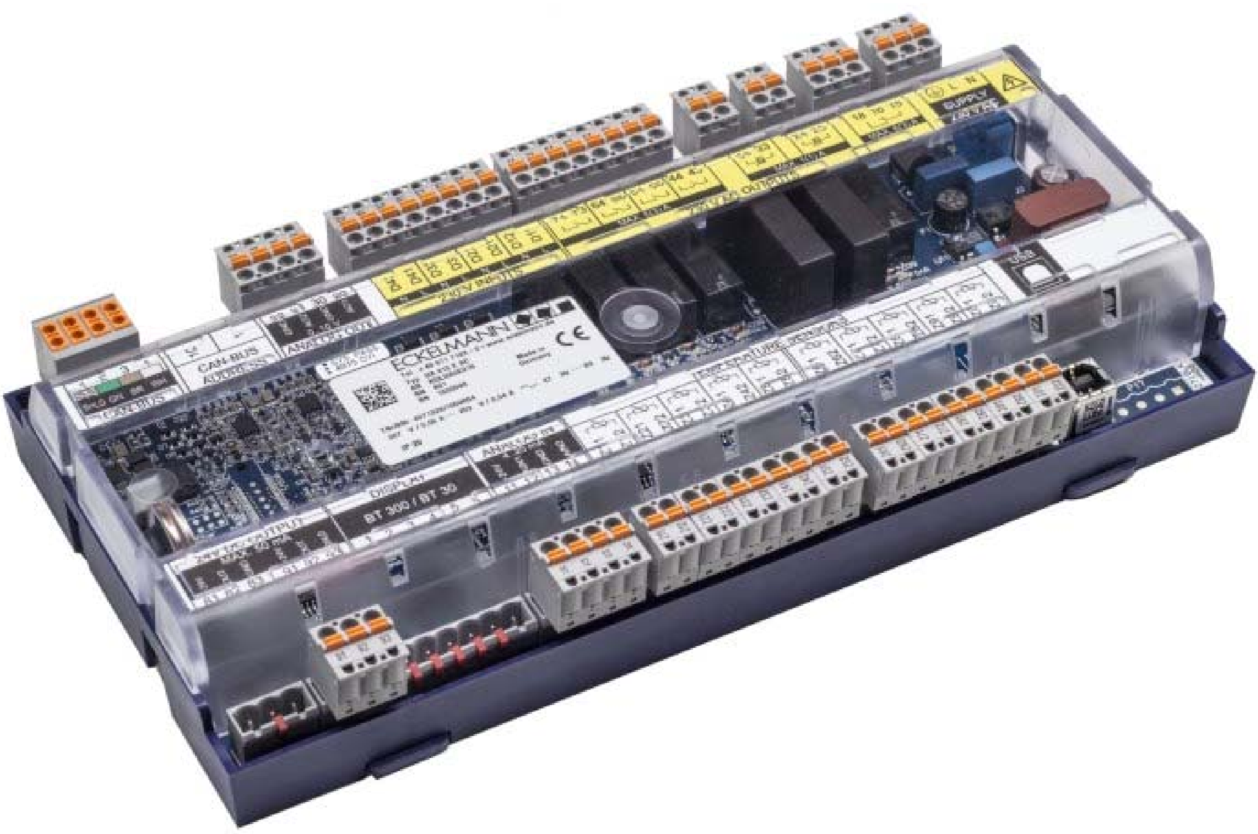
Operating instruction

UA 400 E / UA 410 E Case Controller

For electronic expansion valves - Version V2.00



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With the publication of a new version of the documentation, all previous versions lose their validity.
Errors and technical modifications are expressly reserved.

The current operating manual and information such as data sheets, more detailed documentation and FAQs are available for you on-line in E°EDP (Eckelmann ° Electronic Documentation Platform) at
www.eckelmann.de/elds

You reach all relevant documents for this component directly using the QR code:

Information on safety and connection instructions
are described in detail in chapter 1 ”Industrial safety notes”.

Notice:

Conventions

Explanation of 'General Instructions'

A general instruction is composed of two elements:
1. A pictogram of a hand at the side of the page as well as
2. The actual text:

For example:

☞ Further information on the device's degree of protection is contained in the chapter ”Technical Data”.

Explanation of 'Safety Instructions and Hazard Warnings'

Safety instructions or hazard warnings are composed of four elements:
1. The pictogram (warning sign / symbol) at the edge of the page.
2. A short, concise description of the danger.
3. A description of the possible consequences.
4. A catalogue with prevention measures.

For example:

Warning - hazardous electrical voltage!
Danger of electric shock! BEFORE and AFTER connection it must checked that the 230 V AC relay outputs are **off load!**

On the following pages the warning signs and symbols employed for
the safety instructions and hazard warnings in this documentation are described in more detail.

Warning Signs and Symbols Employed

Explanation of the warning signs and symbols employed for the safety instructions and hazard warnings in this documentation:

- **Attention symbol - general hazard warning**

1. Hazard warning
The attention symbol indicates all safety instructions in this operating and service manual, which, if not observed, could result in danger to life and limb. Carefully comply with the work safety instructions and proceed with special caution in these cases.

2. Attention
The attention symbol highlights guidelines and regulations, instructions and correct working procedures that must be carefully observed in order to prevent damage to or destruction of E*LDS components or a malfunctioning (for example to avoid damage to goods).

Failure to observe the attention symbol can result in personal injury (in extreme cases serious injuries or death) and/or material damage!

- **Voltage symbol - warns of hazardous electrical voltage**

This work safety symbol warns of danger from a hazardous electrical voltage, with potential consequences such as serious injury or death.

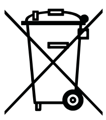
- **ESD symbol - warns of electrostatic sensitive components and assemblies**

This symbol indicates electrostatic sensitive components and assemblies, for details see chapter 1.5.

- **Note symbol**

The note symbol highlights practice tips and other useful information contained in this operating and service manual.

- **Battery disposal symbol**



Never dispose of this product with other household waste. Please inform yourself of the local regulations for the separate disposal of electrical and electronic products. The correct disposal of your old equipment will protect people and the environment from possible negative effects.
You will find further information in the chapter ”Decommissioning and Disposal”.

1 Safety instructions

The safety regulations, codes and notes contained in this section must definitely be observed and complied with at all times. During repairs on the entire E*LDS system, the accident prevention regulations and general safety instructions must be observed. Important information (safety instructions and hazard warnings) are indicated by corresponding symbols (see page 1 of the chapter "Conventions").
Follow these instructions in order to prevent accidents and danger to life and limb, as well as damage to the E*LDS system.

Warning - hazardous electrical voltage!
Danger of electric shock! Beware of external voltage at the digital inputs and outputs!
All device connections/plugs are **only** to be plugged in, unplugged and/or wired when **off load**.

- This instruction manual is an integral part of the equipment. It **must** be kept in the proximity of the equipment and must be stored for future use, so that it can be referred to when necessary. To avoid operating errors, the operation instructions must **always** be kept available for operating and maintenance staff, see Chapter 1.2.
- For safety reasons, the equipment must not be used for any application other than described in the manual i.e. only for the intended use, see Chapter 1.3.
- Before using the equipment, always check that its limits are suitable for the intended application.
- Check that the electric power supply is correct for the equipment before connecting it to power.
- When using uncoded plug connectors, it is possible to connect them so that there is a danger to life and limb! If this cannot be ruled out, coded plug connectors must be used.
- Specified ambient conditions (e.g. humidity and temperature limits) must be observed and complied with in order to avoid malfunctioning (see Section "Specifications").
- Check correct wiring of the connections before switching on power to the equipment.
- Never operate the equipment without its casing. Before opening the casing the equipment must be switched to zero potential.
- Note and observe maximum load on relay contacts (see Section "Specifications").
- Contact the supplier in any malfunction.
- Note that all leads running to and from the controller- especially those of the CAN bus - must be shielded and installed sufficiently clear of other leads carrying live power. Doing so will avoid faulty measurements and will protect the equipment from external interference via the analog inputs.
  Parallel connection of RC elements is recommended for applications in a critical environment.

1. According to experience, error message transmission is not yet fully functional during commissioning (no telephone line laid etc.) In such cases it is urgently recommended to monitor the controller via the CAN bus using a system centre, a store computer or an operator terminal, and enable error message transmission e.g. using a GSM modem via a mobile telephone network. In stand alone operation, or as an alternative to monitoring with the system centre / store computer / operator terminal, an alarm contact on the controller must be used in order to realise error message transmission via a telephone network.
2. In the interests of fire prevention, allowance should be made at the time of planning the system for a suitable shutdown device designed to operate in the event of excessive temperature on the defrost heater (high-temperature cutout).

For further information on the CAN bus, see the operation instructions "Basic and General Safety and Connection Instructions".

Work on electrical equipment may **only be undertaken by authorized and duly trained personnel** (as defined by DIN/VDE 0105 and IEC364) with full observance of the currently valid regulations contained in the following:

- VDE Regulations
- Local safety codes
- Intended use see chapter 1.3
- BGV A3 - Five Safety Rules see chapter 1.4
- ESD precautions and rules see chapter 1.5.
- Operating instructions

1.1 Disclaimer in the event of non-compliance

These operating instructions contain information on the commissioning, function, operation and maintenance of the controls and of the associated components.

Observance of these operating instructions is a prerequisite for safe and trouble-free operation.

1.2 Personnel requirements, requirements on staff

Special skills are required for project planning, programming, assembly, commissioning and maintenance work. This work may be performed by qualified and specially trained staff.

The staff involved in installation, commissioning and maintenance must have received the special training needed for them to work on the unit and on the automation system.

The project planning and programming staff must be familiar with the safety concepts involved in automation technology.

Expertise is a requirement for any work on electrical systems. Work on electrical installations may only be performed by trained electrical specialists (or may only be performed when directed or supervised by them). The applicable regulations (e.g. DIN EN 60204, EN 50178, BGV A3, and DIN VDE 0100/0113) must be followed.

The operating staff who deal with the unit/machine and the controls must be correspondingly trained and familiar with the operating instructions.

1.3 Intended use

This control system may only be used for the purpose for which it is intended:

The UA 400 E / UA 410 E AC control system has been designed for use as case controller in commercial and industrial refrigeration systems with the intended functional scope as described in these operating instructions, and it is to be used under the environmental conditions in these instructions.

Follow the safety instructions, as well as the instructions on installation, commissioning, operation and maintenance. Only THEN should you start commissioning or operating the machine/system.

The safety and function of the machine/unit is only assured in the use for which it has been intended.

Never use the machine/unit, its components, assemblies or parts of it for a different purpose.

The installation may be only operated for the first time when the entire unit has been shown to conform to the EC Directives.

1.4 BGV A3 - Five safety rules

The following rules must be strictly observed:

1. **Disconnect electric power:** Disconnect power at all connections of the entire installation on which work is to be carried out.

Warning - hazardous electrical voltage!
Beware of possible external power supplies! **BEFORE and AFTER** connection it must be checked that the controller is **off load**! All device connections/plugs are only to be plugged in, unplugged and/or wired when off load.

2. **Secure against reconnection of power:** Tag the disconnected equipment with the following information:
   - What has been disconnected from power
   - Why it has been disconnected
   - Name of person who disconnected power
   - Use a suitable lock-out (e.g. padlock) to prevent reconnection of power.
3. **Make sure that power is off (authorized and duly trained personnel only):**
   - Check with voltmeter immediately before use.
   - Check that power is off on all connections at the disconnection point.
   - Check that power is off on all connections at the place of work.
4. **Ground and short circuit:** Ground and then short circuit all electrical parts at the place of work.
5. **Cover or bar off adjacent power-carrying parts:** Any equipment carrying power adjacent to the work area must be covered by suitable means (e.g. insulating cloths or panels).

1.5 Electrostatic sensitive devices (ESDs)

Electronic components and assemblies (e.g. printed circuit boards) are vulnerable to electrostatic discharge. Regulations for handling and working with electrostatic sensitive devices must definitely be observed and complied with, see also section 1.5.1!

All electrostatic sensitive devices (ESDs) are identified by the warning sign illustrated. Electrostatic discharge is caused by friction of insulating materials (e.g. floor coverings, synthetic fiber clothing, etc.).

Even slight charges can cause components to be damaged or destroyed. Damage cannot always be ascertained directly and it may take time for the component to actually fail in operation.

1.5.1 ESD - Rules for handling and working

Transport and store ESDs only in the protective packaging provided.

Avoid materials that may produce electrostatic discharge, for example

- Plastic containers and table tops
- Synthetic fiber clothing
- Plastic-soled shoes
- Plastic file covers
- Styrofoam packaging
- Computer monitors, etc.

Preferably wear the following:

- Cotton work clothes
- ESD shoes with conductive soles or leather soles

Use the following:

- Conductive flooring
- ESD workstations equipped with suitable tools (grounded soldering guns, antistatic wrist straps, etc.)
- Conductive ESD bags, conductive plastic containers, IC tubes or cartons lined with conductive foam
- Containers and worktops made of wood, metal or conductive plastics or paper bags

1.6 Abbreviations used

DIN	**D**eutsches **I**nstitut für **N**ormung e. V.
EGB	**E**lektrostatisch **G**efährdete **B**auelemente oder Baugruppen
ESD	**E**lectro-**s**tatic **d**ischarge (**E**lectro **S**ensitive **D**evices)
VDE	**V**erband **d**er **E**lektrotechnik **E**lektronik **I**nformationstechnik e.V.
IEC	**I**nternational **E**lectric **C**ommittee
BGV A3	Employer’s Liability Association regulations for health and safety in the workplace

2 System Design of UA 400 E / UA 410 E

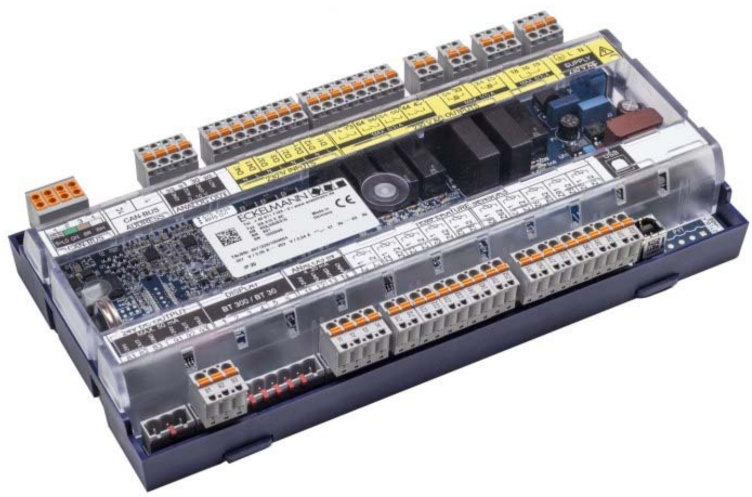


Figure: UA 410 E AC - full configuration

2.1 Application

The UA 400 E CC / UA 410 E AC case controller for electronic expansion valves (EEV), is suitable for the control and monitoring of up to two temperature zones in refrigerated display cases and cold rooms for normal cooling, low temperature refrigeration (NT/LT) or sub coolers.

The appropriate application for refrigerated shelves, refrigerated display cases, island freezers and freezer rooms can be simply set using the DIP switches on the controller. Factory settings for the desired application, tired and tested in praxis, are then loaded.

The use of the case controller for electronic expansion valves offers decisive advantages thanks to a reduced pressure difference between the high and low pressure sides, lower superheat at the evaporator as well as constant conditions for the goods and evaporator thanks to continual regulation. The adaptive suction pressure control generates further savings potential thanks to the load independent increase in suction pressure.

A range of functions for cost and energy saving such as defrost on demand, latent heat utilisation, intelligent fan control, enthalpy controlled frame heating and the constant temperature control of the goods are available with this case controller.

In order to fully utilise its performance features the controller is typically connected to the CAN bus, through which it communicates with further control and monitoring components across the entire network.

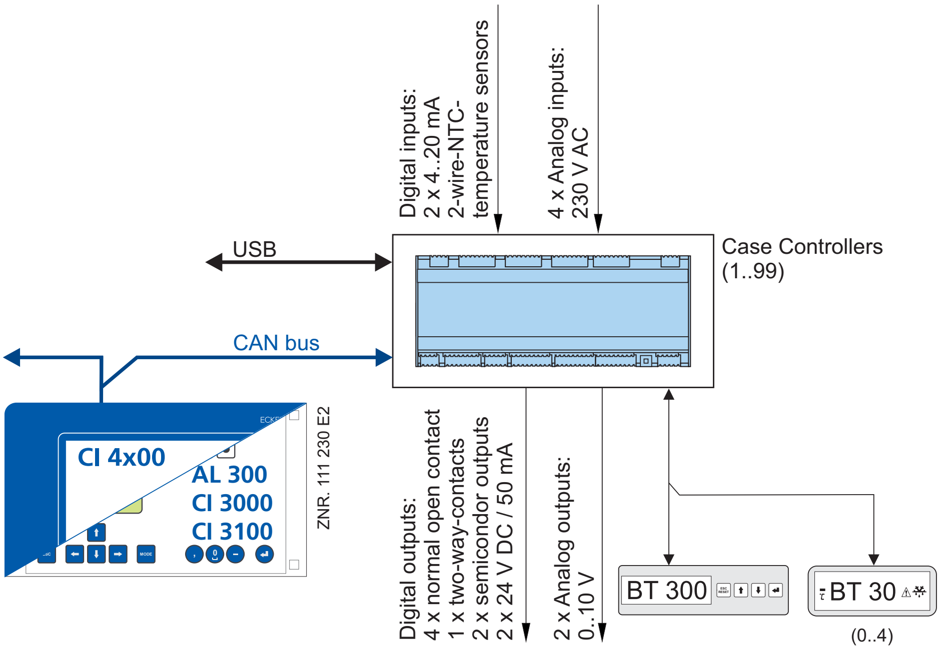
Via the CAN bus an intelligent data exchange is carried out with the following system components:

- System centre / Store computer:	Archiving of the operating data as well as alarm and message management, Connection to LDSWin for analysis, configuration and evaluation
- Pack controller:	Adaptive regulation in connection with the corresponding pack controller, Consumer lock (emergency function in the event of pack failure)

2.2 Hardware

The case controller is housed in a plastic casing for DIN rail mounting and does not require any further optional expansion modules. Up to 99 case controllers can be used within the E*LDS system. As required, a BT 300 x Operator Interface and up to 4 BT 30 Temperature Displays can be connected. For the direct parameterisation of the case controller via LDSWin, for carrying out a firmware update of the case controller or for the parameterisation of system components via CAN bus using LDSWin, the controller can be connected to a notebook or PC via USB interface. The application range of the case controller is described in more detail in chapter 3.3.

The following diagram illustrates the system architecture of the UA 410 E AC case controller (complete):



Ports

CAN bus:	Communication in E*LDS-System, new version
DISPLAY:	Connection for BT 300 x Operator Interface and up to four BT 30 Temperature Displays
USB:	1. For direct parameterisation of the case controller via LDSWin or 2. For carrying out a firmware update of the case controller or 3. The parameterisation of system components via CAN bus using LDSWin

Inputs

4 digital inputs	230 V AC, floating
10 analogue inputs	For the connection of 2-wire NTC temperature sensors
Only UA 410 E AC: 2 x analogue inputs	4..20 mA, e.g. for the connection of pressure transmitters or a humidity sensor

Outputs

2 semiconductor relays (SSR)	230 V AC / 1 A (SSR = Solid-State-Relay, N.O., to the control of electronic expansion valves)
1 relay output	230 V AC / 6 A (changeover)
4 relay outputs	230 V AC / 6 A (N.O.)
2 transistor outputs	24 V DC / 50 mA (for lighting control and frame heater)
Only UA 410 E AC: 2 x analogue outputs	0..10 V DC, e.g. for the control of continuous valves

Real-time clock

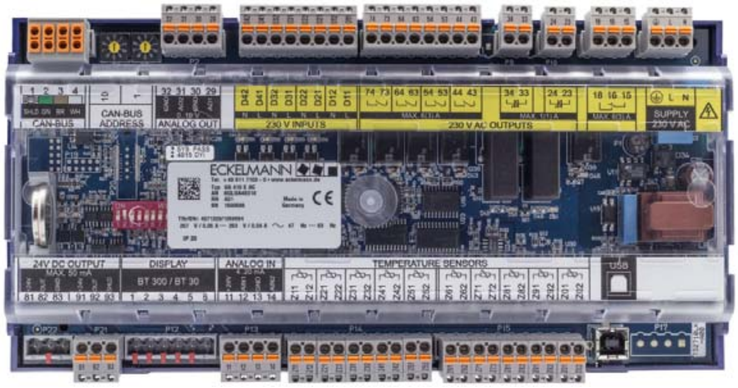
Only UA 410 E AC:
Battery-backed, lithium cell

For precise details of the different features of the two controllers UA 400 E CC and UA 410 E AC see chapter 3.1. The connection and terminal configurations are described in the chapter Connection and Terminal Configuration.

2.3 New features compared to previous versions

Version 2.00

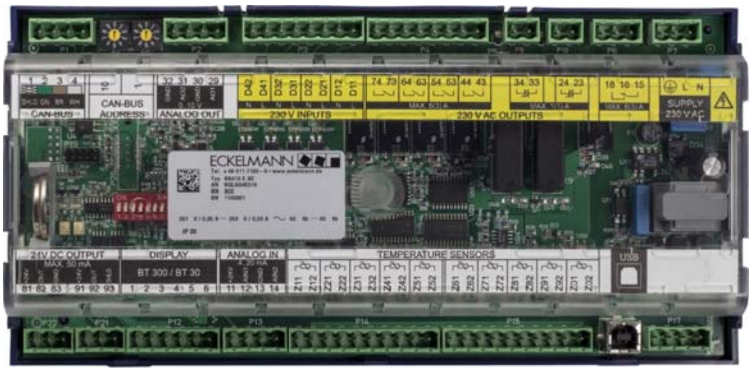
- New hardware platform UA 400 E CC / UA 410 E AC
  - blue main board
  - grey, coded mating connector with spring terminals, see chapter 5.1.2
  - two-row CAN bus spring terminal for easier wiring



- Communication with LDSWin via the USB interface (USB2CAN)
- Advanced defrost functions:
  Separate defrost start for the two temperature zones by means of internal defrost timer, master/slave defrost via CAN bus, cDefrost sequenz (DS)
- Advanced functions for the digital inputs:
  Configurable and invertible input functions, connection of an external alarm with freely editable text, manual shutdown on zone-by-zone basis
- Semiconductor relay (SSR) as enable relay
- Transistor output “Frame / Pane Heating” invertible
- Advanced monitoring functions:
  Supply air warning value
- Humidity control
- Separate suction pressure control for the 2nd temperature zone
- Continuous cooling monitoring adjusted
- COP+TEV variants for EEV controller
- R152a, R170, R600, and R600a refrigerants supported

Version 1.87

- Sending and receiving the analogue values via CAN bus
- Fourth digital input for external alarms
- USB interface for the direct parameterisation of the case controller via LDSWin, for carrying out a firmware update of the case controller or for the parameterisation of system components via CAN bus using LDSWin.
- New hardware platform UA 400 E / UA 410 E – blue case with compact dimensions, see chapter 11.2.
- Coded connectors



Version 1.83

- Dynamic determination of the t_c setpoint
- Setpoint switching via CAN bus
- Functions for frame heater and light during emergency power operation
- Different refrigerant for each temperature zone
- Operation of the UA 131 E LS with four return air sensors

Version 1.57 and higher

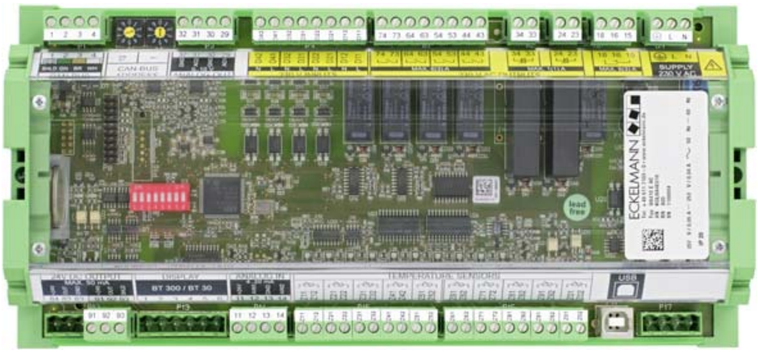
- Firmware update
- New function of the setpoint adjustment through the TS 30 W wireless sensors

Version 1.52 and higher

- Manual adjustment of the opening degree is automatically terminated after a safety period of five minutes; the controller returns to normal controlled operation.
- With the UA121E, the relay with the function "*inverted defrost*" is eliminated. The relay output is now assigned the function "*static cooling/ enable*", similar to the function with the UA131E/ UK100E.

Version 1.50 and higher

- New hardware platform UA 400 E / UA 410 E



- Differences in the complete hardware (UA 410 E AC, see photo) compared to UA 300 E AC:

- 2 analogue inputs 4..20 mA	e.g. for the connection of pressure transmitters or a humidity sensor
- 2 analogue outputs 1..10 V	e.g. for the activation of continuous expansion valves
- Fourth digital input	currently reserved for future applications
- USB interface	for the direct parameterisation via LDWin or for a firmware update

- Adjustment and implementation on the basis of the new hardware platform:
  All the controller types and their functions familiar from the UA 300 E are retained in the UA 400 E CC / UA 410 E AC.
- The UA 400 E CC is the successor (replacement controller) to the UA 300 E AC.

Notice:

3 Application of UA 400 E / UA 410 E

3.1 Versions

	UA 400 E CC	UA 410 E AC
For DIN rail mounting	●	●
For integration in the CAN bus of the E*LDS system	●	●
Replacement controller for UA 300 E AC	●	●
Suitable for stand alone operation		●
With integrated real-time clock (lithium cell power reserve)		●
With integrated archive memory for data recording		●
2 analogue inputs 4..20 mA		●
2 analogue outputs 0..10 V		●

Abbreviations used

- CC stands for CAN-Bus and Cabinet/DIN rail mounting (C = with CAN bus, i.e. C = cabinet mounting).
- AC stands for All in one and Cabinet/DIN rail mounting (All = with CAN bus and real-time clock, i.e. C = cabinet mounting).

3.2 Stand Alone operation

The case controller is equipped with two types of stand alone operation. For one, stand alone operation can be realised via a suction gas pressure transmitter. Alternatively, stand alone operation can be realised with two temperature sensors (mode of operation as with UA 300 E).

In contrast to these two operating modes, during CAN bus operation the superheat is determined by means of the suction gas temperature of the pack controller belonging to the refrigeration circuit. Further information on the stand alone operating modes are contained in the following sections.

3.2.1 Stand alone operation by means of evaporator inlet sensors

The UA 400 E CC i.e. UA 410 E AC can only be run in so called stand alone operation under **certain conditions.**

This means that the case controller operates autonomously without a CAN bus connection (mode of operation as with UA 300 E). In stand alone operation the superheat is measured by means of evaporator inlet and evaporator outlet sensors. In contrast, during CAN bus operation the superheat is determined by means of the suction gas temperature of the pack controller belonging to the refrigeration circuit.

The operating mode is set using the parameter *Corr off. to* = -- (menu 6-3).

Stand alone operation has an effect on the following functions of the case controller. Details are contained in the corresponding chapter.

- Required sensors (see chapter 4.2)
- Evaporator pumpdown following defrosting (for subsequent temperature control)
- Superheat control (see chapter 4.4.7)
- Controller operation

Stand-alone mode is not suitable for normal operation, only for system commissioning or servicing.

3.2.2 Stand alone operation by means of activated local pressure transmitter

Only UA 410 E AC

If this operating mode is employed then the superheat is calculated by means of the suction gas temperature supplied by the local pressure transmitter and the value from the evaporator outlet sensor (see chapter 4.4.7).

The determination of the superheat via the local pressure transmitter has priority, even when the suction gas temperature is transmitted from the pack controller via the CAN bus to the controller.

This operating mode is activated via the parameter AIn1 active = ON (menu 6-2-6).

Further parameters for the configuration of the local pressure transmitters and humidy sensors must be complied with, for further details see chapter 4.4.8.

3.3 Controller types

The case controller for refrigeration points equipped with pulse width modulated or continous expansion valves (motor valves) contains different controller types with different fields of application which are summarised as follows:

Controller type		Application
Case controller	UA 121 E	Normal-temperature (NT) refrigeration (multidecks, islands, wallsides, counters) with defrost heater Multidecks without defrost heater
	UA 131 E	Low-temperature (LT) refrigeration (islands, wallsides, verticals, combinations) with defrost heater. Or for display cases supplied by refrigeration system using two-pipe discharge gas defrosting.
	UA 131 E LS	Like UA 131 E, but with advanced fan control (see chapter 4.6).
	UA 141 E	Service counters with/without defrost heater
Coldroom controller	UR 141 NE	NT coldrooms with/without defrost heater
	UR 141 TE	LT coldrooms with/without defrost heater and discharge gas defrosting
Subcooler controller	UK 100 E	Subcooler controller with dedicated characteristics for control of refrigerant subcooler

In order to define the basic control behaviour, only one controller type can ever be selected, which is set using the DIP switch S3. For details see chapter 5.4:

Controller type and master/slave mode		DIP Switch S3 (Coding Switch positions 1 to 8)							
		1	2	3	4	5	6	7	8
Case controller	UA 121 E	ON	OFF	OFF	ON/OFF	OFF	OFF	OFF	ON/OFF (*)
	UA 131 E	OFF	ON	OFF	ON/OFF	OFF	OFF	OFF	ON/OFF (*)
	UA 131 E LS	ON	ON	ON	ON/OFF	ON	OFF	OFF	ON/OFF (*)
	UA 141 E	ON	ON	OFF	ON/OFF	OFF	OFF	OFF	ON/OFF (*)
Coldroom controller	UR 141 NE	OFF	OFF	ON	ON/OFF	OFF	OFF	OFF	ON/OFF (*)
	UR 141 TE	ON	OFF	ON	ON/OFF	OFF	OFF	OFF	ON/OFF (*)
Subcooler controller	UK 100 E	OFF	ON	ON	OFF	OFF	OFF	OFF	ON/OFF (*)

(*) Release of special functions. In the chapter ”Function” you will find instructions as to whether DIP switch 8 needs to be set to ON for the respective function. Following the switching of DIP switch 8 a controller start must be carried out otherwise the setting will not be adopted.

☞ Operation with an unsupported DIP switch setting is not permitted. In the event of a change of controller type, all parameters are returned to their factory settings.
For further information, see chapter 5.4 - Controller Type Setting.

Selection of controller type defines the controller properties and basic controller settings.
The controller can be operated by:

- Host computer e.g. via network / modem with connection to the system centre / store computer,
- the system centre, a store computer or an operator terminal,
- a local operator interface BT 300 via the DISPLAY interface on the controller or
- a notebook (PC) with the PC-software LDSWin connected via USB.

For further details see chapter Operation.

3.4 Version update

The case controller is supplied with the current firmware, ready for operation. Future software versions can be loaded into the case controller as required by means of a firmware update, and thus updated.

Danger data loss! In some cases a change of firmware version can lead to the loss of all the set-points in the case controller.
As a precaution, the settings must be backed up by saving them to the LDSWin PC software, **prior** to the update. After the firmware update the backup settings can be reloaded into the controller from LDSWin.
A software update is only to be carried out by trained staff or factory-side by the manufacturer.
More details on firmware updates can be found in chapter 5.10.

4 Function of UA 400 E / UA 410 E

The parameters mentioned in this section are described in Section 7 Menu Structure. Changing the default settings for these parameters will not normally be necessary. Parameters that cannot be changed are referred to as fixed parameters in the following description.

4.1 Selection of the temperature sensors

The case/coldroom controller uses two-wire NTC temperature sensors to perform control.

All sensors connected **must** be the same type and parameters are not set separately for the sensors. The type of sensor used can be defined by the Sensor Type parameter (Menu 6-2-5).

The following NTC sensor types are usable:

L243 (K243)	Temperature range -50°C to 50°C; Type K243 sensor can be used in place of type L243. Characteristics of these two sensors are identical.
K277	Temperature range -50 to 50°C
5K3A1	Temperature range 0 to 100°C

For information on the dimensions see chapter 11.3.

For details of the dimensions see chapter 11.3.

Detailed information on the temperature sensors is contained in the data sheet ”Temperature Sensors”.

All due care must be exercised when installing temperature sensors. Sensor leads need not be shielded when installed exclusively within the refrigerated display case to be controlled and when interference is not to be expected (for example from power wires running parallel to the leads. Otherwise suitable precautions must be taken to protect the sensor leads from external interference.

An offset can be independently applied to the temperature sensors, which is effective for display and control functions, see Section 4.4.1.

4.2 Required and optional sensors

Temperature sensors used with the case controller may be either required or optional depending on the set controller type and operating mode. Sensor scan takes place automatically on first start of the controller. The number of sensors scanned can be checked in Menu (6-1) or with the LDSWin software. By this means unconnected sensors can be excluded from the monitoring for sensor failure.

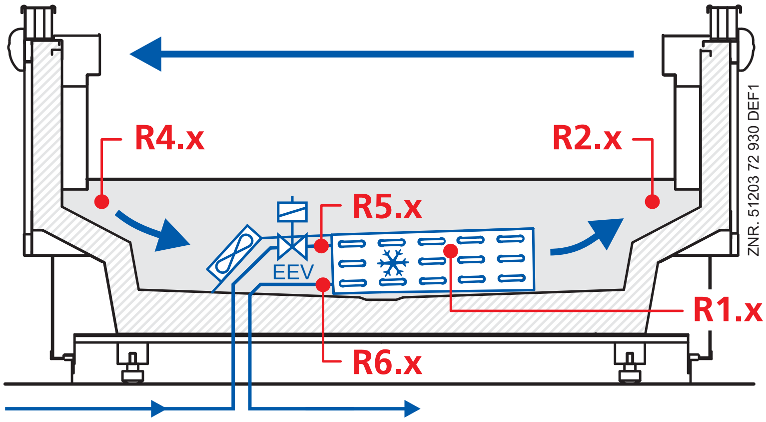
The evaporator inlet sensor R5.x should be connected for ”t_0 via CAN bus” operating mode. This results in better emergency running characteristics in the event of CAN bus transfer failure.
In stand alone operation (without local pressure transmitter), the sensors R5.1 und R5.2 **must** be connected!

Controller type	Sensors necessary for regulation	Optional sensors (advanced functions)
Single-zone operation		
UA 121 E UA 131 E / UA 131 E LS UA 141E	R1.1 R2.1 R4.1 R6.1	R1.2 R2.2 R4.2 R5.1 R5.2 R6.2 (or R4.3 / R4.4)*
UR 141 NE UR 141 TE	R1.1 R4.1 R6.1	R1.2 R2.1 R2.2 R4.2 R5.1 R5.2 R6.2
UK 100 E	R4.1 R6.1	R1.1 R1.2 R4.2 R5.1 R5.2 R6.2
Two-zone operation		
UA 121 E UA 131 E / UA 131 E LS UA 141E	R1.1 R1.2 R2.1 R2.2 R4.1 R4.2 R6.1 R6.2	R5.1 R5.2 (or R4.3/R4.4)*
UR 141 NE UR 141 TE	R1.1 R1.2 R4.1 R4.2 R6.1 R6.2	R2.1 R2.2 R5.1 R5.2
UK 100 E	R4.1 R4.2 R6.1 R6.2	R1.1 R1.2 R5.1 R5.2

* only UA 131 E LS

Sensor identification

Legend: Ry.x		Function
y = Sensor type	1 2 4 5 6	Defrost sensor Supply air sensor Return air sensor/ room air sensor/ refrigerant temperature sensor (UK 100 E) Evaporator inlet sensor Evaporator outlet sensor
x = Case part	1..2	Sensor element zone 1 Sensor element zone 2



Sensor break alarm

Alarm (sensor break) is always generated if required sensors are not connected. If optional sensors are not connected, alarm is only generated when the sensors are included by sensor scan. Sensors scan can be initiated from the menu 6-1 using the parameter *No. Sensors*.

Sensors R5.1 and R5.2 are **optional** when the case controller is operated with a pack controller on the CAN bus.
In stand-alone operation with evaporator inlet sensors, R5.1 and R5.2 are **required** sensors and must be connected and included by sensor scan to prevent fault alarm, see chapter 3.2.1.

In the case of optional sensors which are not included in a sensor scan, no actual values are archived in the system centre / store computer.

4.3 Description of controller functions

The sections that follow describes the various functions of the case controller for control of refrigeration points equipped with an electronic expansion valve. The availability of certain controller functions is governed by which controller type is set on DIP Switch S3 (see Section 5.4 Setting Controller Type and Master/Slave Mode).

4.4 Cooling

4.4.1 Temperature control

Temperature is controlled by the opening degree of the expansion valve (see chapter 4.4.3). Control is made separately for each temperature zone by a separate set of controller parameters, temperature and superheat each being controlled by a PID controller.

A decision is made automatically as to whether the refrigeration point temperature controller (partial evaporator charge) or the superheat controller (maximum evaporator charge) is active. Depending on the minimum superheat temperature specified, the evaporator can be operated beyond the critical point of evaporator control (MSS point).

Following defrosting (stand-alone operation only with evaporator inlet sensor) or controller restart, the evaporator is first pumped down (solenoid valve closes) and refrigerant is then fed in (fixed valve opening of 100%) for a time that can be set by parameter. The two cooling relays are operated at separate times. Operation of the cooling relay is the normally open type. Therefore, cooling will not take place in failure of the pilot energy or total failure of the controller.

Cooling via non-clocked output (controller types UA 121 E, UA 131 E, UK 100 E)

With controller types UA 131 E and UK 100 E, cooling can be operated through a static, non-clocked cooling output. The relay is operated as a function of the current valve opening.

The general rule is that the output for static cooling is off when the valve opening is zero. With a case controller opening degree greater than zero (there is a need for refrigeration) the output for the static cooling is switched on. With controller type UK 100 E a separate output is provided for each zone. In single-zone operation only the first output is actuated for static cooling and the second output remains continuously off.

With controller type UA 121 E and UA 131 E both zones are operated through a common output. Static cooling is then only off when the valve opening is zero for both zones. This output can be used for example to enable cooling or enable a compressor in operation with the case controller.

Duration of pulse width modulation

The duration of pulse width modulation can be selected as either 3 or 6 seconds. Setting is made via the *OD 3s interv* parameter (Menu 6-2-7).

On switchover, control is suspended for 6 seconds, after which the valve opening is output for the set duration. Resolution of valve opening is 1% at both settings.

4.4.2 Activation of the expansion valves

The opening degree for the activation of the two electronic expansion valves from zone 1, i.e. zone 2, is transmitted via the clocking of the two semi-conductor relays EEV1 and EEV2 (terminals 23/24 and 33/34, as with the UA 300 E). In order for the semiconductor relay to transmit the opening degree in clocked form, then the parameter “*EnablingRel*” must be set to “OFF” (factory setting. Menu 6-3).

Simultaneously, the opening degree is transmitted via the two analogue outputs 0..10V for the activation of continuous motor valves (UA 410 E AC only), see chapter 4.4.2.1.

When employing the analogue outputs the following must be observed:

Some continuous valves require activation via an additional signal input. The requisite signal can be generated e.g. via a timing relay with the help of the pulsed semi-conductor relay EEV1 or EEV2 (dwell time t of the timing relay 10 sec. < t < 30 sec.) or it can be realized using the function “Freigaberelais”, see chapter 4.4.2.2.

With the UA 121 E, UA 131 E and UK 100 E there is one output ”*Static Cooling*” (terminals 63/64) or two outputs with the UK 100 E (63/64 and 73/74). Here the activation signal does not need to be generated via a timing relay or using the function “*EnablingRel*”; the output ”*Static Cooling*” can be used directly for activation purposes.

Danger of compressor stoppage! Systems with single compressors where the suction pressure cannot be regulated to a setpoint via a pack controller can be operated with the assistance of the function “Freigaberelais“ (see chapter 4.4.2.2). The hazard warnings listed in this chapter must be observed.

4.4.2.1 Activation of continuous motor valves

Only UA 410 E AC

For the activation of continuous motor valves the opening degree is transmitted from the two analogue outputs via a 0..10 V signal:

Analogue output 1 (AO1): Terminals 29/30
Analogue output 2 (AO2): Terminals 31/32

For further connection instructions see chapter 6.6.

4.4.2.2 Enable relay

Using the parameter "*EnablingRel*" (menu 6-3), the two semiconductor relays (terminals 23/24 and 33/34), which are normally used for cooling via PWM, can be switched to *"Enable"* operation.

This function is employed for the activation of continuous motor expansion valves via the analogue outputs 0…10 V. If the motor valves require their enable inputs to be switched in order to be employed, or if for safety purposes an additional solenoid valve is to be employed for shut-off, then the two semiconductor relays can be used for this purpose.

Furthermore, the enable relays can support the realisation of stand-alone operation with case-side compressor activation.

Compressor damage!
Danger due to liquid refrigerant on the suction side of the compressor! The superheat regulation is only carried out via the analogue outputs! In the event of incorrect wiring there is a danger of liquid refrigerant escaping from the compressor!
For the realisation of stand alone operation with case side compressor activation, a protective circuit, e.g. an HP monitor, and application specific, external safety equipment **must be installed**!
The compressors are "only enabled" by the case controller.

Tip: In addition to the protective circuit, external error signals can be registered via the fourth digital input ("*External alarm*", factory setting) and by renaming the message text (e.g. in "*HP monitor*" etc.) used to trigger an alarm.

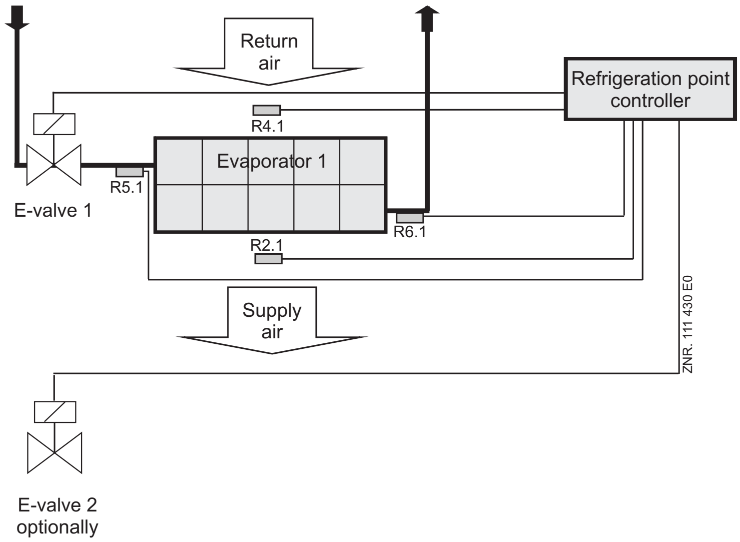
Configuration

If the parameter "*EnablingRel*" is set to "OFF", then the two semiconductor relays are clocked (factory setting, see chapter 4.4.2). If the parameter "*EnablingRel*" Is set to "ON", then the two semiconductor relays
- are switched on if the controller signals the need for cooling, i.e.
- switched off again if no cooling is required.

4.4.3 Continuous temperature control by supply and return air temperature

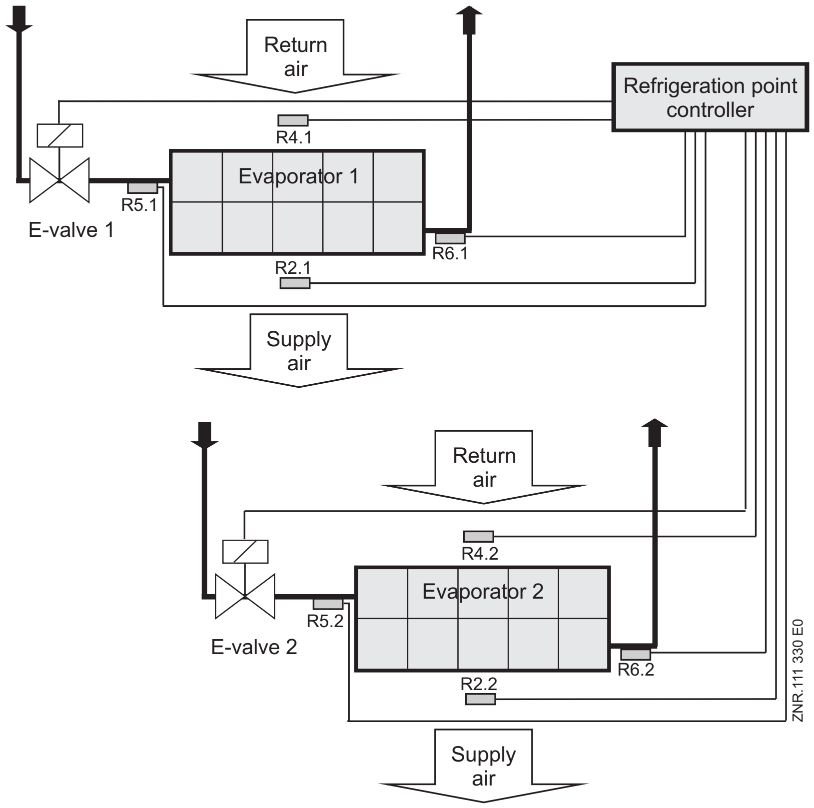
Controller types UA 121 E, UA 131 E, UA 141 E

Control is made by two temperature sensors (supply air or return air sensor of pilot case). Cooling can take place in single-zone or two-zone mode. In single-zone mode, sensors Ry.1 act on both relays 1 and 2 of the expansion valves. The two relays are actuated at separate times (see Section 4.4.17 Two Temperature Zones).



R2.1:	Supply air sensor	(Terminal Z11/12)
R4.1:	Return air sensor	(Terminal Z21/22)
R5.1:	Evaporator inlet sensor	(Terminal Z41/42)
R6.1:	Evaporator outlet sensor	(Terminal Z51/52)
Expansion valve 1:	Relay for expansion valve 1	(Terminal 23/24)
Expansion valve 2:	Relay for expansion valve 2	(Terminal 33/34)

In two-zone mode, sensor Ry.1 acts on Relay 1 and Ry.2 acts on Relay 2.



R2.1:	Supply air sensor	(Terminal Z11/12)
R4.1:	Return air sensor	(Terminal Z21/22)
R5.1:	Evaporator inlet sensor	(Terminal Z41/42)
R6.1:	Evaporator outlet sensor	(Terminal Z51/52)
R2.2:	Supply air sensor	(Terminal Z61/62)
R4.2:	Return air sensor	(Terminal Z71/72)
R5.2:	Evaporator inlet sensor	(Terminal Z91/92)
R6.2:	Evaporator outlet sensor	(Terminal Z01/02)
Expansion valve 1:	Relay for expansion valve 1	(Terminal 23/24)
Expansion valve 2:	Relay for expansion valve 2	(Terminal 33/34)

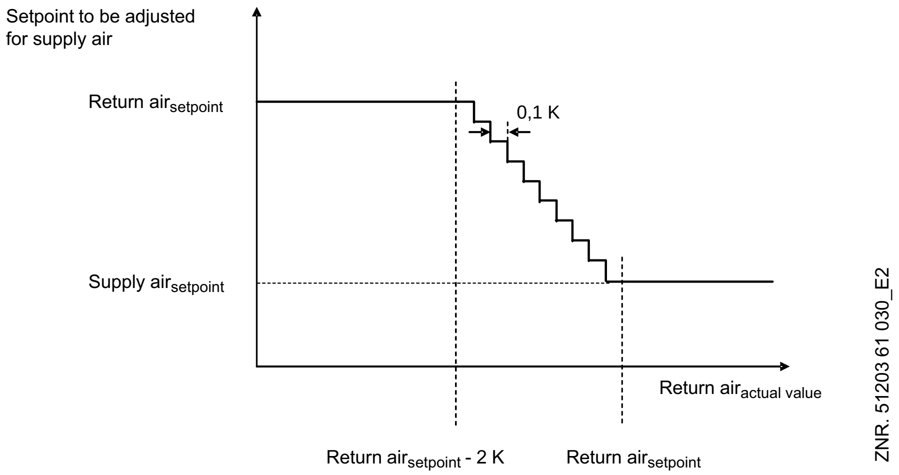
Supply air/return air mode

The supply air setpoint is toggled as a function of return air temperature as follows:

Example 1: Return air_{Actual} < Return $air_{Setpoint}$ - 2K:
Supply air temperature is controlled to return air setpoint.

Example 2: Return $air_{Setpoint}$ - 2K < Return air_{Actual} < Return $air_{Setpoint}$
Setpoint is toggled between supply air and return air setpoint in linear steps (see diagram below).

Example 3: Return air_{Actual} > Return $air_{Setpoint}$:
Supply air is controlled to supply air setpoint.



