

CompTrol 1002

Index 50

Issue 8.09

AIR CONDITIONING

MICROPRO	DCESSOR
88:88	• ** • ▲ • ** • ▲ • ** ** • ***** • *
STLILZ CompTrol 1002	

TECHNICAL MANUAL

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Subject to technical modifications - precedent manuals are not valid anymore

1. Features

STULZ CompTrol 1002 is a complete control system for A/C-Units. The controller is build in a compact microprocessor design and is completely digital. The controlling system is driven by software only.

CompTrol 1002 controls temperature and humidity and supervises the room in respect of freely adjusted limit values.

With the CompTrol 1002 single-module Chilled water (CW) units or units with a 2-stage compressor can be controlled. A 2-unit-sequencing is also included.

Functions such as cooling, reheat, humidification and dehumidification are continuously controlled and supervised. In case of any deviation from setpoints, the CompTrol 1002, will initiate necessary measures immediately. Parameters for the control system and the functions which have to be controlled can be adjusted by three keys on the CompTrol 1002.

The CompTrol 1002 can be connected to the STULZ Monitoring System.

This manual is valid from CompTrol 1002 Software-Version 2.0



4-Digit LED-Display

In this LED-display all controlling parameters such as setpoints, actual values and limiting values, are shown.

Status LED

Status LED shows actual operation mode of controller. As a function is switched on, the corresponding Status LED is indicated. On a CW-Unit, Status LED "cooling" indicates when CW-valve has an opening degree bigger than 0%.

Status LED "alarm" indicates when an alarm occurs.

DIP-Switch 1-4

Adjustments that need not to be changed after initial installation, are made by these DIP- switches. DIP- Switches 1-4 have the following functions:

DIP-Switch 1	No fund Modific menue this swi	No function Modification from Version 2.1: When the sequencing is active (i.e. menue point $24 > 0$), the start of the stand-by unit can be chosen by this switch.		
	ON:	No start by passing over a limit value		
	OFF:	Start of stand-by unit in addition, 3K before the limit value "Temp. too high" is reached.		
DIP-Switch 2	The con this DIF	trol of the compressor version or the CW version can be chosen by P-switch.		
	OFF:	Control of compressor version is chosen.		
	ON:	Control of CW version is chosen.		
	Some menu items, alarm inputs and outputs will obtain another meaning. DIP Switch 2 must only be switched when dead.			
DIP-Switch 3	Two ala	rm inputs can be chosen by this DIP- switch.		
	ON:	The inputs "auxiliary alarm 1" and "auxiliary alarm 2" have the function of external alarms.		
	OFF:	The input alarm 2 has the function of a fire and smoke detector. The input alarm 1 has the function of a water sensor.		



Consequences of alarm inputs "auxiliary alarm 1" and "auxiliary alarm 2" depends on position of DIP-switch 3. DIP-switch 3 can be switched at any time, even during controller operation. The function of this switch is immediately valid without further measures.

DIP-Switch 4Temperatures in °C or °F can be chosen by this DIP-switch.OFF: All temperatures are shown in °C.
Temperature differences are shown in K.
The actual value is marked by a "C".

ON: All temperatures are shown in °F. Temperature differences are converted to degree Rankin. The actual value is marked by an R.



DIP - switch 4 can be switched over any time, even during controller operation. Function of switch is valid without further measures.

Membrane Keys

Start/Stop Key

Operation mode "start" and "stop" are the only functions of this key. If the controller is in enter mode, the key is ineffective.

Operation Mode "Stop"

Control system and unit are not in operation. CW-valve closes. Limit values are supervised. Independent failures (like sensor break-down, water sensor alarm, fire alarm, smoke detector and other external alarms) are supervised. Display indicates $\prod \vdash \vdash$

The horizontal bar in display means that controller has been locally turned off by the ① Start/ Stop-key.

Occuring alarms and failures can be reset in menu item 1. Inputs and modifications in all menu items can be made.

Operation Mode "Start" Control system and unit are in operation. Unit functions are turned on when start values match setpoints of corresponding functions. Limit values are supervised. Menu item 1 is shown. Display is alternating between actual value "temperature" and actual value "humidity" in 2- second- intervals.
Occuring alarms and failures can be reset in menue item 1. Inputs and modifications in all menue points can be made.
Right Arrow Key This key has several functions.
Menu Item 1 And Operation Mode "Stop" Alarm reset is activated by pressing the key.

