. After this switch on the master switch.

For loading a software in the flash-EPROM of the C7000AT you must connect the service port of the C7000AT to a serial interface of your PC/Laptop by means of a RS232 modem connection.

Switch off the master switch. After this the jumper X6 must be set in the position A. The master switch must then be switched on again. The C7000AT is now in the „download“-mode. Start the program "C7000-Service.exe" on your PC. After the new software has been loaded, switch off the master switch and set the jumper X6 in position B. After this the master switch must be on again. When switching on, ensure that the new version number is correctly displayed.

*System requirements: Windows 95/98/NT/2000/ME/XP

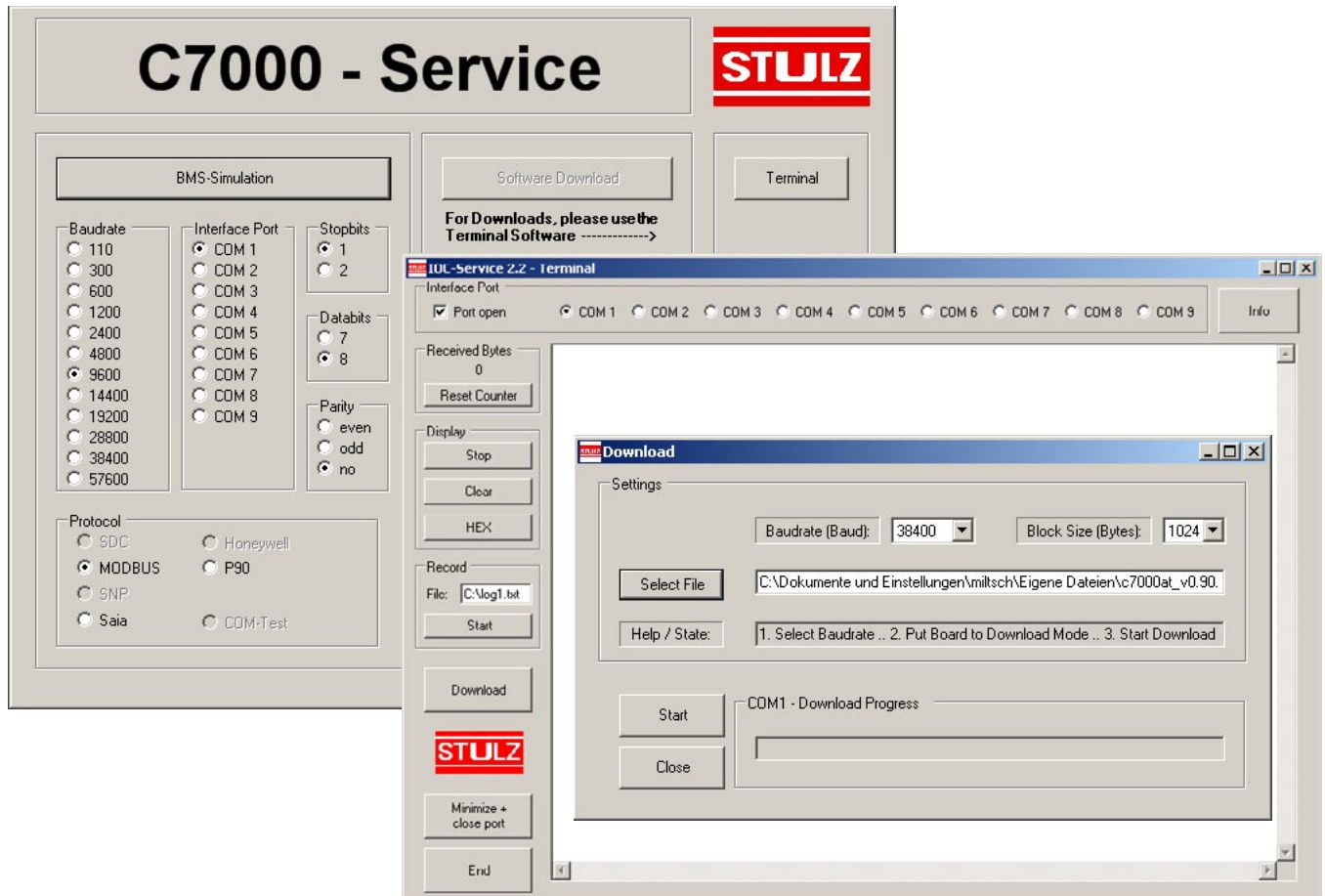


Only for the C7000 AT:

In the next step all parameters, if they deviate from the default settings and the bus configuration, must be readjusted. The default language is English. If you require another language, you can change this in the „Control\Preferences\Languages“ menu.

8.1.1 Operation of the program "C7000-Service.exe"

With an up-to-date WinXP system the program must only be copied onto the computer hard disk and can directly be started by a doubleclick. The files (C7000-Service.exe and IOC-Service.exe) must be stored in the same folder. With former WinXP versions, Win2000, WinME and Win98 the install-package which can be obtained from the e-Stulz domain must be carried out.



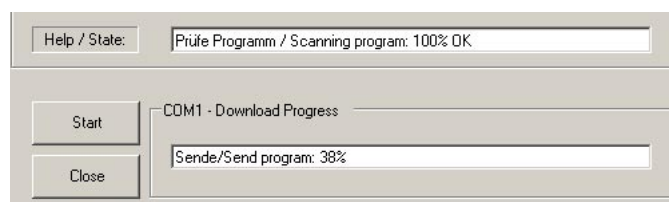
Start C7000-Service.exe und click on the button "Terminal", which starts the program IOC-Service.exe.

Select an interface to the PC (COM 1 - 9) and check the connection to the IOC or C7000AT by pressing the Return key. If you receive a response from the IOC/C7000AT the connection is established.

Clicking on the "Download" button opens a window, in which you can enter the file which shall be loaded. This is done by clicking on the button "Select file", which opens a dialogue windows for the selection of a file. The file is a hexadecimal file with the extension *.h86.

The file name gives information about the software destination. C7000AT-Vxxx.H86 is destined for the C7000AT. C7000IOC-Vxxx.h86 correspondingly for the IO-controller. The number behind the V indicates the version.

Concerning the block size and the transmission rate, you can take the preadjusted values (1024 Bytes and 38400 kBit/s). The transmission will then take approx. 2 minutes for each software. With a longer cable however, you may be obliged to reduce the rate.



You can start the download now with the button "Start". The single steps are indicated in the "Help/State" line, the progress of each step in the "Download Progress" line.

Clicking on "Close" closes the download window. Pressing the "End" button quits the program IOC-Service.