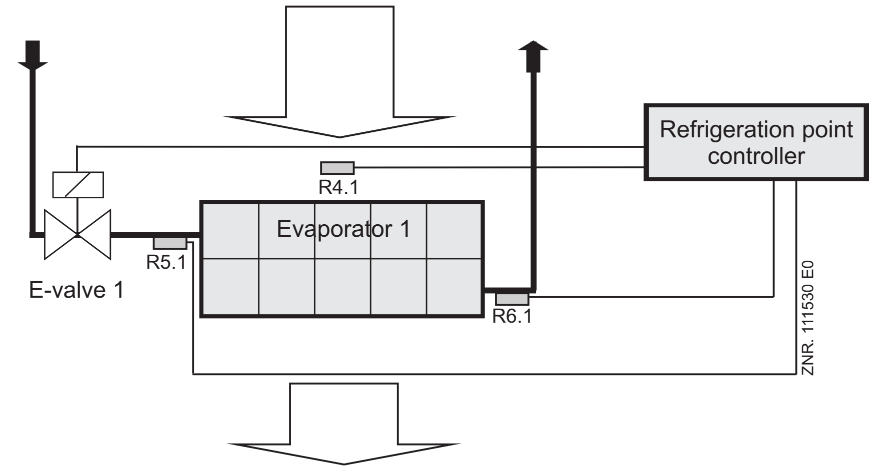
When supply air temperature equals the current setpoint, opening duration of the expansion valves is reduced to the time required to maintain the current state. If only one of the two sensors is fitted (supply air or return air), control is made exclusively by that sensor.

4.4.4 Continuous temperature control by coldroom sensor

Controller types UR 141 TE, UR 141 NE

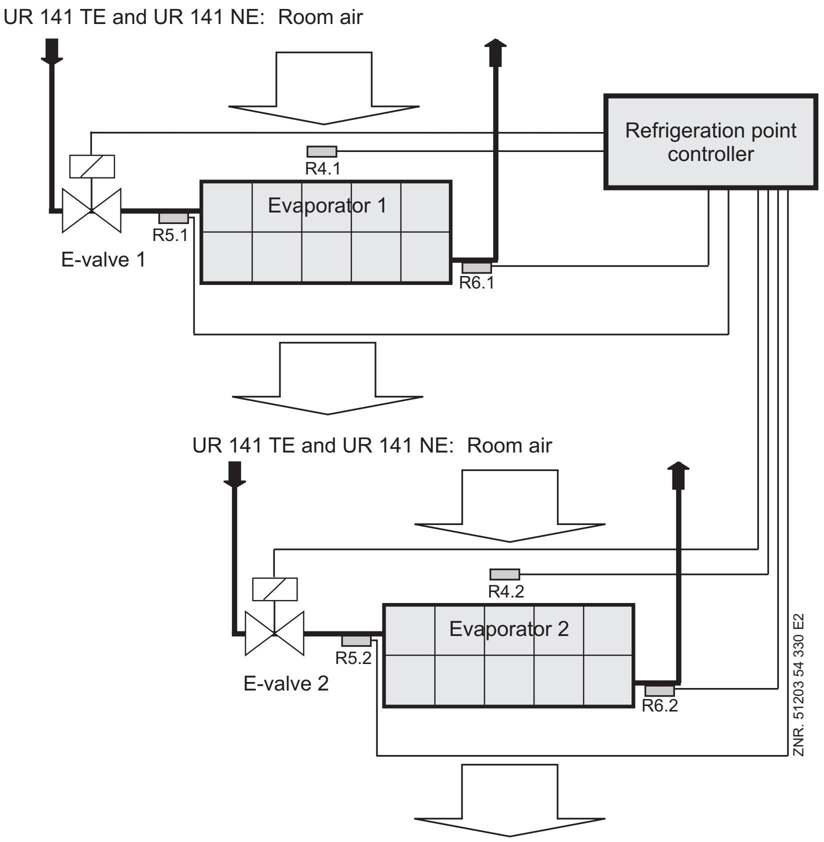
Cooling is controlled according to temperature measured on the coldroom air sensor. When coldroom air temperature equals the current setpoint, opening duration of the expansion valve is reduced to the time required to maintain the current state. Cooling can take place in single-zone mode or two-zone operating mode. In single-zone mode, Ry.1 sensors act on Relay 1.

UR 141 TE and UR 141 NE: Room air



R4.1:	Coldroom air sensor	(Terminal Z21/22)
R5.1:	Evaporator inlet sensor	(Terminal Z41/42)
R6.1:	Evaporator outlet sensor	(Terminal Z51/52)
Expansion valve 1:	Relay for expansion valve 1	(Terminal 23/24)

In two-zone mode, Ry.1 sensors act on Relay 1 and Ry.2 on Relay 2.



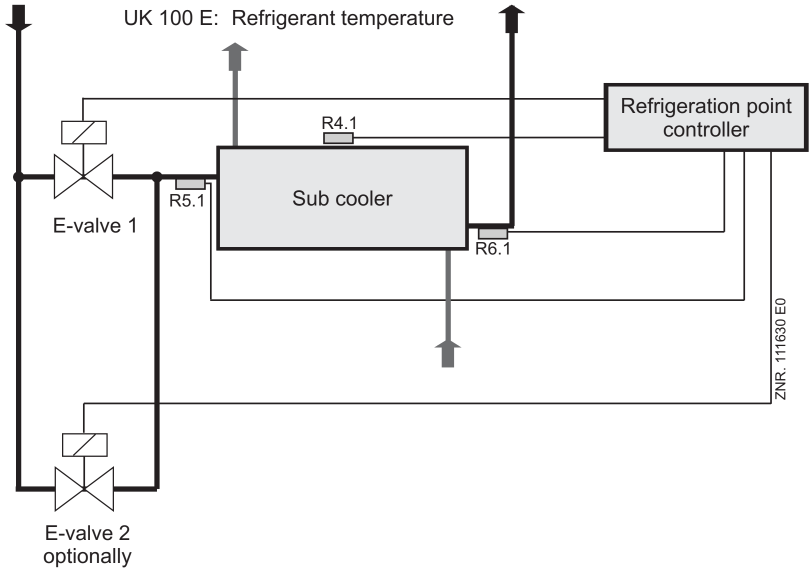
R4.1:	Coldroom air sensor	(Terminal Z21/22)
R5.1:	Evaporator inlet sensor	(Terminal Z41/42)
R6.1:	Evaporator outlet sensor	(Terminal Z51/52)
R4.2:	Coldroom air sensor	(Terminal Z71/72)
R5.2:	Evaporator inlet sensor	(Terminal Z91/92)
R6.2:	Evaporator outlet sensor	(Terminal Z01/02)
Expansion valve 1:	Relay for expansion valve 1	(Terminal 23/24)
Expansion valve 2:	Relay for expansion valve 2	(Terminal 33/34)

4.4.5 Continuous temperature control by refrigerant sensor

Controller type UK 100 E

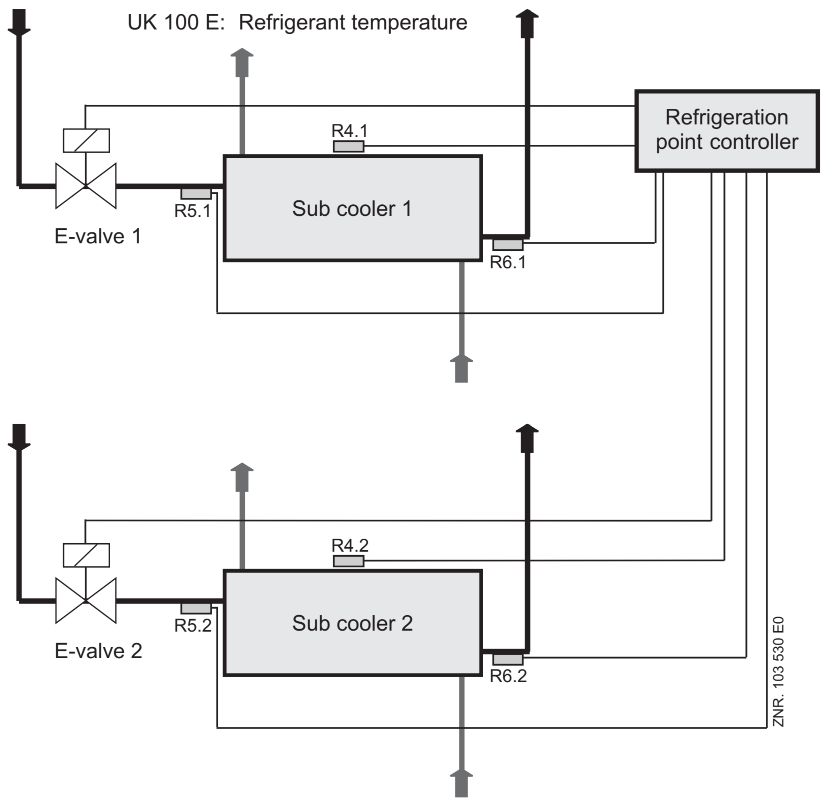
Cooling is controlled as a function of temperature on the refrigerant temperature sensor. When refrigerant temperature equals the current setpoint, opening of the expansion valve is reduced to the duration required to maintain the state obtained.

Cooling can take place in single-zone (tandem mode) or two-zone mode. In single-zone operation (tandem mode) sensors Ry.1 act on Relay 1 and Relay 2.



R4.1:	Refrigerant temperature sensors	(Terminal Z21/22)
R5.1:	Evaporator inlet sensor	(Terminal Z41/42)
R6.1:	Evaporator outlet sensor	(Terminal Z51/52)
Expansion valve 1:	Relay for expansion valve 1	(Terminal 23/24)
Expansion valve 2:	Relay for expansion valve 2	(Terminal 33/34)

In two-zone mode, Ry.1 sensors act on Relay 1 and Ry.2 on Relay 2.



R4.1:	Refrigerant temperature sensor	(Terminal Z21/22)
R5.1:	Evaporator inlet sensor	(Terminal Z41/42)
R6.1:	Evaporator outlet sensor	(Terminal Z51/52)
R4.2:	Refrigerant temperature sensor	(Terminal Z71/72)
R5.2:	Evaporator inlet sensor	(Terminal Z91/92)
R6.2:	Evaporator outlet sensor	(Terminal Z01/02)
Expansion valve 1:	Relay for expansion valve 1	(Terminal 23/24)
Expansion valve 2:	Relay for expansion valve 2	(Terminal 33/34)

4.4.6 On-off control

On-off control can be selected by parameter in place of continuous temperature control and can be set separately for each temperature zone.

Alarm priority of the "*Check OD*" (opening degree) alarm should be set to "0" in on-off controller mode so as to avoid false alarms.

The operation of the superheat regulation with two temperature sensors R5.x/R6.x (without local pressure transmitter and transmission of the suction pressure from the pack controller via the CAN bus) and the two-step control have not been fully tested. Use of this function must be checked carefully on the system and is entirely at the owner's/operator's risk.

UA 121 E, UA 131 E, UA 141 E:

Control takes place alternatively via two temperature sensors (supply air and return air). The cooling relay cuts out when the defined setpoint (cutout temperature) is obtained on one of the two sensors. Temperature control enables superheat control with the set hysteresis of the sensor that disabled superheat control..

In failure of one sensor or disabling of a setpoint (supply air or return air), control is transferred to the other sensor. In failure of both sensors, emergency mode is activated.

UR 141 TE, UR 141 NE:

Cooling is controlled according to temperature measured on the coldroom air sensor. The cooling relay cuts out when the defined setpoint (cutout temperature) is obtained on the coldroom air sensor. The coldroom controller enables superheat control with the set hysteresis of the sensor that disabled superheat control.

Emergency mode is activated in failure of the coldroom air sensor. In on-off mode of UR 141 NE/UR 141 TE coldroom controllers the fans are switched with temperature control. The fans are started when superheat control is enabled by the temperature controller and stopped when superheat control is disabled.

UK 100 E:

Cooling is controlled according to temperature measured on the refrigerant temperature sensor. The cooling relay cuts out when the defined setpoint (cutout temperature) is obtained on this sensor. Refrigerant temperature control enables superheat control with the hysteresis of the sensor that disabled superheat control. Emergency mode is activated in failure of the coldroom air sensor.

4.4.7 Superheat control

Superheat control works parallel with temperature control. As required, control is made to the defined superheat setpoint. Superheat control works in two modes that can be toggled by a parameter (offset).

Operating mode "Stand Alone": With activated local pressure transmitter (see chapter 4.4.8):

Calculating differences in the temperature measured at the local pressure transmitter (suction gas temperature, based on the measured pressure with the assistance of the set coolant table) and the temperature measured at the evaporator output (R6.x).

If the pressure transmitter fails, then in the first step an attempt is made to switch to the operating mode "Interconnected Operation". If this is not possible, for example because "Interconnected Operation" is not configured or because the pack controller does not provide any suction pressure, then an attempt is made to switch to stand alone operation with temperature sensors.

Operating mode "Stand Alone": With evaporator inlet sensor Offset = --

Difference between temperature measured at evaporator inlet (R5.x) and evaporator outlet (R6.x). If it is not possible to calculate the difference, for example because one of the two requisite temperature sensors does not supply a value, then the system is switched to emergency operation.

Operating mode "Compressor pack": Offset >= 0 K

Difference between evaporating temperature measured on compressor pack (transmitted via CAN bus) and at evaporator outlet (R6.x). An adjustable offset corrects the temperature t_0 measured by the pack controller (suction pressure actual value) by any pressure loss in the suction line and the associated variations between evaporating temperature on the suction pressure side and evaporator side.

Correct transmission of suction pressure via the CAN bus requires the Pack No. (menu 6-1) to be set on the case controller. When using a VS 3010 BS pack controller, the compressor pack parameter must also be set.

If transmission of evaporating pressure by the pack controller is interrupted, superheat is derived from the temperature difference between R5.x and R6.x.

As a supplementary protective function the expansion valve is fully closed if superheat temperature drops below a critical minimum level.

Reset I-Sum

The I-sum is reset in the case of the following events:
During the defrost, manual shutdown, setpoint switching, emergency operation and forced cooling.

When the *Reset I-Sum* parameter (Menu 6-2-7) is set to ON, the procedure is as follows:

If the valve opening is set to 0% due to superheat dropping below the low level, the I-sum integrated over time (NOT the I-term) is additionally set to zero on the PID controller. This is applicable to both superheat control and temperature control. Distinction also made by control zone.

This is intended to allow the controller to re-learn an I-sum that may have become too large, thus enabling it to adjust to changed ambient conditions.

When the *Reset I-Sum* parameter (Menu 6-2-7) is set to OFF, the integrated I-sum is not changed on drop of superheat below the low level.

Analysis of the pack controller superheat

If the case controller is operated with a VS 3010 pack controller (version ≥ V3.00), then the superheat status is also analysed.

If the superheat of the pack controller is in a non-critical range (dependent on the parameterisation of the pack controller), then the case controller continues controlling **even when** there is a shortfall relative to the minimum value of its own superheat. The case controller only closes the solenoid valve when the pack controller superheat is also too low.

Superheat regulation

In order to determine the superheat there are a number of channels which the controller can use to calculate the temperature corresponding to the suction pressure. The following priorities apply:

1) t_0 local Z1:	The local pressure transmitter is used for the regulation in zone 1 and zone 2, see menu 6-2-6! One **MUST** be in stand-alone operation. When using the function "*toZ2ctl*" (see parameter "*Fct. AIN2*" in menu 6-2-6) the value t0 lokal Z1 is used for the regulation of zone 1 and the value t0 lokal Z2 for zone 2.
2) t_0 via CAN bus:	A t_0 value received from a remote case controller via the CAN bus, see menu 6-2-6.
3) t_0 corr:	Transmitted from the pack controller via the CAN bus, see menu 6-1 and 6-3.

4) R5.x: Generally, in order to guarantee high plant safety in both CAN bus and stand alone operation, the evaporator inlet sensor R5.x must always be connected.

The value from the pressure transmitter connected to analogue input 1 (AIN1, terminals 21/22) is preferred for evaluation (see chapter 4.4.8). If this is deactivated or fails, then recourse is made to the t_0 transmitted from a case controller or the pack controller via the CAN bus. If this is also not available, then the evaporator input sensor R5.x is employed.

☞ When employing the function "*toZ2ctr*", see parameter "*Fct. AIN2*" (menu 6-2-6), in the event of a failure of the pressure transmitter no recourse (fallback) is made to the suction pressure value transmitted from the pack controller via CAN bus!

Limiting of the evaporator output sensor R6.x

Only UA 410 E AC,
Only controller type UK 100 E,
Only when the function of the analogue input AIN2 is set to "*tc LT*", see menu 6-2-6

In cascade controller operation it is possible that the measuring range at the evaporator output sensor R6.x is exceeded. In order to ensure regulation in this limit range the sensor value is kept at the upper end of the measuring range for as long as it is exceeded. With the sensor type L243 for example, this value is 50°C.

4.4.8 Connection of pressure transmitters / humidity sensors

Only UA 410 E AC

The parameterisation and functionality of the two analogue inputs AIN1/AIN2 (terminals 11/12 resp. 11/14) is carried out via menu 6-2-6. The actual value capture is carried out via 4..20 mA. The following configuration options are available:

- Activation of the analogue input (if used at all)
  For further details on superheat control see chapter 4.4.7.
- Selection of the refrigerant (can be set for each sensor):
  R404A, R744 (CO2), R134a, R410A, R717 (NH3), R22, R290, R407C, R507, R1270, R402A, R502, R407F, R422A, R422D, R408A, R407D, R407A, R427A, R438A, R152a, R170, R600, R600a
- Adjustment of the analogue input to the pressure transmitter employed:
  Input of the lowest/biggest pressure value (factory settings 0..10 bar)

- Type of measurement:
  Analogue input 1 (AIN1): t_0 (fixed setting, cannot be parameterised)
  Analogue input 2 (AIN2): Selection between t_0,humidity, t_c or LT

☞ If the transcritical range is exceeded during the measurement of tc with the coolant R744 (CO_2), then the temperature continues to be converted, however it no longer corresponds with the pressure. The current version is not equipped with limiting at 31°C. Currently, the pressure in respect of t_0/t_c is neither measured or displayed, only the temperatures.

In order to measure the suction pressure at the case controller, a low pressure transmitter 0..10 bar can be connected. The electrical connection of the pressure transmitter, i.e. humidity sensor, is carried out according to the same principles as those familiar from the pack controller. For further connection instructions see chapter 6.10.

4.4.9 Sending and receiving the analogue values via CAN bus

It is possible to receive analogue values (t0, humidity, tc) from a remote case controller, and conversely to send them to as many case controllers within the system as desired. This serves to reduce the number of pressure transmitters installed in the system, thus leading to a reduction in costs.

The necessary parameterisation is carried out in menu 6-2-6.

Sending the analogue values

By setting the parameter *AIN1/2 Send CAN* the corresponding analogue value is made available within the CAN bus and can be received by other case controllers.

Receiving the analogue values

Using the parameters *AIN1/2 Rcv. CAN* to *„YES"* the analogue values can be received from a remote case controller. The parameters *AIN1/2 Rcv. CAN* represent the CAN bus address of the case controller which sends the analogue values.

A case controller where this parameter has been set to *"YES"* is termed a "Remote Case Controller".

The parameters *AIN1 Rcv. Inp* are used to select the zone from which the locally measured analogue value is obtained.

Priority of the local pressure transmitter

The local pressure transmitter always has a higher priority than analogue values that are transmitted via the CAN bus. If values from both sources are available then the controller will use the value from the local pressure transmitter. This affects the data recording, visualisation, and with the corresponding parameterisation, the control functions.

If the analogue value measured locally by the pressure transmitter is sent directly to the controller then the analogue value received via the CAN bus is never used!

Beware of incorrect parameterisation! If the analogue value measured locally by the pressure transmitter is not sent directly to the controller then the analogue value received via the CAN bus is always used!
In the event of unsuitable parameterisation this can result in malfunctioning.

Example: Configuration of the analogue values for the sending and receiving of the analogue values for Zone 1

Task

Four island freezers are to use the same pressure transmitter. In order to do this the pressure transmitter is connected to a case controller and the pressure values recorded made available to the other three case controllers.

The following parameters need to be set:

1. Configuration of the remote case controller – for example this has the CAN bus address 15

Menu 6-2-6: Parameter *AIN1 activ* set to "Yes" (analogue input 1 is used)
Parameter *Refrig.Z 1* (selection of the refrigerant)
Parameter *LP Z1 min.* (smallest pressure value for pressure monitoring at 4 mA)
Parameter *LP Z1 max.* (largest pressure value for pressure monitoring at 20 mA)
Parameter *AIN1 Send CAN* set to "Yes" (this is therefore the remote case controller)
Parameter *AIN1 Rcv.CAN* set to "--"
Parameter *AIN1 Rcv. AIN1* set to "1"

2. Configuration of the three case controllers (group members)

Menu 6-2-6: Parameter *AIN1 activ* set to “No” (analogue input 1 is not used)
Parameter *Refrig.Z 1* (selection of the refrigerant)*
Parameter *LP Z1 min.* (smallest pressure value for pressure monitoring at 4 mA)*
Parameter *LP Z1 max*. (largest pressure value for pressure monitoring at 20 mA)*
Parameter *AIN1 Send CAN* set to “No” (this is therefore a group member)
Parameter *AIN1 Rcv. CAN* set to “15” (CAN bus address of the remote case controller)
Parameter *AIN1 Rcv. AIN1* set to “1”

☞ If the participating case controllers are connected to a pack without E*LDS pack control, then further setting need to be made.
Menu 6-1: Parameter *Refr. Sys. No.* set to “--“
Parameter *Compr. pack* set to “--„

* For details on stand alone operation by means of activated local pressure transmitter, see chapter 3.2.2.

Praxis tip: If the participating case controllers are connected to a pack **with** E*LDS pack control, and even though a local pressure transmitter is used, the two parameters Verbund Nr. and Verbundsatz (menu 6-1) must always be set to a plausible value.

4.4.10 Humidity control

UR 141 NE / UR 141 TE only

With the controller types UR 141 NE / UR 141 TE a dehumidification of the ambient air can be realised in an NT/LT room. A basic principle of the regulation is “temperature before humidity”, i.e. maintaining the room temperature is prioritised. The following settings need to be made for regulation:

- Controller types UR 141 NE / UR 141 TE
- Single-zone operation is parameterised (menu 6-1) so that the semiconductor relay 33/34 is available for the switching of the heating circuit.
- The relative humidity is measured using a humidity sensor via the second analogue input (11/14) and parameterised in menu 6-2-6 (parameter “*Fct. AIN2*“ = *Humidity*). The humidity sensor employed must have a linear characteristic curve. The following applies: 4 mA corresponds to 0% relative humidity, 20 mA corresponds to 100% relative humidity!

The humidity value determined is used within the case controller for regulation purposes, and in addition, recorded in the system centre / store computer. No alarm signal is generated with respect to the registered humidity.

The setpoint *Humidity* (switching threshold) and the corresponding parameter *Humidity Hyst.* (menu 6-3) are employed for the humidity regulation. If the switching threshold + hysteresis are exceeded by the humidity actual value, then the heating circuit is activated. If it falls below the switching threshold then the heating circuit is switched off.

The cooling remains independent of the status of the heating and the measured humidity actual value, and is solely coupled to the setpoints provided by the user. This means, in particular, that in the event of an overshoot of the setpoint + hysteresis the cooling is switched on, and in the event of the setpoint being undershot, it is switched off.

Room-air sensor R4.1	**Humidity setpoint overshot**		**Humidity actual value within the hysteresis**		**Humidity setpoint undershot**	
Exceeds room setpoint + hysteresis + 1 K	Cooling ON	Heating OFF (*)	Cooling ON	Heating OFF (*)	Cooling ON	Heating OFF
Exceeds room setpoint + hysteresis	Cooling ON	Heating OFF (*)	Cooling ON / OFF	Heating OFF (*)	Cooling ON	Heating OFF
Within the hysteresis	Cooling ON / OFF	Heating ON	Cooling ON / OFF	Heating ON / OFF	Cooling ON / OFF	Heating OFF
Undershoots room setpoint (**)	Cooling OFF	Heating ON	Cooling OFF	Heating ON / OFF	Cooling OFF	Heating OFF

(*) The heating is switched off, although the relative humidity measured in the room is too high. In this case maintaining the room temperature has a higher priority than regulating the humidity.

(**) In this case the room temperature cannot fall any lower, even when the heating fails due to a fault. For this reason no further distinction between cases is required in order to prevent the room air from becoming “too cold”.

With the parameter *Humidity Hyst.* the switching threshold for the humidity regulation can be set. In the event of this value being undershot at the humidity sensor, the relay contact 33/34 for the heating circuit is switched on. In all other cases, the activation of the heating contact is carried out from the UR 141 NE / UR 141 TE in the usual manner. If one does not wish to activate the heating in the event of the temperature setpoint being undershot, then the parameter *“Heatg. Circuit”* must be set accordingly. The heating circuit can only be used when the controller is employed in single-zone operation. This restricts the deployment of this solution to applications with one control loop.

☞ Special attention must be paid to the following:
- If the door contact is operated, then heating and cooling are initially turned off (irrespective of the current humidity actual value).
- The fan controller turns the fan ON when the heating circuit is ON.
- During a defrost, manual shutdown or a sensor failure at R4.1 the heating circuit is always OFF.

4.4.11 Regulation according to t_c / high pressure

Only UA 410 E AC and controller type UK 100 E

The controller type UK 100 E can be used to regulate via both the sub cooler outlet temperature R4 and t_c. The following settings need to be made for regulation via t_c:

1. In menu 6-1 the pack number must be set to the pack controller for the control circuit which provides the refrigeration. For example, in cascade controller operation this is the LT control circuit.

2. In menu 6-2-6 the second analogue input must be parameterised. The corresponding parameters are to be set as follows:

- AIN2 active to ”Yes”
- Select *Refrig.Z 2*
- Fkt. AIN2 must be set to ”tc LT”
- The limits for the pressure transmitter are to be set via the parameters *HP Z2 min* and *HP Z2 max*
- Optional: Via the parameter “*RfrSy. tcLT*” the CAN bus address of the pack controller can be parameterised for the reception of tc via the CAN bus (e.g. as backup value (fallback) in the event of the failure of the local pressure transmitter or for saving on the local pressure transmitter).

For control purposes the value of the pressure transmitter connected to the analogue input AIN2 (terminals 11/14) is preferred. In the event that this is deactivated or fails, where possible recourse is made to the tc received from a “remote case controller” (see chapter 4.4.9). If this is not available, then, at the lowest fallback level, recourse is made to the tc transmitted from the pack controller via CAN bus. If this is also not available then the sensor R4.1, i.e. R4.2 (sub cooler outlet temperatures zone 1/2) is used for regulation purposes.

This function is not supported by older pack controllers. Thus before use it must be clarified whether the corresponding pack controller supports this function. If necessary a firmware update must be carried out.

If the transcritical range is exceeded during the measurement of t_c with the coolant R744 ($C0_2$), then the temperature continues to be converted, however it no longer corresponds with the pressure.

The current version is not equipped with limiting at 31°C. Currently, the pressure in respect of t_o/t_c is neither measured nor displayed, only the temperatures.

4.4.12 Dynamic measurement of the t_c setpoint

Only UA 410 E AC and controller type UK 100 E

The t_c setpoint can be dynamically calculated in accordance with the difference between the tc and the t_0 actual values. This function can be employed through the use of a local pressure transmitter (AIN2, terminals 11/14) or a t_c actual value transmitted from a pack controller via CAN bus.

The following parameters (menu 6-2-6) must be observed:

- Set parameter "*Fct. AIN2*" to "*tc LT*".
- Parameterise analogue input AIN2 and/or parameter "*RfrSy. tcLT*"
- Set "tcZ2-Ramp/m" to a value other than "--"

Danach kann die Funktion mittels der Parameter "tcZ2-Max", "tcZ2-Min" und "tcZ2-toZ1Df" eingestellt werden.

Der dynamisch ermittelte tc-Sollwert kann nie größer als "tcZ2-Max" und nie kleiner als "tcZ2-Min" werden. Der Parameter "*tcZ2-ramp/m*" gibt die maximale Änderungsgeschwindigkeit des dynamisch ermittelten t_c-Sollwerts in Kelvin pro Minute an.

4.4.13 E*COP+

The auto-adaptive E*COP+ control process dynamically adjusts the suction pressure to the current cooling power requirement. The algorithm evaluates the operating data of all controllers and determines the optimum suction pressure over the respective requesting cooling units. The suction pressure p0 i.e. evaporation temperature t0 is raised dynamically as far as possible.

The procedure makes use of the fact that an increase in p0 i.e. t0 requires less compression work. Dependent on the operating status, raising the evaporation temperature by 1 K can save ca. 3 % energy. In the case of fluctuating partial loads E*COP+ always finds the ideal operating point and improves the COP (Coefficient of Performance).

In order for the case controller to be included in the control process the parameter "*OD over CAN*" must be set to ON (see menu 6-2-7) and the corresponding pack number set (see menu 6-1).

☞ Further details are contained in the pack controller operating manual.

4.4.13.1 Parameters for E*COP+

In order for the case controllers to be included in the control process, the following parameters must be set:

- *Refr. Sys. No.*		(menu 6-1)
- *OD over CAN*	set to OFF	(menu 6-2-7)
- *COPT+*	set to ON	(menu 6-7)

☞ Due to its advanced features, this operating mode is to be preferred to that described in chapter 4.4.13.2. The operating mode is also suitable for the mixed operation of EEV and TEV controllers. As all controllers participate in the suction pressure shift, they must all (including the TEV controllers) be set to COPT+.

4.4.13.2 Parameters for E*COP+ (compatibility mode)

In order for the EEV case controllers to be included in the control process in compatibility mode, the following parameters must be set:

- *Refr. Sys. No.*		(menu 6-1)
- *OD over CAN*	set to ON	(menu 6-2-7)
- *COPT+*	set to OFF	(menu 6-7)

This operating mode serves to maintain compatibility with existing systems using UA 400 E- / UA 410 E controllers up to version V1.89.
As soon as one of the controllers participating in E*COP+ uses this “older” mode, then all the other controllers must also be set to this mode. A mixed operation with EEV/TEV controllers is then no longer possible.

4.4.14 Fixed valve opening degree in pumpdown/feed-in phase

There are three events where the controller runs through an initialization cycle, in which a fixed valve opening degree is defined:

- After first start and restart / manual shutdown
- After defrosting (after completion of drip time)
- When controller stall is detected (controll blocking)

In these instances the evaporator is first pumped down for an adjustable time (valve opening 0%) and then refrigerant is fed into the evaporator at a fixed valve opening of 100% also for an adjustable time. This procedure prevents the evaporator inlet sensor signal from assuming invalid values especially in superheat control with two temperature sensors.

The feed-in phase is interrupted when at least one of the two conditions is met:

- When feed-in duration is completed (safety function).
- When the difference between R6.x and R5.x (corresponding to superheat in control with two temperature sensors) exceeds the superheat setpoint and the temperature measured on evaporator inlet sensor R5.x drops below return air setpoint + 5K.
- Suction pressure transmission t_0 from the pack controller

Compressor damage!
Danger due to liquid refrigerant on the suction side of the compressor! Liquid refrigerant can exit the evaporator if the feed-in time for the evaporator to be controlled is set too large. During the set feed-in interval, superheat is not checked for drop below minimum level.

4.4.14.1 Fixed valve opening degree for servicing purposes

As an alternative to automatically defining valve opening degree by the control functions, a fixed valve opening degree can be defined for servicing purposes.

Compressor damage!
Danger due to liquid refrigerant on the suction side of the compressor! With a fixed opening degree the superheat controller is not active! Consequently there is a danger of a flooding of the evaporator!

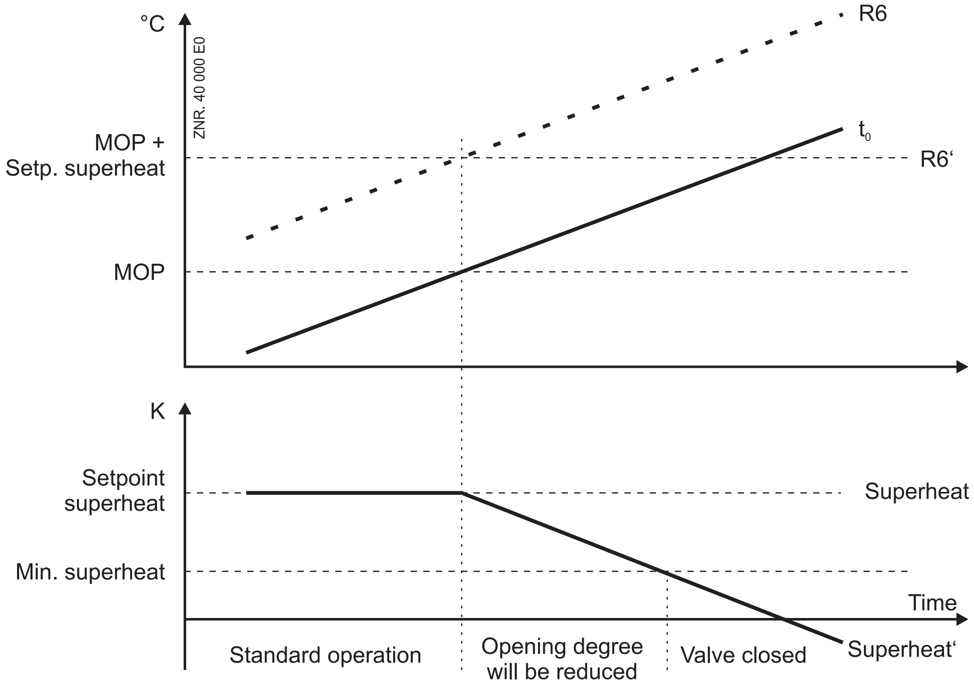
4.4.15 MOP function

The MOP point (Maximum Operating Pressure) is part of the superheat regulation and describes the maximum permissible value of the evaporation temperature t0. If to is lower than the set MOP point then normal superheat regulation is carried out. If t0 exceeds the MOP point then the opening degree of the E value is reduced until it finally closes completely.

This behaviour is achieved by "freezing" the temperature sensor R6, which simulates a small superheat to the controller. Thus it is irrelevant how high the temperature at R6 rises as the superheat controller only sees the maximum value R6' which it calculates from the set MOP + the superheat setpoint (*Setp.SH*).

With increasing to and "frozen" R6, the superheat SH' (SH = R6 - t_0) sinks and the opening degree of the valve is reduced.

At the latest, once the minimum superheat has been reached (if active) the valve closes completely.
MOP mode functions both in CAN bus operation and stand alone operation (to measured via R5 or the local pressure transmitter).



4.4.16 Run time limiting/continuous run monitoring

All controller types, apart from UK 100 E.

Continuous running of a refrigerated display case, caused for example by aggravated ambient conditions, has an adverse effect especially in connection with multidecks. It results in icing of the evaporator and diminished air curtain cooling. Run time limiting automatically initiates forced shutdown of cooling for intervals as a means of preventing icing.

The duration of these forced shutdown intervals can be set (menu 6-3). Commencement of forced shutdown is defined at a fixed time. Forced shutdown takes place 1.5 hours after commencement of defrosting and at subsequent one-hour intervals.

Continuous run monitoring can be activated for all controller types. Under certain circumstances, i.e. in the event that the refrigerated display case, goods, or E-valve (key phrase "zeroing of the valve") requires it, it can also be used to force a regular shutdown of the E-valves. which would otherwise regulate continuously.

☞ When forced shutdown is active, shutdown will be terminated before the end of the set duration if temperature rises 4K on the supply air sensor.

4.4.17 Two temperature zones

It is possible in principle for one refrigerated display case to be controlled in single-zone operation (*Temperature Zones* parameter set to 1; one pilot case only) or two refrigerated display cases with two temperature zones (two pilot cases). In operation with two temperature zones, temperature and superheat are controlled separately for each case.

In single-zone operation the second expansion valve is operated at the same opening degree as the first valve with a time delay ("tandem operation"). Only the first five sensors and the setpoints of the first zone are used for control.

☞ In single-zone operation the setpoint for the heating circuit must be set to "--" on coldroom controllers so as to allow tandem operation.

With two-zone operation it is possible, in addition to conventional termination of defrosting, for both cases to be returned jointly to cooling mode after defrosting. This requires master-slave mode to be activated in two-zone operation (see the corresponding section for further details). Only one evaporator temperature sensor is provided for each evaporator.

One-room-air-sensor operation (controller types UR 141 NE, UR 141 TE)

In two-zone operation, it is possible for the coldroom controller to regulate both zones via one common room air sensor. In this operating mode the room air sensor for the first zone (R4.1) is used for the coldroom temperature regulation of both zones. The superheat regulation of both zones continues to be conducted independently. This operating mode is suitable e.g. for the deployment of two independently regulated evaporators within one coldroom.

In order to activate operation the following **must** apply

- two-zone operation is set (menu 6-1) and

- the coldroom temperature setpoint of the second zone (menu 2-1-2) is set to "--".

☞ - The alternative coldroom temperature setpoint of the second zone (e.g. night-time value) has no function in this operating mode.

- If following a defrost, the transition to cooling is to be carried out simultaneously for both zones, then the master-slave mode for this case controller is to be activated.

- The room air sensor for the second zone (R4.2) is **not** used for regulation in this operating mode, however if it is attached then this sensor conducts temperature monitoring.

4.4.18 Heating circuit control

Controller types UR 141 NE and UR 141 TE

As an alternative to the second temperature zone, the temperature can be controlled in coldrooms with a supplementary heating circuit. Heating circuit control is plain on-off control. The heating circuit control relay cuts out when temperature rises to a value equal to the setpoint plus hysteresis. The relay cuts in when temperature drops below the setpoint. The relay with terminals 33/34 is used for heating circuit control.

☞ A second zone must **not** be selected when heating circuit control is used. Only then is it possible to adjust the setpoints.

⚠ **Damage to equipment and goods!** Faulty adjustment of setpoints entails the risk of damage to the system and merchandise! The setpoint for the heating circuit must be set lower than for cooling.

Note that refrigerant feed and heating can occur simultaneously when the heating circuit setpoint and temperature setpoint are set close together in continuous control mode. The parameters must be set accordingly.

☞ Control of heating circuit and temperature takes place simultaneously. Actuation of heating and cooling at the same time can be prevented by selecting on-off mode for temperature control instead of continuous temperature control. When the heating circuit setpoint is set to -- in single-zone operation (Temperature Zones parameter set to 1), the Cooling 2 relay is operated at the same opening degree as Cooling 1 relay (push-pull action).

4.4.19 Emergency operation

In failure of temperature measurement or superheat control, cooling continues at an emergency valve opening degree. This emergency valve opening degree is computed from the mean valve opening degrees of the preceding 24 hours, and has an upper limit that can be adjusted by a parameter.

Parameter for emergency valve opening degree:

- The *Max. Emergency Opening Degree* parameter (Menu 6-2-7) is used to limit maximum emergency valve opening degree.
- The *Max. Emergency Opening Degree* parameter also takes effect when a 24-hour value of valve opening degree cannot be computed, for example at first start.

Failure of display case and coldroom temperature control:

- In failure of both sensors for display case and coldroom temperature control, control continues at the emergency valve opening degree. The superheat controller remains active and can limit minimum emergency valve opening degree.

☞ In failure of one of the two sensors, control continues with the remaining sensor and emergency operation is not activated.

Failure of superheat control:

- In failure of superheat control, emergency mode is initiated and the emergency valve opening degree is output. The display case controller remains active and can limit minimum emergency valve opening degree.

Failure of display case and coldroom temperature control and superheat control:

- Emergency valve opening degree is output.

4.5 Defrosting

Fire hazard! On grounds of fire prevention, during the planning of the installation a device for shutting down the defrost heating in the event of excessive temperature (e.g. ”KLIXON”) must be provided.

4.5.1 Types of defrosting – an overview

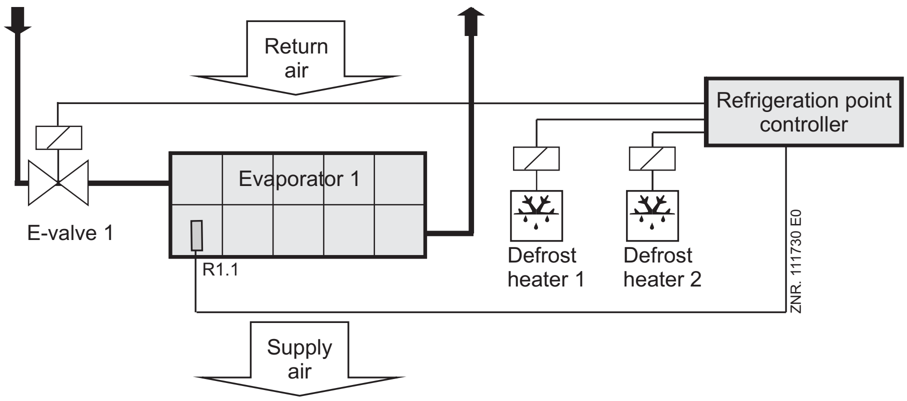
The following types of defrost are described in the following chapters:

- Chapter 4.5.2: Defrost in general
- Chapter 4.5.3: Discharge gas defrosting (hot gas defrosting)
- Chapter 4.5.4: Master/slave mode – defrost synchronisation via CAN bus
- Chapter 4.5.5: Master/slave mode – defrost synchronisation via wiring
- Chapter 4.5.6: Defrost sequenz (DS) via CAN bus

4.5.2 Defrost in general

Defrosting is used to prevent icing of the evaporators due to normal control action. The evaporator is defrosted by supplementary heating of the evaporator (electric heater) or by the off-cycle method. Temperature control for the refrigeration point is shut down during defrosting. Defrosting differs in single-zone mode and two-zone mode: In two-zone operation R1.1 determines the defrost termination of the first zone and R1.2 the defrost termination of the second zone. In single-zone operation however, the defrost termination of the common first zone is first reached when both sensors have exceeded the defrost termination temperature; the sensor R1.1 operates on heating 1, R1.2 (when plugged) operates on heating 2.

Exception: Second defrosting stage with coldroom controllers (see description below).



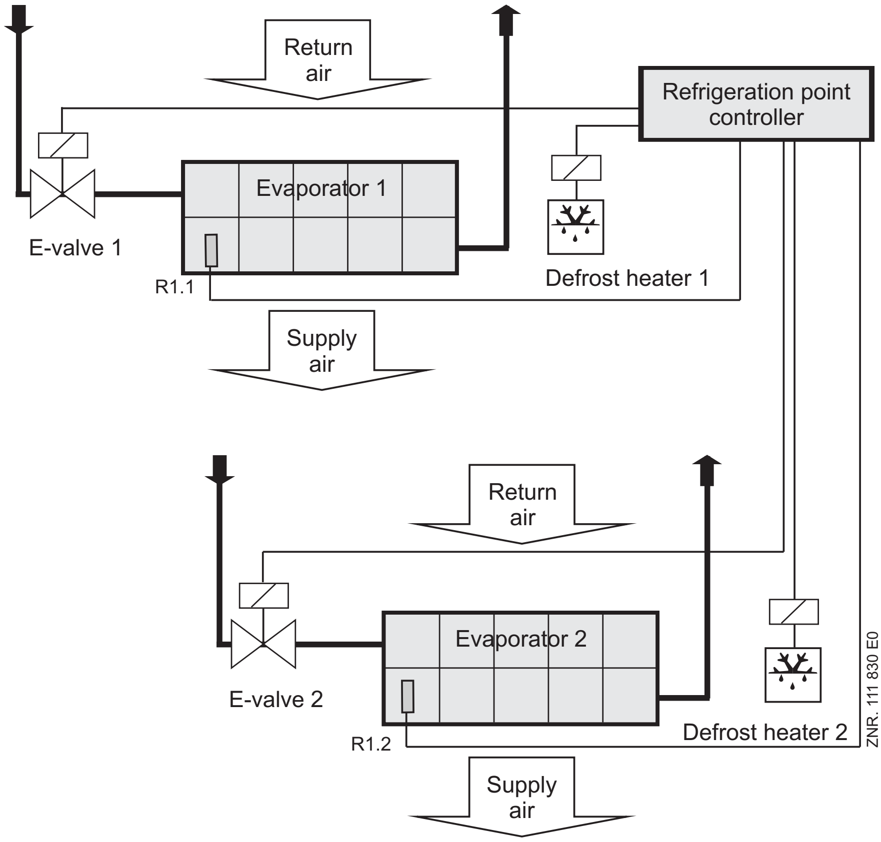
R1.1:	Defrost sensor	(Terminal Z31/Z32)
R1.2:	Optional	(Terminal Z81/Z82)
Expansion valve 1:	Relay for expansion valve 1	(Terminal 23/24)
Defrost heater 1:	Relay for defrost heater 1	(Terminal 43/44)

Allocation of sensors to defrost relays

Optional sensors that are not connected are not used to operate the defrost relay.

Controller type	Sensor	Comment
UA 121 E, UA 131 E, UA 131 E LS UA 141 E, UR 141 NE, UR 141 TE UK 100 E	R1.1	Defrost Relay 1
	R1.2	Defrost Relay 2

In two-zone mode, sensors R1.1 and R1.2 act on defrosting.



R1.1:	Defrost sensor	(Terminal Z31/Z32)
R1.2:	Defrost sensor	(Terminal Z81/Z82)
Expansion valve 1:	Relay for expansion valve 1	(Terminal 23/24)
Expansion valve 2:	Relay for expansion valve 2	(Terminal 33/34)
Defrost heater 1:	Relay for defrost heater 1	(Terminal 43/44)
Defrost heater 2:	Relay for defrost heater 2	(Terminal 53/54)

Allocation of sensors to defrost relays

Optional sensors that are not connected are not used to operate the defrost relay.

Controller type	Sensor	Comment
UA 121 E, UA 131 E, UA 131 E LS UA 141 E, UR 141 NE, UR 141 TE UK 100 E	R1.1	Defrost Relay 1
	R1.2	Defrost Relay 2

Start of defrosting

Defrosting can be initiated by four methods:

- By internal clock (except UK 100 E)

Defrosting cannot be started again before the safe defrost time has expired (defrosting parameters) regardless of defrosting having been terminated in the meantime by evaporator temperatures. Defrosting should be timed to take place between 2:00 and 3:00 hours where possible so as to avoid problems of missed or duplicated defrosting when changing to or from daylight saving time.

- **Using an external timer** via digital input D11/D12 (factory setting).

Warning – hazardous electrical voltage!
Danger of electric shock! BEFORE connecting and disconnecting it must be checked that the 230 V AC digital inputs are off load!
The controller and connected voltage carrying components remain supplied with power!

The defrost is activated via digital input 1(terminals D11/D12), its function can be configured using the parameter Inv. D1 in menu 6-2-4. The following cases are possible:

External defrost (master/slave mode not active):

The time for which the defrost signal for external defrosting is applied must be as long as the required maximum defrost duration. Defrosting is terminated as soon as the external request command is halted. During the time the defrost signal is applied, defrosting can always be terminated by the evaporator sensor (on exceeding defrost termination temperature).

Note for external defrost in master/slave mode:

The defrost signal must be applied only briefly, as in this instance it serves only to initiate defrosting. The safe defrost time is controlled by the internal parameter *Safe Defrost Time*. The external signal must always be shorter than the set safe defrost time.

- By command signal via CAN bus (manual actuation, in PC software)

In every instance, defrosting is not initiated unless the conditions for defrosting are found to be fulfilled. These are:

Evaporator temperature lower than defrost termination temperature

Defrost counter set to 1 with demand defrosting

There is no alarm *Sens.fault eev1/2* i.e. *Emerg.cut-out SH Z1/2*.

- By command from pack controller via CAN bus

Defrosting (discharge gas defrosting) is initiated without checking for conditions.

With controller types UA 121 E, UA 131 E and UR 141 TE defrosting will also be inhibited when the following conditions are all met:
1.) Temperature alarm is active or alarm delay is set to 0 minutes.
2.) Evaporator temperature R1.1 or R1.3 is higher than the defined return air setpoint.

Separate defrost start according to the two temperature zones using the internal defrost timer

Usually it is sufficient if the defrost is started simultaneously for both zones. However, should an application require it, a separate defrost for each zone can be carried out. Additional parameters are available for this purpose.

In the E*LDS system, defrost time refers to the time for the start of a defrost. In order to activate separate defrost times for the two temperature zones the parameter *Defrost Timer* must be set to “INT” (menu 3-2-a). The parameters available for this function, *„Safe Defr Time*” and “*Defrost 1..14”* are identical to those for the first zone and can be set as usual.

☞ The simultaneous deployment of separate defrost zones and the master/slave function is not recommended! If these functions are nevertheless used together, it should be noted that, depending on the parameterisation, this can result in very long defrost phases!