Menu Items 2 to 24

The enter mode for these menu items is activated by pressing the key. After pressing this key there is a request for entering in the password.

Enter Mode

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Being in the enter mode, you can confirm the entered parameters and leave the enter mode by pressing this key again. The value shown last is stored in the memory and is used for controlling.

Up Arrow Key

Next menu item can be entered by this key. The shown value is increased in enter mode.

Down Arrow Key

Last menu item can be reached by pressing this key. The shown value is diminished in enter mode.



Pressing one of these two keys longer than one second in enter mode means pressing this key 12 times.

If none of the keys is used within five minutes, the display automatically returns to menu item 1.

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3. Start-up

Prior to initialization, the software version number is displayed for about 1 s.

Example:

When the C1002 is started (operation voltage is supplied) the following symbol appears in the display for one second during initial phase:

88:88

In this initial phase all values of the EEPROM memory are loaded into the RAM. Independent of the requirements for a certain function the CW- valve is closed for the time entered in menu item 8. This procedure is necessary to synchronise the control system with the modulating valve.

Start- up in Operation Mode "Stop"

If the CompTrol 1002 was in operation mode "Stop" before cutting off the power supply, the controller will be in this operation mode again after the restart. Three s of how the unit has been stopped, exist:

	Display
1. Start/Stop-Key: local mode	OF F_
2. Remote On/Off: remote mode	0F F -

3. Software On/Off: Monitoring system

If controller is stopped from several locations, the corresponding bars in the fourth character position appear on the display. Restarting is only possible if the controller is locally started by the Start/Stop-key. The Start/Stop-Key has the highest priority.

Start-up in Operation Mode "Start" (Autostart)

The CompTrol 1002 is equipped with an "Autostart"- function. This means that the unit starts automatically after a power supply failure when it was in operation mode "Start" before. A restart of several units equipped with the C1002 at the same time can be avoided by entering a time delay in menu point 22.

Э	possibilitie
s	play







Software version 2.1

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Start-up with Standard- Program If the two keys which represent the password are pressed at the same time as power is turned on, the following reading appears on the display:
P - 99
At this time the standard program is loaded from program memory EPROM to the EEPROM memory and RAM. During this procedure the control system is not working. By loading the standard program the controller is switched off locally and has to be set in operation mode "start" by pressing the Start/Stop-key.
Start- up with new EEPROM If the CompTrol 1002 is started with a new EEPROM, the following symbol appears in the display during the initial phase (about 1 second):
The standard values of the program memory EPROM are loaded into the EEPROM and into the RAM. During this procedure the control system is not working. During this time the controller is not working. By loading the standard program the controller is switched off locally and has to be set into operation mode "start" by pressing the Start/Stop-key.
Warm start The Controller CompTrol 1002 is equipped with a "watchdog-timer". This "watchdog-timer" incre- ases the operating safety and restarts the program if a runtime error occurs. In such a case the following reading appears in the display:
If the C1002 was in operation mode "start", the autostart function is activated in this case.

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4. Menu



The menu items 8-11 depend on the position of the Dip-switch 2. The menu item 25 only exists, if the Dip-switch 2 is in position "ON".

RT : Room temperature RH : Room humidity

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Menu item	Meaning	Display	Further Functions
1	Actual value "Temperature"	25:30	▶1s ▶alarm reset
	Actual value "Humidity"	<u> 66</u> Н	
2	Setpoint "Temperature"	50:0F	
3	Setpoint "Humidity"	50 h	
4	Limit value "Room tempera- ture too high"	35 E n	
5	Limit value "Room tempera- ture too low"	00 E u	+ PASSWORD
6	Limit value "Room humidity too high"	80 h ⁿ	enter mode modification of values by
7	Limit value "Room humidity too low"	00 hu	and 🗸
8a	Valve modulating time (in seconds)	IS OR	leaving the enter mode
8b	Compressor restart delay	25 SR	
9a	CW-valve start value	00:06	
9b	1. Compressor start value	00:06	
10a	Proportional range of CW- valve	0 1:0c	
10b	Hysteresis of compressors	00:75	