Defrost termination

Defrosting can be terminated by three methods:

- By defrost termination temperature being obtained on the respective evaporator sensor regardless of set controller type
- By completion of safe defrost time
- By command signal (manual or pack controller) via CAN bus

☞ Defrosting is always terminated by the safe defrost time when defrost termination temperature is set to --. In this instance, no *Timer-Term. Defrost* alarm is entered in the fault report list.

Suppression of sensor break alarm during defrosting

While defrosting is in progress, temperature sensors and particularly the evaporator sensors may become heated to a temperature above the limits of the case/coldroom controller's temperature detection range. Sensor break alarm is accordingly suppressed for the duration of defrosting so as to avoid signalling of false alarms. (See also Section 10.1)

Demand defrosting (controller type UA 131 E, UR 141 NE, UR 141 TE)

Demand defrosting means that a decision is made, depending on duration of a previous defrosting cycle, whether defrosting is actually initiated or skipped on becoming due. Demand defrosting is activated when the counting rate is set other than to 0 and is deactivated when the counting rate is set to 0.

A defrost counter is set to 6 at the commencement of defrosting and counts down as a function of the set counting rate until temperature on the evaporator sensor of the pilot case is in the range between -3°C and +3°C. If the counting rate is set low, the demand defrost counter will count down faster to 1. This means that **all** defrost cycles are indeed initiated when due. If a higher counting rate is set, more defrost cycles will be **skipped** (maximum 5 cycles).

Waiting time (not with controller type UA 141 E)

A wait between the time cooling is stopped and the defrost heater is started can be set at the initiation of defrosting. This prevents simultaneous operation of the defrost heater while the evaporator is being pumped down.

Drip time (not with controller type UA 141 E)

Start of cooling after defrosting can be delayed by setting a drip time. The drip time does not commence until the last defrost relay has de-energized. This allows defrost water to drip off before cooling restarts. With the UR 141 TE and UR 141 NE controllers the fan remains off until the drip time has expired, after which check is made to determine whether the conditions for starting the fan are met.

Defrosting with two temperature zones

When two zones have been selected for control of cooling, each zone is treated separately for defrosting. Defrost start time is however the same for both zones.

Second defrost stage (controller type UR 141 NE, UR 141 TE)

The two defrost stages function can be used for example if a risk exists of the drip water collecting pan drain freezing over on evaporators equipped with such a pan when single-stage defrosting is used.

In order to activate a second defrost stage the controller parameter *Temperature Zones* must be set to **one** zone (Menu 6-1). This will then display the menu item for a second defrost stage (Menu 2-2-1). Defrosting is initiated by starting the first defrost stage (*Defrost1* relay). Termination of first-stage defrosting is controlled by evaporator sensor R1.1 and termination of second-stage defrosting is controlled by evaporator sensor R1.2.

When evaporator temperature (R1.1) rises above the setpoint for the second defrost stage, the *Defrost2* relay is operated. The defrost termination temperature set for Zone 1 is used.

If the 2nd defrost level is deactivated (parameter 2nd defrost level = ”--”), then both defrost relays are employed. If the evaporator sensors are connected, then R1.1 is assigned to defrost relay 1 and R1.2 to defrost relay 2. Both defrost relays are active at the start of the defrost; the shutdown proceeds via the assigned evaporator sensor or the safe defrost time.

☞ The second defrost stage parameter must not be set with discharge gas defrosting, as the second defrost relay will otherwise not energize as generally desired with discharge gas defrosting.

Stock compartment on service counters
(controller type UA 141 E)

The *Defrost Inverted* relay (contacts 63/64, inverted operation) can be used to interrupt cooling for example of the stock compartments. The relay is open when cooling is in progress and closed when defrosting is started:
- which means that the relay contact is open when the controller initiates defrosting
- which means that the relay contact is closed when the controller terminates defrosting.

Interruption of cooling during defrosting extends for the safe defrost time in the case of the stock compartments and therefore can last longer than defrosting in the 1st or 2nd temperature zone. Moreover the relay is not operated until the waiting time has expired.

Manual defrosting
(not with UA 131 E in master/slave mode)

For a manual defrost (e.g. for service purposes), the defrost can be initiated via the system centre / store computer / operator terminal, as follows:

- by opening Menu 5 Remote Operation – Select Refrigeration Point (or CAN bus address) - 3 Clock - 2 Defrost Timer and selecting ON in the line *Man. Defrost* or on the

- Host Computer (see operating instruction description of LDSWin).

☞ When defrosting is initiated (by controller or in LDSWin) and is terminated or skipped by d**emand defrosting / terminated by defrost sensor**, the complete safe defrost time must have expired before manual defrosting can again be initiated.
If manual defrosting is to be initiated again immediately following, the first defrost cycle **must** previously be terminated by either of the following:
By controller: Menu 5 Remote Operation – Select Refrigeration Point (CAN bus address) - 3 Clock - 2 Defrost Timer, set parameter “*Man. Defrost*” (Menu 3-2) OFF.
In LDSWin: Click on Terminate Defrosting button.
Manual defrosting can then be restarted immediately.

Automatic activation of the defrost during the first start

Defrosting is initiated automatically at first start with the following controller types:
UA 121 E, UA 131 E, UA 141 E

4.5.3 Discharge gas defrosting (hot gas defrosting)

Discharge gas defrosting involves feeding discharge gas into the evaporator and can be performed with either hot or cold gas. The discharge gas is supplied from a point upstream of the condenser (hot gas defrosting) or from the receiver downstream of the condenser (cold gas defrosting).

Compressor damage!
Danger due to liquid refrigerant on the suction side of the compressor! Discharge gas defrosting as described herein is D2D two-pipe discharge defrosting, which can be performed only with hot gas.

Notes on discharge gas defrosting (controller type UA 131 E, UR 141 TE)

These notes apply to two-pipe discharge gas defrosting. The defrost relays are used to control special solenoid valves specific for discharge gas defrosting. In discharge gas defrosting allowance is made for the specific properties of the discharge gas:

- Demand defrost counter ignored on initiation of defrosting
- No internal initiation of defrosting
- No interruption of defrosting in occurrence of temperature alarm
- Discharge gas defrosting requires the system to include a pack controller. Case/coldroom controllers involved in discharge gas defrosting must be assigned to a pack controller through the Pack No. parameter. With VS 3010 BS pack controllers, the *Refrigeration Pack* parameter must also be set on the case/coldroom controller.

Activating discharge gas defrosting with UA 131 E:

In order to activate the discharge gas function of the UA 131 E, the parameter *HG operation* (Discharge Gas Mode, menu 6-3) must be set ON on the controller.

Activating discharge gas defrosting with UR 141 TE:

Discharge gas defrosting can be performed at any time with the UR 141 TE and does not need any further parameters to be set.

Termination of discharge gas defrosting with UA 131 E:

Defrosting is terminated by the defrost termination temperature sensors and can be carried out immediately. In contrast to the UA 131 DD (see UA 300/UA 400), there is no time delay before the start of defrosting.

Termination of discharge gas defrosting with UR 141 TE:

Defrosting is terminated by the defrost termination temperature sensors without delay. If an internal defrost timer is set on controller types suitable for discharge gas defrosting, it will be changed automatically to external defrosting by the pack controller the first time discharge gas defrosting is initiated. This prevents the case controller from automatically initiating defrosting.

Compressor damage!
Danger due to liquid refrigerant on the suction side of the compressor! At first start with the UA 131 E, defrosting is initiated directly after starting. If the system is not interlocked by appropriate pack controller control leads for initiation of discharge gas defrosting, it is then possible for liquid refrigerant to enter the suction line for example. Therefore, in applications with discharge gas defrosting, always make sure that manual defrosting is disabled when the controller starts and the defrost timer is set to external defrosting. Alternatively or additionally, operation of the positioners specific to discharge gas can be interlocked by the pack controller by means of suitable control leads.

Discharge gas defrosting cannot be used together with the master-slave function. With discharge gas defrosting the operation must be terminated when the CAN bus defrost command ends, whereas with master-slave defrosting the operation always continues until the safe defrost time expires. Alarm will be generated by the controller if such a combination is set.

4.5.4 Master/slave mode – defrost synchronisation via CAN bus

All controller types from version >= V2.00, apart from UK 100 E

Damage to equipment and goods! With this function it is essential to ensure that simultaneous defrosting and cooling of the synchronized refrigeration points cannot take place due to **faulty parameter setting**.

Function description

The master/slave mode is used with refrigerated display cases when the operation of more than 2 evaporators, without additional protective measures, could result in the reciprocal icing of the evaporators.
This problem is avoided through the defrost synchronisation in master/slave mode. All refrigerated display cases and case zones defrost simultaneously and then switch to cooling together. The synchronisation of several participating controllers is performed via the CAN bus.

The master/slave defrost via CAN bus covers the following functions: Following a joint defrost, a group of controllers only switches back to cooling when all the controllers have completed their respective defrost. Thus the transition from defrost to cooling is synchronised for all the case controllers in a defrost group.

The case controllers in a defrost group are divided into a defrost master and the defrost slaves. The defrost master sets the defrost start, and at the end of the process, enables cooling again. All the other defrost participants (when existing) are called defrost slaves and follow the instructions of the defrost master. Several independent defrost groups can be realised, i.e. a number of defrost masters who each administer an arbitrary number of defrost saves. In addition to the defrost groups, further controllers entering defrost within the system can exist independently of the groups.

The size of the defrost groups as well as the number of defrost groups are only limited by the maximum number of participants in the E*LDS system.

Realisation, i.e. sequence of the master/slave defrost via CAN bus

A defrost is initiated by the master. From this point in time, all the slaves enter a defrost. As long as one of the participants (slave or master) is undergoing a defrost, none of the participating controllers switch to cooling.

If one of the controllers reaches the defrost termination temperature, then this controller switches its own defrost relay to OFF, however it still remains in the defrost mode, i.e. does not switch to cooling mode.

When all of the participating controllers have reached the end of the defrost cycle (whether via the safe defrost time or defrost termination temperature), they all return to the “cooling” mode together.

The safe defrost time set on the master, and a possible delay or drip time, are also executed by the slaves.

Configuration/parameterisation of the master/slave defrost via CAN bus

The controllers must be configured so that the defrost can be executed. In the case of the master a defrost is activated via the internal clock, the external contact or via manual defrost (CAN/local). The master, with respect to the parameter "*M/S Defr.Fct.*", must be set to "*Master*" (menu 2-2-1 i.e. 2-2-2).
The parameter "*M/S CAN Adr.*" is of no relevance for the master.

It is recommended to set the parameter "*M/S CAN Adr.*" on the master to „--".

The slaves, with respect to the parameter "*M/S Defr.Fct.*" are set to "*Slave*". The parameter "*M/S CAN Adr.*" **must** be set to the CAN address of the master controller, and that for all participating slave controllers.

Special case – synchronisation of both defrost zones

If the M/S CAN address on a slave is set to "--", then a defrost via internal and external defrost timers is possible. This enables both zones of the respective controller to be synchronised so that they return to cooling simultaneously following the defrost.

Short guide

1. Set which controllers are to defrost together, i.e. switch to cooling.
Define one of the controllers as the defrost master.

2. Configure the defrost master (e.g. controller with CAN address 11) as follows:
   Under 2 Setpoints – 2 Defrost – 1 Zone 1:
   1. Set M/S Abt. Fct Master and
   2. M/S CAN Adr. to „--"

3. Configure all the slaves as follows: Under 2 Setpoints – 2 Defrost – 1 Zone 1:
   1. Set M/S Abt. Fkt to "Slave" and
   2. M/S CAN Adr. to the CAN address of the master (e.g. 11)

4. Configure the defrost on the master:
   1. Safe defrost time and defrost time, i.e. external defrost in menu 3 Timer – 2 Defrost Timer (Note: In master/slave operation the controller always responds to the external defrost timer, even when the defrost timer is set to INT).
   2. Defrost termination temperature, delay and drip time for zone 1 and 2 in the menu 2-2-1, i.e. 2-2-2 (Note: The slaves assume the delay and drip time from the corresponding zone of the master. If the master is working in single-zone operation then a slave in two-zone operation employs the delay and drip time from zone 1 of the master for both zones.)

5. Check whether the sensor for the defrost termination temperature (R1) is connected and is supplying plausible values.

Necessary measures for the parameterisation of the master/slave defrost via CAN bus

- The master's safe defrost time also applies to the slave controllers. Should the slave controllers be set to different values these are ignored.

- The master's delay and drip times also apply to the slave controllers. Should the slave controllers be set to different values these are not taken into consideration.

- The initiation of a defrost (manual, external, internal, CAN) on a slave participant is not permitted and will be prevented.
- Exception: Slaves with the M/S CAN address "--" can have external defrost sources! (see Special cases / useful information)

- The defrost on demand only functions on the master. With the slave controllers, a parameterised defrost on demand will be ignored.

- The defrost termination temperature must be set individually for each slave controller.

Status values

The total number of controllers participating in the master/slave process is displayed in menu 1-3 ("*M/S Nof. Sl.*"). Every time the parameter "*M/S Degiv.Fct.*" is reset or set to "Master" this number is measured again.
In addition, menu 1-3 also displays the last UA which failed to send a signal to the master during the defrost (parameter "*M/S Lost Sl.*"). If the defrost proceeded without error, then this value is "--".

If a master receives the command to defrost (defrost timer, manual or external) and the master itself has already reached the defrost termination temperature, then it does not defrost and the slaves are not instructed to defrost.

Behaviour of a master/slave CAN slave when it receives a defrost command from a master and the defrost conditions have not been met (slave is too warm): The slave does not defrost or begin cooling as long as the cooling remains blocked by the master.

Generation of an alarm message in the absence of a defrost

If the defrost is not conducted then the alarm message "*No Defrost*" is generated by both the master and slave controller. The generation of this message is coupled to the alarm delay time and thus is automatically sent by all affected controllers if no defrost takes place. In master/slave operation the alarm "*No Defrost*" can also mean that a slave no longer has any contact to the master. If a slave fails to receive a signal from its defrost master for a period longer than 60 minutes, then this message is generated.

Special cases/useful information

- The master/slave defrost via CAN bus cannot be used together with the wired variant of the master/slave defrost.
- UA 400 / UA 400 E mixed operation is possible with both the master/slave defrost (MSD) and the defrost sequenz (DS).
- Once a defrost has been initiated on a slave, this can only be interrupted when the parameter 2-2-1 (Defrost 1) – "*DS-Function*" on the slave is set to "OFF" for a minimum of 10 seconds and then reset to "Slave". It is generally recommended that this procedure only be employed for commissioning situations as an interruption of the defrost can result in increased icing.
- Slaves with the M/S CAN address = "--" can have external defrost sources
- Slave with M/S CAN-Address "--" -> defrost via INT / EXT possible
- The master does not start the defrost of the slaves if it has already reached the defrost termination temperature.
- Even if all the slaves have already reached their defrost termination temperature, they do not switch to cooling until the end of the delay time. The master does not turn on the defrost heating (= relay is NOT activated) when it is already too warm.
- Safe defrost, delay and drip times are transmitted to the slaves from the master during both a master/slave defrost (MSD) and a defrost sequenz (DS) and are used irrespective of the slave parameters set by the user.

4.5.5 Master/slave mode – defrost synchronisation via wiring

All controller types, apart from UK 100 E

Damage to equipment and goods! With this function it is essential to ensure that simultaneous defrosting and cooling of the synchronized refrigeration points cannot take place due to **faulty parameter setting**.

This function requires **additional external** wiring for more than one participating controller. When connecting master and slave case controllers, make sure that power supply is connected with **only one phase** (e.g. only through L1)! See Section 5.7 - Wiring Master-Slave Function for Defrosting.

Function description

Master-slave mode is used with refrigerated display cases on which operation of such evaporators without additional protective measures can lead to mutual evaporator icing.

This problem is prevented by synchronization in master-slave mode. All refrigerated display cases and case zones defrost simultaneously and then switch to cooling together. The synchronisation of several participating controllers is carried out by hardware wiring, see chapter 6.13. This also enables both zones to be caused to return jointly to cooling mode after defrosting with **one** controller in two-zone operation.

4.5.5.1 Master-slave mode for the synchronisation of the zones of a single contr.

Function description

Master configuration: With the case controller the internal defrost timer must be active (menu 3-2, parameter *Defrost Timer* = *INT*). This case controller is then designated as the master.

On reaching the defrost end temperature for the respective zone the defrost relay is switched off. Cooling is only resumed once all the control zones have completed the defrost or the safe defrost time has elapsed.

Further details of special features and restrictions are provided in chapter 4.5.5.4.

Example: Synchronized defrost termination on **one** controller with two temperature zones.

In standard operation with two temperature zones, the defrost in each zone is terminated dependent on the defrost termination sensor of the respective zone and immediately switched to cooling. If in contrast, an operating mode is required where both zones simultaneously switch to cooling following the defrost, then the master/slave function on DIP switch 3 of coding switch 4 also needs to be set to ON.

Cooling will then not be resumed until defrosting is terminated in both zones. The defrost heater relay is still operated separately for each zone according to temperature on the defrost termination sensor.

The special features and restrictions for the master now apply, see chapter 4.5.5.4.

4.5.5.2 Master-slave mode for the synchronisation of several controllers

Function description

Master configuration: The internal defrost timer must be active on one of the participating case controllers (menu 3-2, parameter *Defrost Timer* = *INT*). This controller is then the master.

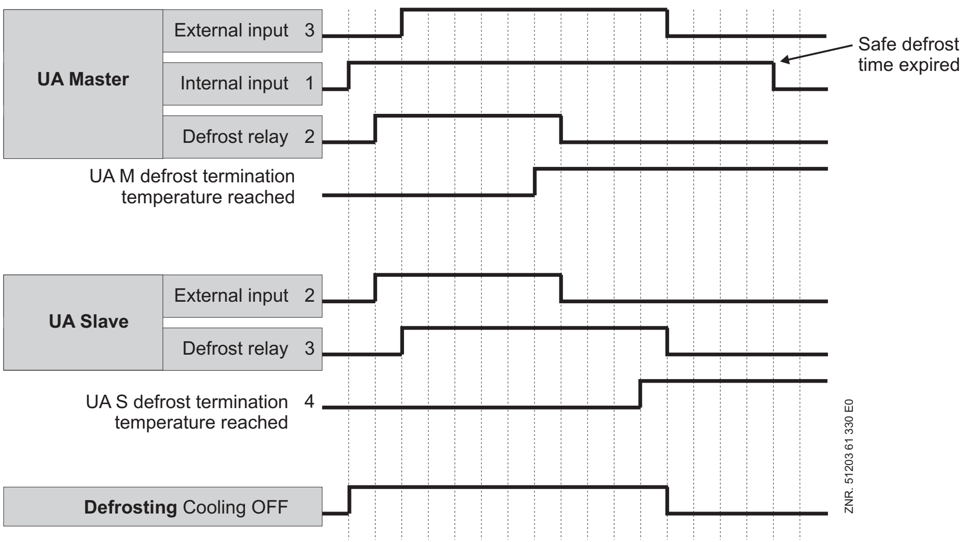
Slave configuration: The other case controllers must be configured for external defrost start (menu 3-2, parameter *Defrost Timer* = *EXT*). These are then automatically slave case controllers.

Further details of special features and restrictions are provided in chapter 4.5.5.4.

On reaching the defrost end temperature for the respective zone the defrost relay is switched off. Cooling is only resumed when all the control zones of all the participating case controllers have completed the defrost or the safe defrost time has elapsed.

Defrosting example

Case controller UA M configured as master. Case controller UA S configured as slave. The start of the synchronised master/slave defrost is initiated via the internal timer.



Note the following for this example:
The internal defrost signal is applied for the entire safe defrost time. Termination of defrosting is generally governed however by de-energizing of the last defrost relay.

4.5.5.3 Necessary settings for master-slave mode

- Control hardware

  In order to activate master-slave mode, Coding Switch 4 of DIP switch 3 on the UA 300 must be set to ON. The change does not take effect until the controller is restarted (switched off and back on).

See Section 6.13 - Wiring of Master-Slave Function for Defrosting for details of Master/Slave wiring.

- Control software

  Activation of master-slave mode can be checked in Menu 6-2-1.

4.5.5.4 Special features and constraints

All defrost relays are energized simultaneously at the commencement of defrosting. As defrosting proceeds, the evaporator defrost relays are de-energized separately and exclusively as a function of defrost termination temperature.

Return to cooling mode is not however made until defrosting is completed on all synchronized cases. Defrosting can be carried out on the master by inputting a signal to the defrost input. It is possible to send a defrost command from the master to the digital input D11/D12 of the slave via a 230 V AC impulse (parameter Eing. 1 must be set to ABTAUUHR, see menu 6-2-4).

All the characteristics of the defrost function such as defrost on demand, defrost via CAN bus and manual defrost are preserved by the master case controller and also need to be parameterised here (on the master).

Configuration

The master-slave function can be employed with all controller types. In order to activate the master/slave mode DIP switch 3 on coding switch 4 must be switched to ON on all participating case controllers. The change is only adopted when the controller is restarted (switched off and back on again).

The set controller mode and activation of master-slave mode can be checked in the Type and Version menu 6-2-1.

The following items must definitely be observed to ensure correct operation.

Damage to equipment and goods!
- Faulty setting of coding switches and defrost timer (INT/EXT) can result in evaporator icing due to non-synchronized defrosting or failure of defrosting to take place!

- Demand defrosting works only on the master case controller. The initiation of a manual defrost on the slave is also prohibited.

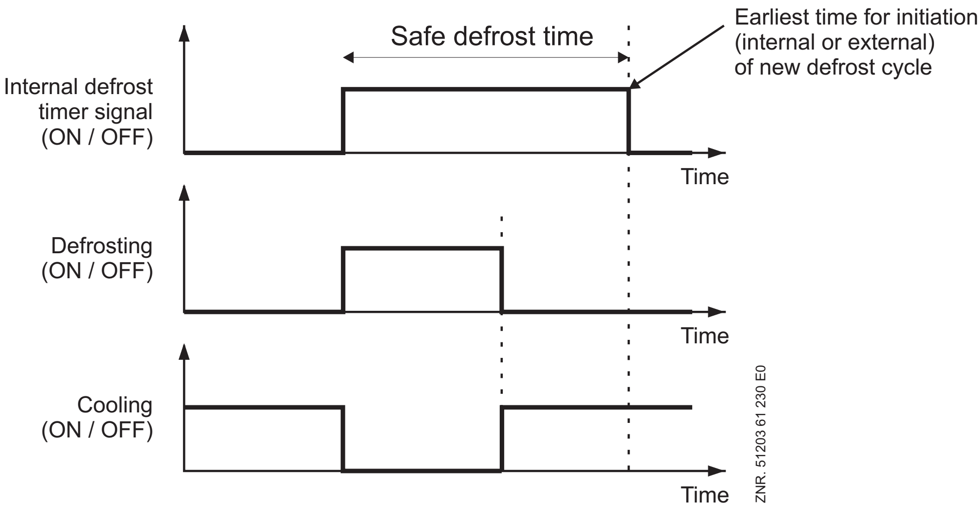
- Due to a defrost on demand configured in a slave it is possible that the master defrosts while the slave continues to operate in cooling mode.

- The safe defrost time for the slave must be exactly the same as the safe defrost time for the master in order to prevent one of the two case controllers switching to cooling mode before the other as a result of the elapse of a safe defrost time

- Counting rate for demand defrosting must be set to zero (0) on the slave controller. Die Waiting time for commencement of defrosting must not be set to any other value but 0 on the slave, as otherwise defrosting on master and slave will not be synchronized.

- When using an external defrost timer on a master its internal defrost timer should be set to "—". If this is not the case then the internal defrost time will be taken into account along with the external defrost. The signal from the external defrost timer may only be employed as an impulse (> 10 seconds) for the initiation of the defrost. In order to configure the master's defrost timer the parameter *Defrost Timer* = *INT* must also be set, see menu 3-2.
- Manual defrosting cannot be initiated on the slave case controller.
- The *No Defrost alarm* applies to master and slave. Demand defrosting on the master can lead to this fault report being generated erroneously on the slave, for example when monitoring time is set too low. Any drain time set will not commence until defosting has been fully completed and cooling resumes.

- Once defrosting is started by the internal clock, no new defrost cycle can be initiated until the safe defrost time has expired even though the controller may have returned to cooling mode before then.



4.5.6 Defrost sequenz (DS) via CAN bus

All controller types from version >= V2.00, apart from UK 100 E

Function description

Defrost sequenz (DS) via CAN bus covers the following functions:

Different refrigeration points, organised into groups, are to start their defrost at different times. A common application is the temporal distribution of the energy requirements generated by the defrost, together with the shortest possible total defrost time for the store. Simultaneously, the total time required for the completion of all the participating defrosts is kept as short as possible.

As soon as one of the defrost groups has completed its defrost, then the next group can start its defrost. A delay time can be specified for the period between two defrosts. The organisation of the defrost groups is carried out by the defrost sequenz master (DS master). All other participants in the defrost sequenz are called defrost sequenz slaves (DS slaves).

It is possible to deploy several independent defrost sequenz masters within one CAN bus segment. In addition to the groups of defrosting controllers, there can be further controllers within the E*LDS system which independently conduct a defrost.

The number of DS masters as well as the number of controllers assigned to them is only limited by the maximum number of participants in the E*LDS system.

Within a defrost sequenz system (master and its assigned slaves) the sequence is established by group numbers. The allocated group numbers are defrosted in ascending order beginning with group number 1. If several controllers assigned to a DS master have the same group number, then they are termed a group (DS group) and are defrosted at the same time. The group with the next group number is only defrosted when all the participants in the previous group have completed their defrost.

Execution i.e. sequence of the defrost sequenz

A defrost is initiated on the master controller for the defrost sequenz (DS master).

☞ The DS master **always** belongs to DS group 1!

The DS master initiates a defrost of all the DS slaves in group 1. If there are no DS slaves with the group number 1, then the DS master defrosts alone. All the controllers (DS slaves) with other DS group numbers continue to operate in their normal cooling mode.

If the defrost termination temperature is reached by **all** the controllers of the DS group or their safe defrost times have elapsed, then the DS master initiates a defrost for the next highest DS group number.

If a delay time “*DS-Wait time*” (menu 2-2-1, i.e. menu 2-2-2) has been parameterised then the start of the defrost sequenz for the subsequent DS group is delayed accordingly.

The defrosts are continued until the entire chain of controllers has been run through. The defrost sequenz is now finished and all controllers have resumed cooling.

Configuration / parameterisation of defrost sequenz

The defrost is parameterised in menu 2 – Setpoints – 2 Defrost Zone 1.

The first thing to be configured is the function of the controller with respect to the defrost sequenz (master or slave, i.e. OFF if the controller is not to participate in the defrost sequenz, parameter “*DS-Function*”).

In the case of the slaves the corresponding DS group (parameter *DS-Group*) and the CAN bus address of the DS master (parameter *DS-Master*) must be set. The DS master is automatically in DS group 1, if it is set to a different group this has no effect on the master. Furthermore, the delay time between two group defrosts must be set on the DS master.

Example: Configuration of a defrost sequenz

Start of defrost

In the case of the DS master controller a defrost is activated via the internal clock, the external contact or via manual defrost (CAN/local).

Configuration of the group members

With respect to the parameter *“DS-Function*”, the DS master must be set to “Master”. The parameter “*DS-Wait time*” specifies the delay time in minutes which the DS master maintains between the defrosting of two groups. The delay time applies unchanged across all groups.

The parameters “*DS-Group*” and “*DS-Master*” are ignored by the DS master and should be set to “--“.

With respect to the parameter “*DS-Function*”, the DS slaves must be set to “Slave”.

On the slaves the parameter “*DS-Group*” must be set so that the controller is defrosted in the desired group with other controllers and/or in the desired sequence relative to other controllers. For purposes of clarity, the group numbers should be assigned in ascending order and without omissions along with the CAN bus address, however this is not obligatory.

With the parameter “*DS-Master*” the CAN bus address of the DS master is set for every slave. This specifies which of the controllers coordinates/executes the defrost. The parameter “*DS-Wait time*” is ignored by the DS slave and should be set to “--“. Similarly, the parameters for the defrost timer should be configured so that no additional defrosts occur on the slave if no additional defrosts are desired outside of the defrost sequenz. To this end, it is recommended to set all the defrost times to “--“ and the parameter “*Defrost Timer*” to “INT” (menu 3-2).

Example configuration:

1. Specify the sequence in which the controllers should defrost (e.g. first the controllers with the addresses 11 and 12, then 22, 25 and 27, then 5 and 28).

2. The controllers that defrost first belong to group 1:
    1. For one of these controllers (e.g. address 11) under 2 Setpoints – 2 Defrost – 1 Zone 1:
        1. Set the *DS-Function* to “Master”
    2. For all other controllers in group 1
       (e.g. UA with address 12) under 2 Setpoints – 2 Defrost – 1 Zone 1:
        1. Set *DS-Function* to Slave and
        2. Set *DS-Group* to 1 and
        3. Set *DS-Master* to the CAN bus address of the master controller
           (in example “11”).
3. The controllers which are to be defrosted next receive the group number 2.
    1. For all these controllers (in example controllers 22, 25 and 27):
        1. Set *DS-Function* to Slave and
        2. Set *DS-Group* to 2 and
        3. Set *DS-Master* to the CAN bus address of the master controller
           (in example “11”).

4. Apply the same procedure to further groups (in the example controller 5 and 28) and enter the respective group number (here group number 3).

5. If required a delay time can be set on the master controller (e.g. 11) for the period between group defrosts under 2 Setpoints – 2 Defrost – 1 Zone 1 - *DS-Wait time*.

Further measures for the parameterisation of the defrost sequenz

- The initiation of an additional, separate defrost (manual, external, internal, CAN) on a defrost sequenz slave is to be avoided (defrost time set to “--“), however if needed it can nevertheless be carried out.

- Safe defrost times, drip and delay times and defrost on demand can be assigned individually for every controller of the consecutive chain.

- The parameter “DS Master” cannot be set to CAN bus addresses that do not exist. If the controller does not exist or is unable to execute a defrost, then the alarm “Defrost Malfunction” is generated.

Group numbers

The defrost sequenz master is automatically in group 1 as it starts the defrost, and if the conditions are met, will also defrost itself in the process.
The number of the group determines the defrost sequence. Numbers can also be jumped over. If one group has finished defrosting, the group with the next highest number will be automatically defrosted following the elapse of the delay time set on the master. By remaining in regular contact with the other controllers on the CAN bus, the DS master has an overview of all the DS slaves and the corresponding group numbers. The controllers must be configured so that the defrost sequenz is carried out in the desired sequence.

Actual values

Under 1 Actual Values – 3 Defrost the following actual values for the defrost sequenz can be found:

The parameter “*DSq Nof. Sl.*” on the defrost sequenz master indicates the number of slaves recognised by the master. The parameter “*DSq Lost Sl.*” On the DS master shows “lost” defrost sequenz slaves:
When a previously available defrost sequenz slave can no longer be contacted, then the CAN bus address of the DS slave which the master first lost contact with during the last defrost is shown here. Otherwise (normal case)”--“ is displayed.

Special cases / useful information

Information on the initiation of the defrost sequenz

- Even if the defrost sequenz master does not itself meet the defrost condition (e.g. defrost termination temperature already reached) at the time the defrost is to be initiated, the defrost of the groups is still initiated.
- Once a defrost has been initiated in master/slave operation this can only be interrupted when the parameter "*DS-Function*" is set to "OFF" for a minimum of 10 seconds and then reset to "SLAVE", see menu 2-2-1 – Defrost 1. It is generally recommended that this procedure only be employed for commissioning situations as an interruption of the defrost can result in increased icing.
- During a defrost sequenz the slave's safe defrost, delay and drip times are retained, the parameters set by the user on the slave are used.

Defrost start times dependent on the number of groups and their defrost durations

The defrost start times configured in the defrost master must have sufficient time between them. It is not permitted for the defrost master to initiate a further defrost while the previous defrost is still underway. If, for example, there are 3 defrost sequenz groups each with a safe defrost time of 60 minutes for the slaves, then the time period between each defrost start on the DS master must be at least 3 hours. If a DS delay time is configured between the groups, then this time is increased accordingly (in the case of n defrost groups (n-1) delay times).

Combination with the master/slave function

A defrost sequenz slave can also function simultaneously as a master in a master/slave defrost via CAN bus.

During the initiation of the defrost sequenz via an external defrost timer, the external 230 V signal, as is customary, may only be applied to the controller, in this case the master controller, for the duration of the defrost. Only when the defrosting of the master has ended - through the removal of the external signal - can the other groups begin with their defrost!

Alarms and messages

The alarm 125 „No Defrost" can also indicate that a defrost sequenz has not been correctly configured.

4.6 Fan control with case and coldroom controllers

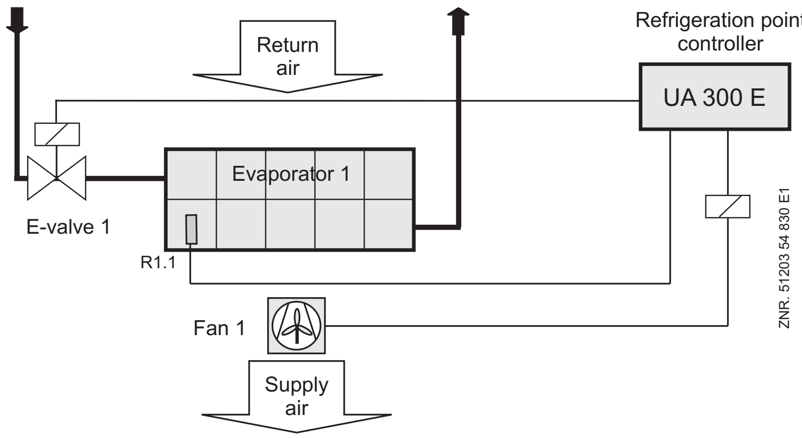
4.6.1 Fan control on multidecks - controller type UA 121 E

The fan continues running during cooling and defrosting. With external toggling of setpoints from set 1 to set 1 – but not vice versa – the fans stop for an adjustable time (parameter *Blind On Time*). This is necessary to ensure troublefree closing of the night blind (e.g. on Light OFF).

The fan relay is the inverted type,
- when the controller turns on the fan, then the relay contact (73/73) is opened;
- when the controller turns off the fan then the relay contact (73/73) is closed.

4.6.2 Fan control - controller type UA 131 E

The fan is switched on during refrigeration. Fan behaviour during defrosting can be adjusted (switch off / continuous operation). The fan controller uses the defrost sensors R1.1 and R1.2 as well as a relay for switching on and off during a defrost in two-zone operation. In single-zone mode only defrost sensor R1.1 controls the fan relay.



R1.1:	Defrost sensor	(Terminal Z31/Z32)
Expansion valve 1:	Expansion valve 1	(Terminal 23/24)
Fan 1:	Fan control relay	(Terminal 73/74)

When thermal fan start delay is set, the fan does not start for a time after defrosting is terminated so as to prevent warm air being forced into the display case.

Version 1.10:
If the Fan Delay parameter is set to ”--”, the fan will remain continuously off.

From Version 1.11:
If the Fan Delay parameter is set to ”--”, the fan will remain continuously on.

The fan relay is the inverted type,
- when the controller turns on the fan, then the relay contact (73/73) is opened;
- when the controller turns off the fan then the relay contact (73/73) is closed.

4.6.3 Fan control - controller type UA 131 E LS with advanced fan control

The advanced functions for the fan control are activated via the DIP switch S3 on the circuit board. The terminal assignment, with the exception of the assignment of the 230 V relay outputs, is identical with the terminal assignment of the UA 131 (see chapter 4 Installation and Startup).

The fan relay operates inverted:
- when the controller turns on the fan, then the relay contact (73/74) is opened;
- when the controller turns off the fan then the relay contact (73/74) is closed.

Parameterisation of the advanced fan control

The relevant parameters for the advanced fan control are found in the operator menu of the case controller under menu item 2 setpoints - 6 fan - Zone 1+2 and can be used for the normal setpoint. The next step is to select the required operating mode for the fan control. This is carried out via the *OpMod.* parameter.

The following four parameters for setting the operating modes are available:

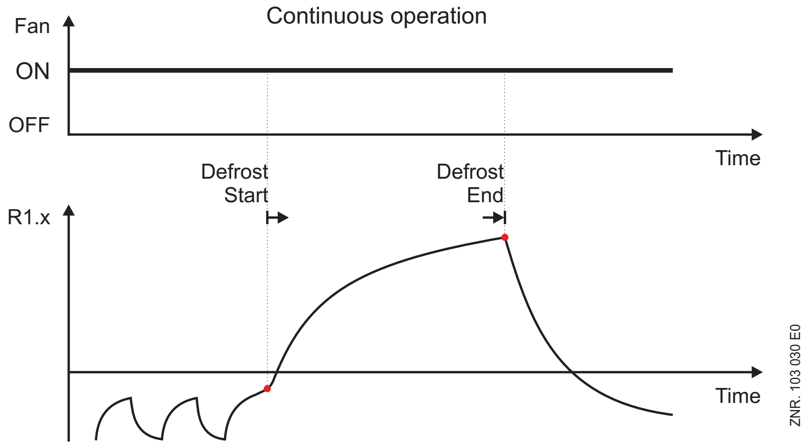
- *CONTINUOUS* (continuous operation)
- *FORERUN* (forerun)
- *OVERRUN* (overrun)
- *DEL.A.DEFR.* (delay after defrosting)

For controlling the fan via the temperature at the evaporator sensors R1.1 und R1.2 the two parameters *Fan Start* and *Fan hightemp.* are used. These parameters are not effective in all operating modes.

Functional characteristics of the 4 operating modes

1. “Fan continuous operation” mode

In this operating mode the fan relay is permanently switched on.



The two parameters *Fan Start* and *Fan hightemp.* are not effective in this operating mode.

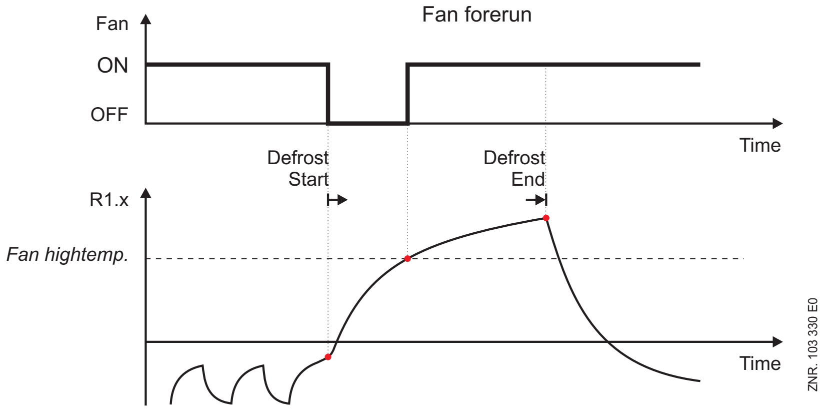
2. ”Fan forerun” operating mode

In this operating mode the fan relay is permanently switched on during cooling.

At the start of a defrosting the fan relay switches off. The fan relay switches on when the parameter *Fan hightemp.* on the evaporator sensor is exceeded. When the defrosting is completed, the fan relay switches back on under all circumstances.

In single-zone operation only the evaporator sensor R1.1 is used for the fan control.

During two-zone operation both the evaporator sensors R1.1 **and** R1.2 are used for the fan control. If the evaporator sensor R1.2 is not attached then the fan relay will only be controlled via R1.1, even during two-zone operation.



During a possible parameterised Drip Time the fan relay doesn't change its condition. During a possible parameterised Wait Time the parameter *Fan hightemp.* is already evaluated.
The parameter *Fan Start* is not effective in this operating mode.

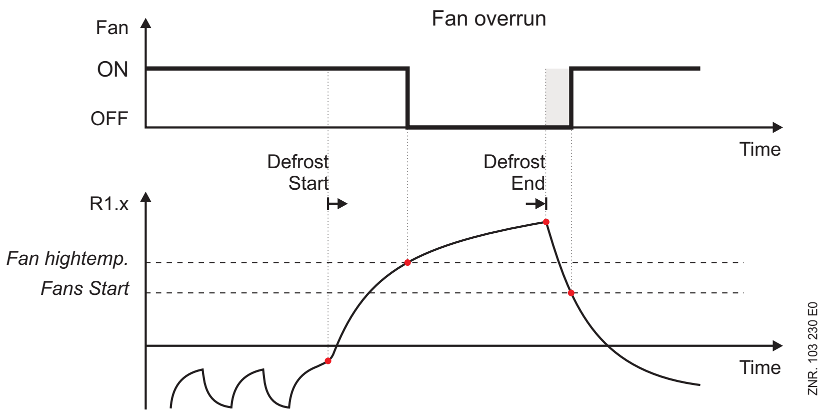
3. “Fan overrun” operating mode

In this operating mode the fan relay is permanently switched on during cooling.

The fan relay initially remains switched on at the start of a defrosting. The fan relay switches off when *Fan hightemp.* parameter is exceeded on the evaporator sensor. Once the defrosting is completed the fan relay switches back on with an undershoot of the *Fan Start* parameter.

In single-zone operation only the evaporator sensor R1.1 is used for the fan control.

During two-zone operation both the evaporator sensors R1.1 **and** R1.2 are used for the fan control. If the evaporator sensor R1.2 is not attached then the fan relay will only be controlled via R1.1, even during two-zone operation.



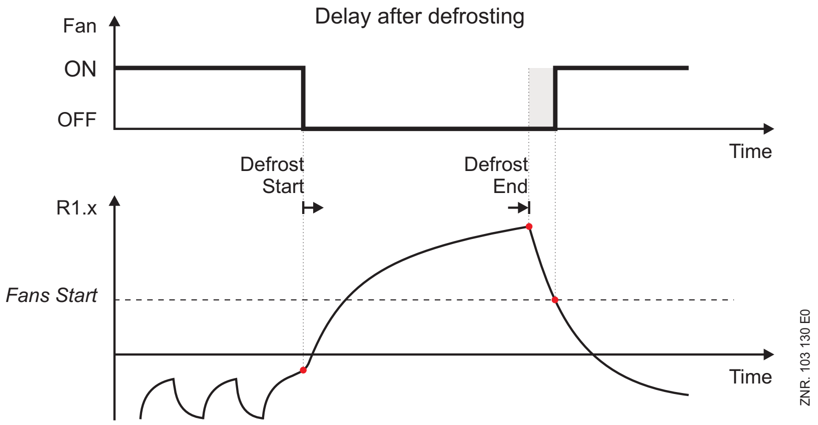
During a possible parameterised Drip Time the fan relay doesn't change its condition. During a possible parameterised Wait Time the parameter Fan hightemp is already evaluated.

4. "Delay after defrost" mode

In this operating mode the fan relay is permanently switched on during cooling. At the start of a defrosting the fan relay switches off. During the defrosting the fan relay remains switched off. When the defrosting is completed the fan relay on the evaporator switches back on in the event of an undershooting of the *Fan Start* parameter.

During single-zone operation only the evaporator sensor R1.1 is required to undershoot the *Fan Start* value in order for the fan relay to be switched on.

During two-zone operation both the evaporator sensors R1.1 **and** R1.2 must undershoot the *Fan Delay* value in order for the fan relay to be switched back on. If the evaporator sensor R1.2 is not attached then the fan relay will only be controlled via R1.1, even during two-zone operation.



☞ During a possible parameterised Wait Time or Drip Time the fan relay is switched off.
The parameter *Fan hightemp.* is not effective in this operating mode.

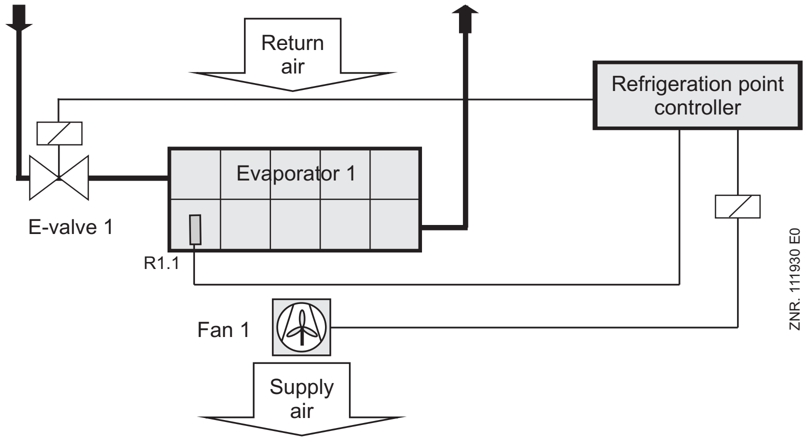
4.6.4 Fan control - controller type UA 141 E

The case controller does not contain any fan control for this controller type.

4.6.5 Fan control with coldroom controllers

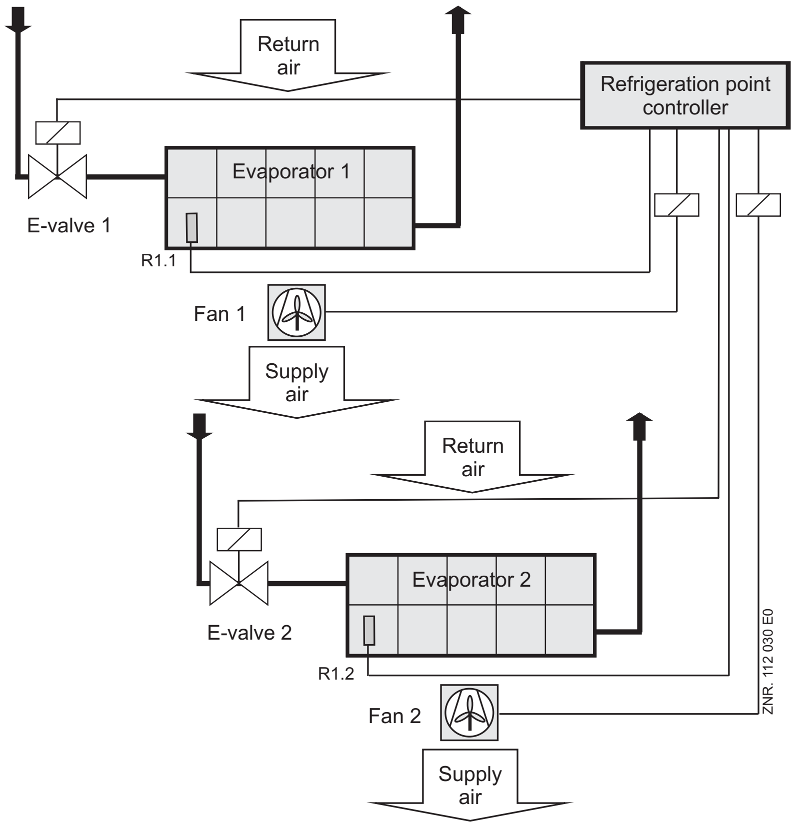
Controller types UR 141 NE, UR 141 TE

In siThe fan is switched on during refrigeration. The behaviour of the fan during defrosting can be adjusted (switch off / continuous operation), i.e. is dependent on the set controller type (see below). The fan controller has a different effect on the fan relay during single-zone or two-zone operation. ngle-zone mode the defrost sensor R1.1 and fan control relay act on one zone.



R1.1:	Defrost sensor	(Terminal Z31/Z32)
Expansion valve 1:	Relay for expansion valve 1	(Terminal 23/24)
Fan 1:	Fan control relay	(Terminal 63/64)

In two-zone mode defrost sensors R1.1 and R1.2 and the fan control relays each act separately on one zone.



R1.1:	Defrost sensor	(Terminal Z31/Z32)
R1.2:	Defrost sensor	(Terminal Z81/Z82)
Expansion valve 1:	Relay for expansion valve 1	(Terminal 23/24)
Expansion valve 2:	Relay for expansion valve 2	(Terminal 33/34)
Fan 1:	Fan control relay	(Terminal 63/64)
Fan 2:	Fan control relay	(Terminal 73/74)

4.6.6 Coldroom with defrost heater (controller type UR 141 TE)

The parameters for fan control are:

- Thermal fan delay

  The fan runs during cooling mode and is stopped during defrosting.

  When the Fan Delay parameter is set to ”--” on the UR 141 TE, the fan continues running during defrosting.

On *completion of defrosting*, the following conditions apply to starting the fan:

- If the thermal fan delay is exceeded on the evaporator sensor after defrosting, the fan will initially not start so as not to force heat into the coldroom.
- After defrosting, the conditions for fan starting are checked only after the drip time has expired.

If *on-off control* is activated, the following will additionally apply:

- The fans are operated with room control.
- If the fan is switched off via the coldroom controller, then in order to switch the fan back on via the coldroom controller the thermal fan delay on the evaporator sensor must also be exceeded.
- The fans start when the room controller enables superheat control and stop when superheat control is disabled.

☞ The fan remains continuously on when the Fan Delay parameter is set to --.

If a **waiting time** has been defined, the fans that are running will not be stopped before initiating defrost until the set waiting time has expired. This allows the refrigerant remaining in the evaporator when the solenoid valves are closed to evaporate.

4.6.7 Coldroom without defrost heater - controller type UR 141 NE

The fan normally continues running during the cooling and defrost cycles. The fan is only stopped in cooling mode when all four of the following conditions are satisfied simultaneously:

- On-off control activated.
- *Thermal Fan Delay* parameter set other than to --.
- Temperature on defrost sensor of Zone x concerned, R1.x, greater than the set *Thermal Fan Delay* parameter. This condition occurs when temperature is too high on the defrost sensor.
- Cooling is stopped by the temperature setpoint plus hysteresis.

☞ The fan remains continuously on when the Fan Delay parameter is set to --.

4.6.8 Heating circuit - contr. type UR 141 TE, UR 141 NE in single-zone operation

The conditions stated above for fan starting after defrosting apply together with following additions:

- Zone 1 fans always starts with the heater relay.
- If no further condition to start the fan is in effect, Zone 1 fan will stop with the heater relay.

4.7 Frame and pane heaters

General

Frame and pane heaters are used to heat window or glass elements on refrigerated display cases and prevent them from fogging due to condensation of moisture in the ambient air. Three operating modes for frame and pane heaters can be selected on the case controller:

- Fixed on time
- On time as function of setpoint (UA 131 E only)
- On time as function of enthalpy

The desired operating mode must first be selected. Additional parameters for the respective mode are described below.

Fixed on time:

The On Time parameter (0-100%) must be set for this mode. The set on time is output by the case controller for the complete duration of operation.

On time as function of setpoint (controller type UA 131 E)

No additional parameters are provided for this mode. The on time is determined by the setpoint defined for the first zone on the controller and is output by the controller.

On time is controlled by the supply air setpoint as follows:

Supply air setpoint > - 32 °C / Heater 75% ON
Supply air setpoint < - 32 °C / Heater 95% ON

Mode of operation of the transistor output for the frame heater
(controller type UA121E, UA131E, UR141TE, UR141NE)

Operation is inverted (factory setting). The transistor output (91/92) delivered by the digital output is 0 V when the frame heater is ON and 24 V when the frame heater is OFF.

Mode of operation of the pane heater relay
(controller type UA 141 E)

The relay (73/74) is closed when the pane heater is ON (factory setting). It is open when the pane heater is OFF. The function can be configured via the parameter „*Invert Output*“ (menu 2-6-2).

On time as function of enthalpy

For this operating mode a pack controller in the E*LDS system equipped with a humidity sensor and a room temperature sensor is required. From the measurements of these two sensors the case controller determines the optimal heater on time. Two parameters are provided, emergency on time and offset for enthalpy-controlled frame heater.

The value entered for the *Enthalp. Offs.* parameter (Menu 2-5-2) is added to the on time computed by the case controller from the room air humidity and temperature. It is recommended to set this value initially to zero. The value can be adjusted upwards to obtain a higher heating power if problems are encountered, for instance fogging of window or glass elements.

If reception of values for room air humidity and temperature from a pack controller is interrupted, the case controller uses the value entered for emergency on time (0-100%) as the on time.

Notes and constraints for use of enthalpy-controlled heater

A minimum of one pack controller fitted with humidity and room air temperature sensors must be installed in the store. If more than one pack controller is equipped with these sensors, the case controller will select a pack controller at new start or first start and then work only with that pack controller's values.

☞ It is recommended to install only one pack controller with humidity and room air temperature sensors in one store. These sensors should be located to ensure that the room air humidity and temperature measured are as representative as possible for all refrigeration points in the store.

To ensure troublefree operation, a pack controller must not be equipped with only a room air temperature sensor or only a humidity sensor. Both sensors must always be fitted as a pair on a pack controller.

Failure of pack controller/CAN bus when using enthalpy-controlled heater

The case controller switches automatically to the emergency on time if it does not receive values from a pack controller for a period of 10 minutes.

Pane heating with service counters
(controller type UA 141E)

☞ Pane heating can be activated via digital input 3 (terminals D31/D32). In addition, the input must be parameterised as *„PANE SWITCH"*, only then is the on/off function available.

Via a voltage impulse (e.g. using a button installed on site, min. 10 seconds) at digital input 3 for the frame heater (terminals D31/D32, factory setting) the corresponding relay of the case controller is activated, and then deactivated following the elapse of the preset running time for the pane heater. This function is available on the UA 141 E supplementary to *fixed on time* or *on time as function of enthalpy*. The function of the digital input can be configured via the parameter *„Inv. D3*" (i.e. Inv. D2) in menu 6-2-4.

So as to remain compatible with earlier software versions, a fixed on time of 0% is set on the UA 141 E at first start. This means that pane heating can now only be controlled via the digital input.

Control interval

The control interval for frame and pane heaters is 10 minutes. An on time of 10% means that the frame heater is ON for 1 minute and OFF for 9 minutes.

Defrosting

The frame heater is switched off during defrosting.

4.8 Automatic on/off

Controller type: UA 141 E only

The counter can be switched on and off via a voltage impulse (using a button installed on site, min. 6 seconds) applied at the 230 V AC digital input for the counter shutdown. As with manual shutdown, all controlled functions are switched off. The function of the digital input can be configured via the parameter *Inv. D3* (i.e. *Inv. D2*) in menu 6-2-4. In addition, external consumers can be switched on and off via an external relay at the transistor output (terminals 91/92/93).

Warning - hazardous electrical voltage!
Danger of electric shock! BEFORE and AFTER connection it must checked that the 24 V DC transistor outputs are **off load**!
The controller and connected voltage carrying components remain supplied with power!

Counter shutdown can be activated via digital Input 2 (terminals D21/D22, factory setting). This requires digital Input 2 to be set as *AUTO ACTU.* (menu 6-2-4) for the switch on/off function to be available.

Switch-on:

Up to 7 control times for automatic restarting of the counter can be set on an internal timer. The same 230 V input is usable as an external input for setpoint toggling, in which case the on-off function will not be available. The counter is switched on either by a voltage pulse applied to digital Input 2 or by the control times. The transisitor output (terminals 91/92/93) is set to 24 V.

Parameters of the internal restart time are displayed and can be adjusted when setpoint toggle is set to ”INT” or ”---” (see Screen 3-3 in the UA 141 menu structure).

Switch-off:

As with manual shutdown, all controlled functions are switched off by the voltage pulse applied to digital Input 2 (terminals D21/D22). The transisitor output (terminals 91/92/93) is set to 0 V.

4.9 Door contact

Controller types UR 141 NE (NT) and UR 141 TE (LT)

With coldrooms, one or two 230 V digital inputs (terminals D21/D22 and D31/D32, factory setting) can each be allocated as a coldroom door contact. Cooling and the evaporator fan are switched off when the coldroom door is opened.

In the event of a permanently open door, an alarm is activated and the controller returns to cooling following the elapse of the adjustable alarm delay time.

Warning - hazardous electrical voltage!
Danger of electric shock! BEFORE and AFTER connection it must checked that the 230 V AC digital inputs are off load!
The controller and connected voltage carrying components remain supplied with power!

Door Contact 1 can be activated via Digital Input 3 (terminals D31/D32). This requires Digital Input 3 to be set as *DOOR CONTACT* (Menu 6-2-4) for the door contact to be available. Door Contact 2 can be activated via Digital Input 2 (terminal D21/D22). This requires Input 3 to be set as *DOOR CONTACT* for the door contact to be available.
The function of the two digital inputs can be configured via the parameter *Inv. D2* (i.e. *Inv. D3*) in menu 6-2-4. If the alarm delay is set to 0 minutes then the cooling and the evaporator fan are not switched off and the alarm is immediately discharged.

Conditions for switch-off:

If the high temperature alarm setpoint (on coldroom sensor) is exceeded or if maximum door open time expires, cooling and the evaporator fan will be restarted before the door closes. High coldroom air temperature (high temperature alarm) also inhibits switch-off.

If the controller is operated with two zones and only the first 230 V input (Door Contact 1) is configured for cold-room door monitoring, the door contact switch will stop cooling and the evaporator fan in both zones. The same applies when only the second 230 V digital input is configured on Door Contact 2.

In single-zone operation the door contacts always act on first zone control. The only exception is when both 230 V inputs are set to door contact function, in which instance Door Contact 1 alone acts on control and Door Contact 2 has no function.

No archiving takes place in the internal archive memory for the second door contact.

4.10 Manual shutdown

All control functions (cooling, defrosting, etc.) are switched off by applying voltage to the 230 V input for manual shutdown. All interfaces and control functions however remain active.

Warning - hazardous electrical voltage!
Danger of electric shock! BEFORE and AFTER connection it must checked that the 230 V AC digital inputs are off load!
The controller and connected voltage carrying components remain supplied with power!

All controller types

The manual shutdown can be activated using all the digital inputs. The corresponding input must be parameterised as *MAN SHUTDOWN* (menu 6-2-4). Only then is the manual shutdown available. A manual shutdown via the digital inputs can also take place separately for zone 1 and zone 2. This requires one digital input to be parameterised as HANDABSCH.Z1 or HANDABSCH.Z2 respectively. The function of the two digital inputs can be configured via the parameters *Inv. D2* to *Inv. D4* in menu 6-2-4.
If more than one digital input has been parameterised with the same function, then this function is active as soon as a signal is applied to one of these inputs.

4.11 Registration of external alarms (e.g. CO_2 alarm)

A voltage applied at the 230 V AC input serves to register external alarms e.g. CO_2 alarms. The message text (CO_2 alarm, factory setting) can be freely entered in menu 6-2-4 (also with the BT 300).

Warning – hazardous electrical voltage!
Danger of electric shock! BEFORE connecting and disconnecting it must be checked that the 230 V AC digital inputs are **off load!**
The controller and connected voltage carrying components remain supplied with power!

The external alarm can be activated via digital input 4 (terminals D41/D42). If the digital input is used for the monitoring of e.g. a CO2 alarm, then for safety reasons its function should be inverted to "ON" via the parameter *Inv. D4* (menu 6-2-4).

4.12 Emergency power operation

Function

The aim of the emergency power operation is, in the event of an interruption in the power supply, to provide intelligent support for the emergency power supplied via an emergency generating unit. The LDS components are designed to prevent unnecessary power consumption which could endanger the emergency power supply.

If the allocated pack controller detects an interruption in the power supply then this is transmitted to the case controllers via the CAN bus. In combination with the emergency power operation functions, the case controllers can block control functions as required. This serves to reduce the load on the emergency generating unit.

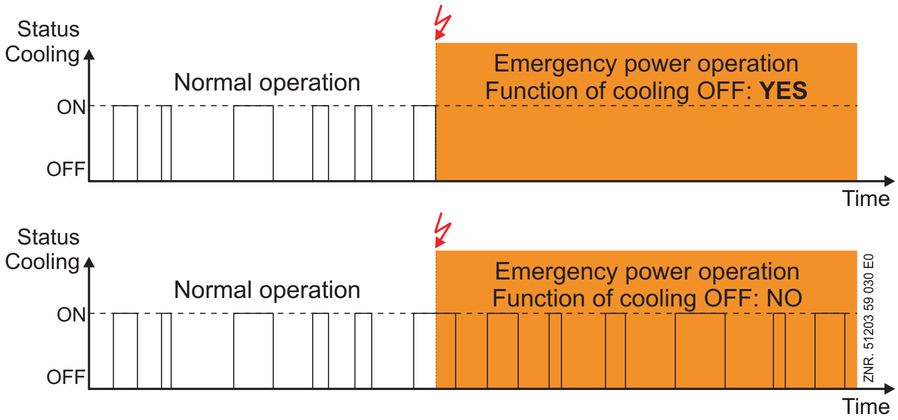
Activation of emergency power operation

The participation of the case controllers in the emergency power operation can be set individually. To do this it is necessary to specify the allocated pack controller via menu item 6-1 on the case controller. This pack controller must support emergency power operation and be parameterised accordingly in order for it to dispatch an emergency power message (see the pack controller operating instraction).

The behaviour of the case controller in emergency power operation can be set using the following parameters in menu 6-6:

• Cooling functionality	Parameter Cool.funct.OFF
• Defrost functionality	Parameter Defr.funct.OFF
• Fan functionality	Parameter Fan funct. OFF
• Frame heating functionality	Parameter Frame fct.OFF
• Light functionality	Parameter Light fct.OFF

If, for example, the case controller is required to switch off the cooling on receiving an emergency power message, then the parameter *Cool.funct.OFF* must be set to Y (Yes). If this parameter is set to N (No), then the case controller continues cooling even during emergency power operation.



All other parameters in principle function the same. They determine whether the defrosting or the fan is switched off during emergency power operation. If the controller is conducting a defrost at the start of emergency power operation then the defrost is immediately interrupted. If the defrost command comes during emergency power operation then the command is ignored.

☞ Defrosts that are ignored or interrupted due to emergency power operation are not automatically repeated by the controller. If a defrost interruption occurs due to emergency power operation then the refrigeration capacity of the corresponding refrigeration points must be checked.

4.13 Setpoint toggle (day / night operation)

Controller setpoints can be enter as both standard and alternative values. Setpoint toggle allows of switching between the standard and alternative set of setpoints. This can be performed by three methods:

- **External:** By voltage applied to 230 V- Digital Input 2 (Terminal D21/D22, factory setting) by a switch or timer. Alternatively, with an appropriate parameterisation of the digital inputs (menu 6-2-4), the setpoint switch can be carried out via digital input 1 (terminals D11/D12) or digital input 4 (terminals D41/D42). The function of the digital inputs can be configured via the parameters Inv. *D1 to Inv.* D4 (menu 6-2-4). If more than one input has been parameterised with the same function, then this function is active as soon as a signal is applied to one of these inputs.

Warning - hazardous electrical voltage!
Danger of electric shock! BEFORE and AFTER connection it must checked that the 230 V AC digital inputs are off load!
The controller and connected voltage carrying components remain supplied with power!

- **Internal:**
  By setting toggle times on the internal clock.
  (only active when the parameter *Toggle interv.* (menu 3-3) is set to ”--”).
- **Toggle interval:**
  For special applications e.g. in service counters, it is necessary to carry out a regular setpoint toggle. By means of the parameter *Toggle interv.* (menu 3-3) it is possible to conduct this cyclical setpoint toggle every 10 to 60 minutes. The function can be switched off when the parameter is set to ”--”. Furthermore, the parameter is only visible when the parameter *Toggle Setp*. (menu 3-3) is set to *INT*.
  Example: If the parameter *Toggle interv.* is set to 15 minutes, then the controller uses the standard setpoint and the alternative setpoint alternately for 15 minutes respectively.

☞ Internal toggle times for the setpoints are ignored if the parameter *Toggle interv.* is assigned values between 10 and 60 minutes.

- **CAN bus**: With the use of system centre or a suitable store computer (version 4.24 and higher) the setpoint can also be controlled from the system centre / store computer via CAN bus. Further information on setpoint switching can be found in the system centres / store computer's operating manual in the chapter ”Special Inputs”.

Controller type UA 121 E

The fan stops for an adjustable time (night blind run time). The fan restarts when toggling back from the alternative to the standard setpoints.

Night blind run time

As a rule, night blinds are closed on refrigerated multidecks when toggling setpoints. Some cases require the fans to be stopped while the blind is being closed to prevent it from being forced out of the case.

Controller types UA 141 E, UR 141 TE, UR 141 NE

Setpoint toggle can be activated via Digital Input 2 (Terminal D21/D22, factory setting). This requires Input 2 to be set as *SETP.TOGGLE.* The external setpoint toggle function is then available. Alternatively, with an appropriate parameterisation of the digital inputs (menu 6-2-4), the setpoint switch can be carried out via digital input 1 (terminals D11/D12) or digital input 4 (terminals D41/D42). The function of the digital inputs can be configured via the parameters *Inv. D1* to *Inv. D4* (menu 6-2-4). If more than one input has been parameterised with the same function, then this function is active as soon as a signal is applied to one of these inputs.

4.14 Light control

The case controller is equipped for activating the case lighting / night blind. Activation is carried out via the 24 V digital output (terminals 81/82). The on/off command is issued by a higher order controller (e.g. system centre / store computer / PLC) via the CAN Bus. The parameterisation is carried out on the higher order controller, the case controller doesn't require parameterisation. The condition of the output is displayed in the menu 1-2 (”Status light ON/OFF”).

The higher order controller must support this function.

4.15 Refrigeration point disabling

The case controller enables refrigeration points to be disabled by the pack controller (e.g. VS 3010) via the CAN bus. Cooling by the case controller is interrupted as long as refrigeration point disabling is active.

4.16 Forced cooling (except UK 100 E)

The case controller enables forced cooling to be initiated by the pack controller (e.g. VS 3010) via the CAN bus. The case controller switches to continuous cooling as long as forced cooling is active.

4.17 Suction pressure shift

Current valve opening degrees and case/superheat control status is transmitted by the case controller to the pack controller via the CAN bus to enable suction pressure setpoint shift to be made on the pack controller according to the actual refrigeration load.

Transmission of the case controller valve opening degrees to the pack controller can be switched on and off by the *VO via CAN* parameter (menu 6-2-7). (This can only be done in Superuser mode). Thus it is possible for transmission of these positions to be disabled individually on any case controller that is not to be included in suction pressure shift.

The suction pressure setpoint on the pack controller is shifted up or down according to the opening degree of the case/coldroom controllers concerned. The action can be defined on the VS 3010 pack controller.

Suction pressure setpoint is **not** shifted up when one of the controllers concerned switches to superheat control and when temperature on the room/return air sensor is greater than the room/return air setpoint + 2K. The suction pressure setpoint is accordingly not shifted up only when a display case is at ”warm” temperature and has also switched to superheat control.

In some cases the suction pressure adjustment can lead to problems. In these cases it is recommended to remove the corresponding controller from the suction pressure adjustment (menu 6-2-7) so it no longer participates. When doing this the limits for the suction pressure adjustment on the pack controller must be set so that the controllers with two-step control have sufficient refrigeration.

4.18 Compressor control via consumers

Damage to equipment and goods! Damage may be sustained by the merchandise or systems if this mode is set on the pack controller. The VS 3010 BS/VS 300 operating mode compressor control is not designed for use together with the case controller, see chapter ”Compressor Control Via Consumers”.

4.19 Operation with four return air sensors

Controller type: only UA 131 E LS **and** DIP switch 8 = ON

Using the parameters in menu 6 Configuration - 3 Refrigeration - Return Air Sensor, operation can be activated via four return air sensors. In order to do this the parameter *Temp. R4.3* i.e. *Temp. R4.4* must be set to ON. As a result the sensors R5.1 i.e. R5.2 are lost.

Appropriate measures must be taken in order to compensate for the loss of the evaporator inlet sensor R5.x. The emergency characteristics in the event of a failure of the suction pressure measurement are also lost.

With the parameter *Weighting R4.3* the temperature regulation between the sensors R4.1 and R4.3 and with the parameter *Weighting R4.4* that between R4.2 and R4.4 can be set.

With a weighting value of 0% regulation is carried out completely according to the original sensor (R4.1 i.e. R4.2), with a weighting value of 100% completely according to the respective second sensor (R4.3 i.e. R4.4). Intermediate values result in regulation according to the weighted average of both sensors.

4.20 Limiting the Opening Degree

An upper limit to the opening degree output by the case controller can be set using this function. This opening degree is **never** greater than the maximum value set using the parameter *Maximum OD* (menu 6-2-7).

Damage to goods! If the value is too low the case controller may no longer be able to reach the preset temperature setpoint. This value should not be set too low.

4.21 Operating data archiving

4.21.1 Temperature recording

Temperature recording is only intended for systems that are not provided with higher-level temperature recording (e.g. system centre / store computer). Temperature measurement of the return air/room air sensors in both temperature zones and status of alarm, cooling, defrost, manual shutdown and door are saved to ring buffer memory at intervals of 15 minutes over a period of one year.

Violation of EU directive! This type of data recording fails to meet the requirements of the EU directive 37/2005 for the monitoring of the temperature of frozen food in the means of transport as well as storage and warehousing facilities. For details of data recording in compliance with the EU directive see chapter 4.21.2.

Local temperature recording

Temperatures are recorded every 15 minutes in the internal flash memory of the UA 410 E AC.
Recorded data can be displayed by the local BT 300 x Operator Interface under Archive (Menu 5). Operating data can be read out on a PC connected to the USB port (currently unavailable).
A USB-A-B cable (optional accessory) is required for PC readout, see operating instruction of LDSWin.

Temperature recording on system centre / store computer

The case controller records temperature at 15-minute intervals and transmits the data to the system centre / store computer via the CAN bus.

4.21.2 Temperature recording to EU Regulation 37/2005

Temperature recording in compliance with EU Regulation 37/2005 on the monitoring of temperatures in means of transport, warehousing and storage of quick-frozen foodstuffs intended for human consumption requires the use of a separate temperature recorder, e.g. UA 300 L / UA 410 L, see UA 300 L / UA 410 L operating instruction.

4.21.3 Recording of t_0, t_c and relative humidity

Using the second analogue input the case controller can also record t0, tc as well as the relative humidity (for configuration details see chapter 4.4.8). These values can be utilised for a controller analysis under LDSWin. The measured values can be seen under the menu item 1-1.

A recording of the added channels is conducted via the system centre / store computer. Here the recording of integral values (-100 °C.. +100 °C) already mentioned is carried out at two minute intervals.

The first analogue channel is also recorded at 2 minute intervals in the existing channel *to corr.*

4.21.4 Recording of messages and alarms

A maximum number of 25 messages and alarms of the case controller are recorded in a ring buffer with fault report text, date/time of start of alarm and date/time of end of alarm.

4.21.5 Actual value archiving with higher accuracy (15 sec)

The *SC Arch. 15s* parameter (Menu 6-2-7) can be used to set higher accuracy of archiving on the system centre / store computer via the CAN bus. When set, the corresponding case controller responds to the system centre's / store computer's request at 15 sec intervals by additionally transmitting the following actual values:

- Valve opening degrees (one in single-zone mode, two in two-zone mode)
- Superheat (one in single-zone mode, two in two-zone mode)
- Corrected t_0
- Selected statuses such as minimum superheat, MOP function etc.

This function reduces the available memory in the store computer!
Therefore, if required, it should be switched off following the analysis.
This has no effect on the system centre.

Danger data loss! If the store computers memory capacity is exceeded due to improper parameterisation (i.e. activation of this option with too many case controllers) then data loss will follow (under certain conditions even from the EU archives)!

4.22 Temperature display BT 30

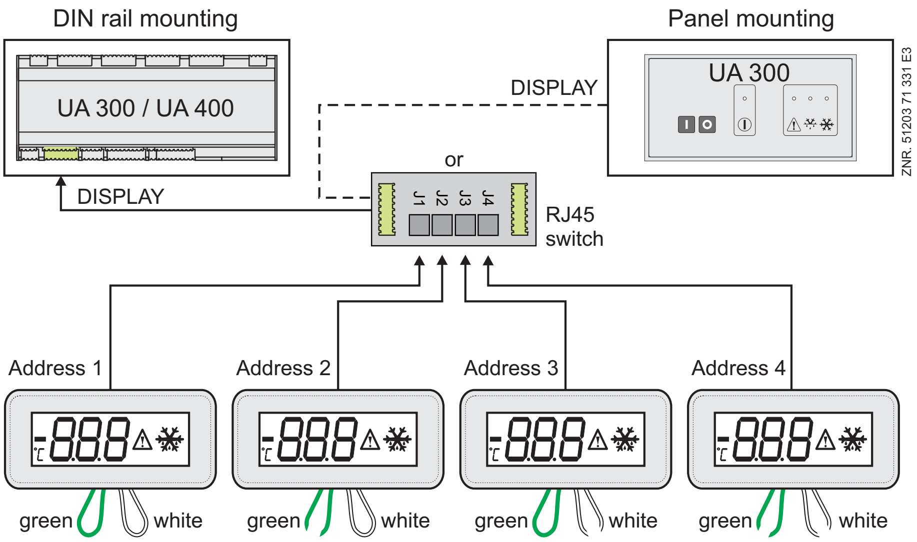
4.22.1 Offset for temperature display

An offset (parameter Offset, Menu 6-2-2) can be applied to temperature values of the temperature diplay BT 30 as a means of compensating differences between readings on thermometers in the refrigerated display case and on the case controller.

This offset has **no** effect on the controlled functions (cooling, defrosting, etc.).

4.22.2 Connecting BT 30 Temperature Display

One to four BT 30 Temperature Displays can be connected to the case/coldroom controller at terminals 1 to 6 using a RJ45 distributor:



The *Alarm symbol* parameter (Menu 6-2-2) can be used to show or hide indication of alarms by the alarm symbol on the display of the BT 30. In addition to the temperature, the current cooling status is indicated by a symbol. During defrosting, the temperature reading is hidden and a defrost symbol is displayed.

The same applies during any waiting time that may be set. Temperature is re-displayed 15 minutes after defrosting terminates. Drain time has no effect on this delay of 15 minutes. he following temperatures of the case / coldroom controller can be displayed on the BT 30:

Controller type	**Temperature display available on BT 30**			
	Address 1	**Address 2**	**Address 3**	**Address 4**
UA 121 E UA 131 E UA 131 E LS	R4.1	R4.2	R2.1	R2.2
UA 141 E	R2.1	R2.2	R4.1	R4.2
UR 141 NE, UR 141 TE, UK 100 E	R4.1	R4.2	R4.1	R4.2

Before connecting to the case/coldroom controller, all BT 30 Temperature Displays must be addressed by means of the exposed leads (see illustration):

Lead	**Configuration of BT 30**			
	Address 1	**Address 2**	**Address 3**	**Address 4**
Green	Closed	Open	Closed	Open
White	Closed	Closed	Open	Open

☞ Detailed information and connection instructions for the BT 30 can be found in the BT 30 operating instruction.

Notice:

5 Installation and Startup of UA 400 E / UA 410 E

Important safety instructions!
Before the installation and commissioning of the controller, chapter 1
should be carefully read in its entirety and all safety instructions and hazard warnings observed.

The controller should only be used with compatible versions of the PC software LDSWin, otherwise the range of functions could be restricted.
Tip: The latest version of LDSWin should be used at all times.

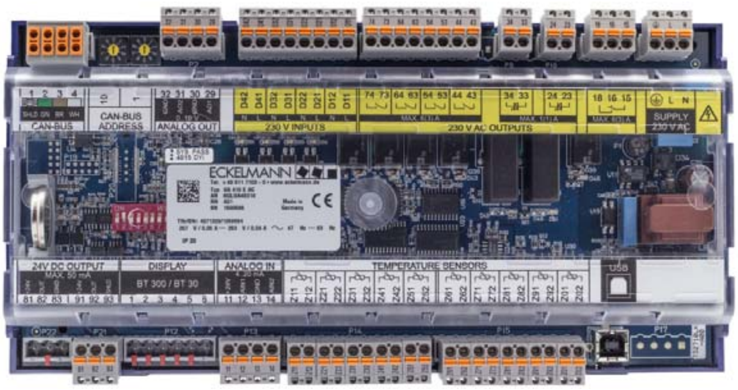
5.1 Installation

The case/coldroom controller is produced in the types UA 400 E CC and UA 410 E AC.

Further details on the distinguishing features of the controllers types are contained in chapter 3.1.

5.1.1 DIN rail mounting of the controller for electronic valves

Power loss of the controller is approx. 11 VA, which needs to be taken into account when installing the unit.



UA 410 E - fill configuration

The case controller is attached to the DIN rail (35 mm) using two retaining springs. The DIN rail must have a minimum height of 5 mm.

The case controller may only be mounted on a Cap (DIN) rail and
operated as an integrated regulation and control device (EN60730).
All leads running to and from the case controller - especially those of the CAN bus - must be shielded (cable type: LiYCY)! No shielding is required on sensor leads when installed exclusively inside the refrigerated display case and when external interference (for example from parallel power wires) is not to be expected (see operating instruction “Introduction, General Safety and Connection Instructions”). As a general rule, care should be taken to ensure that signal leads and leads carrying a supply voltage are routed through separate cable channels.

Electrical enclosure and dimensions are listed in Section Specifications.

5.1.1.1 Mounting on the DIN rail

Step 1: The two retaining springs on the underside of the device are to be pulled out using a flat-bladed screw-driver until they click into place.

In order to carry out the assembly/disassembly there must be a distance of at least 8 mm between the bottom of the case controller and the next component (e.g. cable channel), otherwise the re-taining springs cannot be pulled out.

Step 2: Place the case controller on the top edge of the DIN rail and tilt it downwards until the case controller is positioned on the lower edge of the DIN rail.

Step 3: Press the two retaining springs until they click into place and check that the case controller is firmly attached to the DIN rail.

The controller can be taken into use after completing mechanical and electrical installation.

Electrical enclosure and dimensions are listed in Section Specifications.

5.1.1.2 Disassembling from the DIN rail

Warning - hazardous electrical voltage!
Danger of electric shock! When disassembling the safety instructions and work safety instructions in chapter 1 must be observed. **All** connectors may only be connected and disconnected when power is off.

Step 1: Pull all mating plugs with cable from the case controller.

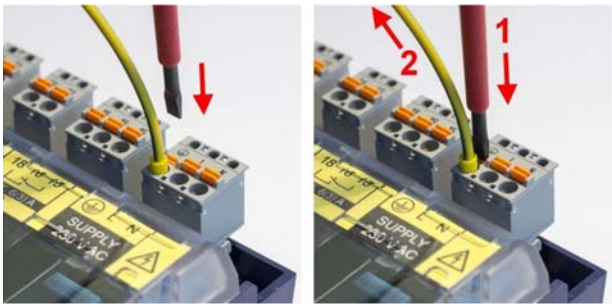
Step 2: Pull out the two retaining springs with a flat-bladed screwdriver until they click into place.

Step 3: Remove the device from the DIN rail by tilting it upwards.

5.1.2 Handling of the spring terminals

All terminal connections of the controller are implemented with grey mating connectors with spring terminals (push-in spring connection). The connectors have the following characteristics:

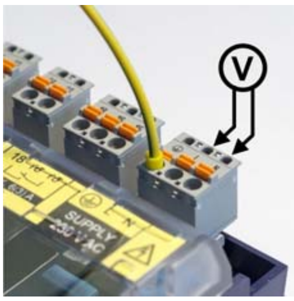
- Conductors with cross sections between 0.25 and 2.5 mm² can be used.
- All mating connectors are coded and any reverse polarity is therefore ruled out.
- For fast installation without tools, direct conductor connection of prefabricated cables (these with 10 mm wire end sleeves) by simply inserting into the spring terminal is also possible.
- The wires are disconnected using a screwdriver (max. 3.5 mm width) via the orange push button at the terminal connection that has no direct contact to live parts:



Step 1: Press the orange push button vertically downwards using a screwdriver to detach the connection.
Step 2: Pull wire upwards.

The button must also be pressed during insertion to connect flexible wires of 0.25 to 2.5 mm² without wire end sleeve.

- For voltage testing, each terminal connection has openings for probe tips of multimeters (V) that are designed with protection against direct contact:



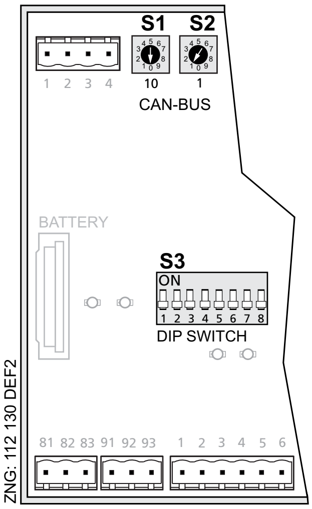
Risk of damage! All mating connectors **must always** be guided vertically and attached / disconnected without twisting so that the pins on the main board are not bent and damaged.

5.2 Basic configuration

The following basic settings on the hardware and software side must be made during the commissioning of the case controller:

Settings before connection of the power supply

- Set CAN bus address (Nd.nnn = 1 to 99) by Decade Switches **S1** and **S2**.
- Set controller type and Mster/Slave mode on DIP Switch **S3**.
- Setting of special functions via DIP switch **S3, coding switch 8**.



- First start (optional loading of default values to configure defined starting state for operation).

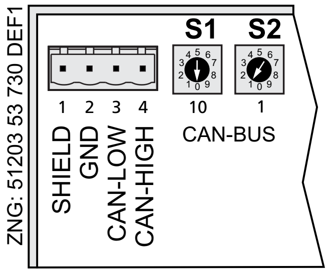
Settings after switching on the power supply

- Basic configuration of the controller

5.3 Setting CAN bus address

CAN bus address (Nd.nnn = 1 to 99) are set by Decade Switches **S1** and **S2**. For all case controllers installed in refrigerated cases, a unique CAN bus address must **first** be set at the two selector switches (**S1, S2**) before commissioning. The CAN bus address is set by the manufacturer on case controllers installed in the control panel, but can subsequently be changed.

Danger of confusion! So as to avoid confusion, it is recommended to choose the Item ID of the display case as its CAN bus address. When both decade switches are at zero (giving address 00), the CAN bus is inactive and the controller is **not** recognized as a CAN bus station. A different CAN bus address must be assigned to each refrigeration point and must be unique within the same system.



Decade switches **S1** and **S2** to set CAN bus address (Nd.nnn = 1 to 99)

S1: Tens of CAN bus address

S2: Units of CAN bus address

S1 (tens)	S2 (units)	Set CAN bus address	Function
0	0	00	CAN-Bus interface inactive (disabled)
0	1..9	01..09	Case controller: CAN bus address (Node No.) allocated
1..9	0..9	10..99	

Settings made on Decade Switches **S1** and **S2** do not become effective on the case controller until the controller is briefly switched off and back on!

5.4 Setting controller type and master / slave mode

Caution: data loss!
All parameters are reset to their factory settings if the controller type is changed or due to a first start (see chapter 5.8)!

Setting controller type

The required controller type is set via the DIP switch S3 by adjusting the coding switches 1..8 with a thin screw-driver (D = 2 mm) through a hole in the case cover. Depending on the set controller type, the respective functionalities are then displayed or hidden in the menu of the controller.

Warning - hazardous electrical voltage!
Danger of electric shock! DIP switch S3 must be changed in voltage-free state only. Settings become effective on the case controller until the controller is briefly switched off and back on!

The following controller types can be set:

Controller type and master/slave mode		DIP Switch S3 (Coding Switch positions 1 to 8)							
		1	2	3	4	5	6	7	8
Case controller	UA 121 E	ON	OFF	OFF	ON/OFF	OFF	OFF	OFF	ON/OFF (*)
	UA 131 E	OFF	ON	OFF	ON/OFF	OFF	OFF	OFF	ON/OFF (*)
	UA 131 E LS	ON	ON	ON	ON/OFF	ON	OFF	OFF	ON/OFF (*)
	UA 141 E	ON	ON	OFF	ON/OFF	OFF	OFF	OFF	ON/OFF (*)
Coldroom controller	UR 141 NE	OFF	OFF	ON	ON/OFF	OFF	OFF	OFF	ON/OFF (*)
	UR 141 TE	ON	OFF	ON	ON/OFF	OFF	OFF	OFF	ON/OFF (*)
Subcooler controller	UK 100 E	OFF	ON	ON	OFF	OFF	OFF	OFF	ON/OFF (*)

(*) Release of special functions. In the chapter "Function" you will find instructions as to whether DIP switch 8 needs to be set to ON for the respective function. Following the switching of DIP switch 8 a controller start must be carried out otherwise the setting will not be adopted.

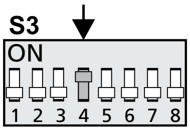
Only part of the overall functions and parameters contained in the case controller are available when selecting a specific controller type.

If the coding switches are set to any combination not included in the following list, the controller type UA 131 E will be selected automatically and alarm is signalled.

☞ Operation of the controller with a unsupported DIP switch setting is not allowed. In the case of any setting of coding switch combinations that are not present in the list, UA 410 L is automatically applied as controller type and an alarm signal is created. In the event of change of the controller type, all parameters are reset to their factory settings.

Setting master/slave mode

Master/slave mode can be set by Coding Switch 4 of DIP Switch **S3**.



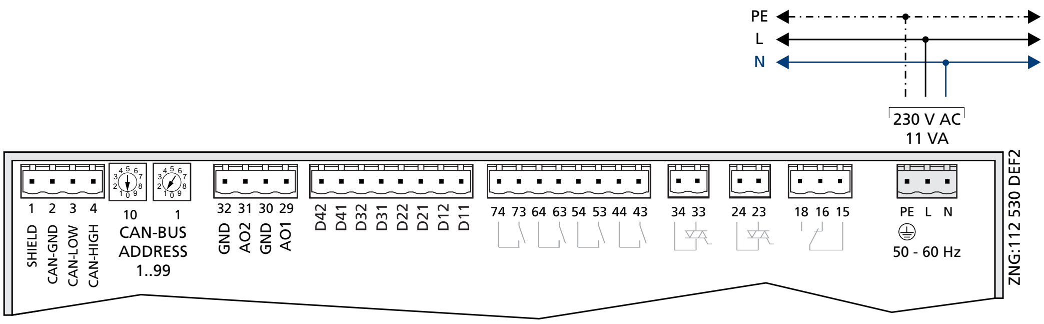
ON = Master/slave mode ON
OFF = Master/slave mode OFF

Settings made on DIP Switch S3 do not become effective on the case controller until the controller is briefly switched off and back on!

5.5 Terminal assignment for 230 V AC power supply

Warning - hazardous electrical voltage!
Danger of electric shock! BEFORE and AFTER connection it must checked that the 230 V AC supply cable is **off load**!

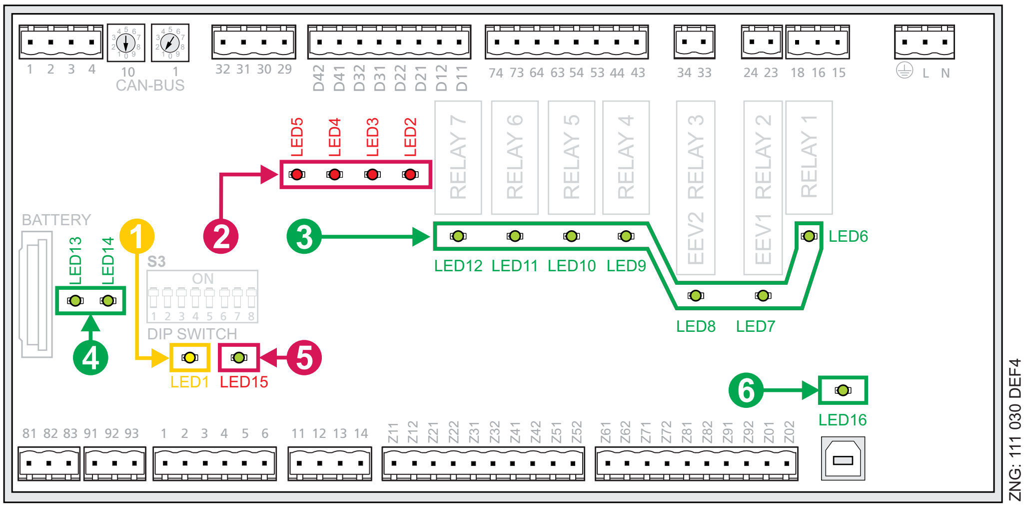
The power supply cable is connected to the case controller using the right hand terminal block PE/L/N:



The case controller can now be supplied with power. If power is being received the active lamp (LIFE LED) flashes for approximately 10 seconds following actuation. If the case controller is also connected to the CAN bus, then the CAN bus LED flashes. For more details on the status LEDs see chapter 5.5.1.

5.5.1 Status LEDs

Warning - hazardous electrical voltage!
Danger of electric shock! The device is never to be operated without its casing. Before opening the casing the equipment must be switched to zero potential.



	Function	Colour	LED	Discription		
1	CAN bus	orange	LED1	Flashing Off	LED always flashes when data is being exchanged with the system centre / store computer via CAN bus CAN bus connection interrupted or CAN bus defect	
2	Digital inputs	red	LED2 LED3 LED4 LED5	ON On On On	Digital input 1 is activated Digital input 2 is activated Digital input 3 is activated Digital input 4 is activated	(terminals D11/D12) (terminals D21/D12) (terminals D31/D32) (terminals D41/D42)
				WARNING: These terminals can carry an external voltage!		
3	Relay outputs	green	LED6 LED7 LED8 LED9 LED10 LED11 LED12	ON ON ON ON ON ON ON	Relay 1 is switched Semi-conductor relay 2 (EEV1) is switched Semi-conductor relay 3 (EEV2) is switched Relay 4 is switched Relay 5 is switched Relay 6 is switched Relay 7 is switched	(terminals 15/16/18) (terminals 23/24) (terminals 33/34) (terminals 43/44) (terminals 53/54) (terminals 63/64) (terminals 73/74)
				WARNING: These terminals can carry an external voltage!		
4	Transistor-outputs	green	LED13 LED14	ON ON	Transistor output 1 is switched Transistor output 2 is switched	(terminals 81..83) (terminals 91..93)
5	LIFE	green	LED15	Flashing: Off	Active lamp, controller is supplied with power, processor is running Power supply interrupted or device defect	
6	USB	green	LED16	ON Off	Connected to PC via USB, i.e. data exchange via USB interface USB connection interrupted or USB connection defect	

5.6 Basic configuration of the controller

The lock-down must previously be deactivated on the higher level controller (system centre / store computer or operator terminal) so that configuration settings can be made on the controller.

1. Deactivating the input lock-down

A. BT 300 operator interface	See chapter 7.2.1 for details.
B. System centre	Via Login symbol; see chapter 7.3.3.1 for details.
C. Store computer / operator terminal	Menu 9-3; see chapter 7.3.3.2 for details.

2. Opening main menu of the controller

A. The main menu of the controller is shown directly in the operator interface.

B. In the system centre, select the required controller in **Menu 4-2** and then tap the **Remote Control** button to display the main menu of the controller. See chapter 7.3.2.1 for details. .

C. In the store computer and operating terminal, a selection list of all CAN bus components is displayed in Menu 5 Remote Control. Select the controller with the corresponding CAN bus address (Kn,nnn = 1..99) in the selection list to be parametrised using the cursor or direct input and recall by tapping the **ENTER** button (↵) so that the main menu of the controller is displayed. See chapter 7.3.2.2 for details.

3. Basic configuration of the controller - select refrigeration point (Menu 6-1)

☞ The menus shown below only provide the overview; the display can be different for certain controller types. Details are described in the "Menu Structure" chapter.

In order to define the refrigeration point to be regulated by the case controller a range of different parameters can be entered and monitored:

6 Configuration - 1 Refriger. Point	
REFR. PT. POS: XXXXX	
Refr. Pt. Name: XXXXXX	Check name of refrigeration point (can only be edited on Store Computer)
Item ID: XXXXX	Check position of refrigeration point (can only be edited on Store Computer)
Priority: X	Alarm priority 0 to 99 (See notes in Section Alarms)
Refr. Sys. No.: X	No. of compressor pack supplying refrigeration point (1 to 9, important when several compressor packs are used)
Refr. Sys. Type XXX	Zone of compressor pack supplying refrigeration point (Z1/Z2, with VS 3000 BS only)
Temp. Zones X	Division of refrigeration point in one zone mode or two zone mode
No. Sensors XX	Number of sensors. The number of sensors connected is scanned on exiting the parameter by pressing ENTER.

Danger of failure of alarm messaging in the event of problem! Alarms can be suppressed by setting Alarm Priority to 0. The case controller cannot receive the suction pressure value for control functions **before** the Pack No. of the associated pack controller has been selected on the case controller.
Danger of damage to equipment and goods! It must be ensured at all costs that the correct pack number is selected, otherwise this can result in damage to the installation or goods. Setting can be checked under Refrigeration Point - 1 Actual Values - 1 Temperature Sensors. The value of t0 VS corr. displayed is the actual value of t0 corrected by the offset for the pack controller specified in the Pack No. field.
In stand alone operation via the local pressure transmitter, the pack number and the parameter *t0 VS corr.* only have meaning when the signal from the pressure transmitter is not available. In this case the controller attempts to replace the missing signal with a pressure value measured at the pack controller and transmitted via the CAN bus (if available).

A sensor scan (Menu 6-1) **must** be performed during commissioning or after a first start. The sensor scan is the only possibility to define the sensors to be monitored; see chapter 4.2.

4. Exit the menu **1 Refrigeration Point** by pressing the **ESC** button once and choose menu **6 Configuration - 2 Controller**

6 Configuration - 2 Controller	
CONTROLLER POS: XXXXX	
1 Type and Version	Type, serial number and master-slave (ON/OFF)
2 Temp. Display	Matching of displayed temperature
3 Alarm Delay	Enter alarm time delay
4 230V Inputs	230 V inputs
5 Sensor Type	Select temperature sensor type (L243, K277 or 5K3A1)

5. Select menu **6 Configuration - 3 Alarm Delay**

6 Configuration - 2 Controller - 3 Alarm Delay	
ALARMDELAY POS: XXXXX	
Sensor Fault XX m	Alarm delay on sensor break
High/Low Temp. XX m	Alarm delay on high or low temperature
No Defrost XX h	Alarm is generated if defrosting does not take place within the set time
Selfholding X	NO: Automatic reset of non-transient alarms YES: Alarms must be reset manually

Press the **ESC** key one time to exit the menu.

6. Select menu **6 Configuration - 2 Controller - 6 Analog Inputs**

6 Configuration - 2 Controller - 6 Analogeinputs		
Ain1 activ x	Analogue input Z1	use (=Y) do not use (=N)
Pr.tr.min1 xxx bar	Smallest pressure value for pressure monitoring at 4 mA	
Pr.tr.max1 xxx bar	Largest pressure value for pressure monitoring at 20 mA	
Ain2 activ x	Analogue input Z2	use (=Y) do not use (=N)
Pr.tr.min2 xxx bar	Smallest pressure value for pressure monitoring at 4 mA	
Pr.tr.max2 xxx bar	Largest pressure value for pressure monitoring at 20 mA	
Refrig. xxxx	Selection of refrigerant (applies to all connected pressure sensors)	
Fct. AIn2 xxxxx	Function of the analogue input Z2	

Exit the menu by pressing the **ESC** button twice.

7. Choose Menu **6 Configuration – 3 Cooling**

6 Configuration - 3 Cooling	
COOLING POS: XXXXX	
corr.off to XX K	Correction offset applied to actual value of t_0 received from pack controller via CAN bus. This enables pressure losses in the refrigerant line to be compensated. If this value is set to --, control is made by the case controller via the temperature sensors at the evaporator inlet and outlet (stand-alone mode).
Cont Cool Mon. XX m	Continuous run monitoring
HG operation XX m	Must be set for UA 131 E to ensure correct operation of D2D defrosting. With this operating mode the defrost timer should be set to EXT.
Fan delay X °C	Only for coldroom controller UR141 NE and UR 141 TE: Maximum temperature on defrost sensor at which fan is started with time delay (e.g. after defrosting)

8. Exit the Configuration menu by pressing the ESC button twice and select 3 Timer 3 - 2 Defrost Timer
Enter the relevant parameters in the following screen.

3 Clock - 2 Defrost Timer	
DEFR.TIMER POS: XXXXX	
Defrost Timer XXX	Select defrosting by external or internal defrost timer
Safe Defr Time XXX m	Safe defrost time; defrost duration does not extend beyond this time
Defr. 1 xxxxx hh:mm Defr. 2 xxxxx hh:mm ... Defr. 14 xxxxx hh:mm	Enter defrost times
Manual Defrost XXX	Manual defrosting ON/OFF

9. Press the **ESC** key to exit Menu **2 Defrost Timer**.

10. Choose Menu **3 Setpoint Toggle**:
Enter the relevant parameters in the following screen.

3 Clock - 3 Setpoint Toggle	
TOGGLE POS: XXXXX	
Status XXX	Only shown when setpoint toggle is set to INT or EXT
Toggle Setp. XXX	Select INT, EXT, ---: Internal, external, deactivated setpoint toggle INT: Internal EXT: External ---: Setpoint toggle deactivated
Blind On Time X s	Enter night blind run time for refrigerated multidecks
Alt ON: xxxxx hh:mm AltOFF: xxxxx hh:mm Alt ON: xxxxx hh:mm AltOFF: xxxxx hh:mm	Enter time for setpoint toggle (Only shown when setpoint toggle is set to INT)

11. Press the **ESC** key twice to exit Menu **3 Setpoint Toggle.**

12. Choose Menu 2 Setpoints - 1 Cooling - Zone 1 / Zone 2 / Zone 1A / Zone 2A.

2 Setpoints - 1 Cooling - Zone 1 - Zone 2 - Zone 1A - Zone 2A	
COOLING 1 POS: XXXXX	
...	
Superheat XXX K	Superheat setpoint for superheat controller
min. SH XX K	If superheat drops below minimum level, controller closes the respective expansion valve and sets the I-sum (NOT I-part) to zero when the *Reset I-Sum* parameter is set to ON.
two pos.ctrl XXX	Temperature control is no longer continuous but on-off. Used for enabling/disabling superheat control (TEV emulation).
MOP-point XXX °C	A value other than -- must be set if the MOP function is desired. When t_0 exceeds this value, the valve opening degree is reduced as t_0 rises.