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Menu item	Meaning	Display	Further Functions
11a	CW-valve opening degree for dehumidification in %	10 0 d	
11b	2. Compressor start value	01:24	
12	Reheat 1 start value	00:5E	
13	Reheat 1 + 2 hysteresis	00:3F	
14	Reheat 2 start value	0 I:0H	+ PASSWORD
15	Humidification start value	05 J	enter modemodification of values by
16	Humidification hysteresis	03 L	and 🗸
17	Dehumidification start value	05 n	leaving the enter mode with
18	Dehumidification hysteresis	03 o	
19	CPU-address	00 IP	
20	Temperature sensor adjust- ment	25:3E	
21	Humidity sensor adjustment	66 h	
22	Unit start delay	00 4-	
	1	I	1



Item

1

Actual Values

Display is alternating between actual value "temperature" and actual value "humidity" in 2- second- intervals. Humidity is shown in % r.h. Actual value "humidity" is marked by an H. Temperatures are shown in °C (marked by C) or °F (marked by F). This can be chosen by DIP- switch 4 at any time.

Resetting an alarm is only possible in this menu item.

2 **Temperature Setpoint**

"Temperature" setpoint is shown in this item. Unit of temperature is °C or °F.

3 Humidity Setpoint

"Humidity " setpoint is shown in this item.

4 High Temperature Limit value

If the actual value "temperature " is rising up to this point, an alarm "Temperature too high" is released.

5 **Low Temperature Limit value**

If the actual value "temperature" is going down to this point, an alarm "Temperature too low" is released.

6 High Humidity Limit value

If the actual value "humidity" is rising up to this point, an alarm "Humidity too high" is released.

7 Low Humidity Limit value

If the actual value "humidity" is moving down to this point, an alarm "Humidity too low" is released.

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1	_	

Item

	a. CW-units	b. Units with Compressor
8	Valve Modulating Time	Compressor Restart Delay
	Modulating time of CW-valve (operating level 0% up to operating level 100% in seconds) will be entered in this menue point. Actuator SQS 82, SQS 81 (L&G): 150 seconds.	In this item the restart delay in seconds is entered. After a compressor shut down, it can only be restarted when the time set has elapsed.
9	CW valve Start Value	1. Compressor Start Value
10	CW valve Proportional Range	Hysteresis of Compressors
	Start point Cooling and proportional range of CW- valve are entered in these points of menue. Refer to control scheme.	
11	Opening degree for dehumidification	2. Compressor Start Value
	Opening degree of CW-valve required for de- humidification can be entered in this item.	The parameters of the compressors' start and hysteresis can be entered in these menu items (9b-11b).
	Maximum opening degree for dehumi- di-fication can be passed over when the CW-valve's opening degree for cooling is increased.	Menu item 11b is only relevant, if a second compressor exists.

If the proportional range or hysteresis is set to actual value "0" the corresponding function is not required, the status- LED is not activated and the corresponding failures are not evaluated.

Item

12 Reheat 1 Start Value

13 Reheat 1 + 2 Hysteresis

14 Reheat 2 Start Value

Parameters of reheat's stages 1+2 can be entered in these items The hysteresis is valid for both stages.

15 Humidification Start Value

16 Humidification Hysteresis

Parameters of 2-point-humidification can be entered in these items.

17 **Dehumidification Start Value CW-units:**

For dehumidification CW-valve opens to the indicated opening degree entered in item 11a.

Units with compressor:

The dehumidification circuit and the compressor will be started.

The "dehumidification" function is stopped when temperature is less than 0.5 K (0.9R) above the low temperature limit value. It is enabled with a hysteresis of 0.5 K (0.9R).

Modification from version 2.1:

3K (5R) underneath the temperature setpoint the dehumidification is stopped. This way a fall of the room temperature by keeping the humidity setpoint is avoided.

Hysteresis Dehumidification

Parameters for dehumidification are entered in this item.



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If the hysteresis of humidification and dehumidification is set to zero, the limit value "humidity" is not supervised.

The values of the items 9a+b, 11b, 12, 14, 15, 17 are entered as a difference to the setpoint.