13. Press the **ESC** key repeatedly to return to the main menu of the Store Compute/Operator Terminal.

14. In the main menu of the Store Computer/Operator Terminal, choose menu **7 Monitoring - 3 Configuration** and enter, amongst other things, the case controller node names in plain text

7 Monitoring - 3 Configuration	
CONFIGURAT POS: XXXXX	Setting the CAN Bus address: Select the case controller to be parameterised with the corresponding CAN bus address (node No. = 1..99) using the cursor or by direct input.
Station name	Enter CAN bus station name (e.g. cheese counter)
Position XXXXX	Enter position of station in store
Priority X	Enter the required priority

15. Changing the basic configuration of the controller
Return to the main menu by repeatedly pressing the **ESC** key.
The basic configuration of the controller is now completed.

5.6.1 Naming of the controller

The following parameters are available for naming the controller:

- refrigeration point name	(19 characters, can be freely edited)
- refrigeration point position	(5 characters, can be freely edited)

The controller can be named using the system centre, store computer, operator terminal or the PC software LDSWin.

A. BT 300 operator interface The input is made in Menu 6-1.

Eine Benennung des Reglers mit einem Bediengerät BT 300 x ist nur beim Regler UA 410 L möglich!

B. System centre	See chapter 7.3.2.1 for details.
A. Store computer / operator terminal	The input is made in Menu 7-2.
D. PC software LDSWin	See operating manual of LDSWin.

5.7 Restart - restart of the controller

For a restart, the device is restarted with all configured parameters and the CAN bus address set on the rotary switch. A restart can be initiated using the following procedure:

- disconnection and reconnection of the power supply

5.8 First start / reset controller to factory settings

Caution: data loss!
A first start causes all parameters to be reset to the factory settings!

All parameters are reset to the factory settings during a first start. This can be achieved by the following procedure:

1. Disconnect controller from the power supply for safety reasons (see also chapter 5.4) and make a note of the settings of the DIP switch S3 (e.g. B. OFF-ON-OFF-...).
2. Adjust settings at the DIP switch S3 (e.g. OFF-OFF-OFF-...).
3. Power off the controller for a short time.
4. Power on the controller again and wait approx. 1 minute while the controller starts up.
5. Disconnect controller from the power supply for safety reasons (see also chapter 5.4).
6. Reset DIP switch S3 to the noted starting position.
7. Switch on controller again.
8. The settings of the controller have been reset to the factory settings.

A first start is also performed when a different controller version (e. g UA 400 ↔ UA 410 D ↔UA 400 E ↔UA 410 L) is loaded on the controller via firmware update, see chapter 5.10.
A sensor scan (Menu 6-1) must be performed during commissioning or after any first start. The sensor scan is the only possibility to define the sensors to be monitored; see chapter 4.2.

5.9 Maintenance and battery replacement

Only UA 410 E AC

The case controller contains a backup battery of Type CR 2450 N, 3V Lithium. The case controller must be removed from the system to change the battery. During this time, control and monitoring of the refrigeration point are disabled.

If the controller is connected via the CAN bus to a higher-level controller, it will no longer be on the CAN bus. In addition to the precautions directly concerning the refrigeration point, consideration must be given to the effects on higher-level controllers on the CAN bus.

Warning - hazardous electrical voltage!
Danger of electric shock! When changing the battery, the safety rules and the industrial safety notes contained in the section 1 must be observed. **All** connectors may only be connected and disconnected when power is off. Circuit boards may only be exchanged when power is off. Always take hold of circuit boards at the edges.

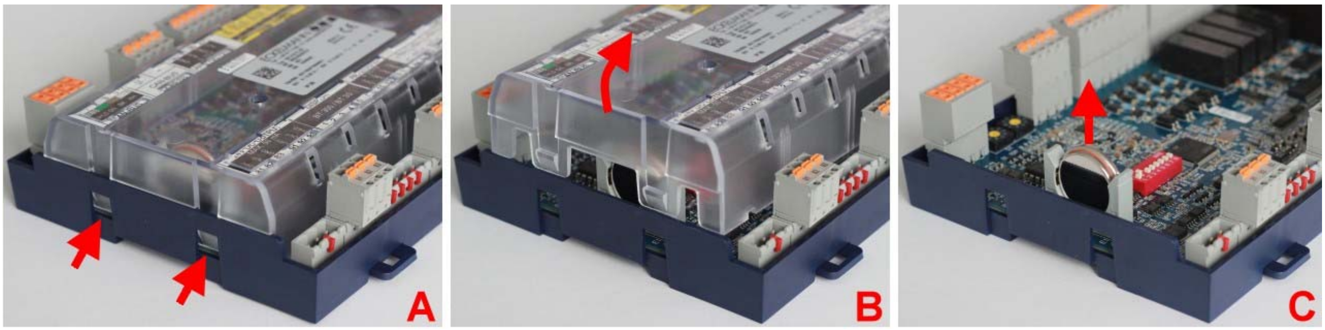
ESD regulations must be observed; see section 1.5.

Danger of fault alarm! Removal of the case controller from the CAN bus generates fault alarm on the higher-level controller (e.g. System Centre / Store Computer). Make sure the alarm is cancelled in due time or the Service Center is advised in advance.

1. Disconnect the case controller and refrigeration point from power.
   Acknowledge alarm at the system centre / store computer.
2. Disconnect all the plugs, remove the device from the DIN rail.

Warning - hazardous electrical voltage!
Danger of electric shock! Some connectors may carry 230 V AC power. Connectors should be marked before disconnecting.

3. Push the plastic lid’s two left-hand snap lugs inwards and upwards with a broad flat-bladed screwdriver (A) and lift up the lid with a swinging movement (B).



4. Pull battery up out of its holder (C) and dispose of it in regulation manner.

Do **not** touch the new battery with metal pliers, as it might be short-circuited and destroyed:
- wipe the new battery with a clean, dry cloth,
- do **not** touch the contact faces on the edges of the new battery.

Never dispose of this product with other household waste. Please inform yourself of the local regulations for the separate disposal of electrical and electronic products. The correct disposal of your old equipment will protect people and the environment from possible negative effects.
You will find further information in the chapter "Decommissioning and Disposal".

5. Then pull the battery from the battery holder and dispose of it in a proper manner.
6. Check that the lid is in the correct position and
push it down until it clicks into place.
7. Put device on the DIN rail and attach all connectors again.

Warning - hazardous electrical voltage!
Danger of electric shock! Some connectors may carry 230 V AC power. Connectors should be marked before disconnecting.

8. Turn on power to the case controller and refrigeration point, which will then resume working.
9. **Controller in CAN bus system:** With unchanged configuration of the system centre / store computer, the controller is automatically detected again via the CAN bus; date, time and automatic summer / winter time changeover are set automatically via the central time synchronisation.
10. **Controller in standalone operation:** The setting of date, time and automatic summer / winter time changeover is required for the data archiving (Menu 3-1).

5.10 Firmware Update

The case controller is supplied with the current firmware, ready for operation. Future software versions can be loaded into the case controller as required by means of a firmware update, and thus updated.

A software update is only to be carried out by trained staff or factory-side by the manufacturer.

Damage to equipment and goods! Before the firmware update the affected component, i.e. equipment must be brought into a safe state as the deactivation of the controller during the firmware update can have undesired effects on the component, i.e. equipment.
Danger data loss! The loading of software via firmware update must not be interrupted. The power cable and USB A-B cable must not be disconnected during the firmware update. It must be ensured that power is supplied throughout the entire procedure. An interruption of the firmware update can result in an inoperative controller. In some cases a change of firmware version can lead to the loss of all the setpoints in the case controller. As a precaution, the settings **should** be backed up by saving them to the LDSWin PC software, **prior** to the update.
After the firmware update the backup settings can be reloaded into the case controller from LDSWin.

5.10.1 Firmware Update requirements

The following components are required for a firmware update:

- Notebook or PC
- USB A-B cable (Accessories)
- The installation program "*Firmware_Uploader_Setup_vxx.exe*" (available from manufacturer)
- Current firmware in the binary file "*UA400_vx.xx.bin*" (available from manufacturer)

Administrator rights required during initial installation!
With the operating systems Windows 2000, XP, Vista and Windows 7, the user **must** have **administrator rights** during installation when the installation program "*Firmware_Uploader_Setup_vxx.exe*" is being executed. Administrator rights will also be required when the controller is initially connected to the PC and the driver is installed by the operating system.

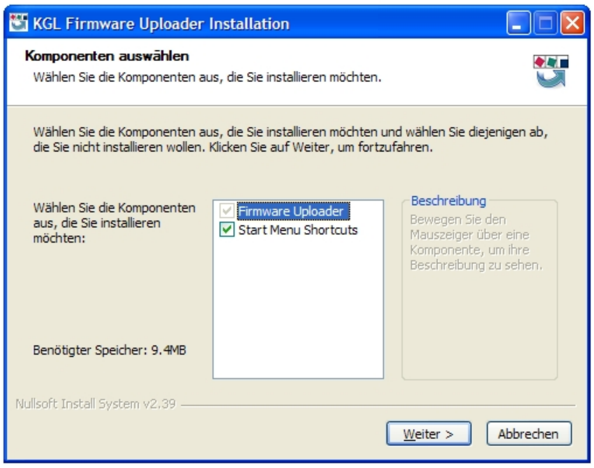
Following installation and the initial connection of the controller to the PC administrator rights are no longer required.

In the event of questions concerning administrator rights under Windows, the responsible IT administrator should be consulted.

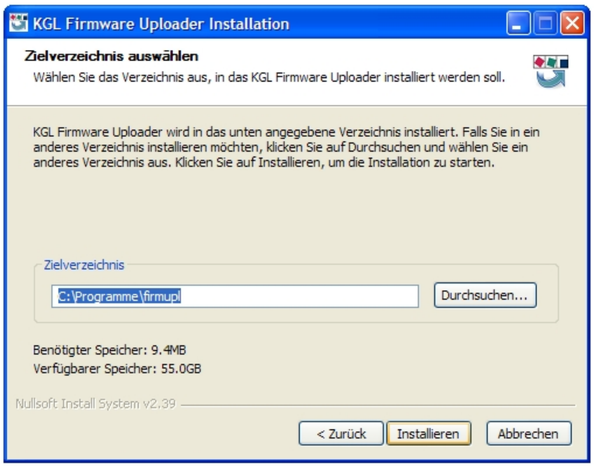
Step 1: Install the software

1. **Before first connecting** the controller to the PC the installation program "*Firmware_Uploader_Setup_vxx.exe*" must be executed **once**. Please follow the instructions given by the installation assistant.

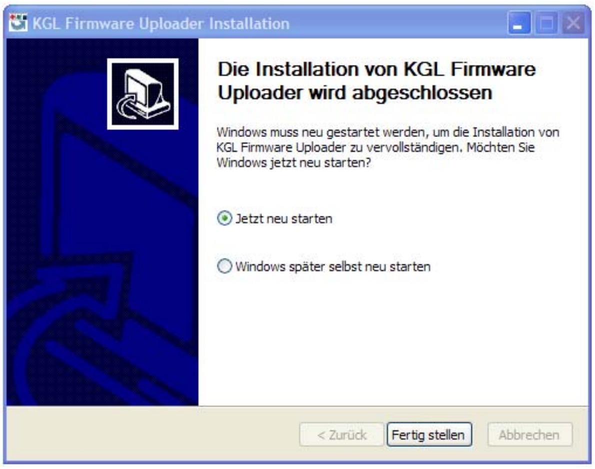
In the following window the components to be installed can be selected.



Now select the target folder:



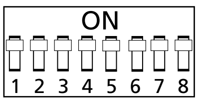
Following installation the PC must be restarted:



Step 2: Changing the position of DIP switch S3 and connecting the controller

☞ The original position of the coding switches 1..8 of the DIP switch S3 must be documented!

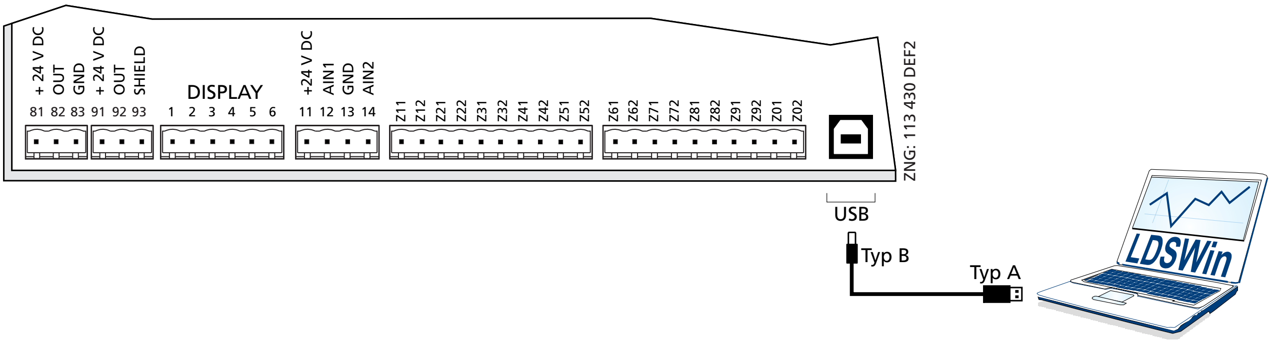
1. In order to carry out the firmware update all coding switches 1..8 of DIP switch S3 **must** be set to **ON**.



S3

☞ **After** the firmware update has been carried out all the coding switches 1..8 of the DIP switch S3 **must** be **returned to their original position**, see chapter 5.10.2

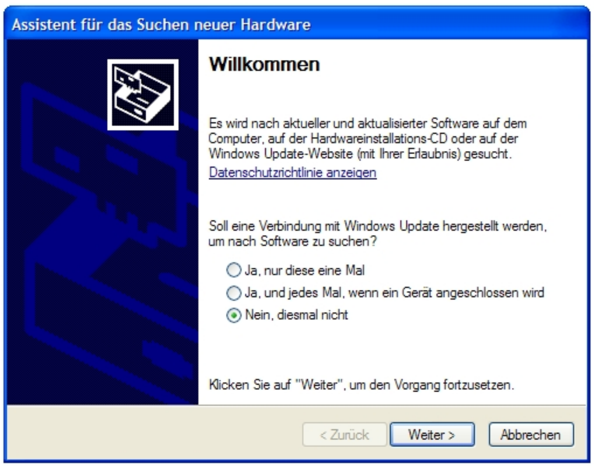
2. Connect the controller while off load to the PC via a USB A-B cable:



3. Now supply the controller with power.

Step 3: Installing the driver

When **first** connecting the controller to the PC the ”Assistant for finding new hardware” opens. Please follow the instructions of the assistant:

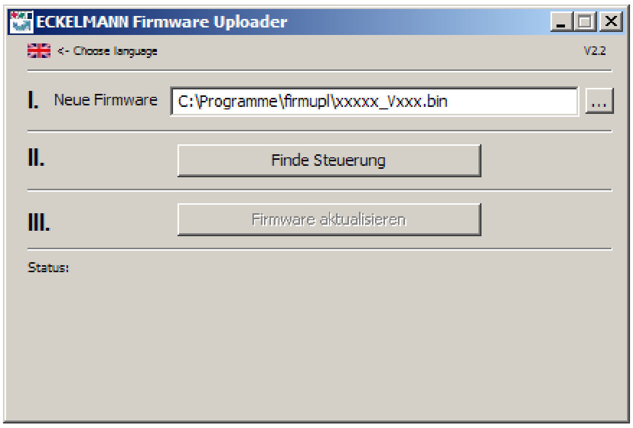


No error message such as ”*USB device not found*” should appear on the notebook or PC! Otherwise tips for rectifying driver problems are explained in more detail in chapter 5.10.3.

5.10.2 Uploading the firmware update

In order to carry out a successful firmware update the steps described in chapter 5.10.1 must be carried out once for each PC.

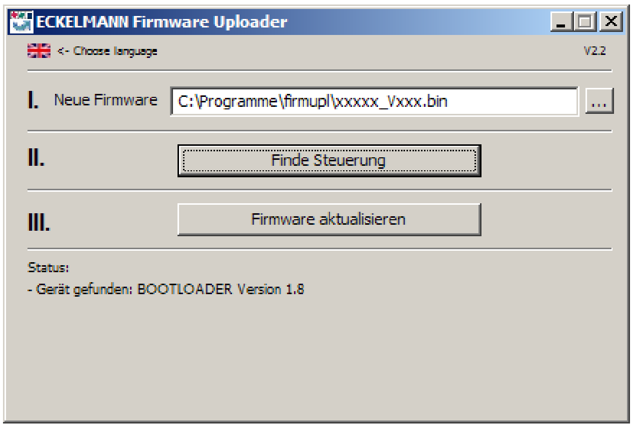
Step 1:
Under "*Start / Programs / ECKELMANN / Firmware Uploader*" start the program "*KGL Firmware Uploader*".
The following window opens:



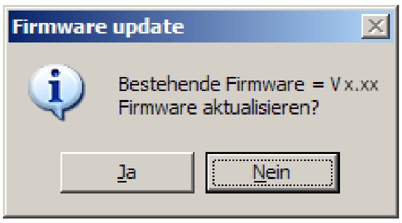
Select language, and then select the path to the folder for the new firmware (binary file).

Step 2:
Connect the controller while off load to the PC via a USB A-B cable, **and then** supply the controller with power.

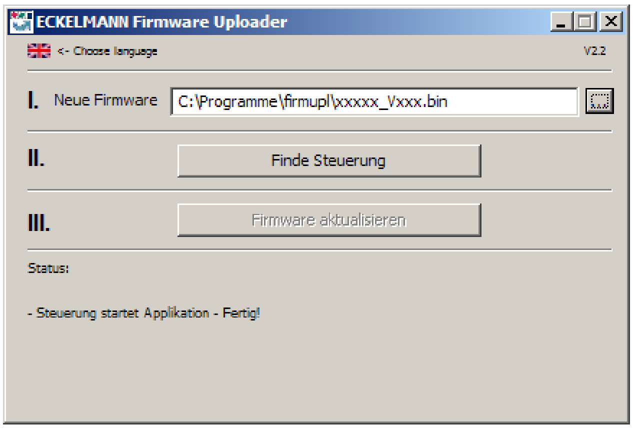
Step 3:
Press the button "*Find Controller*" in order to locate the controller. Then press the button "*Update Firmware*" in order to start the firmware upload.



Step 4:
Following the start of the firmware upload a confirmation window appears, confirm this with "**YES**".



Step 5:
Following the successful firmware update the program can be closed.



The USB A-B cable can now be disconnected from the controller.

Step 6: DIP switch S3 returned to original position

Danger of failure of controller!
After the firmware update has been carried out all the coding switches 1..8 of the DIP switch S3 **must** be **returned to their original position**. The controller only accepts the settings for DIP switch S3 **after** the controller has been briefly disconnected from the power supply!

After the firmware update the backup settings can be reloaded into the case controller from LDSWin as required.

5.10.3 Rectification of driver problems

Should the driver installation be incomplete or should the controller have been accidentally connected to the PC before the execution of the installation program, then the following instructions will provide you with information on how the problem can be rectified:

Windows XP/Vista: If the controller was accidentally connected to the PC before the execution of the installer, then the driver **must** be updated in the system control.

First of all it must be ensured that the installation program for the firmware upload was executed: In the start menu, under "*Settings" - "System Control" - "Administration" - "Computer Administration*" - "*Device Manager*" - select "*Connections (COM and LPT)*" and with the right hand mouse button select the incorrectly installed COM port (*"UA 400 COM Port"* oder *"WR 300 COM Port"*).

Then press "*Update Driver*" and follow the instructions in the drop down menu;
the driver should now be correctly installed.

Windows 7: In the start menu select "System Control", then "*Hardware and Sound" - "Devices and Printers" - "Device Manager" - "Connections (COM & LPT)*". Then proceed as described above.

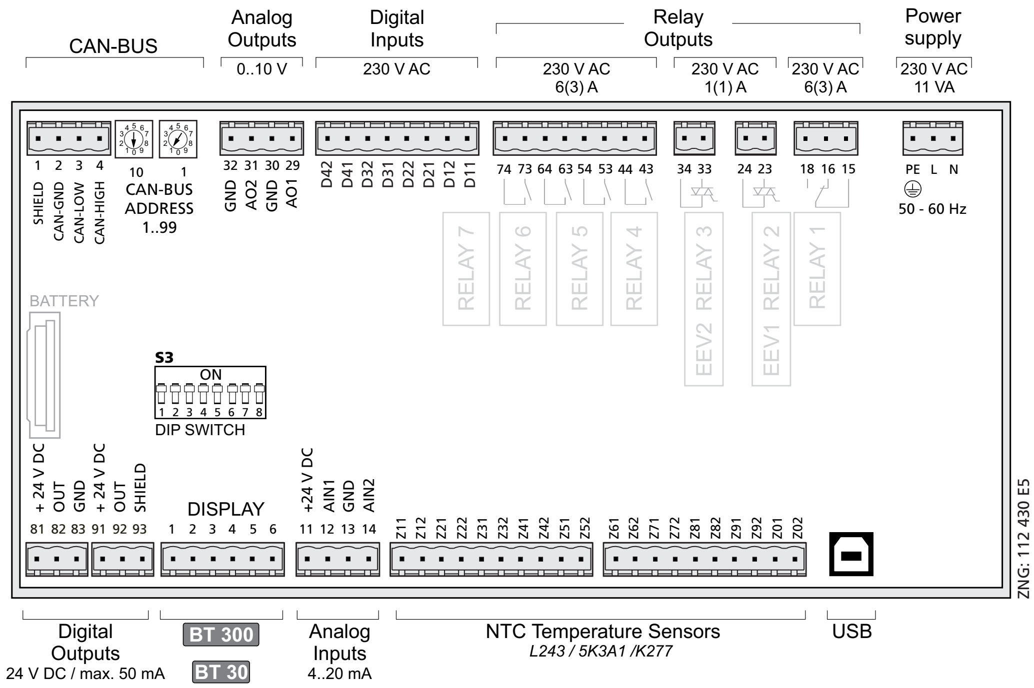
Special features under Windows 7: When executing the program, the request "*Do you want to allow the following program from an unknown publisher to make changes to this computer?*" is to be confirmed with YES.
If this request is to be permanently masked, then the following procedure is recommended:

In the folder "*C:\Programme\firmupl*", click on the file "*firmupl.exe*" with the right hand mouse button. In the drop down menu under "*Properties*" select the entry "*Allow*".
The request should no longer appear during the next start.

Notice:

6 Pin and Terminal Assignments of UA 400 E / UA 410 E

6.1 Terminal diagram



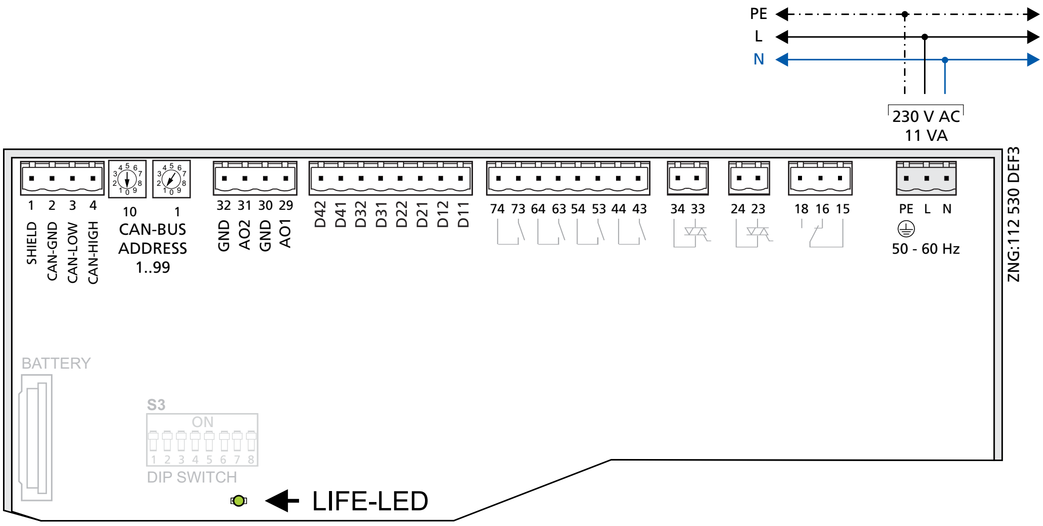
Connection diagram of the case controller with terminal designation, here pictured in the full configuration UA 410 E AC.

Warning - hazardous electrical voltage!
In order to guarantee reverse voltage protection, only coded mating plugs are to be used on the assembly connections.

A detailed description of the connection and terminal configuration of the case/coldroom controller and its components is contained on the following pages.

6.2 Terminal assignment of the 230 V AC power supply

Warning - hazardous electrical voltage!
Danger of electric shock! BEFORE and AFTER connection it must checked that the 230 V AC supply cable is **off load**!



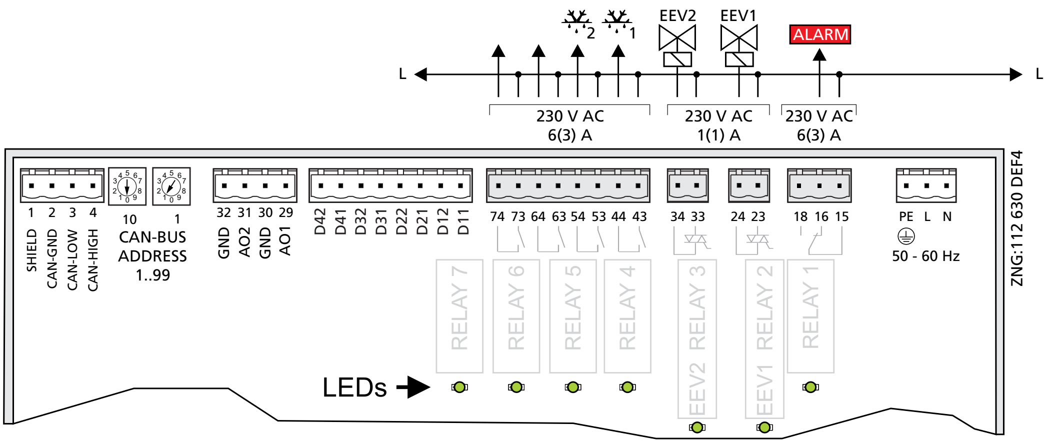
Controller Type	Terminal No.	Function
All controllers	PE	Ground conductor
	L	Phase 230 V AC
	N	Neutral conductor

After connection of the 230 V AC power supply, the green LIFE LED flashes, see chapter 5.5.1 Status LEDs for details.

6.3 Terminal assignment of the 230 V AC relay outputs

Warning - hazardous electrical voltage!
Danger of electric shock! BEFORE and AFTER connection it must checked that the 230 V AC relay outputs are **off load**!
Low voltage **and** safety extra-low voltage must **not** be applied together at the relay outputs.

Fuse protection of semiconductor relay (SSR = Solid-State-Relay) terminal 23/24 and 33/34:
Every SSR must be externally fused with a 1.25 A fast acting fuse (FF), nominal voltage 230 V AC, with a melting integral of << 10.4 A^{2}s and a tripping time at 8.0 A < 10 ms (e.g., SIBA No. 70 001 40).
If large inductive loads (e.g. fan coils) are to be switched via the semi-conductor relay then protective devices appropriate to the loads must be connected (e.g. an RC element and a varistor) in order to prevent the destruction of the SSRs due to over-voltage. Information on suitable protective devices as well as measures for the minimisation of over-voltage can be obtained from the manufacturer.



Fire hazard! On grounds of fire prevention, during the planning of the installation a device for shutting down the defrost heating in the event of excessive temperature (e.g. ”KLIXON”) must be provided.

	Relay 7	Relay 6	Relay 5	Relay 4	Relay 3 (EEV2)	Relay 2 (EEV1)	Relay 1
Controller Type	**74/73**	**64/63**	**54/53**	**44/43**	**34/33**	**24/23**	**18/16/15**
Case controller							
UA 121 E	Fan	Static cooling 1+2 (solenoid valve)	Defrosting 2	Defrosting 1	Cooling 2 or enabling 2	Cooling 1 or enabling 1	Alarm
UA 131 E	Fan	Static cooling 1+2 (solenoid valve)	Defrosting 2	Defrosting 1	Cooling 2 or enabling 2	Cooling 1 or enabling 1	Alarm
UA 131 E LS with advanced fan control	Fan	Static cooling 1+2 (solenoid valve)	Defrosting 2	Defrosting 1	Cooling 2 or enabling 2	Cooling 1 or enabling 1	Alarm
UA 141 E	Pane heater	Defrosting 1 inverted	Defrosting 2	Defrosting 1	Cooling 2 or enabling 2	Cooling 1 or enabling 1	Alarm

	Relay 7	Relay 6	Relay 5	Relay 4	Relay 3 (EEV2)	Relay 2 (EEV1)	Relay 1
Controller Type	**74/73**	**64/63**	**54/53**	**44/43**	**34/33**	**24/23**	**18/16/15**
Room controller							
UR 141 NE (NT)	Fan 2	Fan 1	Defrosting 2	Defrosting 1	Cooling 2 or enabling 2 / Heating circuit*	Cooling 1 or enabling 1	Alarm
UR 141 TE (LT)	Fan 2	Fan 1	Defrosting 2	Defrosting 1	Cooling 2 or enabling 2 / Heating circuit*	Cooling 1 or enablingv	Alarm
Sub cooler							
UK 100 E	Cooling 2 (solenoid valve)	Cooling 1 (solenoid valve)	Defrosting 2	Defrosting 1	Cooling 2 or enabling 2	Cooling 1 or enabling 1	Alarm

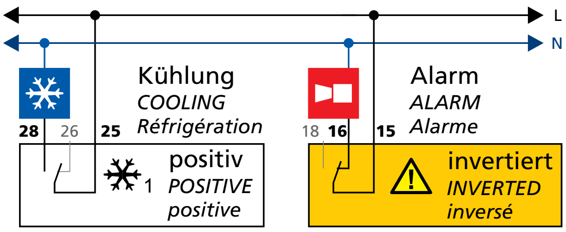
* Heating circuit only in single zone operation. For further details on the function of the relay outputs see chapter 6.4.

☞ If any relay output is activated by the controller, the associated green LED lights, see chapter 5.5.1 - Status-LEDs for details.

6.4 Mode of operation of the relay and transistor outputs

The table shows operation of the outputs for the separate controller types.

	Relay outputs 230 V AC					**Transistor outputs 24 V DC/50 mA (91/92)**		
Controller Type	**Fan**	**Defrosting**	**Static cooling**	**Cooling**	**Alarm**	**Light (81/82)**	**Frame/ pane heater ***	Switching on and off of external consumers
Case controller								
UA 121 E	Inverted	Positive	Positive	Positive	Inverted	Positive	Inverted	--
UA 131 E	Inverted	Positive	Positive	Positive	Inverted	Positive	Inverted	--
UA 131 E LS	Inverted	Positive	Positive	Positive	Inverted	Positive	Inverted	--
UA 141 E	--	Positive	--	Positive	Inverted	Positive	Positive (relay 73/74)	Positive (91/92)
Room controller								
UR 141 NE	Positive	Positive	--	Positive	Inverted	Positive	Inverted	--
UR 141 TE	Positive	Positive	--	Positive	Inverted	Positive	Inverted	--
Sub cooler								
UK 100 E	Positive	Positive	Positive	Positive	Inverted	Positive	--	--



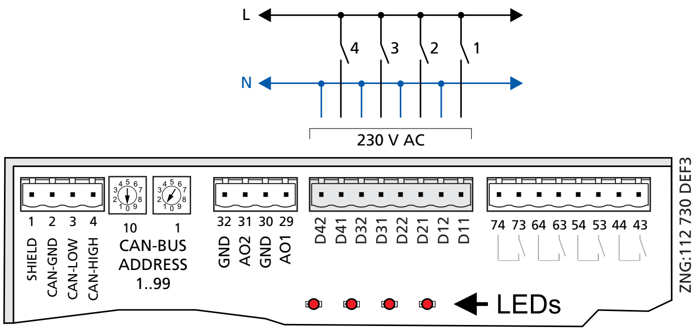
Mode of operation „positive” means that operation of the relay is not inverted:
The relay is energized when the controller activates the function output (e.g. cooling = ON).
(This means that the contact of a normally open relay is closed.)
The relay is not energized when the controller deactivates the function output (e.g. cooling = OFF).
(This means that the contact of a normally open relay is open.)
Mode of operation „inverted” means that operation of the relay is inverted:
The relay is not energized when the controller activates the function output (e.g. alarm = ON).
(This means that the contact of a normally open relay is open.)
The relay is energized when the controller deactivates the function output (e.g. alarm = OFF).
(This means that the contact of a normally open relay is closed.)

* The function for the frame heater / pane heater can be configured
via the parameter „*Invert Output*“ (menü 2-5-2 / menu 2-6-2).

6.5 Terminal assignment of the 230 V AC digital inputs

Warning - hazardous electrical voltage!
Danger of electric shock! BEFORE and AFTER connection it must checked that the 230 V AC digital inputs are **off load!**

The mode of operation of the digital inputs can be configured via the parameters *Inv. D1* to *Inv. D4* (menu 6-2-4). If more than one input has been parameterised with the same function, then this function is active as soon as a 230 V signal is applied to one of these inputs. For further details see the appropriate chapter in the function description.



Controller Type	D42/D41	D32/D31	D22/D21	D12/D11
Case controller UA 121 E UA 131 E UA 131 E LS	External alarm [1,2] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2 / Setpoint toggle	All manual shutdown [1] or Manual shutdown Z1 / Manual shutdown Z2	Setpoint toggle [1] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2	Defrosting [1] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2 / Setpoint toggle
Case controller UA 141 E	External alarm [1,2] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2 / Setpoint toggle	Pane switch [1] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2	Setpoint toggle [1] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2 / Shutdown switch	Defrosting [1] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2 / Setpoint toggle
Coldroom controller UR 141 NE UR 141 TE	External alarm [1,2] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2 / Setpoint toggle	Coldroom door 1 [1] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2	Setpoint toggle [1] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2 / Coldroom door 2	Defrosting [1] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2 / Setpoint toggle
Subcooler controller UK 100 E	External alarm [1,2] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2 / Setpoint toggle	All manual shutdown [1] or Manual shutdown Z1 / Manual shutdown Z2	Setpoint toggle [1] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2	Defrosting [1] or All manual shutdown / Manual shutdown Z1 / Manual shutdown Z2 / Setpoint toggle

1) Factory setting
2) Freely configurable alarm text - factory setting is “CO2 Alarm”

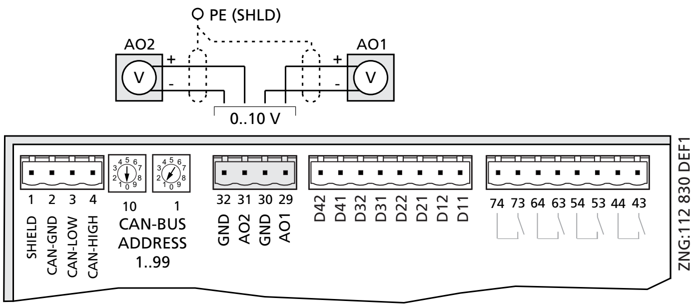
If 230 V AC voltage is present at digital input, the associated red LED lights, see chapter 5.5.1 Status LEDs for details.

6.6 Terminal assignment of the 0..10 V analogue outputs

Only UA 410 E AC

Warning - hazardous electrical voltage!
Connecting mains power to the analogue outputs will lead to the destruction of the controller!

Malfunctions due to interference sources: All leads running to and from the case controller must be shielded (cable type: LiYCY)! No shielding is required on sensor leads when installed exclusively inside the refrigerated display case and when external interference (for example from parallel power wires) is not to be expected (see operating instruction “Basics and General Safety and Connection Instructions”). As a general rule, care should be taken to ensure that signal leads and leads carrying a supply voltage are routed through separate cable channels.

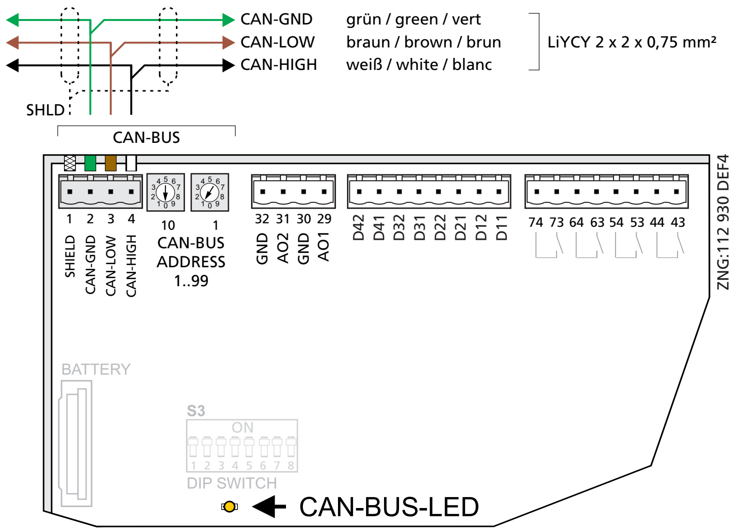


Controller Type	Terminal No.	Analogue output 2	Analogue output 1
All controllers	32	GND	--
	31	AO2 (+ 0..10 V)	--
	30	--	GND
	29	--	AO1 (+ 0..10 V)

6.7 Terminal assignment of the CAN bus

Warning - hazardous electrical voltage!
If mains voltage is connected to the CAN bus terminals,
this will result in the destruction of all components connected to the CAN bus!

Leads running of the CAN bus must be shielded (cable type: LiYCY)! As a general rule, care should be taken to ensure that signal leads and leads carrying a supply voltage are routed through separate cable channels.



For further details on the setting of the CAN bus address see chapter 5.3.

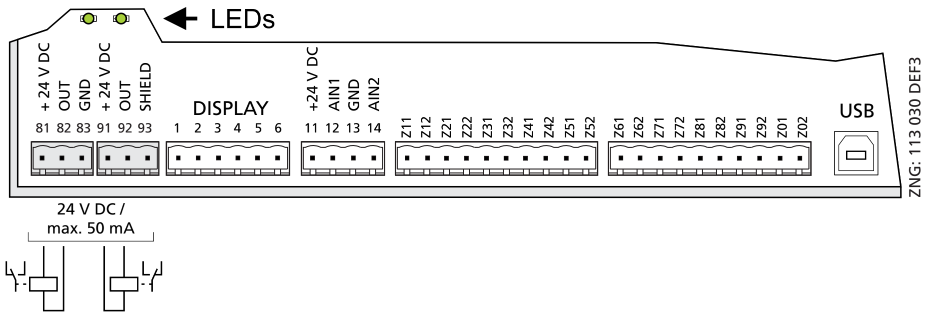
Controller Type	Terminal No.	CAN bus	Lead colour
Alle controllers	1	Shielding (SHLD)	Shielding
	2	CAN-GND	green
	3	CAN-LOW	brown
	4	CAN-HIGH	white

The orange CAN bus LED always flashes when data are being exchanged via the CAN bus with the system centre / store computer; see chapter 5.5.1 Status LEDs for details.

6.8 Terminal assignment of the 24 V DC transistor outputs

Warning - hazardous electrical voltage!
Connecting mains power to the transistor outputs will lead to the destruction of the controller!

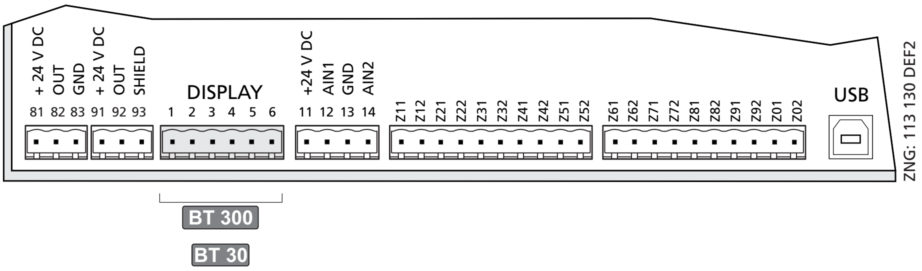
Destruction of the transistor outputs! Due to the capacity of the transistor outputs of a max. of 50 mA, 24 V DC coupling relays must be used for controlling the load.



Controller Type	**Digital output 1** **81: 24 V DC / max. 50 mA** **82: OUT** **83: GND**	**Digital output 2** **91: 24 V DC / max. 50 mA** **92: OUT** **93: SHIELD**
UA 121 E UA 131 E UA 131 E LS UR 141 NE UR 141 TE	Lighting control (Terminal 81/82)	Frame heater (Terminal 91/92)
UA 141 E		Switching on and off of external consumers (terminals 91/92)
UK 100 E		--

If any transistor output is activated by the controller, the associated green LED lights, see chapter 5.5.1 "Status LEDs" for details.
For further details on the function of the transistor outputs see chapter 6.4.

6.9 Terminal assignment of the DISPLAY interface



An operator interface of the BT 300 series (e.g. for service purposes) and up to four BT 30 temperature displays can be connected to the DISPLAY interface.

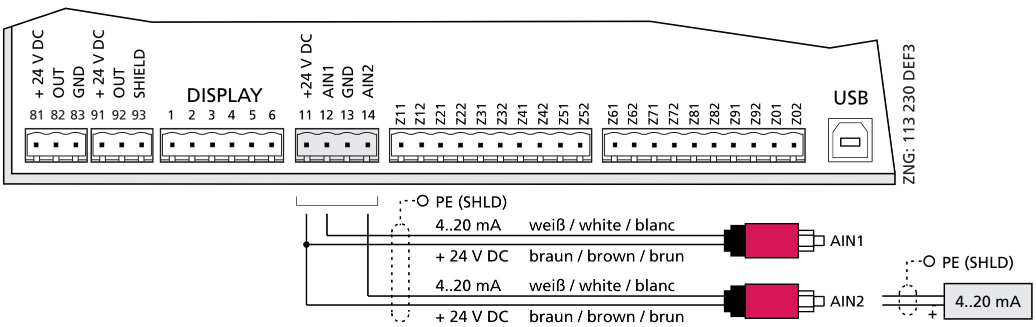
For further details see chapter 4.22.2.

6.10 Terminal assignment of the 4..20 mA analogue inputs

Only UA 410 E AC

Warning - hazardous electrical voltage!
Connecting mains power to the analogue inputs will lead to the destruction of the controller!

Malfunctions due to interference sources! All leads running to and from the case controller must be shielded (cable type: LiYCY)! No shielding is required on sensor leads when installed exclusively inside the refrigerated display case and when external interference (for example from parallel power wires) is not to be expected (see operating instruction “Basics and General Safety and Connection Instructions”). As a general rule, care should be taken to ensure that signal leads and leads carrying a supply voltage are routed through separate cable channels.



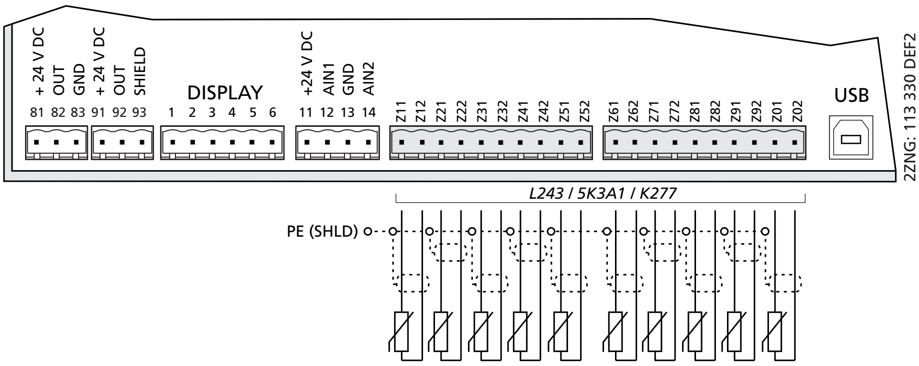
Connection of pressure transmitter / humidity sensors (analogue input 2 only)

Controller Type	Terminal No.	Analogue input 1	Analogue input 2
All controller	11	+24 V DC	+24 V DC
	12	AIN1 (4..20 mA)	--
	13	GND	GND
	14	--	AIN2 (4..20 mA)

6.11 Terminal assignment of the analogue inputs of temperature sensors

Warning - hazardous electrical voltage!
Connecting mains power to the analogue inputs will lead to the destruction of the controller!

Malfunctions due to interference sources! All leads running to and from the case controller must be shielded (cable type: LiYCY)! No shielding is required on sensor leads when installed exclusively inside the refrigerated display case and when external interference (for example from parallel power wires) is not to be expected (see operating instruction “Basics and General Safety and Connection Instructions”). As a general rule, care should be taken to ensure that signal leads and leads carrying a supply voltage are routed through separate cable channels.
The case controller analogue inputs are **only** approved for the connection of temperature sensors as named in chapter 3.1. Connecting a supply voltage to the analogue inputs will lead to the destruction of the case controller!



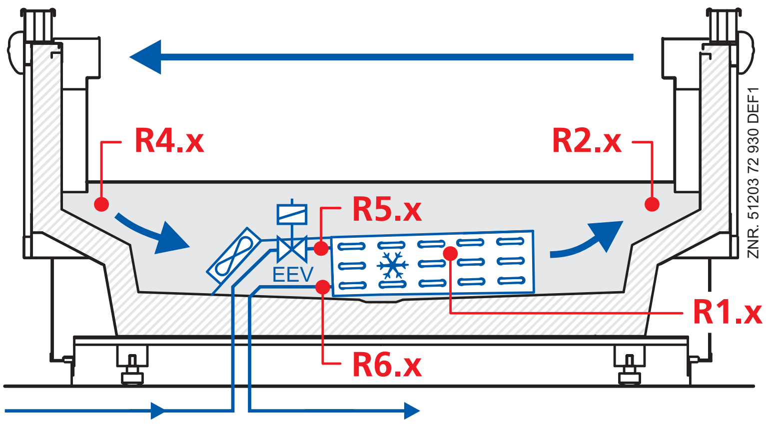
	Temperature zone 1					Temperature zone 2				
Controller Type	**Sensor 1**	**Sensor 2**	**Sensor 3**	**Sensor 4**	**Sensor 5**	**Sensor 6**	**Sensor 7**	**Sensor 8**	**Sensor 9**	**Sensor 10**
Terminal No.	**Z11/Z12**	**Z21/Z22**	**Z31/Z32**	**Z41/Z42**	**Z51/Z52**	**Z61/Z62**	**Z71/Z72**	**Z81/Z82**	**Z91/Z92**	**Z01/02**
Case controller UA 121 E UA 131 E UA 131 E LS UA 141 E	R2.1	R4.1	R1.1	R5.1 or R4.3*	R6.1	R2.2	R4.2	R1.2	R5.2 or R4.4*	R6.2
Coldroom controller UR 141 NE UR 141 TE	R2.1	R4.1	R1.1	R5.1	R6.1	R2.2	R4.2	R1.2	R5.2	R6.2
Subcooler controller UK 100 E	--	R4.1**	R1.1	R5.1	R6.1	--	R4.2**	R1.2	R5.2	R6.2

* only UA 131 E LS

** = Sub cooler outlet temperature

6.11.1 Sensor identification

Legend: Ry.x		Function
y = Sensor type	1 2 4 5 6	Defrost sensor Supply air sensor Return air sensor/ room air sensor/ refrigerant temperature sensor (UK 100 E) Evaporator inlet sensor Evaporator outlet sensor
x = Case part	1 2	Sensor element zone 1 Sensor element zone 2

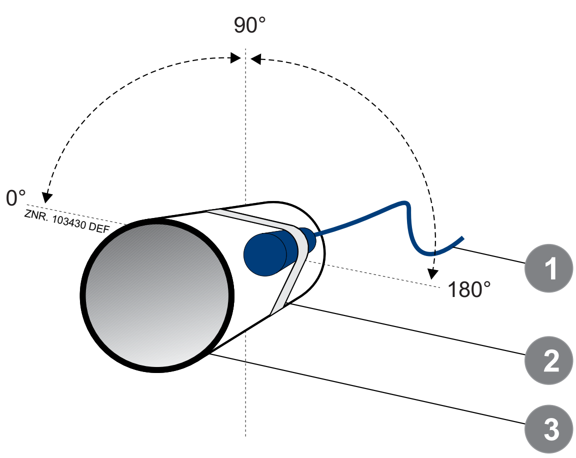


6.11.2 Instructions on sensor positioning

As a general rule, when positioning the sensor the recommendations of the respective case or evaporator manufacturer are to be followed.