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Item

19 CPU- Address

CPU- Address can be entered in this item. If CompTrol 1002 is connected to a STULZ Monitoring System, an address between 1 and 32 for every connected controller has to be adjusted.

20 Temperature Sensor Adjustment

Temperature sensor adjustment can be done in this item. The actual value is indicated and can be adjusted to another value, that is measured by use of an independent temperature sensor.



Display is in reference to position of DIP- switch 4 degrees Celsius or Fahrenheit.

By loading the basic program of the controller, sensor adjustment is reset to zero.

21 Humidity Sensor Adjustment

Humidity sensor adjustment can be done in this item. The actual value taken from a reference measurement has to be entered.



By loading the basic program of the controller, sensor adjustment is reset to zero.

22 Unit Start Delay

Unit start delay can be entered in this item. This is the time, the unit start is delayed in addition to the initialization time, when the unit is turned on in start mode (Autostart)

The start delay can be entered in 4-second intervals.

STLLZ Item 23 Integral Factor for Setpoint "Temperature" In this point of the menue, the I-proportion of the PI controller can be preset. If a nonzero value is entered, the control discrepancy, which is characteristic for P-controllers, is avoided. The setpoint SP1 entered becomes "control setpoint". Now, it is no more a constant value but is changed in integral intervals of 5 minutes and indicated in the menu item 2 "temperature setpoint". Alteration of the setpoint is made using the following formula: Δ SP = (Setpoint - Actual Value) x Integral Factor % which results in Control Setpoint $SP_2 = SP_1 + \Delta SP$ Actual value a) modification of setpoint in enter mode SP1 <u>г</u> SP_{new} SP2 5 min. control setpoint 1 t

The originally entered setpoint SP_1 appears in the enter mode, which can be changed in this item and which is immediately rendered valid after the alteration has been made (refer to illustration a)).

The values of the integral factor may be adjusted between 0 and 80%. As a rule, a low value should be used to start with, otherwise the system will start oscillating. 10% are proposed, which can be increased step by step, until the system has been adjusted.

Item

For test purposes or in case the I-proportion is not desired, the integral factor is set to **zero**. A P-controller exists and the control setpoint is equal to the setpoint.

Under the following circumstances, the setpoint is immediately taken over into the control setpoint:



- during initialization phase (switch on voltage)
 - turning on (start mode)
- failure "sensor break-down" active
- limit alarms "temperature" active
- modification of setpoint

The range of the control setpoint is limited to setpoint \pm 3 K (\pm 5.4 R).

24 Sequencing for 2 units

A 2-unit-sequencing is integrated in the software. The display during input mode and normal mode can vary.

input mode	normal mode	Meaning
0 1	0 5-4-3-2-1	No sequencing function. Short sequencing 5 min for testing purposes. In nor- mal mode the remaining minutes till sequencing are shown.
2254	2541	Sequencing shown in hours. In the input mode a time lap of 2 to 254 hours can be chosen. In normal mode the remaining hours till sequen- cing are shown.
255	Un2	If "255" is set in the input mode, the unit is set as the "2nd" unit. No adjustments are carried out on this unit. The sequencing time is only set and displayed on the "1st" unit.

In case of failure (unit 1 or unit 2) the sequencing time is frozen. This state is maintained until a failure reset is carried out. After that, sequencing continues as normal.

Item

If unit 1 is the StBy-unit (i.e. the unit, which is not in operation at the moment, due to the sequencing), a colon (":") is displayed in item "U". If unit 2 is the StBy-unit the colon disappears.

3K below the alarm "temperature too high" the StBy-unit starts in addition. The sequencing time will not be interrupted. At a hysteresis of 3K the unit stops again.

The sequencing uses the standard inputs for remote on/off and water detector/Aux1 and the standard outputs for common alarm and heating 2.

If the input Aux1/water detector and/or the output heating 2 is needed, an extension board is installed, on which one input and output are available for the sequencing. This way the 2nd heating stage and the water detector input are available again on the processor board.

As the sequencing is carried out by using the input for remote on/off, the display of the StBy-unit shows:



from version 2.1: If the sequencing is enabled (i.e. menu item 24 > 0), the start of the standby unit can be adjusted by DIP switch 1.