The evaporator inlet or outlet sensor (1) should be attached to the upper surface of the pipe (3) with a metal pipe clip (2). Care is to be taken that there is a good temperature change response and that the sensor is insulated following attachment.

☞ The ideal position of the sensor is between 0 and 180°:



1: Temperature sensor
2: Metal pipe clip
3: Injection pipe / suction pipe

Danger of incorrect temperature measurements! As a general rule, plastic cable straps should not be used as they loosen over time leading to false temperature measurements which can have a negative effect on the superheat regulation.

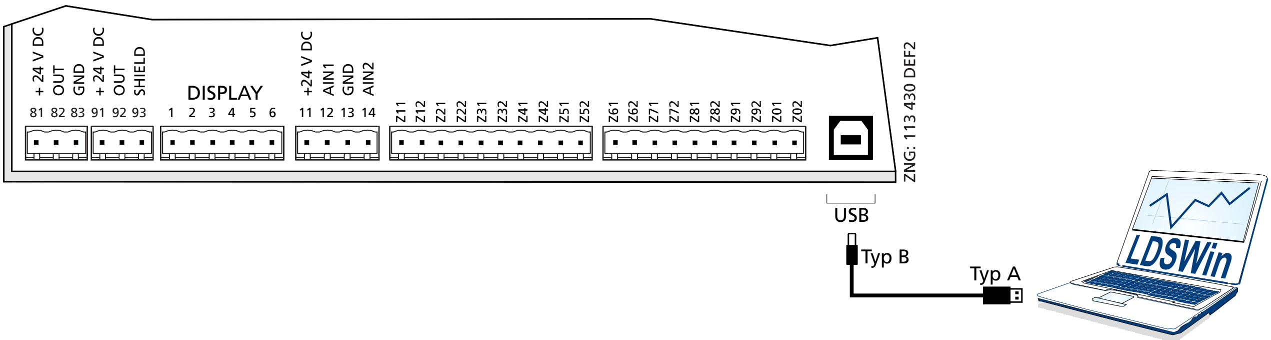
6.12 Terminal assignment of the USB interface

The USB interface is used for
1. The direct parameterisation of the case controller via LDSWin, or

2. For carrying out a firmware update of the case controller, or

3. The parameterisation of system components via CAN bus using LDSWin (USB2CAN). Furthermore it will be possible to read out the operating data of the case controller via a PC equipped with LDSWin.

For further information on the connection to LDSWin see the LDSWin operation instruction.



If the controller is connected to a PC via USB and/or any data exchange is taking place via the USB interface, the green USB LED lights; see chapter 5.5.1 "Status LEDs" for details.
A USB A-B cable (accessory) is required for the connection to a PC. For further information on the connection to LDSWin see the LDSWin operating instruction. A detailed description of the firmware update is contained in chapter 5.10.

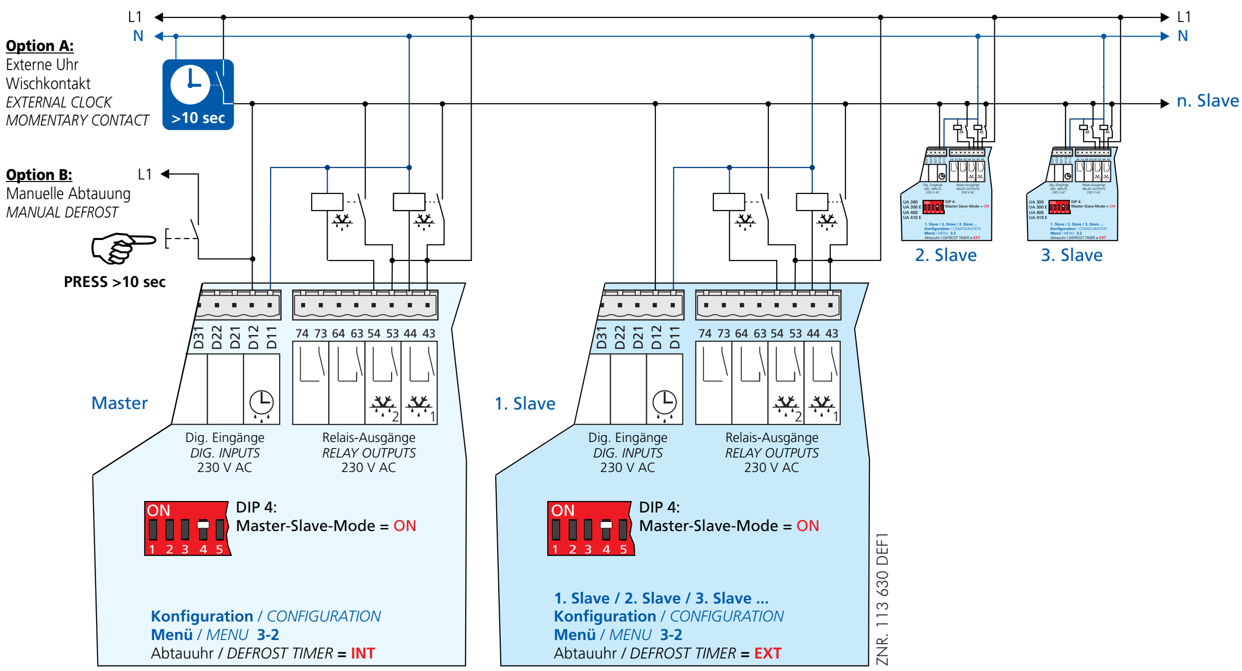
6.13 Wiring of the master-slave function for defrost synchronisation

For defrost synchronisation via wiring the auxiliary contactors of the master defrost relay are switched in parallel and then routed as a 230 V signal to the slave's external defrost input (terminals D11/D12). The auxiliary contactors of the slave controller are also connected in parallel and conducted back as a 230 V level to the external defrost input of the master. This enables the software to determine whether defrosting is still taking place in associated case controllers.

Warning - hazardous electrical voltage!
Danger of electric shock! BEFORE and AFTER connection it must checked that the 230 V AC digital inputs are off load!

The description and operating instructions for the master-slave mode via wiring are contained in chapter 4.5.4.

Basic diagram for wiring between one master and **one** or **more** slave case/coldroom controllers:



Danger of short circuit! When wiring master and slave case/coldroom controllers, make sure that power supply is made with only **one** phase (e.g. only through L1, see illustration)!

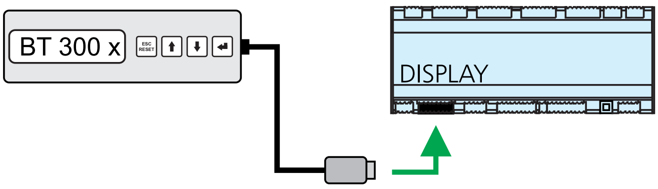
Defrosting is terminated by the software not later than when the set safe defrost time expires. The external clock must be wired as a passing contact as it only provides the start signal for the defrosting. The shutdown is entirely managed by the participating controllers according to their safe defrost time.

7 Operation of UA 400 E / UA 410 E

7.1 Operation possibilities

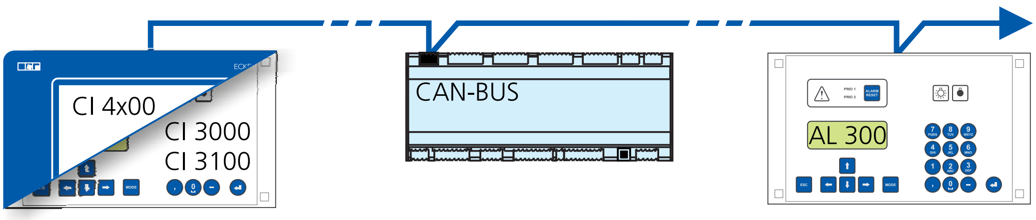
The controller provides menus and screens for the display and adjustment of values. However, no operation for this is provided on the controller itself. The actual operation of these menus is performed externally using the following possibilities:

- **Local operation with a BT 300 x operator interface:** The operation is performed directly on-site at the controller with an operator interface of the BT 300 series.



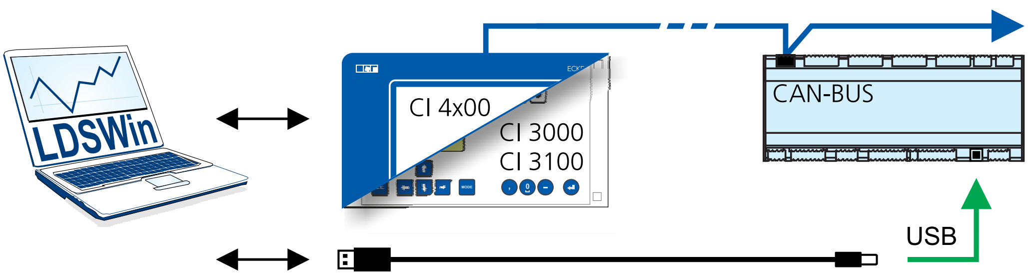
See chapter 7.2 for details for the operation.

- **Remote control via the terminal:** The controller can be operated remotely (e.g. from the machine room) using the system centre, a store computer or an operator terminal. The communication with the controller is performed via the CAN bus



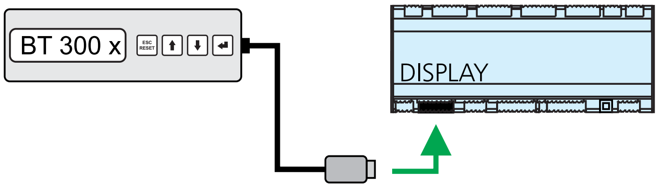
See chapter 7.3 for details for the operation.

- **Remote control with PC software LDSWin:** A PC with LDSWin installed is connected to the system centre or the store computer. The connection can be made here, for example, via the serial interface, a modem, a network or the PC-CAN bus adapter. In this way, the controller can be operated very conveniently with the PC software and its powerful functions such as controller analysis, evaluations, storing parameter sets, creating lists, etc.



See the LDSWin operating instruction for details about the range of functions.

7.2 Local operation with a BT 300 x operator interface



An operator interface in the BT 300 series is connected locally via the DISPLAY interface. Thereby, the controller can be operated standalone as shown or also connected to the CAN bus.

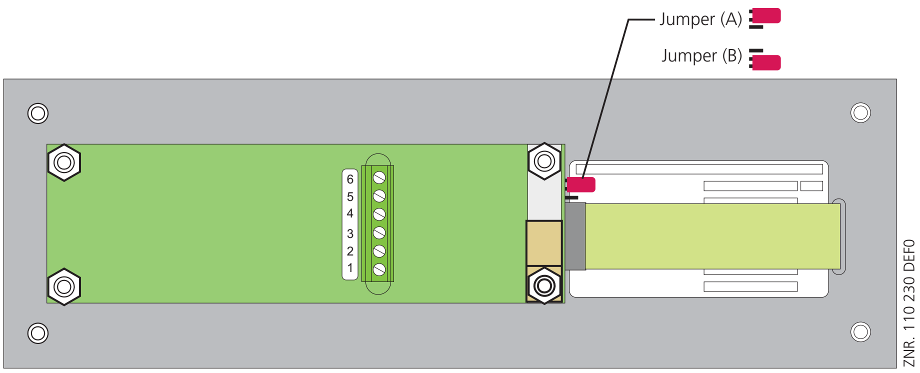
The operation here largely corresponds to the possibilities as described for the system centre, the store computer and the operator terminal; see chapter 7.3.1 for details.

If no buttons are pressed, the display of the BT 300 x operator interface shows the name of the controller and its position designation. The ENTER button (↵) must be tapped to return from the display of the operating status back to the Operation menu.

Device-specific limitations arise due to the smaller display (only 2 rows x 20 characters) and fewer buttons as compared with the system centre, the store computer and operator terminal.
Operation with a system centre, store computer, operator terminal or the PC software LDSWin provides more functional possibilities.
Technical details about the operator interfaces can be found in their operating instructions.

7.2.1 Lock-down of the setpoint change

The operator interfaces of the BT 300 series can be locked using a jumper on the circuit board so that all actual values, parameters, temperatures and statuses can be viewed, but so that it is no longer possible to adjust the setpoints of the respective controller.



Jumper setting A: with setpoint change
Jumper setting B: without setpoint change

The operator interfaces are set to the jumper position A (with setpoint change) at the factory.

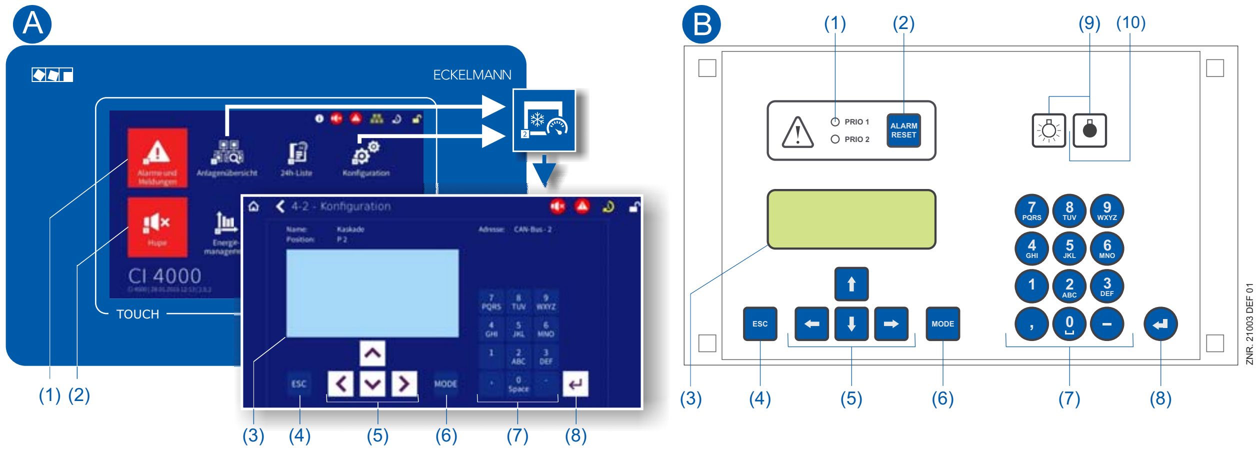
If operator interfaces are mounted in areas accessible to the public, i.e. on serving counters for the sales personnel, the jumper position **B** should be selected (without setpoint change).

7.3 Remote control via a terminal

Further details for the operation of a system centre, store computer or operator terminal can be found in their operating manuals.

For the remote control of a controller, it makes no difference whether this is done with a system centre (A), a store computer or with an operator terminal (B) as the user interfaces on the terminals are almost identical and the same functions are available. See chapter 7.3.2 for details about remote control.

The system centre only emulates the "hardware front" of its "store computer" predecessor or of the operator terminal by software on its touchscreen which is demonstrated by the following comparison between the terminals of the CI 4x00 and CI 3x00 / AL 300:



(1) CI 4x00: "Alarms and messages" button in the main menu for display of whether alarms are pending.

Alarms are acknowledged in the "alarm list".

CI 3x00 / AL 300: Red LED signal lamps to indicate whether alarms are pending.

(2) CI 4x00: "Horn" button in the main menu for muting of the buzzer and for reset of the AUX relay.

CI 3x00 / AL 300: Button for muting of the buzzer, for reset of the AUX relay* and for acknowledgement of alarms.

(3) Display (4 lines x 20 characters) for display of the menu of the controller.

(4) **ESC** button

(5) Cursor buttons

(6) **MODE** button for, e.g. toggle upper case / lower case for text input.

(7) Alphanumeric keypad

(8) **ENTER** button (↵)

Only CI 3x00 / AL 300:

(9) On/Off button for, e.g. lighting

(10) Green LED signal lamp for status indicator whether the button is activated (then green) or deactivated.

7.3.1 Menus and operating screens

If the system centre, store computer or operator terminal remain locked down, settings on the controller are read-only.
Changes and inputs are not possible. However, if any parametrisation is required, the lock-down for the input must be removed first, see chapter 7.3.3.

Numbering of menus and screens:

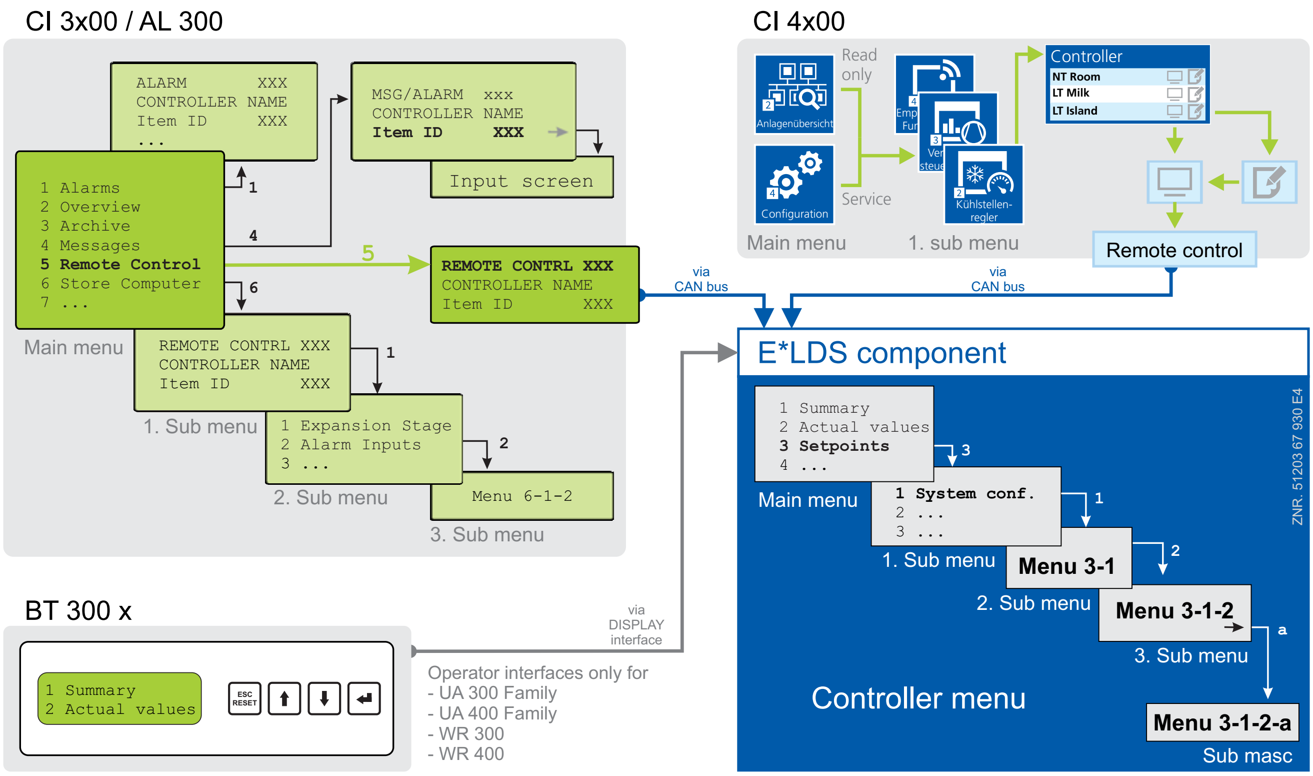
Every menu in the menu tree can be reached using a specific number and every operating screen in a menu can be reached using a specific selection in the menu. This is identified in the operating manual by a unique identifier of digits (and letters if necessary) in the menu tree (e.g. Menu 3-1-2-a). Thereby, the digits 1, 2, .. stand for the identification of the corresponding menu, and the letters a, b, .. stand for the sequence of the corresponding operating screens in the menu.

Example for the numbering of a menu / screen

Any reference to, for example Menu 3-1-2 in the operating manual means that the required menu of the E*LDS component is called by entering the digits or selection of "3 - 1 - 2" via the remote control in the system centre, store computer or operator interface. The menu item "Remote control" is the interface for the E*LDS controller; see chapter 7.3.2 for details.

If any letter is appended (e.g. Menu 3-1-2-a), this means that another submenu (operating screen or selection list) can be reached using the cursor right button (→). The letters indicate their sequence in the screen.

If any menu or operating screen consists of more lines than are possible in the display, scrolling is possible using the cursor buttons (↑) and (↓).



In contrast to the system centre, store computer or operator terminal,
the menu of the controller is displayed directly on the operator interface.

Menus

A menu can contain up to ten menu items (0 .. 9; 0 for menu item 10). After the selection of a menu item using the cursor buttons (↑) and (↓) and by tapping the ENTER button (↵) or by tapping the buttons 0..9), other sub-menus or operating screens are displayed.

Selection of the menu items

Each line of this selection list in the display has a digit between 1 and 9 and 0 for menu item 10 with the associ-ated name of the corresponding menu item. The various menu items can be selected directly by tapping the digit buttons 0 .. 9.

If a menu provides more than 3 submenus, the cursor buttons (↑) and (↓) can be used for paging in the menu to display the remaining menu items.

☞ A menu item can be selected by pressing the respective numeric key regardless of whether the item itself is visible on the display.

Screens

An operating screen shows values for output and/or input. There may be more values for output and/or input than fit into the display at one time. The cursor keys can be used to scroll through these additional values. The screen may also contain more than one page, in which case the pages can be viewed one at a time.

☞ Arrows appear on the right of the display to indicate whether you can scroll or page through a menu or screen.

Scrolling

Using the cursor buttons (↑) and (↓)

- scrolling can be line by line, e.g. for selection of a variable in a line from a list of predefined variables.
- scrolling can be block by block so that values can be shown that cannot be displayed with the others due to the limited capacity of the display

Paging

If an operating screen contains multiple pages (e.g. the alarm list), these can be paged through using the cursor buttons (←) and (→). In menus that provide more than 3 submenus, these can be paged through using the cursor buttons (↑) and (↓) to display the remaining menu items.

MODE + 9 three lines upwards and
MODE + 3 three lines downwards

Input of values and text

Select the required line using the cursor buttons (↑) and (↓) and then tap the ENTER button (↵). The cursor jumps to the input field. Values can now be entered and changed using the cursor buttons (↑) and (↓) or digit buttons.
If the cursor buttons (↑) and (↓) are kept pressed, the adjustment is made in high speed mode.

Deleting input text

The **MODE** button and **-** must be pressed simultaneously to delete the complete text line.
A character is deleted using the button combination **MODE** and **,** .

Cancelling of an entry

The entry of a value can be cancelled by tapping the **ESC** button. The value is not applied.

Entering text

In fields that allow text entry, text can also be entered by the alphanumeric keypad. Repeatedly press the numeric keys to generate letters. Press the ENTER key (↵) to confirm the entered value or text.

Key	Letter/Character
0	äöüß0, space character
1	1
2	abc2
3	def3
4	ghi4
5	jkl5
6	mno6
7	pqrs7
8	tuv8
9	wxyz9
-	. _ -
,	Insert space character

☞ Upper case and lower case can be toggled by tapping the **MODE** button.

Exit from the menus and operating screens

Press the **ESC** key to exit the menu or screen you are in at any time. This returns you to the next higher menu. All menus and screens are closed automatically if no key is pressed for 10 minutes. The display then jumps to the Main Menu or to the Alarm menu if any fault report is currently active (only CI 3x00 / AL 300).

7.3.2 Calling the controller menu via remote control

☞ If the system centre, store computer or operator terminal remains locked down, settings on the controller are read-only. Changes and inputs are not possible.

However, if any parametrisation is required, the lock-down for the input must be removed, see chapter 7.3.3.

Tip: Detailed descriptions for the basic configuration of the controller and its position designation or about the settings of important parameters can be found in chapter 5.6.

7.3.2.1 System Centre CI 4x00

The terminal for remote control of the controller (Menu 2-2 or Menu 4-2) is called in the system centre as follows:

Step 1: Tap "**2 - System overview" or "4 - Configuration**" in the main menu.
If "2" is selected, the values below are only displayed as read-only,
for "4", lock-down must previously be removed by logging in (see chapter 7.3.3) so that settings below can be made.

Step 2: Tap "**2 Case controllers**" and select the required controller in the list that is then displayed using the cursor buttons (↑) and (↓). In the screen that opens, the
name, position designation and the alarm priority of the controller can be input as required.

Step 3: The main menu of the controller is then displayed by tapping the "**Remote control**" button:

7.3.2.2 Store computer CI 3x00 / operator terminal AL 300

The main menu of the controller is called in the store computer or operator terminal as follows:

Step 1: Select the submenu "**5 Remote control**" in the main menu (see graphic).

```
Main menu
4 Messages                     ↑
5 Remote control
6 Store computer               ↓
```

Step 2: Select the required controller using the cursor buttons (↑) und (↓) or
by input of the CAN bus address (node number nnn) using the digit buttons.
Thereby, the following screen is displayed:

```
REMOTE CONTROL   Kn.nnn
Node Name                      ↑
Item ID                  XXXXX↓
```

Step 3: The main menu of the controller is then displayed in the terminal by tapping the **ENTER** button

```
KÜHLSTELLE          Pos: XXXXX
1 Istwerte ↑
2 Sollwerte
3 Uhr                          ↓
4 Meldungen
5 Archiv
6 Konfiguration                ↓
```

7.3.3 Deactivating the input lock-down

Operation via system centre, store computer or operator terminal is only possible for controllers with CAN bus connection; the removal of the lock-down is then applicable for all components in the CAN bus system. The lock-down is automatically reactivated 15 minutes after the last button tap.

☞ The release of the lock-down must only be carried out by service personnel.

Before entering values, the input lock-down must be removed as follows:

7.3.3.1 System centre CI 4x00

Login to and logout (unlock and lock-down) of the system centre:

7.3.3.2 Store computer CI 3x00 / operator terminal AL 300

Before entering values, the input lock must be removed from the store computer or operator terminal as follows:

Step 1: Select menu item 9 "Parametrisation" in the main menu.

Step 2: Select menu item 3 "Lock-down" in this menu.

Step 3: **A. Unlocking store computer (standard)**
Tap the ENTER button (↵) to set the marker (√).
The lock-down has now been deactivated and it is possible to make settings.

or

B. Unlocking store computer and activating Superuser mode (Superuser permissions)
Input current date backwards (nothing is shown on the display).
Example: The current date is April 17, 2016, i.e. 17/04/16;
the required input for enabling Superuser permissions is then 614071.

Confirm the input with the **ENTER** button (↵); an "**S**" is shown on the display.

Step 4: Exit the operating screen and return to the main menu by tapping the **ESC** button twice.

☞ **Tip:** If you are already in the user interface of a CAN bus node but have forgotten to release the input lock-down, you can unlock the input lock-down for this controller using the button combination **MODE** and ,. The input lock-down is active again as soon as you exit the user interface of the controller.

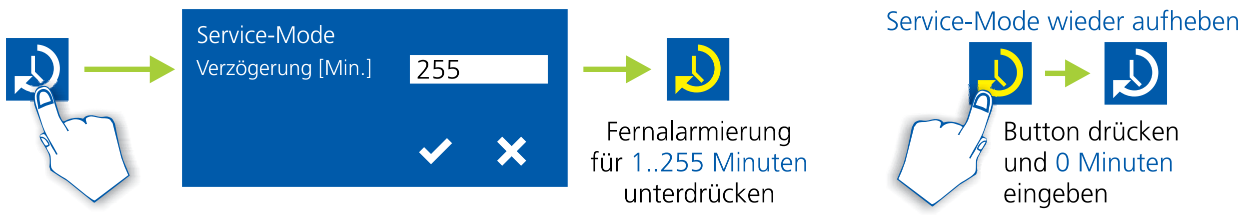
7.3.4 Activating service mode

For repair and maintenance work, service personnel can deactivate the remote alarm function of the system centre and of the store computer for a limited period using the service mode.

The activation of the service mode must only be carried out by service personnel.
If there are still pending alarms (with the priority 1..2) after the time of the Service Mode has elapsed, the audible warning devices and the alarm relays are activated and the alarms are forwarded using the automatic transmission of alarms.

7.3.4.1 System centre CI 4x00

Activating/deactivating service mode



The service mode can only be activated if the system centre has previously been unlocked; see chapter 7.3.3.1.

7.3.4.2 Store computer CI 3x00

Activating/deactivating service mode

Step 1: Select menu item 9 "Parametrisation" in the main menu.

Step 2: Select menu item 3 "Lock-down" in this menu.

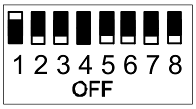
Step 3: Tap the buttons **MODE + ENTER** (↵) simultaneously to open the screen for the suppression of the remote alarm signalling and input the service duration (1..255 minutes).
The service mode is now activated for the duration entered above.

Step 4: The service mode can be reset / revoked again by the input of 0 minutes.

Notice:

8 Menu structure UA 400 E / UA 410 E

8.1 Contr. Type UA 121 E - Menu Tree



1: **ON**
2: **OFF**
3: **OFF**
4: **ON/OFF = Master-/Slave-Modus ON/OFF**
5..8: **OFF**

Level 1	Level 2	Level 3	Menu No.	Menu Name
Main Menu			0	REFR. PT.
Actual Values			1	ACT VALUES
	Temperature Sensors		1-1	TEMPERATUR
	Cooling Zone 1		1-2	COOLING 1
	Defrost Zone 1		1-3	DEFROST 1
	--			
	Alarm		1-5	ALARM
	Frame Heater		1-6	MODE
	Cooling Zone 2		1-7	COOLING 2
	Defrost Zone 2		1-8	DEFROST 2
Setpoints			2	SETPOINTS
	Cooling		2-1	COOLING
		Zone 1	2-1-1	COOLING 1
		Zone 2	2-1-2	COOLING 2
		Zone 1T Toggle	2-1-3	COOLING 1A
		Zone 2T Toggle	2-1-4	COOLING 2A
	Defrost		2-2	DEFROST
		Zone 1	2-2-1	DEFROST 1
		Zone 2	2-2-2	DEFROST 2
		Zone 1T Toggle	2-2-3	DEFROST 1A
		Zone 2T Toggle	2-2-4	DEFROST 2A

	Alarm		2-4	ALARM
		Zone 1	2-4-1	ALARM 1
		Zone 2	2-4-2	ALARM 2
		Zone 1T Toggle	2-4-3	ALARM 1A
		Zone 2T Toggle	2-4-4	ALARM 2A

Level 1	Level 2	Level 3	Menu No.	Menu Name
Setpoints	Frame Heater		2-5	FRAME HTR
		Frame Mode	2-5-1	MODE
		Frame Setpoints	2-5-2	SETPOINTS
		Toggle Mode	2-5-3	MODE ALT
		Setpoint Toggle	2-5-4	TOG. SETP.
Clock			3	Clock
	Current Time		3-1	CLOCK
	Defrost Timer		3-2	DEFR.TIMER
		Defrost Timer Z2	3-2-a	DEF.TIM.Z2
	Setpoint Toggle		3-3	TOGGLE
Messages			4	MESSAGES
	View Messages		4-1	MESSAGES
	Cancel Messages		4-2	MESSAGES
	Delete Messages		4-3	MESSAGES
Archive			5	ARCHIVE
Configuration			6	CONFIGURAT
	Refrigeration Point		6-1	REFR. PT.
	Controller		6-2	CONTROLLER
		Type and Version	6-2-1	VERSION
		Temperature Display	6-2-2	DISPLAY
		Alarm Delay	6-2-3	ALARMDELAY
		230V Inputs	6-2-4	230V INPUT
		Sensor Type	6-2-5	SENSORS
		Analog inputs*	6-2-6	ANALOG INPUTS
		EEV Controller Zone 1	6-2-7	EEV ZONE 1
		EEV Controller Zone 2	6-2-8	EEV ZONE 2
	Cooling		6-3	COOLING
	Language		6-4	LANGUAGE
	Alarm Priorities		6-5	ALARMPRIOS
	Em.Powersupply		6-6	EM.POW.SUP
	COPT+		6-7	COPT+

* Only UA 410 E AC

8.1.1 Menu 0 Main Menu

REFR. PT. POS: XXXXX	
1 Actual Values	Move to menu 1
2 Setpoints	Move to menu 2
3 Clock	Move to menu 3
4 Messages	Move to menu 4
5 Archive	Move to menu 5
6 Configuration	Move to menu 6

8.1.2 Menu 1 Actual Values

ACT VALUES POS: XXXXX	
1 Temp. Sensor	Move to menu 1-1
2 Cooling Zone 1	Move to menu 1-2
3 Defrost Zone 1	Move to menu 1-3
4	Not used with this controller type
5 Alarm	Move to menu 1-5
6 Frame Heater	Move to menu 1-6
7 Cooling Zone 2	Move to menu 1-7: Menu item is shown only whenn two-zone operation is set (Menu 6-1).
8 Defrost Zone 2	Move to menu 1-8: Menu item is shown only whenn two-zone operation is set (Menu 6-1).

- Menu 1-1 Temp. Sensor

TEMPERATUR XXXXX	
Temp. R2.1 XXX °C	Displays current supply air temperature Input Z11/Z12
Temp. R4.1 XXX °C	Displays current return air temperature Input Z21/Z22
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Temp. R5.1 XXX °C	Displays current evaporator inlet temperature Input Z41/Z42
Temp. R6.1 XXX °C	Displays current evaporator outlet temperature Input Z51/Z52
Temp. R2.2 XXX °C	Displays current supply air temperature Input Z61/Z62
Temp. R4.2 XXX °C	Displays current return air temperature Input Z71/Z72
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Temp. R5.2 XXX °C	Displays current evaporator inlet temperature Input Z91/Z92
Temp. R6.2 XXX °C	Displays current evaporator outlet temperature Input Z01/Z02
to VS corr. XXX °C	Displays current corrected suction pressure temperature on VS pack controller (assigned by Pack No.)
t0 locale Z1 xxx °C	Displays current t_0 $_t$emperature zone 1 [1)]
t0 locale Z2 xxx °C	Displays current t_0 $_t$emperature zone 2 [1) 2)]
tc xxx °C	Displays current tc $_t$emperature [1) 2)]
Humidite xx %	Displays current, relative humidity [1) 2)]

1): Only UA 410 E AC
2): The value is **only** recorded in the system centre / store computer via the CAN bus - it is **not** used for control purposes! Exception: Use of function „*toZ2Ctl.*“, parameter „*Fct. AIN2*“ (menu 6-2-6).

- Menu 1-2 Cooling Zone 1

COOLING 1 XXXXX	
Cooling XXX	Displays currentr OFF/ON status of cooling
op.deg. Z 1 XX %	Displays current valve opening degree Zone 1
OD med. 24h XX %	Displays mean valve opening degree Zone 1 for past day
Temp. R2.1 XXX °C	Displays current supply air temperature Input Z11/Z12
Setpoint R2.1 XXX °C	Displays supply air temperature setpoint for comparison
Hystersis R2.1 XXX K	Displays supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)
Temp. R4.1 XXX °C	Displays current return air temperature Input Z21/Z22
Setpoint R4.1 XXX °C	Displays return air temperature setpoint for comparison
Hystersis R4.1 XXX K	Displays return air temperature hysteresis setpoint; shown only when of-off control is set (Menu 2-1-1)
SH Z 1 XXX °C	Displays current superheat temperature Zone 1
sup air ctrl XXX	Displays current OFF/ON status of supply or return air control
MOP op. XXX	Displays OFF/ON setpoint of MOP mode
Status light XXX	Status lighting control (ON/OFF)

- Menu 1-3 Defrost Zone 1

DEFROST 1 XXXXX	
Defrost XXX	Displays current OFF/ON status of defrosting
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82; shown only when single-zone operation is set (Menu 6-1)
Def. End. Tmp. XXX °C	Displays defrost termination temperature setpoint for comparison
Wait Time XX m	Displays waiting time setpoint
Drip Time XX m	Displays drip time setpoint
Last Defrst XX hh:mm	Displays time (day, time of day) of last defrost cycle started
M/S Nof. Sl.	Number of parameterised and accessible MA slaves
M/S Lost Sl.	CAN address of the first MA slave which was not accessible during the last defrost
M/S Defr.Sl.	Number of slaves currently undergoing a defrost
M/S DSlMat	List of MA slaves currently undergoing a defrost (can be scrolled through using ENTER)
DSq Nof. Sl.	Number of DS slaves (only in the case of DS master)
DSq Lost Sl.	CAN address of the first FA slave which was not accessible during the last defrost
DSq Defr.Sl.	Number of slaves currently undergoing defrost
DSq DSlMat	List of FA slaves currently undergoing a defrost (can be scrolled through using ENTER)

- Menu 1-4 Not used with this controller type.

- Menu 1-5 Alarm

ALARM XXXXX	
Alarm Relay XXX	Displays current OFF/ON status of alarm output Terminal 15/16/18
Hi Temp Setp.1 XX °C	Displays high temperature setpoint Zone 1
Lo Temp Setp.1 XX K	Displays low temperature setpoint Zone 1
Hi Temp Setp.2 XX °C	Displays high temperature setpoint Zone 2; shown only when two-zone operation is set (Menu 6-1)
Lo Temp Setp.2 XX K	Displays low temperature setpoint Zone 2; shown only when two-zone operation is set (Menu 6-1)

- Menu 1-6 Frame Heater

MODE XXXXX	
Frame Heater XXX	Displays current OFF/ON status of frame heater output Terminal 91/92/93
Run Time XXX %	Displays current frame heater on time
Humidity XXX %	Displays current room air humidity (transmitted via CAN bus from VS pack controller with fitted humidity sensor)
Room temp. XX °C	Displays current room air temperature (transmitted via CAN bus from VS pack controller with fitted room air temperature sensor)

- Menu 1-7 Cooling Zone 2

COOLING 2 XXXXX	
Cooling XXX	Displays current OFF/ON status of cooling
op.deg. Z 2 XX %	Displays current valve opening degree Zone 2
OD med. 24h XX %	Displays mean valve opening degree 2 for past day
Temp. R2.2 XXX °C	Displays current supply air temperature Input Z61/Z62
Setpoint R2.2 XXX °C	Displays supply air temperature setpoint for comparison
Hysteresis R2.2 XXX K	Displays supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)
Temp. R4.2 XXX °C	Displays current return air temperature Input Z71/Z72
Setpoint R4.2 XXX °C	Displays return air temperature setpoint for comparison
Hysteresis R4.2 XXX K	Displays return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)
SH Z 2 XXX °C	Displays current superheat temperature Zone 2
sup air ctrl XXX	Displays current OFF/ON status of supply or return air control
MOP op. XXX	Displays OFF/ON setpoint of MOP mode

- Menu 1-8 Defrost Zone 2

DEFROST 2 XXXXX	
Defrost XXX	Displays current OFF/ON status of defrosting
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Def. End. Tmp. XXX °C	Displays defrost termination temperature setpoint for comparison
Wait Time XX m	Displays waiting time setpoint
Drip Time XX m	Displays drip time setpoint
Last Defrst XX hh:mm	Displays time (day, time of day) of last defrost cycle started

8.1.3 Menu 2 Setpoints

SETPOINTS POS: XXXXX	
1 Cooling	Move to menu 2-1; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-1-1
2 Defrost	Move to menu 2-2; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-2-1
3	Not used with this controller type
4 Alarm	Move to menu 2-4; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-4-1
5 Frame Heater	Move to menu 2-5

- Menu 2-1 Cooling

COOLING POS: XXXXX	
1 Zone 1	Move to menu 2-1-1
2 Zone 2	Move to menu 2-1-2
3 Zone 1T Toggle	Move to menu 2-1-3; not shown when setpoint toggle is deactivated (Menu 3-3)
3 Zone 2T Toggle	Move to menu 2-1-4; shown only when two-zone operation is set and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-1-1 Zone 1

COOLING 1 POS: XXXXX		Entry	Default
Setpoint R2.1 XXX °C	Supply air temperature setpoint	--, -10..20	-2 °C
Hystersis R2.1 X K	Supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	4 K
Setpoint R4.1 XXX °C	Return air temperature setpoint	--, -10..20	4 °C
Hystersis R4.1 X K	Return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	2 K
Superheat XXX K	Superheat setpoint Zone 1	0..20	6 K
Min. SH XX K	Minimum superheat setpoint, below which cooling relay switches off in Zone 1. I-sum (not I-part) is set to zero when the *Reset I-Sum* parameter is set to ON.	0..10	2 K
Two pos.ctrl XXX	Switch between on-off control (ON) and continuous control (OFF)	↑, ↓ (ON/OFF)	OFF
MOP-point XXX °C	Starting setpoint for MOP mode	--, -50..50	-- °C

- Menu 2-1-2 Zone 2

COOLING 2 POS: XXXXX		Entry	Default
Setpoint R2.2 XXX °C	Supply air temperature setpoint	--, -10..20	-2 °C
Hystersis R2.2 X K	Supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	4 K
Setpoint R4.2 XXX °C	Return air temperature setpoint	--, -10..20	4 °C
Hystersis R4.2 X K	Return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	2 K
Superheat XXX K	Superheat setpoint Zone 2	0..20	6 K
Min. SH XX K	Minimun superheat setpoint, below which cooling relay switches off Zone 2. I-sum (not I-part) is set to zero when the *Reset I-Sum* parameter is set to ON.	0..10	2 K
Two pos.ctrl XXX	Switch between on-off control (ON) and continuous control (OFF)	↑, ↓ (ON/OFF)	OFF
MOP-point XXX °C	Starting setpoint for MOP mode	--, -50..50	-- °C

- Menu 2-1-3 Zone 1T Toggle

COOLING 1A POS: XXXXX		Entry	Default
Setpoint R2.1 XXX °C	Supply air temperature setpoint	--, -10..20	0 °C
Hysteresis R2.1 X K	Supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	4 K
Setpoint R4.1 XXX °C	Return air temperature setpoint	--, -10..20	4 °C
Hysteresis R4.1 X K	Return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	2 K

- Menu 2-1-4 Zone 2T Toggle

COOLING 2A POS: XXXXX		Entry	Default
Setpoint R2.2 XXX °C	Supply air temperature setpoint	--, -10..20	0 °C
Hysteresis R2.2 X K	Supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	4 K
Setpoint R4.2 XXX °C	Return air temperature setpoint	--, -10..20	4 °C
Hysteresis R4.2 X K	Return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	2 K

- Menu 2-2 Defrost

DEFROST POS: XXXXX	
1 Zone 1	Move to menu 2-2-1
2 Zone 2	Move to menu 2-2-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-2-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-2-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-2-1 Zone 1

DEFROST 1 POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 5..20	8 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min
M/S Degiv.Fct. XXX	Configuration of the defrost via CAN bus function. For details see chapter 4.5.5.	OFF, MASTR, SLAVE	OFF
M/S CAN Adr. XXX	Selection of the controller (1..99) participating in the defrost via CAN bus which is the master. “--“, if this controller is itself master (Parameter *M/S Degiv.Fct.*. = MASTR)	---, 1..99	--
DS-Function XXX	Configuration of the defrost sequenz function (DS). For details see chapter 4.5.6.	OFF, MASTR, SLAVE	OFF
DS-Group XXX	Selection of which group a defrost sequenz of this controller (1..99) belongs to.	---, 1..99	--
DS-Master XXX	Selection of which controller (1..99) participating in the defrost sequenz is the master. “--“, if this controller is itself the master (Parameter *DS-Function* = MASTR)	---, 1..99	--
DS-Wait time XXXm	Wait time for the defrost sequenz	0..127	1 min

- Menu 2-2-2 Zone 2

DEFROST 2 POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 5..20	8 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min

- Menu 2-2-3 Zone 1T Toggle

DEFROST 1A POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 5..20	5 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min

- Menu 2-2-4 Zone 2T Toggle

DEFROST 2A POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 5..20	5 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min

- Menu 2-3 Not used with this controller type.

- Menu 2-4 Alarm

ALARM POS: XXXXX	
1 Zone 1	Move to menu 2-4-1
2 Zone 2	Move to menu 2-4-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-4-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-4-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-4-1 Zone 1

ALARM 1 POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	0..30	8 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	4 K

- Menu 2-4-2 Zone 2

ALARM 2 POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	0..30	8 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	4 K

- Menu 2-4-3 Zone 1T Toggle

ALARM 1A POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	0..30	8 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	4 K

- Menu 2-4-4 Zone 2T Toggle

ALARM 2A POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	0..30	8 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	4 K

- Menu 2-5 Frame Heater

FRAME HTR POS: XXXXX	
1 Mode frm htr	Move to menu 2-5-1
2 Setpoint frm htr	Move to menu 2-5-2
3 Mode altern.	Move to menu 2-5-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Setpoint altern.	Move to menu 2-5-4;not shown when setpoint toggle is deactivated (Menu 3-3)

- Menu 2-5-1 Frame Mode

Selection is made according to entry. Checkmark shows current setting.

MODE POS: XXXXX		Entry	Default
Fixed run time √		↲	√
Enthalpy-ctrl rtm		↲	

- Menu 2-5-2 Frame Setpoints

SETPOINTS POS: XXXXX		Entry	Default
Mod: xxxxxxxxxxxx	Displays set frame mode (Menu 2-5-1)		fixed run time
Run Time XXX %	Fixed on time, shown only when mode set to Fixed OT (Menu 2-5-1)	--, 0..100	100 %
emerg.run time XXX %	On time in loss of humidity or room air temperature (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-1)	--, 0..100	100 %
enthalp. offs. XXX %	Offset for on time when enthalpy control is activated (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-1)	-50..50	0 %
Invert Output xxx	Inversion of the function of the frame heater output (terminals 91/92)	↑, ↓, (ON/OFF)	ON

- Menu 2-5-3 Toggle Mode

MODE ALT. POS: XXXXX		Entry	Default
Fixed run time √		↲	√
Enthalpy-ctrl rtm		↲	

- Menu 2-5-4 Setpoint Toggle

TOG. SETP. POS: XXXXX		Entry	Default
Mod: xxxxxxxxxxxx	Displays set frame mode (Menu 2-5-3)		fixed run time
Run Time XXX %	Fixed on time, shown only when mode set to Fixed OT (Menu 2-5-3)	--, 0..100	100 %
emerg.run time XXX %	On time in loss of humidity or room air temperature (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-3)	--, 0..100	100 %
enthalp. offs. XXX %	Offset for on time when enthalpy control is activated (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-3)	-50..50	0 %

8.1.4 Menu 3 Clock

CLOCK POS: XXXXX	
1 Current Time	Move to menu 3-1
2 Defrost Timer	Move to menu 3-2
3 Toggle Setpoints	Move to menu 3-3

- Menu 3-1 Current Time

☞ Time is defined by time master (system centre / store computer / operator terminal) when CAN bus is connected. Any entry made will then be overwritten by the defined value.

CLOCK POS: XXXXX		Entry	Default
Date: XX dd.mm.yy	Display and entry of current weekday, date	dd.mm.yy	
Time: hh.mm	Display and entry of current time	hh.mm	
Daylight Saving X	Display and entry of automatic daylight saving time change (Y/N)	↑, ↓, (Y/N)	Y

- Menu 3-2 Defrost Timer

DEFR.TIMER POS: XXXXX		Entry	Default
Defrost Timer XXX	Defrost initiation via Input D11/12 (EXT) or internal (INT)	↑, ↓, (EXT, INT)	INT
Safe Defr Time XXX m	Safe defrost time, i.e. max. allowed duration of defrosting (internal defrost only)	0..120	60 min
Manual Defrost XXX	Status (ON/OFF) of auxiliary manual defrost *)	↑, ↓, (ON/OFF)	OFF
Def.Tim.Z2 →	Separate defrost timer for zone 2	Menu 3-2-a	
Defr. 1 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter *defrost timer* = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 01:00
Defr. 2 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter *defrost timer* = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 07:00
Defr. 3 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter *defrost timer* = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 13:00
Defr. 4 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter *defrost timer* = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 19:30
...			
Defr. 14 xxxxx hh:mm			

☞ *) Parameter is automatically set to ON at first start for the duration of the safe defrost time.

- Menu 3-2-a Def.Tim.Z2

DEFR.TIMER POS: XXXXX		Entry	Default
Defrost Timer XXX	Setting for how temperature zone 2 should defrost: - MitZ1 Together with zone 1 - INT Internally - EXT Externally – the defrost of both temperature zones is started simultaneously via the external signal	↑, ↓, (ViaZ1(ViaZ1, EXT, INT)	ViatZ1
Safe Defr Time XXX m	Safe defrost time, i.e. max. allowed duration of defrosting (internal defrost only)	0..120	60 min
Manual Defrost XXX	Status (ON/OFF) of auxiliary manual defrost *)	↑, ↓, (ON/OFF)	OFF
Defr. 1 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter *defrost timer* = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 01:00
...			
Defr. 14 xxxxx hh:mm			

- Menu 3-3 Toggle Setpoints

TOGGLE POS: XXXXX		Entry	Default
Status XXX	Status (ON/OFF) of setpoint toggle for alternative set of setpoints (setpoint set toggle)		
Toggle Setp. XXX	Setpoint toggle via - EXT digital input D21/22 - INT internal timer - CAN CAN bus - „--“ deactivated	↑, ↓, (EXT, INT, CAN, --)	EXT
Blind On Time X s	Time for shutdown fan and cooling after toggling to alternative set of setpoints with external setpoint toggle (Menu 3-3)	0..250	50 sec
Toggle interv. X m	The interval for the cyclical toggling between standard and alternative setpoint data records; only appears when the internal setpoint toggling is activated (menu 3-3).	--, 10..60	-- min
Alt ON: xxxxx hh:mm	Start time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Lu-Di 21:00
AltOFF: xxxxx hh:mm	End time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Lu-Di 05:00
Alt ON: xxxxx hh:mm	Start time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Di 05:00
AltOFF: xxxxx hh:mm	End time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Di 21:00
...	A total of 7 different ON, OFF toggle times can be entered. Toggle time will only be obeyed when a **matched pair** of ON and OFF time is set.		

8.1.5 Menu 4 Messages

MESSAGES POS: XXXXX	
1 View	Move to menu 4-1 View Messages
2 Acknowledge	Messages in log are cancelled, press ESC to exit after cancel is confirmed
3 Delete	Move to menu 4-3

- Menu 4-1 View Messages

MESSAGES POS: XXXXX	
Error text 1:	Fault message Fault 1
dd.mm.yy hh:mm ON	Start of Fault 1
dd.mm.yy hh:mm OFF	End of Fault 1 (only when Fault 1 has ended)
...	
Error text n:	Fault message Fault n
dd.mm.yy hh:mm ON	Start of Fault n
dd.mm.yy hh:mm OFF	End of Fault n (only when Fault n has ended)

- Menu 4-2 Cancel Messages

This diplays the *Alarms Cancelled!* message.

- Menu 4-3 Delete Messages

MESSAGES POS: XXXXX		Entry
Delete ! Are you sure ? NO: ESC YES: ↲	Safety prompt for deleting messages; press ESC to exit after confirming or cancelling delete	↲, ESC

8.1.6 Menu 5 Archive

ARCHIVE POS: XXXXX	
dd.mm.yy hh:mm	Time of archiving Data RecordTime of archiving Data Record 1
Zone 1: abcdef x °C	Status and temperature of Zone 1, see note *)
Zone 2: abcdef x °C	Status and temperature of Zone 2, see note *); shown only when two-zone operation is set (Menu 6-1)
...	
dd.mm.yy hh:mm	Time of archiving Data Record n
Zone 1: abcdef x °C	Status and temperature of Zone 1, see note *)
Zone 2: abcdef x °C	Status and temperature of Zone 2, see note *); shown only when two-zone operation is set (Menu 6-1)

*) Status abcdef covers following states of refrigeration point. The entry at this position is - when a state is not active.

Example `Zone 1: abcdef x °C`

	Single-zone operation resp. Operator interface BT 300	Two-zone operation
a	O = Operation	O = Operation
b	R = Refrigeration / Cooling	R = Refrigeration / Cooling
c	R = Refrigeration/ Cooling	D = Defrost
d	D = Defrost	G = Gate / Door (coldroom controller only)
e	G = Gate / Door (coldroom controller only)	A = Alarm
f	A = Alarm	

8.1.7 Menu 6 Configuration

CONFIGURAT POS: XXXXX	
1 Refriger. Point	Move to menu 6-1
2 Controller	Move to menu 6-2
3 Cooling	Move to menu 6-3
4 Language	Move to menu 6-4
5 Alarm priorities	Move to menu 6-5
6 Em.Powersupply	Move to menu 6-6
7 COPT+	Move to menu 6-7

- Menu 6-1 Refrigeration Point

REFR. PT. POS: XXXXX		Entry	Default
Refr. Pt. Name:	Text only		
xxxxxxxxxxxxxxx	Free text entry describing refrigeration point (see note at end of table)		Case Controller
Item ID: XXXXX	Free text entry shown after Position (POS:) in screens (see note at end of table)		UA400
Priority: XX	Priority of alarms in failure of refrigeration point or when setting global controller priority (Menu 6-5)	↑, ↓, or numbers (0..99)	1
Refr. Sys. No.: XX	Pack No. of pack controller assigned to case controller. The case controller cannot receive the suction pressure value for control functions before the Pack No. of the associated pack controller has been selected on the case controller	↑, ↓, or numbers (--, 1..9)	--
Refr. Sys. Type XXX	Allocation to compressor pack. Parameter only required for linking to VS 3010 BS with several zones. Deactivate this parameter (---) when using pack controllers of other type.	↑, ↓, or numbers (---, Z1, Z2)	---
Temp. Zones X	Number of temperature zones. Single-zone operation Two-zone operation	↑, ↓, or numbers (1, 2)	2
No. Sensors XX	Displays number of temperature sensors connected. After pressing ↵, sensor scan is performed and number of sensors is redefined.	↵	

It must be ensured that the correct pack number has been selected, i.e. the correct Refr. Sys. type has been set, otherwise this can result in damage to the installation or goods. Furthermore, the parameter *Corr.off* t_0 (menu 6-3) must not be set to ”--” if the t_0 from the pack controller is to be used for regulating.

A meaningful name that describes the refrigeration point in more detail should be entered, e.g. Cheese Counter 2 and CC2. Entry is made in the screens on system centre, store computer or operator terminal. Direct entry cannot be made in the controller screens displayed on the operator terminal. Entry cannot be made either on operator interface BT 300.

- Menu 6-2 Controller

CONTROLLER POS: XXXXX	
1 Type and Version	Move to menu 6-2-1
2 Temp. Display	Move to menu 6-2-2
3 Alarm Delay	Move to menu 6-2-3
4 230V Inputs	Move to menu 6-2-4
5 Sensor Type	Move to menu 6-2-5
6 Analog inputs	Move to menu 6-2-6
7 eev ctrlr zone1	Move to menu 6-2-7; shown only when Superuser mode is activated system centre / store computer / operator terminal (see Section Operation)
8 eev ctrlr zone2	Move to menu 6-2-8; shown only when Superuser mode is activated system centre / store computer / operator terminal (see Section Operation)

- Menu 6-2-1 Type and Version

VERSION POS: XXXXX		Entry	Default
Ctrlr. Type XXXXXXX	Set on DIP Switch S3		UA121E
Software Ver.: XXXX	Software version of case controller		
Serial No.: XXXXXX	Device No. of case controller (from EEPROM)		
Master/Sl. Mode XXX	Synchronized defrosting in master/slave mode	↑, ↓, (ON/OFF)	OFF

- Menu 6-2-2 Temperature Display

DISPLAY POS: XXXXX		Entry	Default
Offset XX K	Offset for temperature display	-10..10	0 K
Alarmsymbol X	Display alarm symbol on BT 30 Temperature Display	↑, ↓, (Y/N)	N

- Menu 6-2-3 Alarm Delay

ALARMDELAY POS: XXXXX		Entry	Default
Sensor Fault XX m	Sensor break alarm delay	0..30	15 min
High/Low Temp. XX m	High/low temperature alarm delay	0..120	60 min
No Defrost XX h	No defrost alarm delay	--, 2..168	24 h
Selfholding X	Alarm latching with manual alarm cancelling (YES) or automatic cancelling on send (NO)	↑, ↓, (Y/N)	N

- Menu 6-2-4 230V Inputs

Only trained personnel should be allowed to change digital inputs, as chenges can affect other functions.

230V INPUT POS: XXXXX		Entry	Default
Entry1: XXXXXXXXXX	Function of digital input 1 D11/D12	1)	DEFR.TIMER
Entry2: XXXXXXXXXX	Function of digital input 2 D21/D22	2)	TOGGLE SETP.
Entry3: XXXXXXXXXX	Function of digital input 3 D31/D32	3)	MANUAL OFF.
Entry4: XXXXXXXXXX	Function of digital input 4 D41/D42	4)	Extern.Alarm
XXXXXXXXXXXXXXXXXXX	Freely configurable alarm text for digital input 4, the default text is “CO2-Alarm”	Text	CO2-ALARM
Inv. D1 XXX	Inverting of digital input 1	↑, ↓, (ON/OFF)	OFF
Inv. D2 XXX	Inverting of digital input 2		OFF
Inv. D3 XXX	Inverting of digital input 3		OFF
Inv. D4 XXX	Inverting of digital input 4		OFF

Possible settings for the digital inputs:

1)	DEFR.TIMER	Defrost timer*
	MANUAL OFF.	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
	TOGGLE SETP.	Toggle setpoint
2)	TOGGLE SETP	Toggle setpoint *
	MANUAL OFF	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
3)	MANUAL OFF	Manual shutoff both zones *
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
4)	EXT ALARM	External Alarm *
	MANUAL OFF	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
	TOGGLE SETP	Toggle setpoint

* Factory setting

- Menu 6-2-5 Sensor Type

Selection is made according to entry. Checkmark shows current setting

SENSORS POS: XXXXX		Entry	Default
L243 √	Temperature range -50 °C .. 50 °C	↵	√
K277	Temperature range -50 °C .. 50 °C	↵	
5K3A1	Temperature range 0 °C .. 100 °C	↵	

- Menu 6-2-6 Analog inputs

ANALOG INPUTS POS: XXXXX		Entry	Default
AIN1 activ x	Analogue input Z1 use (=Y) do not use (=N)	(Y,N)	N
Refrig.Z 1 xxxx	Selection of refrigerant zone 1	None R404A .. R600a*	None
LP Z1 Min xxx bar	Smallest pressure value for pressure monitoring at 4mA	0.0 .. 2.0 bar	0.0 bar
LP Z1 Max xxx bar	Largest pressure value for pressure monitoring at 20 mA	8.0 .. 200.0 bar	10.0 bar
AIN1 Send CAN	This parameter is used to instruct the case controller to make the local t0 (AIN1) available via CAN bus. ONLY possible when the parameter AIN1 active = Y	(Y,N)	N
AIN1 Rcv. CAN xx	CAN bus address of the remote case controller from which the t_0 is received.	1..99	--
AIN1 Rcv. Inp x	This parameter is used to specify the zone from which the t0 is taken. (refers to the parameter *AIN1 Rcv. Inp*)	1,2	1
AIN2 activ x	Analogue input Z2 use (=Y) do not use (=N)	(Y,N)	N
Refrig.Z 2 xxxx	Selection of refrigerant zone 2	None R404A .. R600a*	None
Fct. AIN2 xxxxx	Function of the analogue input zone 2 t0Z2 For recording only t0Z2ctl For regulation	t0Z2, toZ2ctl, Humidity, tc	
HP Z2 Min xxx bar	Smallest pressure value for pressure monitoring at 4mA	0.0 .. 2.0 bar	0.0 bar
HP Z2 Max xxx bar	Largest pressure value for pressure monitoring at 20 mA	8.0 .. 200.0 bar	10.0 bar
AIN2 Send CAN	This parameter is used to instruct the case controller to make the locally measured value of analogue input 2 (AIN2) available via CAN bus. ONLY possible when the parameter AIN2 active = Y	(Y,N)	N
AIN2 Rcv. CAN xx	CAN bus address of the remote case controller which provides the locally measured analogue value.	1..99	--
AIN2 Rcv. Inp x	This parameter is used to specify the zone from which the locally measured analogue value is taken. (refers to the parameter *AIN2 Rcv. Inp*)	1,2	2

* Supported refrigerants:
R404A, R744 (CO_2), R134a, R410A, R717 (NH_3), R22, R290, R407C, R507, R1270, R402A, R502, R407F, R422A, R422D, R408A, R407D, R407A, R427A, R438A*, R152a, R170, R600, R600a

Praxis tip using the example of the ”connection of a pressure transmitter - 1 .. 7 bar”:
Here the indication on the pressure transmitter is clear (-> -1 bar) relative to the ambient pressure The adjustment of the pressure transmitter in the controller is carried out using absolute pressure values (the absolute pressure cannot be negative). In order to parameterise the above pressure transmitter with the relative pressure indication - 1 bar (at 4 mA, i.e. 0 V) at 7 bar (at 20mA, i.e. 10 V) the ambient pressure (1 bar) must be added.
The entry is carried out as follows: 0..8 bar.

- Menu 6-2-7 EEV Controller Zone 1

This menu is only visible if
- the “Master” mode is activated in the system centre, i.e.
- the “Superuser mode” is activated in the store computer.
For details see the Operation chapter.

EEV ZONE 1	POS: XXXXX		Entry	Default
Pc Z 1:	XX.XX	Temperature control Zone 1, P-part	0..99.99	7.00
Ic Z 1:	XX.XX	Temperature control Zone 1, I-part If parameter I_c is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.30
Dc Z 1:	XX.XX	Temperature control Zone 1, D-part	0..99.99	5.00
offs OD cab.	XX %	Percentage valve opening degree offset for temperature control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	30 %
Psh Z 1:	XX.XX	Superheat control Zone 1, P-part	0..99.99	5.00
Ish Z 1:	XX.XX	Superheat control Zone 1, I-part If parameter I_{sh} is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.10
Dsh Z 1:	XX.XX	Superheat control Zone 1, D-part	0..99.99	5.00
offs OD SH	XX %	Percentage valve opening degree offset for superheat control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
emerg.c-o OD	XX %	Maximum valve opening degree	0..50	20 %
delay min SH	XX s	Delay on drop of superheat below set minimum	9..600	9 sec
setuptime	XX.X m	Setup time following the switching on of the controller or following a defrost or in the event of a blockade of the regulation. The value entered must not be less than the current ”*inject.time*” parameter, otherwise the smallest valid value will be used. Further details about “Fixed valve opening degree in pumpdown/feed-in phase” see chapter 4.4.14.	0..100.0	2.0 min
inject.time	XX.X m	Injection time following the switching on of the controller or following a defrost or in the event of a blockade of the regulation. The value entered must not be greater than the current ”*setuptime*” parameter, otherwise the largest valid value will be used. Further details about “Fixed valve opening degree in pumpdown/feed-in phase” see chapter 4.4.14.	0..100.0	1.0 min

EEV ZONE 1 POS: XXXXX		Entry	Default
OD over CAN XXX	Send opening degree via CAN bus (is employed when a demand dependent setpoint evaluation / to shift via consumer" is parameterised in the corresponding pack controller)	↑, ↓, (ON/OFF)	ON
15s Archiv X	A few statuses and values are additionally archived at 15 second intervals in the system centre / store computer when this parameter is set to "J". WARNING: This setting increases the memory requirement and should only be activated when needed / for diagnostic purposes.	↑, ↓, (Y/N)	N
OD 3s interv XXX	Select interval for output of opening degree. OFF = 6s ON = 3s Control is suspended for 6 seconds when toggling.	↑, ↓, (ON/OFF)	OFF
Reset I-Sum XXX	Reset I-sum (to zero) if superheat drops below set minimum for longer than time set by "delay min SH" parameter. OFF = I-sum not reset to zero ON = I-sum is reset to zero	↑, ↓, (ON/OFF)	ON
edit op.deg. XXX	Manual entry of valve opening degree	↑, ↓, (ON/OFF)	OFF
op.deg. Z 1 XXX %	Current valve opening degree Zone 1; can be edited when manual entry is activated	0..100	Default by controller
Maximum OD xxx %	Sets an upper limit to the opening degree output by the case controller	20..100	100%
Lo Temp to xxK	Monitoring of the t_0 transmitted by the pack controller for unsuitably low values NOTE: Following commissioning this value can be set to "-".	10..60, --	28K
to VS corr. XXX °C	Displays current corrected suction pressure temperature on pack controller (assigned by Pack No.)		

- Menu 6-2-8 EEV Controller Zone 2

☞ This menu is only visible if
- the “Master” mode is activated in the system centre, i.e.
- the “Superuser mode” is activated in the store computer.
For details see the Operation chapter.

EEV ZONE 2 POS: XXXXX		Entry	Default
Pc Z 2: XX.XX	Temperature control Zone 2, P-part	0..99.99	7.00
Ic Z 2: XX.XX	Temperature control Zone 2, I-part If parameter I_c is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.30
Dc Z 2: XX.XX	Temperature control Zone 2, D-part	0..99.99	5.00
offs OD cab. XX %	Percentage valve opening degree offset for temperature control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	30 %
Psh Z 2: XX.XX	Superheat control Zone 2, P-part	0..99.99	5.00
Ish Z 2: XX.XX	Superheat control Zone 2, I-part If parameter I_{sh} is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.10
Dsh Z 2: XX.XX	Superheat control Zone 2, D-part	0..99.99	5.00
offs OD SH XX %	Percentage valve opening degree offset for superheat control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
emerg.c-o OD XX %	Maximum valve opening degree	0..50	20 %
delay min SH XX s	Delay on drop of superheat below set minimum	9..600	9 sec
edit op.deg. XXX	Manual entry of valve opening degree	↑, ↓, (ON/OFF)	OFF
op.deg. Z 2 XXX %	Current valve opening degree Zone 2; can be edited when manual entry is activated	0..100	Default ctrlr.

- Menu 6-3 Cooling

COOLING POS: XXXXX		Entry	Default
corr.off to XX K	Correction offset for pressure loss in suction line **IMPORTANT:** in stand alone operation must be set to ”--”!	--, 0..20	2 K
Cont Cool Mon. XX m	Continuous run monitoring	--, 0..15	---
EnablingRel XXX	Switching to “Enable Operation“: OFF Opening degree is transmitted via the solid state relay (SSR) ON The two SSRs are no longer clocking, they are switched on if the case controller requires refrigeration, i.e. switched off again if no refrigeration is required.	↑, ↓, (ON/OFF)	OFF

- Menu 6-4 Language

LANGUAGE POS: XXXXX		Entry	Default
Deutsch D √		↵	√
English GB		↵	
Francais F		↵	
Espanyol ESP		↵	
Finnish FIN		↵	
Cesky CZ		↵	

- Menu 6-5 Alarm Priorities

ALARMPRIOS POS: XXXXX		Entry	Default
Prio.Refrig. Pt. X	Global setting of alarm priority via refrigeration point priority (Menu 6-1) (Y)	↑, ↓, (Y/N)	N
Priority: XX	Displays refrigeration point priority (Menu 6-1); only shown when refrigeration point priority is set to Y		
Following parameters are only shown when refrigeration point priority is set to N. Meaning of vaild entries for alarm priority is as follows: *- = Event ignored* *0 = Message (entered only in message log)* *1 = Priority 1 alarm* *..* *99 = Priority 99 alarm*			
Low Temp.	Temperature below lo alarm limit. Priority applies to alarms Low Temp. Zone 1, *Low Temp. Zone 2*	-, 0..99	2
High Temp.	Temperature above high alarm limit. Priority applies to alarms *High Temp. Zone 1, High Temp. Zone 2*	-, 0..99	1
Sensor Fault	Temperature sensor failure	-, 0..99	2
No Defrost	No defrost within alarm delay time. Priority applies to *No Defrost* alarm	-, 0..99	2
Timer-Term. Defrost	Defrosting terminated by safe defrost time	-, 0..99	0
Power Failure	Start following power failure	-, 0..99	0
First Start	Controller startup (basic settings are loaded!)	-, 0..99	2
Manual Shutoff	Manual switch Input D31/D32 set OFF	-, 0..99	0
Hardware Fault	Internal hardware defect. Priority applies to alarms *EEPROM Defective, RTC Defective, Flash Memory Defective*	-, 0..99	1
Setpoint Change	Message generated when changing setpoints	0..99	0
Refrig.Pt.Dis.	Cooling interrupted by VS pack controller cia CAN bus	-, 0..99	0
Battery Voltage	Battery low	-, 0..99	0
Check t0	The pack controller to is not received via CAN bus; priority is given to the messages *Check to Z1*, *Check to Z2* (see also chapter 10.1.3 "Low Temperature Monitoring to")	-, 0..99	2
Sensor Fault eev	EEV Control sensor failure. Priority applies to alarms *Sensor Break EEV Z1, Sensor Break EEV Z2*	-, 0..99	2

ALARMPRIOS POS: XXXXX		Entry	Default
eev ctrl block	EEV control stalled. Priority applies to alarms *EEV Stall Detect Z1, EEV Stall Detect Z2*	-, 0..99	0
wrong ctrlr type	Configuration error: Invalid controller type set on DIP Switch S3. Priority applies to *Wrong Controller Type* alarm	-, 0..99	0
emerg.cut-out SH	Superheat drop below minimum level for duration of delay time	-, 0..99	0
OD manual	Valve opening degree defined by manual entry. Priority applies to alarms *VO Manual Zone 1, VO Manual Zone 2*	-, 0..99	0
config:M/S w HG	Configuration error: Simultaneous setting of parameters for master-slave mode and discharge gas defrosting	-, 0..99	2
Check OD	Alarm due to implausible opening degree (see chapter 10.1.10)	-, 0..99	0
Extern.Alarm	Alarm for registering external alarms, default text is "CO2-Alarm"	-, 0..99	0

- Menu 6-6 Em.Powersupply (Emergency Power supply)

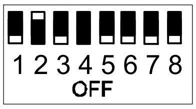
EM.POW.SUP POS: XXXXX		Entry	Default
Cool.funct.OFF xxx	Functionality of the cooling switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Defr.funct.OFF xxx	Functionality of the defrosting switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Fan funct. OFF xxx	Functionality of the fan switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Frame fct.OFF xxx	Functionality of the frame heater off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Light fct. OFF xxx	Functionality of the light during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N

- Menu 6-7 COPT+

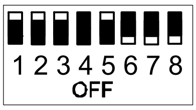
COPT+ POS: XXXXX		Entry	Default
COPT+ xxx	Principle participation of the controller in the suction pressure shift. (function COPT+). Note: This is transmitted via a CAN bus telegram and intervenes in the regulation!	↑, ↓, (ON/OFF)	OFF
Inact.a.Def xxm	Delay time following completion of the defrost before the controller actively intervenes in the shift.	0..40	30 min
Dely_HystON xxxxm	Delay time for the reduction request with active cooling and overshoot of the hysteresis.	0..10	2.5 min
HiTmpZ1 dwn xxm	Delay time before the elapse of the high temperature alarm delay in zone 1, before the reduction is reques-ted.	0..15	5 min.
HiTmpZ2 dwn xxm	Delay time before the elapse of the high temperature alarm delay in zone 2, before the reduction is reques-ted.	0..15	5 min.
TolOvHystZ1 xxK	Tolerance limit above the setpoint plus hysteresis in zone 1. Influences when it is switched from stop to reduce.	0..20	2 K
TolOvHystZ2 xxK	Tolerance limit above the setpoint plus hysteresis in zone 2. Influences when it is switched from stop to reduce.	0..20	2 K
SwtchSupRet xxx	Switching from supply air to return air and the reverse with temperature alarm delay time.	↑, ↓, (ON/OFF)	OFF
Dely_Switch xxxm	Switching from supply to return air: determines when it is switched within the delay time for the high tempera-ture alarm.	0..15	5 min.
Add.Values xxx	Creation of additional (additive) “Debug” actual value archives in the system centre / store computer. **Warning**: This can force a reorganisation of the actual value archives – for this reason **only** use when requi-red!	↑, ↓, (ON/OFF)	OFF
Incl_UpLim xxxK	Upper limit of the neutral zone for determining the in-cline.	0..5	0.3 K
Incl_LwLim xxxK	Lower limit of the neutral zone for determining the in-cline.	0..5	0.2 K
SDS Hyst Z 1 xxxK	Determines the hysteresis used during the shift from this value and the P-quota Möbelreg. Zone 1. (*)	1..10	5 K
SDS Hyst Z 2 xxxK	Determines the hysteresis used during the shift from this value and the P-quota Möbelreg. Zone 2. (*)	1..10	5 K
SDS RMode virtSet	Please always leave this value on “virtSwt”	-	virtSwt

(*) The lower this parameter, then the earlier the pack controller is instructed to lower the suction pressure, which increases the accuracy with which the controller can maintain its setpoint. In addition the case controllers P-quota is also employed. The higher the case controller’s P-quota, then the earlier the pack controller is in-structed to lower the suction pressure, which increases the accuracy with which the controller can maintain its setpoint.

8.2 Contr. Type Type UA 131 E / UA 131 E LS - Menu tree



1: OFF
2: ON
3: OFF
4: ON/OFF = Master-/Slave-Modus ON/OFF
5..8: OFF



1: ON
2: ON
3: ON
4: ON/OFF = Master-/Slave-Mode ON/OFF
5: ON = with advanced fan control: UA 131 E LS
6..8: OFF

Level 1	Level 2	Level 3	Menu No.	Menu Name
Main Menu			0	REFR. PT.
Actual Values			1	ACT VALUES
	Temperature Sensors		1-1	TEMPERATUR
	Cooling Zone 1		1-2	COOLING 1
	Defrost Zone 1		1-3	DEFROST 1
	Fan		1-4	FANS
	Alarm		1-5	ALARM
	Frame Heater		1-6	MODE
	Cooling Zone 2		1-7	COOLING 2
	Defrost Zone 2		1-8	DEFROST 2
Setpoints			2	SETPOINTS
	Cooling		2-1	COOLING
		Zone 1	2-1-1	COOLING 1
		Zone 2	2-1-2	COOLING 2
		Zone 1T Toggle	2-1-3	COOLING 1A
		Zone 2T Toggle	2-1-4	COOLING 2A
	Defrost		2-2	DEFROST
		Zone 1	2-2-1	DEFROST 1
		Zone 2	2-2-2	DEFROST 2
		Zone 1T Toggle	2-2-3	DEFROST 1A
		Zone 2T Toggle	2-2-4	DEFROST 2A

	Alarm		2-4	ALARM
		Zone 1	2-4-1	ALARM 1
		Zone 2	2-4-2	ALARM 2
		Zone 1T Toggle	2-4-3	ALARM 1A
		Zone 2T Toggle	2-4-4	ALARM 2A

Level 1	Level 2	Level 3	Menu No.	Menu Name
Setpoints	Frame Heater		2-5	FRAME HTR
		Frame Mode	2-5-1	MODE
		Frame Setpoints	2-5-2	SETPOINTS
		Toggle Mode	2-5-3	MODE ALT
		Setpoint Toggle	2-5-4	TOG. SETP.
	Fans		2-6	FANS
		Zone 1 + 2	2-6-1	FANS
		Zone 1 + 2 Toggle *	2-6-2	FANS A
Clock			3	Clock
	Current Time		3-1	CLOCK
	Defrost Timer		3-2	DEFR.TIMER
		Defrost Timer Z2	3-2-a	DEF.TIM.Z2
	Setpoint Toggle		3-3	TOGGLE
Messages			4	MESSAGES
	View Messages		4-1	MESSAGES
	Cancel Messages		4-2	MESSAGES
	Delete Messages		4-3	MESSAGES
Archive			5	ARCHIVE
Configuration			6	CONFIGURAT
	Refrigeration Point		6-1	REFR. PT.
	Controller		6-2	CONTROLLER
		Type and Version	6-2-1	VERSION
		Temperature Display	6-2-2	DISPLAY
		Alarm Delay	6-2-3	ALARMDELAY
		230V Inputs	6-2-4	230V INPUT
		Sensor Type	6-2-5	SENSORS
		Analog inputs**	6-2-6	ANALOG INPUTS
		EEV Controller Zone 1	6-2-7	EEV ZONE 1
		EEV Controller Zone 2	6-2-8	EEV ZONE 2
	Cooling		6-3	COOLING
		Ret Air Sensor	6-3-a	RET AIR SENSOR
	Language		6-4	LANGUAGE
	Alarm Priorities		6-5	ALARMPRIOS
	Em.Powersupply		6-6	EM.POW.SUP
	COPT+		6-7	COPT+

* Visible: Controller configured as UA 131 E
Not visible: Controller configured as UA 131 E LS

** Only UA 410 E AC

8.2.1 Menu 0 Main Menu

REFR. PT. POS: XXXXX	
1 Actual Values	Move to menu 1
2 Setpoints	Move to menu 2
3 Clock	Move to menu 3
4 Messages	Move to menu 4
5 Archive	Move to menu 5
6 Configuration	Move to menu 6

8.2.2 Menu 1 Actual Values

ACT VALUES POS: XXXXX	
1 Temp. Sensor	Move to menu 1-1
2 Cooling Zone 1	Move to menu 1-2
3 Defrost Zone 1	Move to menu 1-3
4 Evap. fans	Move to menu 1-4
5 Alarm	Move to menu 1-5
6 Frame Heater	Move to menu 1-6
7 Cooling Zone 2	Move to menu 1-7: Menu item is shown only when two-zone operation is set (Menu 6-1).
8 Defrost Zone 2	Move to menu 1-8: Menu item is shown only when two-zone operation is set (Menu 6-1).

- Menu 1-1 Temp. Sensor

TEMPERATUR XXXXX	
Temp. R2.1 XXX °C	Displays current supply air temperature Input Z11/Z12
Temp. R4.1 XXX °C	Displays current return air temperature Input Z21/Z22
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Temp. R5.1 XXX °C	Displays current evaporator inlet temperature Input Z41/Z42
Temp. R6.1 XXX °C	Displays current evaporator outlet temperature Input Z51/Z52
Temp. R2.2 XXX °C	Displays current supply air temperature Input Z61/Z62
Temp. R4.2 XXX °C	Displays current return air temperature Input Z71/Z72
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Temp. R5.2 XXX °C	Displays current evaporator inlet temperature Input Z91/Z92
Temp. R6.2 XXX °C	Displays current evaporator outlet temperature Input Z01/Z02
to VS corr. XXX °C	Displays current corrected suction pressure temperature on VS pack controller (assigned by Pack No.)
t0 locale Z1 xxx °C	Displays current t_0 $_t$emperature zone 1 [1)]
t0 locale Z2 xxx °C	Displays current t_0 $_t$emperature zone 2 [1) 2)]
tc xxx °C	Displays current tc $_t$emperature [1) 2)]
Humidite xx %	Displays current, relative humidity [1) 2)]

[1)]: Only UA 410 E AC
[2)]: The value is **only** recorded in the system centre / store computer via the CAN bus - it is **not** used for control purposes! Exception: Use of function „*toZ2Ctl.*“, parameter „*Fct. AIN2*“ (menu 6-2-6).

- Menu 1-2 Cooling Zone 1

COOLING 1 XXXXX	
Cooling XXX	Displays current OFF/ON status of cooling
op.deg. Z 1 XX %	Displays current valve opening degree Zone 1
OD med. 24h XX %	Displays mean valve opening degree Zone 1 for past day
Temp. R2.1 XXX °C	Displays current supply air temperature Input Z11/Z12
Setpoint R2.1 XXX °C	Display supply air temperature setpoint for comparison
Hysteresis R2.1 XXX K	Displays supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)
Temp. R4.1 XXX °C	Displays current return air temperature Input Z21/Z22
Setpoint R4.1 XXX °C	Displays return air temperature setpoint for comparison
Hysteresis R4.1 XXX K	Cisplays return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)
SH Z 1 XXX °C	Displays current superheat temperature Zone 1
sup air ctrl XXX	Displays current OFF/ON status of supply or return air control
MOP op. XXX	Displays OFF/ON setpoint of MOP mode
Status light XXX	Status lighting control (ON/OFF)

• Menu 1-3 Defrost Zone 1

DEFROST 1 XXXXX	
Counting Rate X	Displays setpoint for time during which evaporator defrost termination temperature may be within band around 0°C before defrost counter counts down
Defrost Counter X	Displays count for number of defrost cycles to be skipped
Defr. Relay 1 XXX	Displays current OFF/ON status of Defrost Relay 1
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Defr. Relay 2 XXX	Displays current OFF/ON status of Defrost Relay 2; shown only when single-zone operation is set (Menu 6-1)
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82; shown only when single-zone operation is set (Menu 6-1)
Def. End. Tmp. XXX °C	Displays defrost termination temperature setpoint for comparison
Wait Time XX m	Displays waiting time setpoint
Drip Time XX m	Displays drip time setpoint
Last Defrst XX hh:mm	Displays time (day, time of day) of last defrost cycle started
M/S Nof. Sl.	Number of parameterised and accessible MA slaves
M/S Lost Sl.	CAN address of the first MA slave which was not accessible during the last defrost
M/S Defr.Sl.	Number of slaves currently undergoing a defrost
M/S DSlMat	List of MA slaves currently undergoing a defrost (can be scrolled through using ENTER)
DSq Nof. Sl.	Number of DS slaves (only in the case of DS master)
DSq Lost Sl.	CAN address of the first FA slave which was not accessible during the last defrost
DSq Defr.Sl.	Number of slaves currently undergoing defrost
DSq DSlMat	List of FA slaves currently undergoing a defrost (can be scrolled through using ENTER)

• Menu 1-4 Fan

FANS 1 XXXXX	
Fans XXX	Displays current fan status
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Fans Start XXX °C	Displays fan start temperature setpoint

• Menu 1-5 Alarm

ALARM XXXXX	
Alarm Relay XXX	Displays current OFF/ON status of alarm output Terminal 15/16/18
Hi Temp Setp.1 XX °C	Displays high temperature setpoint Zone 1
Lo Temp Setp.1 XX K	Displays low temperature setpoint Zone 1
Hi Temp Setp.2 XX °C	Displays high temperature setpoint Zone 2; shown only when two-zone operation is set (Menu 6-1)
Lo Temp Setp.2 XX K	Displays low temperature setpoint Zone 2; shown only when two-zone operation is set (Menu 6-1)

- Menu 1-6 Frame Heater

MODE XXXXX	
Frame Heater XXX	Displays current OFF/ON status of frame heater output Terminal 91/92/93
Run Time XXX %	Displays current frame heater on time
Humidity XXX %	Displays current room air humidity (transmitted via CAN bus from VS pack controller with fitted humidity sensor)
Room temp. XX °C	Displays current room air temperature (tranmitted via CAN bus from VS pack controller with fitted room air temperature sensor)

- Menu 1-7 Cooling Zone 2

COOLING 2 XXXXX	
Cooling XXX	Displays current OFF/ON status of cooling
op.deg. Z 2 XX %	Displays current valve opening degree Zone 2
OD med. 24h XX %	Displays mean valve opening degree Zone 2 for past day
Temp. R2.2 XXX °C	Displays current supply air temperature Input Z61/Z62
Setpoint R2.2 XXX °C	Displays supply air temperature setpoint for comparison
Hystersis R2.2 XXX K	Displays supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)
Temp. R4.2 XXX °C	Displays current return air temperature Input Z71/Z72
Setpoint R4.2 XXX °C	Displays return air temperature setpoint for comparison
Hystersis R4.2 XXX K	Displays return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)
SH Z 2 XXX °C	Displays current superheat temperature Zone 2
sup air ctrl XXX	Displays current OFF/ON status of supply or return air control
MOP op. XXX	Displays OFF/ON setpoint of MOP mode

- Menu 1-8 Defrost Zone 2

DEFROST 2 XXXXX	
Counting Rate X	Displays setpoint for time during which evaporator defrost termination temperaure may be within band around 0°C before defrost counter counts down
Defrost Counter X	Displays count for number of defrost cycles to be skipped
Defr. Relay 2 XXX	Displays current OFF/ON status of Defrost Relay 2
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Def. End. Tmp. XXX °C	Displays defrost termination temperature setpoint for comparison
Wait Time XX m	Displays waiting time setpoint
Drip Time XX m	Displays drip time setpoint
Last Defrst XX hh:mm	Displays time (day, time of day) of last defrost cycle started

8.2.3 Menu 2 Setpoints

SETPOINTS POS: XXXXX	
1 Cooling	Move to menu 2-1; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) und setpoint toggle is deactivated (Menu 3-3), Continue to 2-1-1
2 Defrost	Move to menu 2-2; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) und setpoint toggle is deactivated (Menu 3-3), Continue to 2-2-1
3	Not used with this controller type
4 Alarm	Move to menu 2-4; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) und setpoint toggle is deactivated (Menu 3-3), Continue to 2-4-1
5 Frame Heater	Move to menu 2-5
6 Fans	Move to menu 2-6

- Menu 2-1 Cooling

COOLING POS: XXXXX	
1 Zone 1	Move to menu 2-1-1
2 Zone 2	Move to menu 2-1-2
3 Zone 1T Toggle	Move to menu 2-1-3; not shown when setpoint toggle is deactivated (Menu 3-3)
3 Zone 2T Toggle	Move to menu 2-1-4; shown only when two-zone operation is set and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-1-1 Zone 1

COOLING 1 POS: XXXXX		Entry	Default
Setpoint R2.1 XXX °C	Supply air temperature setpoint	--, -40..20	-32 °C
Hysteresis R2.1 X K	Supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	2 K
Setpoint R4.1 XXX °C	Return air temperature setpoint	--, -30..20	-20 °C
Hysteresis R4.1 X K	Return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	2 K
Superheat XXX K	Superheat setpoint Zone 1	0..20	6 K
Min. SH XX K	Minimum superheat setpoint, below which cooling relay switches off in Zone 1. I-sum (not I-part) is set to zero when the *Reset I-Sum* parameter is set to ON.	0..10	2 K
Two pos.ctrl XXX	Switch between on-off control (ON) and continuous control (OFF)	↑, ↓ (ON/OFF)	OFF
MOP-point XXX °C	Starting setpoint for MOP mode	--, -50..50	-- °C

- Menu 2-1-2 Zone 2

COOLING 2 POS: XXXXX		Entry	Default
Setpoint R2.2 XXX °C	Supply air temperature setpoint	--, -40..20	-32 °C
Hysteresis R2.2 X K	Supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	2 K
Setpoint R4.2 XXX °C	Return air temperature setpoint	--, -30..20	-20 °C
Hysteresis R4.2 X K	Return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	2 K
Superheat XXX K	Superheat setpoint Zone 2	0..20	6 K
Min. SH XX K	Minimum superheat setpoint, below which cooling relay switches off in Zone 2. I-sum (not I-part) is set to zero when the *Reset I-Sum* parameter is set to ON.	0..10	2 K
Two pos.ctrl XXX	Switch between on-off control (ON) and continuous control (OFF)	↑, ↓ (ON/OFF)	OFF
MOP-point XXX °C	Starting setpoint for MOP mode	--, -50..50	-- °C

- Menu 2-1-3 Zone 1T Toggle

COOLING 1A POS: XXXXX		Entry	Default
Setpoint R2.1 XXX °C	Supply air temperature setpoint	--, -40..20	-32 °C
Hysteresis R2.1 X K	Supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	2 K
Setpoint R4.1 XXX °C	Return air temperature setpoint	--, -30..20	-22 °C
Hysteresis R4.1 X K	Return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	2 K

- Menu 2-1-4 Zone 2T Toggle

COOLING 2A POS: XXXXX		Entry	Default
Setpoint R2.2 XXX °C	Supply air temperature setpoint	--, -40..20	-32 °C
Hysteresis R2.2 X K	Supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	2 K
Setpoint R4.2 XXX °C	Return air temperature setpoint	--, -30..20	-22 °C
Hysteresis R4.2 X K	Return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	2 K

- Menu 2-2 Defrost

DEFROST POS: XXXXX	
1 Zone 1	Move to menu 2-2-1
2 Zone 2	Move to menu 2-2-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-2-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-2-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-2-1 Zone 1

DEFROST 1 POS: XXXXX		Entry	Default
Counting Rate X	Setpoint of time during which evaporator defrost terminia-tion temperature may be within band around 0°C before defrost counter counts down	0..15	3
Defrost Counter X	Setpoint of count for number of defrost cycles to be skip-ped. By pressing the ↵ key the value can be set to 1 until it is automatically reset to the basic settings.	↵	6
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 5..20	10 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	3 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and coo-ling	0..15	5 min
M/S Degiv.Fct. XXX	Configuration of the defrost via CAN bus function. For details see chapter 4.5.5.	OFF, MASTR, SLAVE	OFF
M/S CAN Adr. XXX	Selection of the controller (1..99) participating in the defrost via CAN bus which is the master. “--“, if this controller is itself master (Parameter *M/S Degiv.Fct.*. = MASTR)	---, 1..99	--
DS-Function XXX	Configuration of the defrost sequenz function (DS). For details see chapter 4.5.6.	OFF, MASTR, SLAVE	OFF
DS-Group XXX	Selection of which group a defrost sequenz of this control-ler (1..99) belongs to.	---, 1..99	--
DS-Master XXX	Selection of which controller (1..99) participating in the defrost sequenz is the master. “--“, if this controller is itself the master (Parameter *DS-Function* = MASTR)	---, 1..99	--
DS-Wait time XXXm	Wait time for the defrost sequenz	0..127	1 min

- Menu 2-2-2 Zone 2

DEFROST 2 POS: XXXXX		Entry	Default
Counting Rate X	Setpoint of time during which evaporator defrost terminia-tion temperature may be within band around 0°C before defrost counter counts down	0..15	3
Defrost Counter X	Setpoint of count for number of defrost cycles to be skip-ped. By pressing the ↵ key the value can be set to 1 until it is automatically reset to the basic settings.	↵	6
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 5..20	10 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	3 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and coo-ling	0..15	5 min

- Menu 2-2-3 Zone 1T Toggle

DEFROST 1A POS: XXXXX		Entry	Default
Counting Rate X	Setpoint of time during which evaporator defrost termination temperature may be within band around 0°C before defrost counter counts down	0..15	3
Defrost Counter X	Setpoint of count for number of defrost cycles to be skipped. By pressing the ↵ key the value can be set to 1 until it is automatically reset to the basic settings.	↵	6
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 5..20	10 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	3 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	5 min

- Menu 2-2-4 Zone 2T Toggle

DEFROST 2A POS: XXXXX		Entry	Default
Counting Rate X	Setpoint of time during which evaporator defrost termination temperature may be within band around 0°C before defrost counter counts down	0..15	3
Defrost Counter X	Setpoint of count for number of defrost cycles to be skipped. By pressing the ↵ key the value can be set to 1 until it is automatically reset to the basic settings.	↵	6
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 5..20	10 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	3 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	5 min

- Menu 2-3 Not used with this controller type.

- Menu 2-4 Alarm

ALARM POS: XXXXX	
1 Zone 1	Move to menu 2-4-1
2 Zone 2	Move to menu 2-4-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-4-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-4-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-4-1 Zone 1

ALARM 1 POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-20..30	-12 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	4 K

- Menu 2-4-2 Zone 2

ALARM 2 POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-20..30	-12 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	4 K

- Menu 2-4-3 Zone 1T Toggle

ALARM 1A POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-20..30	-14 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	4 K

- Menu 2-4-4 Zone 2T Toggle

ALARM 2A POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-20..30	-14 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	4 K

- Menu 2-5 Frame Heater

FRAME HTR POS: XXXXX	
1 Mode frm htr	Move to menu 2-5-1
2 Setpoint frm htr	Move to menu 2-5-2
3 Mode altern.	Move to menu 2-5-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Setpoint altern.	Move to menu 2-5-4; not shown when setpoint toggle is deactivated (Menu 3-3)

- Menu 2-5-1 Frame Mode

Selection is made according to entry. Checkmark shows current setting.

MODE POS: XXXXX		Entry	Default
Fixed run time		↵	
Enthalpy-ctrl rtm		↵	
set point-ctrl rtm √		↵	√

- Menu 2-5-2 Frame Setpoints

SETPOINTS POS: XXXXX		Entry	Default
Mod: xxxxxxxxxxxx	Displays set frame mode (Menu 2-5-1)		set point-ctrl runtime
Run Time XXX %	Fixed on time, shown only when mode set to Fixed OT (Menu 2-5-1)	--, 0..100	100 %
emerg.run time XXX %	On time in loss of huimidity or room air temperature (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-1)	--, 0..100	100 %
enthalp. offs. XXX %	Offset for on time when enthalpy control is activated (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-1)	-50..50	0 %
Invert Output xxx	Inversion of the function of the frame heater output (terminals 91/92)	↑, ↓, (ON/OFF)	ON

- Menu 2-5-3 Toggle Mode

Selection is made according to entry. Checkmark show current setting.

MODE ALT. POS: XXXXX		Entry	Default
Fixed run time		↵	
Enthalpy-ctrl rtm		↵	
set point-ctrl rtm √		↵	√

- Menu 2-5-4 Setpoint Toggle

TOG. SETP. POS: XXXXX		Entry	Default
Mod: xxxxxxxxxxxx	Displays set frame mode (Menu 2-5-3)		Sollwertab-häng. ED
Run Time XXX %	Fixed on time, shown only when mode set to Fixed OT (Menu 2-5-3)	--, 0..100	100 %
emerg.run time XXX %	On time in loss of huimidity or room air temperature (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-3)	--, 0..100	100 %
enthalp. offs. XXX %	Offset for on time when enthalpy control is activated (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-3)	-50..50	0 %

- Menu 2-6 Fans

Controller type UA 131 E: with fan control

Menus 2-6 / 2-6-1 / 2-6-2 are only show when the case controller is configured to UA 131 with fan control (further details in the chapter Installation and Startup):

FANS POS: XXXXX	
1 Zone 1+2	Move to menu 2-6-1
2 Zone 1+2 Altern.	Move to menu 2-6-2; shown only when setpoint toggle is activated (Menu 3-3)

- Menu 2-6-1 Zone 1+2

FANS POS: XXXXX		Entry	Default
Fans Start XXX °C	Fan start temperature setpoint	--, -20..20	-- °C

- Menu 2-6-2 Zone 1+2 Toggle

FANS A POS: XXXXX		Entry	Default
Fans Start XXX °C	Fan start temperature setpoint	--, -20..20	-- °C

Controller type UA 131 E LS: with **advanced** fan control

Menu 2-6 only shown when the case controller is configured to UA 131 LS with **advanced** fan control (further details in the chapter Installation and Startup):

FANS POS: XXXXX	
1 Zone 1+2	Move to menu 2-6-1

- Menü 2-6-1 Zone 1+2

FANS POS: XXXXX		Entry	Default
Op.mode: XXXXXXXXXXXX	Possible operating modes: Continuous operation, Forerun, Overrun	CONTINU-OUS FORERUN OVERRUN DEL.A.DEFR.	CONTINU-OUS
Fans Start	Continuous operation mode: not relevant Forerun mode: not relevant Overrun mode: Fan on by undershoot of temperature at evaporator sensor Delay after defrost mode: Fan on by undershoot of temperature at evaporator sensor	--, -20..20	-- °C
Fan hightemp.	Continuous operation mode: not relevant Forerun mode: fan on when temperature at evaporator sensor exceeded Overrun mode: fan off when temperature at evaporator sensor exceeded Delay after defrost mode: not relevant	-30..30	5 °C

8.2.4 Menu 3 Clock

CLOCK POS: XXXXX	
1 Current Time	Move to menu 3-1
2 Defrost Timer	Move to menu 3-2
3 Toggle Setpoints	Move to menu 3-3

- Menu 3-1 Current Time

Time is defined by time master (system centre / store computer / operator terminal) when CAN bus is connected. Any entry made will then be overwritten by the defined value.

CLOCK POS: XXXXX		Entry	Default
Date: XX dd.mm.yy	Display and entry of current weekday, date	dd.mm.yy	
Time: hh.mm	Display and entry of current time	hh.mm	
Daylight Saving X	Display and entry of automatic daylight saving time change (Y/N)	↑, ↓, (Y/N)	Y

- Menu 3-2 Defrost Timer

DEFR.TIMER POS: XXXXX		Entry	Default
Defrost Timer XXX	Defrost initiation via Input D11/12 (EXT) oder internal (INT)	↑, ↓, (EXT, INT)	INT
Safe Defr Time XXX m	Safe defrost time, i.e. max. allowed duration of defrosting (internal defrost only)	0..120	60 min
Manual Defrost XXX	Status (ON/OFF) of auxiliary manual defrost *)	↑, ↓, (ON/OFF)	OFF
Def.Tim.Z2 →	Separate defrost timer for zone 2	Menu 3-2-a	
Defr. 1 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter defrost timer = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 20:15
...			
Defr. 14 xxxxx hh:mm			

*) Parameter is automatically set to ON at first start for the duration of the safe defrost time.