ON: no start at limit value

OFF: Start at 3K before attaining the limit value "Temp. too high".

A connection scheme for both units is shown on the pages 32 and 36.

25 Actual Opening degree CW Valve

In this item, the actual opening degree of the CW valve is displayed. This item exists only at CW-units.

5. Alarms and Failures

General

An alarm or failure is indicated via a short text in the display and status-LEDs. Conditions that activate the alarm relay are shown in the following table. The delay with which the

alarm relay is activated, depends on the failure and is documented in the table.

Texts for alarms and failures are only shown in operation mode "start", in menu item 1, and in operation mode "stop". All alarms and failures that have occured up to this time and corresponding operation modes are indicated by showing up every four seconds.

Warnings

Warnings have no direct influence on the function of the unit, i.e. after a warning has occured, the unit can be continued in operation for a while. The alarm relay is not activated.

These functions are only supervised in start mode:

- Ultrasonic humidifier (5µS/cm)
- Filter

Alarms

Actual values are supervised not to reach limit values. After a delay of about 30 seconds the limit alarm is activated. Limit values are supervised even in operation mode "stop".



Alarm "humidity" is only evaluated if dehumidification and humidification hysteresis is not set at "0".

Failures

Failures on the following functions are only supervised in the operation mode "start":

- Reheat

Compressor 1 low pressure

- Humidification (20µS/cm)
- Airflow

Compressor 1 failure Compressor 2 low pressure

Compressor 2 failure

Failures on the following functions are also supervised in the operation mode "stop".

- Aux 1 / water sensor
- Aux 2 / fire and smoke detector
- Sensor break-down

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If the alarm input is supplied with 24V, there is no failure/alarm. If the alarm inputs are not used they have to be supplied with 24V or, if possible, the hysteresis of the function has to be set to "0". The inputs concerned are:
Heating 1 and 2 Air volume 1 and 2 Water sensor/Aux 1 Alarm Fire/Aux 2 Alarm
High pressure, low pressure failure compressor Humidifier alarm / 20 μS/cm Alarm 5 μS/cm Filter alarm
Reset Alarms And Failures
Resetting of alarms and failures can only be done in menu item 1.
Warning (Alarm Relay Inactive)
Press key and within 1 s later, press key . After that, warning is reset and the alarm LED disappears.
Alarm + Failure (Alarm Relay Active)
Press \blacktriangleright key and within 1 s later, press key \fbox . The alarm relay is deactivated.
Press \blacktriangleright key and within 1 s later, press key \checkmark . All failures indicated are reset and the alarm LED disappears.
In case of a failure reset the components are switched on sequentially (same as after power failure), to prevent an overcharge of the alimentation line by the starting current.

Table of Alarms and Failures

Alarms Display Meaning Alarm LED Alarm Relay Time Delay Consequences П Х about 30 s -----Room temperature too high Х гĿ Room temperature too low r E Х Х about 30 s ------U п Х Х about 30 s ----гh Room humidity too high about 30 s -----Room humidity too low Х Х гh L **Failures** HF R Reheat 1 or 2 failure Х Х about 3 s Reheat 1 and 2 are switched off. HЦ Humidifier (20µS/cm) failure Х Х about 5 min. Humidifier off. [[] n about 5 min. -----Conductivity meter (5µS/cm) Х FLOI Airflow 1 failure Х Х about 20 s All compon. off, FL DZ Airflow 2 failure Х Х about 20 s Valve is closing, Damper is closing. The alarms "HEA", "HIP" and "LOP" are inhibited. Low pressure compressor 1 Х Х 3 min. Compressor 1 off. 1 П Р Р Low pressure compressor 2 Х Х 3 min. Compressor 2 off. HIPI Compressor 1 failure Х Х 3 s Compressor 1 off. HIP2Compressor 2 failure Х Х 3 s Compressor 2 off. FIL Clogged filter Х about 5 min. -----All (1) Auxiliary alarm 1 Х Х about 3 s ------ΗU Ľ (2) Auxiliary alarm 2 Х Х about 3 s ------SE \vdash $3^{\circ}C > T > 50^{\circ}C$ Х Х about 3 s Reheat, compressor Sensor break-down (temp.) off, valve closed. SE h 3% > r.h. > 97% Х Х about 3 s Humidifier off, Sensor break-down (humidity) dehum. off. $F \vdash F$ (2) Fire alarm / smoke detector Х Х about 3 s All components off, valve is closing. LL S (1) Water alarm Х Х about 3 s Humidifier off. CPU Controller defective immediately All components off.

(1) (2) These failures can be alternatively chosen (DIP-switch 3).

After compressor start, otherwise 3 s.

(3)





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7. Specification CompTrol 1002	
7.1 Technical Data	
Dimensions L x W x H	280 x 195 x 45 mm (11.0" x 7.7" x 1.8")
Power supply	(24 V + 20 % / - 15 %) V AC X10, X11.1 grounded
Power consumption	12 W
Fuse	1 Amp
Power output	15 V DC, 40 mAmp
Sensor input	2 (020 mAmp)
Operating resistance "temperature"	330 Ohm
Operating resistance "humidity"	162 Ohm
Display	4-Digit LED-display 4 LED green for status φ3 mm (1/8") 1 LED red for alarm φ3 mm (1/8")
Service elements	4 keys
Interface for BMS (Building Management	RS 485 9600 Baud
Outputs	2 x relays 3 Amp, 24 V,1 normally open for alarm, humidification 5 x triac 4 Amp, 24 V fan, valve or compressor and dehumidification saver circuit, reheat 1, reheat 2
	The consumer is connected to 24V.
Inputs	8 x 24 V AC 2.7 kOhm input resistance
Operating temperature	0°C 40°C (32°F 104°F)
Storage temperature	-10°C 60°C (14°F 140°F)



7.2 Connection Diagram of Processor Board C1002



X10: flat-cable plug 6.3 • 0.8 X11: connection terminal 33 pins X12: extension plug 20 pins

The **sequencing** uses the standard inputs for Remote on/off and Aux1/water detector and the standard outputs for reheat 2 and the common alarm.

If the input for Aux1/water detector and/or the output for reheat 2 are required, an extension card must be installed, which provides an input/output for the sequencing.

This way the water detector input and the output for the 2nd reheat are provided on the processor board again.



 * If an extension card is installed, the inputs for Ultrasonic 5µS/cm and Aux2/fire are situated on the extension card.

In a CW application, the CompTrol 1002 is usually used for a proportional valve with motor drive. The operation of the control is explained in the following drawing (example for a 150- seconds-runtime).



When connection V+ is supplied with power, the valve is completely opened within 150 seconds (operation level 0% to operation level 100%). Shorter times mean steeper operation level. When connection V- is supplied by power the valve is closing. If there is a power interruption to the valve, the last operation level is fixed.

The consumer is connected to 24V.

Examples:



The function of a triac **cannot be checked** by means of an ohmmeter. Measurements provided by these instruments would give faulty results because a triac needs a load for a correct function. For an operational test, a tester with filament lamp (about 2 W) should be used.

Inputs are designed for 24 V AC, but also a voltage 24V DC can be used.

7.3 Bus connection

C1002 board with driver module



The C1002 controller can be integrated in the Stulz bus. The driver module serves to properly adjust the C1002 as a bus participant in dependence of the position within the bus. For a detailed description of the driver module see next page.

Driver module

The driver module has the following features:

- 1. a static bus termination (120 Ohm), which can be activated by a jumper.
- 2. a circuit to set the bias for the bus. By means of two jumpers either a low bias (bus middle) or a high bias (bus end) can be set.
- 3. protection against electrostatic discharge (ESD) impulses on the data lines

The interference immunity of the bus is increased by the driver module. As far as the jumper settings are concerned, only the two settings shown below are allowed. The jumpers must be changed blockwise. Other settings result in an unstable bus communication.



Participant at the end of the RS485 bus

This figure shows the jumper position for the participant at the end of the bus. The rightmost jumper is located in a position where the termination resistor is activated. The other jumpers are set for a high bias.

Jumper to activate the termination resistance

Two jumpers to set the bias on the bus.



Participant in the middle of the RS485 bus

This figure shows the jumper position for the participant in the middle of the bus. The rightmost jumper is located in a position where the termination resistor is deactivated. The other jumpers are set for a low bias. STLLZ





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8. Specifications of the Extension Card 1b

Characteristics

With the extension card 1b, additional inputs and outputs are provided for the CompTrol 1002. The extension card 1b is fixed on the CompTrol 1002 by means of the two distance pieces enclosed. Electric connection to the basic board is made by a 20 pins plug connector. As soon as the extension card has been connected, the alarms aux 2 / fire and smoke detector and Ultrasonic humidifier 5μ S/cm can only be detected on the extension board.

Operating Elements (DIP Switches 1-6)

DIP-Switch 1	Configuration of a damper		
	ON:	A damper is configured. Fan start is delayed by approxi- mately 90 s.	
	OFF:	A damper is not configured. The fan starts immediately.	
DIP-Switch 2	Configuration of a second compressor.		
	ON:	A second compressor is available. The DIP switch on the rear side of the CompTrol 1002 must be set to OFF (Compressor version).	
	OFF:	A second compressor does not exist.	
DIP-Switch 3-6	No functi	on	



All DIP switches on the extension card 1b must only be switched when no voltage is applied!

8.1 Technical Data Extension Card 1b

Dimensions L x W x H	125 x 70 x 30 mm (4.9" x 2.8" x 1.2")			
Power supply	(24 + 20 % / - 15 %) V AC			
	X20.24 grounded			
Power consumption	4 W			
Fuse	0.4 AT			
Operating elements	6-fold DIP switches			
Outputs	3 x triac (4 A, 24 V) for			
	damper, compressor 2, sequencing			
	The consumer is connected to 24 V.			

Inputs	8 x 24 V AC		
	2.7 kOhm input resistance		
Operating temperature	0°C 40°C (32°F 104°F)		
Storage temperature	-10°C 60°C (14°F 140°F)		

Function of Extension Card 1b

Compressor Sequencing

If two compressors are configured, these are subject to compressor sequencing, according to the "first in - first out" principle, i.e. should both compressors be turned on, the compressor which has been turned on first will be turned off first. Start parameters (menu items 9 and 11) will be changed internally, not visibly, after each compressor start.

Temperature Limit

The input "Temperature Limit" exists. As soon as a voltage of 24 V is applied to this input, the cooling is interrupted.

That means for

- CW version: The CW valve closes
- Compressor version: The compressors are switched off.





9. Appendix

9.1 Standard Setting

9.1 Standard Setting	I	Standard	
Menu item	Range	value	Adjusted value
2. Setpoint temperature	10,030,0°C	24,0°C	
3. Setpoint humidity	1090%	45%	
4. Limit value temperature too high	1050°C	35°C	
5. Limit value temperature too low	030°C	0°C	
6. Limit value humidity too high	3090%	80%	
7. Limit value humidity too low	070%	0%	
8a. Valve modulating time	0255 s	150 s	
8b. Compressor restart delay	0255 s	255 s	
9a. CW-valve start value	09,9 K	0,0 K	
9b. Compressor 1 start value	09,9 K	0,7 K	
10a. CW valve proportional range	09,9 K	1,0 K	
10b. Hysteresis compressors	09,9 K	0,3 K	
11a. Opening degree for dehumidif.	0100%	100%	
11b. Compressor 2 start value	09,9 K	1,2 K	
12. Start value reheat 1	09,9 K	0,5 K	
13. Hysteresis reheat 1 + 2	09,9 K	0,3 K	
14. Start value reheat 2	09,9 K	1,0 K	
15. Start value humidification	020%	5%	
16. Hysteresis humidification	020%	3%	
17. Start value dehumidification	020%	5%	
18. Hysteresis dehumidification	020%	3%	
19. CPU-address	1255	1	
20. Sensor adjustment "temperature"	-12,8+12,7 K	0	
21. Sensor adjustment "humidity"	-24+24%	0	
22. Unit start delay	0996s	4	
23. Integral factor	080%	0%	
24. Sequencing for 2 units	0255	0	

9.2 Password

In menu items 2 to 24 a password is requested in enter mode. The display shows



To enter the password, keys \land and \checkmark must be pressed within 5 seconds. Now the display flashes and the parameter can be modified.

Should a wrong key be pressed or the time be exceeded, entering of password is aborted.