- Menu 3-2-a Def.Tim.Z2

DEFR.TIMER POS: XXXXX		Entry	Default
Defrost Timer XXX	Setting for how temperature zone 2 should defrost: - MitZ1 Together with zone 1 - INT Internally - EXT Externally – the defrost of both temperature zones is started simultaneously via the external signal	↑, ↓, (ViaZ1(ViaZ1, EXT, INT)	ViatZ1
Safe Defr Time XXX m	Safe defrost time, i.e. max. allowed duration of defrosting (internal defrost only)	0..120	60 min
Manual Defrost XXX	Status (ON/OFF) of auxiliary manual defrost *)	↑, ↓, (ON/OFF)	OFF
Defr. 1 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter *defrost timer* = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 01:00
...			
Defr. 14 xxxxx hh:mm			

- Menu 3-3 Setpoint Toggle

TOGGLE POS: XXXXX		Entry	Default
Status XXX	Setpoint toggle for alternative set of setpoints (setpoint set toggle)		
Toggle Setp. XXX	Type of setpoint toggle via - digital input D21/22 (EXT), - internal (INT), - CAN bus (CAN) or - deactivated (--);	↑, ↓, (EXT, INT, CAN, --)	EXT
Blind On Time X s	Time for shutdown fan and cooling after toggling to alternative set of setpoints with external setpoint toggle (Menu 3-3)	0..250	0 sec
Toggle interv. X m	The interval for the cyclical toggling between standard and alternative setpoint data records; only appears when the internal setpoint toggling is activated (menu 3-3).	--, 10..60	-- min
Alt ON: xxxxx hh:mm	Start time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 21:00
AltOFF: xxxxx hh:mm	End time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 05:00
Alt ON: xxxxx hh:mm	Start time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Su 05:00
AltOFF: xxxxx hh:mm	End time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Su 21:00
...	A total of 7 different ON, OFF toggle times can be entered. Toggle time will only be obeyed when a ***matched pair*** of ON and OFF time is set.		

8.2.5 Menu 4 Messages

MESSAGES POS: XXXXX	
1 View	Move to menu 4-1 View Messages
2 Acknowledge	Messages in log are cancelled, press ESC to exit after cancel is confirmed
3 Delete	Move to menu 4-3

- Menu 4-1 View Messages

MESSAGES POS: XXXXX	
Error text 1:	Fault message Fault 1
dd.mm.yy hh:mm ON	Start of Fault 1
dd.mm.yy hh:mm OFF	End of Fault 1 (only when Fault 1 has ended)
...	
Error text n:	Fault message Fault n
dd.mm.yy hh:mm ON	Start of Fault n
dd.mm.yy hh:mm OFF	End of Fault n (only when Fault n has ended)

- Menu 4-2 Cancel Messages

This displays the *Alarms Cancelled!* message.

- Menu 4-3 Delete Messages

MESSAGES POS: XXXXX		Entry
Delete ! Are you sure ? No: ESC YES: ↵	Safety prompt for deleting messages; press ESC to exit after confirming or cancelling delete	↵, ESC

8.2.6 Menu 5 Archive

ARCHIVE POS: XXXXX	
dd.mm.yy hh:mm	Time of archiving Data Record 1
Zone 1: abcdef x °C	Status and temperature of Zone 1, see note *)
Zone 2: abcdef x °C	Status und Temperatur von Zone 2, see note *); shown only when two-zone operation is set (Menu 6-1)
...	
dd.mm.yy hh:mm	Time of archiving Data Record n
Zone 1: abcdef x °C	Status and temperature of Zone 1, see note *)
Zone 2: abcdef x °C	Status und Temperatur von Zone 2, see note *); shown only when two-zone operation is set (Menu 6-1)

*) Status abcdef covers following states of refrigeration point. The entry at this position is - when a state is not active.

Example `Zone 1:  abcdef            x °C`

	Single-zone operation resp. Operator interface BT 300	Two-zone operation
a	O = Operation	O = Operation
b	R = Refrigeration / Cooling	R = Refrigeration / Cooling
c	R = Refrigeration/ Cooling	D = Defrost
d	D = Defrost	G = Gate / Door (coldroom controller only)
e	G = Gate / Door (coldroom controller only)	A = Alarm
f	A = Alarm	

8.2.7 Menu 6 Configuration

CONFIGURAT POS: XXXXX	
1 Refriger. Point	Move to menu 6-1
2 Controller	Move to menu 6-2
3 Cooling	Move to menu 6-3
4 Language	Move to menu 6-4
5 Alarm priorities	Move to menu 6-5
6 Em.Powersupply	Move to menu 6-6
7 COPT+	Move to menu 6-7

- Menu 6-1 Refrigeration Point

REFR. PT. POS: XXXXX		Entry	Default
Refr. Pt. Name:	Text only		
xxxxxxxxxxxxxxx	Free text entry describing refrigeration point (see note at end of table)		Case Controller
Item ID: XXXXX	Free text enty shown after Position (POS:) in screens (see note at end of table)		UA400
Priority: XX	Priority of alarms in failure of refrigeration point or when setting global controller priority (Menu 6-5)	↑, ↓, or numbers (0..99)	1
Refr. Sys. No.: XX	Pack No. of pack controller assigned to case controller. The controller cannot receive the suction pressure value for control functions before the Pack No. of the associated pack controller has been selected on the case controller	↑, ↓, or numbers (--, 1..9)	--
Refr. Sys. Type XXX	Allocation to compressor pack. Parameter only required for linking to VS 3010 BS with several zones. Deactivate this parameter (---) when using pack controllers of other type.	↑, ↓, or numbers (---, Z1, Z2)	---
Temp. Zones X	Number of temperature zones. Single-zone operation Two-zone operation	↑, ↓, or numbers (1, 2)	2
No. Sensors XX	Displays number of temperature sensors connected. After pressing ↵, sensor scan is performed and number of sensors is redefined.	↵	

It must be ensured that the correct pack number has been selected, i.e. the correct Refr. Sys. type has been set, otherwise this can result in damage to the installation or goods. Furthermore, the parameter *Corr.off* t_0 (menu 6-3) must not be set to ”--” if the t_0 from the pack controller is to be used for regulating.

A meaningful name that describes the refrigeration point in more detail should be entered, e.g. Cheese Counter 2 and CC2. Entry is made in the screens on system centre, store computer or operator terminal. Direct entry cannot be made in the controller screens displayed on the operator terminal. Entry cannot be made either on operator interface BT 300.

- Menu 6-2 Controller

CONTROLLER POS: XXXXX	
1 Type and Version	Move to menu 6-2-1
2 Temp. Display	Move to menu 6-2-2
3 Alarm Delay	Move to menu 6-2-3
4 230V Inputs	Move to menu 6-2-4
5 Sensor Type	Move to menu 6-2-5
6 Analog inputs	Move to menu 6-2-6
7 eev ctrlr zone1	Move to menu 6-2-7; shown only when Superuser mode is activated system centre / store computer / operator terminal (see Section Operation)
8 eev ctrlr zone2	Move to menu 6-2-8; shown only when Superuser mode is activated system centre / store computer / operator terminal (see Section Operation)

- Menu 6-2-1 Type and Version

VERSION POS: XXXXX		Entry	Default
Ctrlr. Type XXXXXXX	Set on DIP Switch S3		UA131E
Software Ver.: XXXX	Software version of case controller		
Serial No.: XXXXXX	Device No. of Case Controllers (from EEPROM)		
Master/Sl. Mode XXX	Synchronized defrosting in master/slave mode	↑, ↓, (ON/OFF)	OFF

- Menu 6-2-2 Temperature Display

DISPLAY POS: XXXXX		Entry	Default
Offset XX K	Offset for temperature display	-10..10	0 K
Alarmsymbol XX	Show alarm symbol on BT 30 Temperature Display	↑, ↓, (ON/OFF)	N

- Menu 6-2-3 Alarm Delay

ALARMDELAY POS: XXXXX		Entry	Default
Sensor Fault XX m	Sensor break alarm delay	0..30	15 min
High/Low Temp. XX m	High/low temperature alarm delay	0..120	60 min
No Defrost XX h	No defrost alarm delay	--, 2..168	50 h
Selfholding X	Alarm latching with manual alarm cancelling (YES) or automatic cancelling on send (NO)	↑, ↓, (Y/N)	N

- Menu 6-2-4 230V Inputs

Only trained personnel should be allowed to change digital inputs, as changes can affect other functions.

230V INPUT POS: XXXXX		Entry	Default
Entry1: XXXXXXXXXX	Function of digital input 1 D11/D12	1)	DEFR.TIMER
Entry2: XXXXXXXXXX	Function of digital input 2 D21/D22	2)	TOGGLE SETP.
Entry3: XXXXXXXXXX	Function of digital input 3 D31/D32	3)	MANUAL OFF.
Entry4: XXXXXXXXXX	Function of digital input 4 D41/D42	4)	Extern.Alarm
XXXXXXXXXXXXXXXXXX	Freely configurable alarm text for digital input 4, the default text is “CO2-Alarm”	Text	CO2-ALARM
Inv. D1 XXX	Inverting of digital input 1	↑, ↓, (ON/OFF)	OFF
Inv. D2 XXX	Inverting of digital input 2		OFF
Inv. D3 XXX	Inverting of digital input 3		OFF
Inv. D4 XXX	Inverting of digital input 4		OFF

Possible settings for the digital inputs:

1)	DEFR.TIMER	Defrost timer*
	MANUAL OFF.	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
	TOGGLE SETP.	Toggle setpoint
2)	TOGGLE SETP	Toggle setpoint *
	MANUAL OFF	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
3)	MANUAL OFF	Manual shutoff both zones *
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
4)	EXT ALARM	External Alarm *
	MANUAL OFF	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
	TOGGLE SETP	Toggle setpoint

* Factory setting

- Menu 6-2-5 Sensor Type

Selection is made according to entry. Checkmark shows current setting.

SENSORS POS: XXXXX		Entry	Default
L243 √	Temperature range -50 °C .. 50 °C	↵	√
K277	Temperature range -50 °C .. 50 °C	↵	
5K3A1	Temperature range 0 °C .. 100 °C	↵	

- Menu 6-2-6 Analog inputs

ANALOG INPUTS POS: XXXXX		Entry	Default
AIN1 activ x	Analogue input Z1 use (=Y) do not use (=N)	(Y,N)	N
Refrig.Z 1 xxxx	Selection of refrigerant zone 1	None R404a .. R438A*	None
LP Z1 Min xxx bar	Smallest pressure value for pressure monitoring at 4mA	0.0 .. 2.0 bar	0.0 bar
LP Z1 Max xxx bar	Largest pressure value for pressure monitoring at 20 mA	8.0 .. 200.0 bar	10.0 bar
AIN1 Send CAN	This parameter is used to instruct the case controller to make the local t0 (AIN1) available via CAN bus. ONLY possible when the parameter AIN1 active = Y	(Y,N)	N
AIN1 Rcv. CAN xx	CAN bus address of the remote case controller from which the t_0 is received.	1..99	--
AIN1 Rcv. Inp x	This parameter is used to specify the zone from which the t0 is taken. (refers to the parameter *AIN1 Rcv. Inp*)	1,2	1
AIN2 activ x	Analogue input Z2 use (=Y) do not use (=N)	(Y,N)	N
Refrig.Z 2 xxxx	Selection of refrigerant zone 2	None R404a .. R438A*	None
Fct. AIN2 xxxxx	Function of the analogue input zone 2 t0Z2 For recording only t0Z2ctl For regulation	t0Z2, toZ2ctl, Humidity, tc	
HP Z2 Min xxx bar	Smallest pressure value for pressure monitoring at 4mA	0.0 .. 2.0 bar	0.0 bar
HP Z2 Max xxx bar	Largest pressure value for pressure monitoring at 20 mA	8.0 .. 200.0 bar	10.0 bar
AIN2 Send CAN	This parameter is used to instruct the case controller to make the locally measured value of analogue input 2 (AIN2) available via CAN bus. ONLY possible when the parameter AIN2 active = Y	(Y,N)	N
AIN2 Rcv. CAN xx	CAN bus address of the remote case controller which provides the locally measured analogue value.	1..99	--
AIN2 Rcv. Inp x	This parameter is used to specify the zone from which the locally measured analogue value is taken. (refers to the parameter *AIN2 Rcv. Inp*)	1,2	2

* Supported refrigerants:
R404A, R744 (CO_2), R134a, R410A, R717 (NH3), R22, R290, R407C, R507, R1270, R402A, R502, R407F, R422A, R422D, R408A, R407D, R407A, R427A, R438A*, R152a, R170, R600, R600a

Praxis tip using the example of the "connection of a pressure transmitter - 1 .. 7 bar":
Here the indication on the pressure transmitter is clear (-> -1 bar) relative to the ambient pressure The adjustment of the pressure transmitter in the controller is carried out using absolute pressure values (the absolute pressure cannot be negative). In order to parameterise the above pressure transmitter with the relative pressure indication - 1 bar (at 4 mA, i.e. 0 V) at 7 bar (at 20mA, i.e. 10 V) the ambient pressure (1 bar) must be added.
The entry is carried out as follows: 0..8 bar.

• Menu 6-2-7 EEV Controller Zone 1

This menu is only visible if
- the “Master” mode is activated in the system centre, i.e.
- the “Superuser mode” is activated in the store computer.
For details see the Operation chapter.

EEV ZONE 1 POS: XXXXX		Entry	Default
Pc Z 1: XX.XX	Temperature control Zone 1, P-part	0..99.99	7.00
Ic Z 1: XX.XX	Temperature control Zone 1, I-part If parameter Ic is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.30
Dc Z 1: XX.XX	Temperature control Zone 1, D-part	0..99.99	5.00
offs OD cab. XX %	Percentage valve opening degree offset for temperature control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	30 %
Psh Z 1: XX.XX	Superheat control Zone 1, P-part	0..99.99	5.00
Ish Z 1: XX.XX	Superheat control Zone 1, I-part If parameter I_{sh} is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.10
Dsh Z 1: XX.XX	Superheat control Zone 1, D-part	0..99.99	5.00
offs OD SH XX %	Percentage valve opening degree offset for superheat control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
emerg.c-o OD XX %	Maximum emergency valve opening degree	0..50	20 %
delay min SH XX s	Delay on drop of superheat below set minimum	9..600	9 sec
setuptime XX.X m	Setup time following the switching on of the controller or following a defrost or in the event of a blockade of the regulation. The value entered must not be less than the current "*inject.time*" parameter, otherwise the smallest valid value will be used. Further details about “Fixed valve opening degree in pumpdown/feed-in phase” see chapter 4.4.14.	0..100.0	2.0 min
inject.time XX.X m	Injection time following the switching on of the controller or following a defrost or in the event of a blockade of the regulation. The value entered must not be greater than the current "*setuptime*" parameter, otherwise the largest valid value will be used. Further details about “Fixed valve opening degree in pumpdown/feed-in phase” see chapter 4.4.14.	0..100.0	1.0 min
OD over CAN XXX	Send opening degree via CAN bus (is employed when a demand dependent setpoint evaluation / to shift via consumer” is parameterised in the corresponding pack controller)	↑, ↓, (ON/OFF)	ON
15s Archiv X	A few statuses and values are additionally archived at 15 second intervals in the system centre / store computer when this parameter is set to “J”. WARNING: This setting increases the memory requirement and should only be activated when needed / for diagnostic purposes.	↑, ↓, (Y/N)	N
OD 3s interv XXX	Select interval for output of opening degree. OFF = 6s ON = 3s Control is suspended for 6 seconds when toggling.	↑, ↓, (ON/OFF)	OFF

EEV ZONE 1 POS: XXXXX		Entry	Default
Reset I-Sum XXX	Reset I-sum (to zero) if superheat drops below set minimum for longer than time set by "delay min SH" parameter. OFF = I-sum not reset to zero ON = I-sum is reset to zero	↑, ↓, (ON/OFF)	ON
edit op.deg. XXX	Manual entry of valve opening degree	↑, ↓, (ON/OFF)	OFF
op.deg. Z 1 XXX %	Current valve opening degree Zone 1; can be edited when manual entry is activated	0..100	Default by controller
Maximum OD xxx %	Sets an upper limit to the opening degree output by the case controller	20..100	100%
Lo Temp to xxK	Monitoring of the t_0 transmitted by the pack controller for unsuitably low values NOTE: Following commissioning this value can be set to "-".	10..60, --	28K
to VS corr. XXX °C	Displays current corrected suction pressure temperature on pack controller (assigned by Pack No.)		

- Menu 6-2-8 EEV Controller Zone 2

☞ This menu is only visible if
- the "Master" mode is activated in the system centre, i.e.
- the "Superuser mode" is activated in the store computer.
For details see the Operation chapter.

EEV Zone 2 POS: XXXXX		Entry	Default
Pc Z 2: XX.XX	Temperature control Zone 2, P-part	0..99.99	7.00
Ic Z 2: XX.XX	Temperature control Zone 2, I-part If parameter I_c is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.30
Dc Z 2: XX.XX	Temperature control Zone 2, D-part	0..99.99	5.00
offs OD cab. XX %	Percentage valve opening degree offset for temperature control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	30 %
Psh Z 2: XX.XX	Superheat control Zone 2, P-part	0..99.99	5.00
Ish Z 2: XX.XX	Superheat control Zone 2, I-part If parameter I_{sh} is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.10
Dsh Z 2: XX.XX	Superheat control Zone 2, D-part	0..99.99	5.00
offs OD SH XX %	Percentage valve opening degree offset for superheat control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
emerg.c-o OD XX %	Maximum valve opening degree	0..50	20 %
delay min SH XX s	Delay on drop of superheat below set minimum	9..600	9 sec
edit op.deg. XXX	Manual entry of valve opening degree	↑, ↓, (ON/OFF)	OFF
op.deg. Z 2 XXX %	Current valve opening degree Zone 2; can be edited when manual entry is activated	0..100	Default ctrlr.

- Menu 6-3 Cooling

COOLING POS: XXXXX		Entry	Default
corr.off to XX K	Correction offset for pressure loss in suction line **IMPORTANT:** in stand alone operation must be set to "--"!	--, 0..20	2 K
Cont Cool Mon. XX m	Continuous run monitoring	--, 0..15	0 min
HG operation XXX	Discharge gas mode	↑, ↓, (ON/OFF)	OFF
Ret Air Sensor →	Operation with four return air sensors	→ or ↵	Menu 6-3-a
EnablingRel XXX	Switching to "Enable Operation": OFF Opening degree is transmitted via the solid state relay (SSR) ON The two SSRs are no longer clocking, they are switched on if the case controller requires refrigeration, i.e. switched off again if no refrigeration is required.	↑, ↓, (ON/OFF)	OFF

- Menu 6-3-a return air sensor

RET AIR SENSOR POS: XXXXX		Entry	Default
Temp. R4.3	R4.3 instead R5.1	↑, ↓, (ON/OFF)	OFF
Temp. R4.4	R4.4 instead R5.2	↑, ↓, (ON/OFF)	OFF
Weighting R4.3	Weighting between R4.1 and R4.3	0..100	0 %
Weighting R4.4	Weighting between R4.2 and R4.4	0..100	0 %

- Menu 6-4 Language

Selection is made according to entry. Checkmark shows current setting.

LANGUAGE POS: XXXXX		Entry	Default
Deutsch D √		↵	√
English GB		↵	
Francais F		↵	
Espanyol ESP		↵	
Finnish FIN		↵	
Cesky CZ		↵	

- Menu 6-5 Alarm Priorities

ALARMPRIOS POS: XXXXX		Entry	Default
Prio.Refrig. Pt. X	Global setting of alarm priority via refrigeration point priority (Menu 6-1) (Y)	↑, ↓, (Y/N)	N
Priority: XX	Displays refrigeration point priority (Menu 6-1); only shown when refrigeration point priority is set to Y		
Following parameters are only shown when refrigeration point priority is set to N. Meaning of valid entries for alarm priority is as follows:: - = *Event ignored* *0* = *Message (enterd only in message log)* *1* = *Priority 1 alarm* .. *99* = *Priority 99 alarm*			
Low Temp.	Temperature below low alarm limit. Priority applies to alarms *Low Temp. Zone 1, Low Temp. Zone 2*	-, 0..99	2
High Temp.	Temperature above high alarm limit. Priority applies to alarms *High Temp. Zone 1, High Temp. Zone 2*	-, 0..99	1
Sensor Fault	Temperature sensor failure	-, 0..99	2
No Defrost	No defrost within alarm delay time. Priority applies to *No Defrost* alarm	-, 0..99	2
Timer-Term. Defrost	Defrosting terminated by safe defrost time	-, 0..99	0
Power Failure	Start following power failure	-, 0..99	0
First Start	Controller Startup (basic settings are loaded!)	-, 0..99	2
Manual Shutoff	Manual switch Input D31/D32 set OFF	-, 0..99	0
Hardware Fault	Internal hardware defect. Priority applies to alarms *EEPROM Defective, RTC Defective, Flash Memory Defective*	-, 0..99	1
Setpoint Change	Message generated when changing setpoints	0..99	0
Refrig.Pt.Dis.	Cooling interrupted by VS pack controller via CAN bus	-, 0..99	0
Battery Voltage	Battery low	-, 0..99	0
Check to	The pack controller to is not received via CAN bus; priority is given to the messages *Check to Z1, Check to Z2* (see also chapter 10.1.3 "Low Temperature Monitoring to")	-, 0..99	2
Sensor Fault eev	EEV Control sensor failure. Priority applies to alarms *Sensor Break EEV Z1, Sensor Break EEV Z2*	-, 0..99	2
eev ctrl block	EEV control stalled. Priority applies to alarms *EEV Stall Detect Z1, EEV Stall Detect Z2*	-, 0..99	0
wrong ctrlr type	Configuration error: Invalid controller type set on DIP Switch S3. Priority applies to *Wrong Controller Type* alarm	-, 0..99	0
emerg.cut-out SH	Superheat drop below minimum level for duration of delay time	-, 0..99	0
OD manual	Valve opening degree defined by manual entry. Priority applies to alarms *VO Manual Zone 1, VO Manual Zone 2*	-, 0..99	0
config:M/S w HG	Configuration error: Simultanesous setting of parameters for master-slave mode and discharge gas defrosting	-, 0..99	2

ALARMPRIOS POS: XXXXX		Entry	Default
Check OD	Alarm due to implausible opening degree (see chapter 10.1.10)	-, 0..99	0
Extern.Alarm	Alarm for registering external alarms, default text is “CO2-Alarm”	-, 0..99	0

- Menu 6-6 Em.Powersupply (Emergency Power supply)

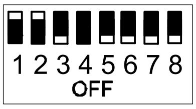
EM.POW.SUP POS: XXXXX		Entry	Default
Cool.funct.OFF xxx	Functionality of the cooling switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Defr.funct.OFF xxx	Functionality of the defrosting switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Fan funct. OFF xxx	Functionality of the fan switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Frame fct.OFF xxx	Functionality of the frame heater off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Light fct. OFF xxx	Functionality of the light during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N

- Menu 6-7 COPT+

COPT+ POS: XXXXX		Entry	Default
COPT+ xxx	Principle participation of the controller in the suction pressure shift. (function COPT+). Note: This is transmitted via a CAN bus telegram and intervenes in the regulation!	↑, ↓, (ON/OFF)	OFF
Inact.a.Def xxm	Delay time following completion of the defrost before the controller actively intervenes in the shift.	0..40	30 min
Dely_HystON xxxxm	Delay time for the reduction request with active cooling and overshoot of the hysteresis.	0..10	2.5 min
HiTmpZ1 dwn xxm	Delay time before the elapse of the high temperature alarm delay in zone 1, before the reduction is requested.	0..15	5 min.
HiTmpZ2 dwn xxm	Delay time before the elapse of the high temperature alarm delay in zone 2, before the reduction is requested.	0..15	5 min.
TolOvHystZ1 xxK	Tolerance limit above the setpoint plus hysteresis in zone 1. Influences when it is switched from stop to reduce.	0..20	2 K
TolOvHystZ2 xxK	Tolerance limit above the setpoint plus hysteresis in zone 2. Influences when it is switched from stop to reduce.	0..20	2 K
SwtchSupRet xxx	Switching from supply air to return air and the reverse with temperature alarm delay time.	↑, ↓, (ON/OFF)	OFF
Dely_Switch xxxm	Switching from supply to return air: determines when it is switched within the delay time for the high temperature alarm.	0..15	5 min.
Add.Values xxx	Creation of additional (additive) “Debug” actual value archives in the system centre / store computer. **Warning**: This can force a reorganisation of the actual value archives – for this reason **only** use when required!	↑, ↓, (ON/OFF)	OFF
Incl_UpLim xxxK	Upper limit of the neutral zone for determining the incline.	0..5	0.3 K
Incl_LwLim xxxK	Lower limit of the neutral zone for determining the incline.	0..5	0.2 K
SDS Hyst Z 1 xxxK	Determines the hysteresis used during the shift from this value and the P-quota Möbelreg. Zone 1. (*)	1..10	5 K
SDS Hyst Z 2 xxxK	Determines the hysteresis used during the shift from this value and the P-quota Möbelreg. Zone 2. (*)	1..10	5 K
SDS RMode virtSet	Please always leave this value on “virtSwt”	-	virtSwt

(*) The lower this parameter, then the earlier the pack controller is instructed to lower the suction pressure, which increases the accuracy with which the controller can maintain its setpoint. In addition the case controllers P-quota is also employed. The higher the case controller’s P-quota, then the earlier the pack controller is instructed to lower the suction pressure, which increases the accuracy with which the controller can maintain its setpoint.

8.3 Contr. Type UA 141 E - Menu tree



1: **ON**
2: **ON**
3: **OFF**
4: **ON/OFF = Master-/Slave-Modus ON/OFF**
5..8: **OFF**

Level 1	Level 2	Level 3	Menu No.	Menu Name
Main Menu			0	REFR. PT.
Actual Values			1	ACT VALUES
	Temperatue Sensors		1-1	TEMPERATUR
	Cooling Zone 1		1-2	COOLING 1
	Defrost Zone 1		1-3	DEFROST 1
	--			
	Alarm		1-5	ALARM
	Pane Heater		1-6	PANE HTR
	Cooling Zone 2		1-7	COOLING 2
	Defrost Zone 2		1-8	DEFROST 2
Setpoints			2	SETPOINTS
	Cooling		2-1	COOLING
		Zone 1	2-1-1	COOLING 1
		Zone 2	2-1-2	COOLING 2
		Zone 1T Toggle	2-1-3	COOLING 1A
		Zone 2T Toggle	2-1-4	COOLING 2A
	Defrost		2-2	DEFROST
		Zone 1	2-2-1	DEFROST 1
		Zone 2	2-2-2	DEFROST 2
		Zone 1T Toggle	2-2-3	DEFROST 1A
		Zone 2T Toggle	2-2-4	DEFROST 2A

	Alarm		2-4	ALARM
		Zone 1	2-4-1	ALARM 1
		Zone 2	2-4-2	ALARM 2
		Zone 1T Toggle	2-4-3	ALARM 1A
		Zone 2T Toggle	2-4-4	ALARM 2A

	Pane Heater		2-6	PANE HTR
		Pane Mode	2-6-1	PANE HTR
		Pane Setpoints	2-6-2	SETPOINTS

Level 1	Level 2	Level 3	Menu No.	Menu Name
Clock			3	Clock
	Current Timer		3-1	CLOCK
	Defrost Timer		3-2	DEFR.TIMER
		Defrost Timer Z2	3-2-a	DEF.TIM.Z2
	Setpoint Toggle		3-3	TOGGLE
	Automatic Start		3-4	Automatic ON
Messages			4	MESSAGES
	View Messages		4-1	MESSAGES
	Cancel Messages		4-2	MESSAGES
	Delete Messages		4-3	MESSAGES
Archive			5	ARCHIVE
Configuration			6	CONFIGURAT
	Refrigeration Point		6-1	REFR. PT.
	Controller		6-2	CONTROLLER
		Type and Version	6-2-1	VERSION
		Temperature Display	6-2-2	DISPLAY
		Alarm Delay	6-2-3	ALARMDELAY
		230V Inputs	6-2-4	230V INPUT
		Sensor Type	6-2-5	SENSORS
		Analog inputs*	6-2-6	ANALOG INPUTS
		EEV Controller Zone 1	6-2-7	EEV ZONE 1
		EEV Controller Zone 2	6-2-8	EEV ZONE 2
	Cooling		6-3	COOLING
	Language		6-4	LANGUAGE
	Alarm Priorities		6-5	ALARMPRIOS
	Em.Powersupply		6-6	EM.POW.SUP
	COPT+		6-7	COPT+

* Only UA 410 E AC

8.3.1 Menu 0 Main Menu

REFR. PT. POS: XXXXX	
1 Actual Values	Move to menu 1
2 Setpoints	Move to menu 2
3 Clock	Move to menu 3
4 Messages	Move to menu 4
5 Archive	Move to menu 5
6 Configuration	Move to menu 6

8.3.2 Menu 1 Actual Values

ACT VALUES POS: XXXXX	
1 Temp. Sensor	Move to menu 1-1
2 Cooling Zone 1	Move to menu 1-2
3 Defrost Zone 1	Move to menu 1-3
4	Not used with this controller type
5 Alarm	Move to menu 1-5
6 Pane Heater	Move to menu 1-6
7 Cooling Zone 2	Move to menu 1-7: Menu item is shown only when two-zone operation is set (Menu 6-1).
8 Defrost Zone 2	Move to menu 1-8: Menu item is shown only when two-zone operation is set (Menu 6-1).

- Menu 1-1 Temp. Sensor

TEMPERATUR XXXXX	
Temp. R2.1 XXX °C	Displays current supply air temperature Input Z11/Z12
Temp. R4.1 XXX °C	Displays current return air temperature Input Z21/Z22
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Temp. R5.1 XXX °C	Displays current evaporator inlet temperature Input Z41/Z42
Temp. R6.1 XXX °C	Displays current evaporator outlet temperature Input Z51/Z52
Temp. R2.2 XXX °C	Displays current supply air temperature Input Z61/Z62
Temp. R4.2 XXX °C	Displays current return air temperature Input Z71/Z72
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Temp. R5.2 XXX °C	Displays current evaporator inlet temperature Input Z91/Z92
Temp. R6.2 XXX °C	Displays current evaporator outlet temperature Input Z01/Z02
to VS corr. XXX °C	Displays current corrected suction pressure temperature on VS pack controller (assigned by Pack No.)
t0 locale Z1 xxx °C	Displays current t_0 temperature zone 1 [1)]
t0 locale Z2 xxx °C	Displays current t_0 temperature zone 2 [1) 2)]
tc xxx °C	Displays current tc temperature [1) 2)]
Humidite xx %	Displays current, relative humidity [1) 2)]

[1)]: Only UA 410 E AC
[2)]: The value is **only** recorded in the system centre / store computer via the CAN bus - it is **not** used for control purposes! Exception: Use of function „*toZ2Ctl.*“, parameter „*Fct. AIN2*“ (menu 6-2-6).

- Menu 1-2 Cooling Zone 1

COOLING 1 XXXXX	
Cooling XXX	Displays current OFF/ON status of cooling
op.deg. Z 1 XX %	Displays current valve opening degree Zone 1
OD med. 24h XX %	Displays mean valve opening degree Zone 1 for past day
Temp. R2.1 XXX °C	Displays current supply air temperature Input Z11/Z12
Setpoint R2.1 XXX °C	Displays supply air temperature setpoint for comparison
Hystersis R2.1 XXX K	Displays supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)
Temp. R4.1 XXX °C	Displays current return air temperature Input Z21/Z22
Setpoint R4.1 XXX °C	Displays return air temperature setpoint for comparison
Hystersis R4.1 XXX K	Displays return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)
SH Z 1 XXX °C	Displays current superheat temperature Zone 1
sup air ctrl XXX	Displays current OFF/ON status of supply or return air control
MOP op. XXX	Displays OFF/ON setpoint of MOP mode
Status light XXX	Status lighting control (ON/OFF)

- Menu 1-3 Defrost Zone 1

DEFROST 1 XXXXX	
Defrost XXX	Displays current OFF/ON status of defrosting
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82; shown only when single-zone operation is set (Menu 6-1)
Def. End. Tmp. XXX °C	Displays defrost termination temperature setpoint for comparison
Wait Time XX m	Displays waiting time setpoint
Drip Time XX m	Displays drip time setpoint
Last Defrst XX hh:mm	Displays time (day, time of day) of last defrost cycle started
M/S Nof. Sl.	Number of parameterised and accessible MA slaves
M/S Lost Sl.	CAN address of the first MA slave which was not accessible during the last defrost
M/S Defr.Sl.	Number of slaves currently undergoing a defrost
M/S DSlMat	List of MA slaves currently undergoing a defrost (can be scrolled through using ENTER)
DSq Nof. Sl.	Number of DS slaves (only in the case of DS master)
DSq Lost Sl.	CAN address of the first FA slave which was not accessible during the last defrost
DSq Defr.Sl.	Number of slaves currently undergoing defrost
DSq DSlMat	List of FA slaves currently undergoing a defrost (can be scrolled through using ENTER)

- Menu 1-4 Not used with this controller type.

- Menu 1-5 Alarm

ALARM XXXXX	
Alarm Relay XXX	Displays current OFF/ON status of alarm output Terminal 15/16/18
Hi Temp Setp.1 XX °C	Displays high temperature setpoint Zone 1
Lo Temp Setp.1 XX K	Displays low temperature setpoint Zone 1
Hi Temp Setp.2 XX °C	Displays high temperature setpoint Zone 2; shown only when two-zone operation is set (Menu 6-1)
Lo Temp Setp.2 XX K	Displays low temperature setpoint Zone 2; shown only when two-zone operation is set (Menu 6-1)

- Menu 1-6 Pane Heater

PANE HTR XXXXX	
Pane Heater XXX	Displays current OFF/ON status of pane heater output Terminal 73/74
Run Time XXX %	Displays current current pane heat on time
Humidity XXX %	Displays current room air humidity (transmitted via CAN bus from VS pack controller with fitted humidity sensor)
Room temp. XX °C	Displays current room air temperature (transmitted via CAN bus from VS pack controller with fitted room air temperature sensor)

- Menu 1-7 Cooling Zone 2

COOLING 2 XXXXX	
Cooling XXX	Displays current OFF/ONB status of cooling
op.deg. Z 2 XX %	Displays current valve opening degree Zone 2
OD med. 24h XX %	Displays mean valve opening degree Zone 2 for past day
Temp. R2.2 XXX °C	Displays current supply air temperature Input Z61/Z62
Setpoint R2.2 XXX °C	Displays supply air temperature setpoint for comparison
Hystersis R2.2 XXX K	Displays supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)
Temp. R4.2 XXX °C	Displays current return air temperature Input Z71/Z72
Setpoint R4.2 XXX °C	Displays return air temperature setpoint for comparison
Hystersis R4.2 XXX K	Displays return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)
SH Z 2 XXX °C	Displays current superheat temperature Zone 2
sup air ctrl XXX	Displays current OFF/ON status of supply or return air control
MOP op. XXX	Displays OFF/ON setpoint of MOP mode

- Menu 1-8 Defrost Zone 2

DEFROST 2 XXXXX	
Defrost XXX	Displays current OFF/ON status of defrosting
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Def. End. Tmp. XXX °C	Displays defrost termination temperature setpoint for comparison
Wait Time XX m	Displays waiting time setpoint
Drip Time XX m	Displays drip time setpoint
Last Defrst XX hh:mm	Display time (day, time of day) of last defrost cycle started

8.3.3 Menu 2 Setpoints

SETPOINTS POS: XXXXX	
1 Cooling	Move to menu 2-1; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-1-1
2 Defrost	Move to menu 2-2; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-2-1
3	Not used with this controller type
4 Alarm	Move to menu 2-4; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-4-1
5	Not used with this controller type
6 Pane Heater	Move to menu 2-6

- Menu 2-1 Cooling

COOLING POS: XXXXX	
1 Zone 1	Move to menu 2-1-1
2 Zone 2	Move to menu 2-1-2
3 Zone 1T Toggle	Move to menu 2-1-3; not shown when setpoint toggle is deactivated (Menu 3-3)
3 Zone 2T Toggle	Move to menu 2-1-4; shown only when two-zone operation is set and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-1-1 Zone 1

COOLING 1 POS: XXXXX		Entry	Default
Setpoint R2.1 XXX °C	Supply air temperature setpoint	--, -20..20	-4 °C
Hystersis R2.1 X K	Supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	4 K
Setpoint R4.1 XXX °C	Return air temperature setpoint	--, -15..20	2 °C
Hystersis R4.1 X K	Return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	2 K
Superheat XXX K	Superheat setpoint Zone 1	0..20	6 K
Min. SH XX K	Minimum superheat setpoint, below which cooling relay switches off in Zone 1. I-sum (not I-part) is set to zero when the *Reset I-Sum* parameter is set to ON.	0..10	2 K
Two pos.ctrl XXX	Switch between on-off control (ON) and contnuous control (OFF)	↑, ↓ (ON/OFF)	OFF
MOP-point XXX °C	Starting setpoint for MOP mode	--, -50..50	-- °C

- Menu 2-1-2 Zone 2

COOLING 2 POS: XXXXX		Entry	Default
Setpoint R2.2 XXX °C	Supply air temperature setpoint	--, -20..20	4 °C
Hysteresis R2.2 X K	Supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	4 K
Setpoint R4.2 XXX °C	Return air temperature setpoint	--, -15..20	2 °C
Hysteresis R4.2 X K	Return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	2 K
Superheat XXX K	Superheat setpoint Zone 2	0..20	6 K
Min. SH XX K	Minimum superheat setpoint, below which cooling relay switches off in Zone 2. I-sum (not I-part) is set to zero when the *Reset I-Sum* parameter is set to ON.	0..10	2 K
Two pos.ctrl XXX	Switch between on-off controll (ON) and contnuous control (OFF)	↑, ↓ (ON/OFF)	OFF
MOP-point XXX °C	Starting setpoint for MOP mode	--, -50..50	-- °C

- Menu 2-1-3 Zone 1T Toggle

COOLING 1A POS: XXXXX		Entry	Default
Setpoint R2.1 XXX °C	Supply air temperature setpoint	--, -20..20	-2 °C
Hysteresis R2.1 X K	Supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	4 K
Setpoint R4.1 XXX °C	Return air temperature setpoint	--, -15..20	2 °C
Hysteresis R4.1 X K	Return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	2 K

- Menu 2-1-4 Zone 2T Toggle

COOLING 2A POS: XXXXX		Entry	Default
Setpoint R2.2 XXX °C	Supply air temperature setpoint	--, -20..20	-2 °C
Hysteresis R2.2 X K	Supply air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	4 K
Setpoint R4.2 XXX °C	Return air temperature setpoint	--, -15..20	2 °C
Hysteresis R4.2 X K	Return air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	2 K

- Menu 2-2 Defrost

DEFROST POS: XXXXX	
1 Zone 1	Move to menu 2-2-1
2 Zone 2	Move to menu 2-2-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-2-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-2-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-2-1 Zone 1

DEFROST 1 POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 5..20	8 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min
M/S Degiv.Fct. XXX	Configuration of the defrost via CAN bus function. For details see chapter 4.5.5.	OFF, MASTR, SLAVE	OFF
M/S CAN Adr. XXX	Selection of the controller (1..99) participating in the defrost via CAN bus which is the master. “--“, if this controller is itself master (Parameter *M/S Degiv.Fct.*. = MASTR)	---, 1..99	--
DS-Function XXX	Configuration of the defrost sequenz function (DS). For details see chapter 4.5.6.	OFF, MASTR, SLAVE	OFF
DS-Group XXX	Selection of which group a defrost sequenz of this controller (1..99) belongs to.	---, 1..99	--
DS-Master XXX	Selection of which controller (1..99) participating in the defrost sequenz is the master. “--“, if this controller is itself the master (Parameter *DS-Function* = MASTR)	---, 1..99	--
DS-Wait time XXXm	Wait time for the defrost sequenz	0..127	1 min

- Menu 2-2-2 Zone 2

DEFROST 2 POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 5..20	8 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min

- Menu 2-2-3 Zone 1T Toggle

DEFROST 1A POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 5..20	5 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min

- Menu 2-2-4 Zone 2T Toggle

DEFROST 2A POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 5..20	5 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min

- Menu 2-3 Not used with this controller type.

- Menu 2-4 Alarm

ALARM POS: XXXXX	
1 Zone 1	Move to menu 2-4-1
2 Zone 2	Move to menu 2-4-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-4-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-4-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-4-1 Zone 1

ALARM 1 POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-10..30	6 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	4 K

- Menu 2-4-2 Zone 2

ALARM 2 POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-10..30	6 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	4 K

- Menu 2-4-3 Zone 1T Toggle

ALARM 1A POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-10..30	6 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	4 K

- Menu 2-4-4 Zone 2T Toggle

ALARM 2A POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-10..30	6 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	4 K

- Menu 2-5 Not used with this controller type.

- Menu 2-6 Pane Heater

PANE HTR POS: XXXXX	
1 Mode pane	Move to menu 2-6-1
2 Setpoint Pane	Move to menu 2-6-2

- Menu 2-6-1 Pane Mode

Selection is made according to entry. Checkmark shows current setting.

PANE HTR POS: XXXXX		Entry	Default
Fixed run time √		↵	√
Enthalpy-ctrl rtm		↵	

- Menu 2-6-2 Setpoint Pane

SETPOINTS POS: XXXXX		Entry	Default
Mod: xxxxxxxxxxxx	Displays set pane mode (Menu 2-6-1)		fixed run time
Pane On Time XX m	Pane heater on time. When making entry, make sure that the corresponding digital input D31/D32 is set to PANE SWITCH (Menu 6-2-4)	0..120	60 min
Run Time XXX %	Fixed on time, shown only when mode set to Fixed OT (Menu 2-6-1)	--, 0..100	0 %
emerg.run time XXX %	On time in loss of humidity or room air temperature (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-6-1)	--, 0..100	0 %
enthalp. offs. XXX %	Offset for on time when enthalpy control is activated (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-6-1)	-50..50	0 %
Invert Output xxx	Inversion of the function of the pane heater output (terminals 91/92)	↑, ↓, (ON/OFF)	ON

8.3.4 Menu 3 Clock

CLOCK POS: XXXXX	
1 Current Time	Move to menu 3-1
2 Defrost Timer	Move to menu 3-2
3 Toggle Setpoints	Move to menu 3-3
4 Automatic ON	Move to menu 3-4

- Menu 3-1 Current Time

☞ Time is defined by time master (system centre / store computer / operator terminal) when CAN bus is connected. Any entry made will then be overwritten by the defined value.

CLOCK POS: XXXXX		Entry	Default
Date: XX dd.mm.yy	Display and entry of current weekday, date	dd.mm.yy	
Time: hh.mm	Display and entry of current time	hh.mm	
Daylight Saving X	display and entry of automatic daylight saving time change (Y/N)	↑, ↓, (Y/N)	Y

- Menu 3-2 Defrost Timer

DEFR.TIMER POS: XXXXX		Eingabe	Default
Defrost Timer XXX	Defrost initiation via Input D11/12 (EXT) oder internal (INT)	↑, ↓, (EXT, INT)	INT
Safe Defr Time XXX m	Safe defrost time, i.e. max. allowed duration of defrosting (internal defrost only)	0..180	150 min
Manual Defrost XXX	Status (ON/OFF) of auxiliary manual defrost *)	↑, ↓, (ON/OFF)	OFF
Def.Tim.Z2 →	Separate defrost timer for zone 2	Menu 3-2-a	
Defr. 1 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter defrost timer = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 03:00
...			
Defr. 14 xxxxx hh:mm			

☞ *) Parameter is automatically set to ON at first start for the duration of the safe defrost time.

• Menu 3-2-a Def.Tim.Z2

DEFR.TIMER POS: XXXXX		Entry	Default
Defrost Timer XXX	Setting for how temperature zone 2 should defrost: - MitZ1 Together with zone 1 - INT Internally - EXT Externally – the defrost of both temperature zones is started simultaneously via the external signal	↑, ↓, (ViaZ1(ViaZ1, EXT, INT)	ViatZ1
Safe Defr Time XXX m	Safe defrost time, i.e. max. allowed duration of defrosting (internal defrost only)	0..120	60 min
Manual Defrost XXX	Status (ON/OFF) of auxiliary manual defrost *)	↑, ↓, (ON/OFF)	OFF
Defr. 1 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter *defrost timer* = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 01:00
...			
Defr. 14 xxxxx hh:mm			

• Menu 3-3 Toggle Setpoints

TOGGLE POS: XXXXX		Entry	Default
Status XXX	Setpoint toggle for alternative set of setpoints (setpoint set toggle)		
Toggle Setp. XXX	Setpoint toggle via - EXT digital input D21/22 - INT internal timer - CAN CAN bus - „--“ deactivated	↑, ↓, (EXT, INT, CAN, --)	EXT
Toggle interv. X m	The interval for the cyclical toggling between standard and alternative setpoint data records; only appears when the internal setpoint toggling is activated (menu 3-3).	--, 10..60	-- min
Alt ON: xxxxx hh:mm	Start time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 21:00
AltOFF: xxxxx hh:mm	End time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 05:00
Alt ON: xxxxx hh:mm	Start time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Su 05:00
AltOFF: xxxxx hh:mm	End time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Su 21:00
...	A total of 7 different ON, OFF toggle times can be entered. Toggle time will only be obeyed when an ***matched pair*** of ON and OFF time is set.		

- Menu 3-4 Automatic Start

AUTO ON POS: XXXXX		Entry	Default
ON 1 XXXXX hh:mm	Defrost start time for internal defrost; weekday, time of day. When making entry, make sure that the corresponding digital input D21/D22 is set to AUTO SWITCH (Menu 6-2-4)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo 06:00
...			
ON 7 XXXXX hh:mm			--

8.3.5 Menu 4 Messages

MESSAGES POS: XXXXX	
1 View	Move to menu 4-1 View Messages
2 Acknowledge	Messages in log are cancelled, press ESC to exit after cancel is confirmed
3 Delete	Move to menu 4-3

- Menu 4-1 View Messages

MESSAGES POS: XXXXX	
Error text 1:	Fault message Fault 1
dd.mm.yy hh:mm ON	Start of Fault 1
dd.mm.yy hh:mm OFF	End of Fault 1 (only when Fault 1 has ended)
...	
Error text n:	Fault message Fault n
dd.mm.yy hh:mm ON	Start of Fault n
dd.mm.yy hh:mm OFF	End of Fault n (only when Fault n has ended)

- Menu 4-2 Cancel Messages

The displays the *Alarms Cancelled!* message.

- Menu 4-3 Delete Messages

MESSAGES POS: XXXXX		Entry
Delete ! Are you sure ? No: ESC YES: ↵	Safety prompt for deleting messages; press ESC to exit after confirming or cancelling delete	↵, ESC

8.3.6 Menu 5 Archive

ARCHIVE POS: XXXXX	
dd.mm.yy hh:mm	Time of archiving Data Record 1
Zone 1: abcdef x °C	Status and temperature of Zone 1, see note *)
Zone 2: abcdef x °C	Status und Temperatur von Zone 2, se note *); shown only when two-zone operation is set (Menu 6-1)
...	
dd.mm.yy hh:mm	Time of archiving Data Record n
Zone 1: abcdef x °C	Status and temperature of Zone 1, see note *)
Zone 2: abcdef x °C	Status und Temperatur von Zone 2, seenote *); shown only when two-zone operation is set (Menu 6-1)

*) Status abcdef covers following states of refrigeration point. The entry at this position is - when a state is not active.

Example `Zone 1: abcdef x °C`

	Single-zone operation resp. Operator interface BT 300	Two-zone operation
a	O = Operation	O = Operation
b	R = Refrigeration / Cooling	R = Refrigeration / Cooling
c	R = Refrigeration/ Cooling	D = Defrost
d	D = Defrost	G = Gate / Door (coldroom controller only)
e	G = Gate / Door (coldroom controller only)	A = Alarm
f	A = Alarm	

8.3.7 Menu 6 Configuration

CONFIGURAT POS: XXXXX	
1 Refriger. Point	Move to menu 6-1
2 Controller	Move to menu 6-2
3 Cooling	Move to menu 6-3
4 Language	Move to menu 6-4
5 Alarm priorities	Move to menu 6-5
6 Em.Powersupply	Move to menu 6-6
7 COPT+	Move to menu 6-7

- Menu 6-1 Refrigeration Point

REFR. PT. POS: XXXXX		Entry	Default
Refr. Pt. Name:	Text only		
xxxxxxxxxxxxxxx	Free text entry describing refrigeration point (see note at end of table)		Case Controller
Item ID: XXXXX	Free text entry shown after Position (POS:) in screens (see note at end of table)		UA400
Priority: XX	Priority of alarms in failure of refrigeration point or when setting global controller priority (Menu 6-5)	↑, ↓, or numbers (0..99)	1
Refr. Sys. No.: XX	Pack No. of pack controller assigned to case controller. The controller cannot receive the suction pressure value for control functions before the Pack No. of the associated pack controller has been selected on the case controller.	↑, ↓, or numbers (--, 1..9)	--
Refr. Sys. Type XXX	Allocation to compressor pack. Parameter only required for linking to VS 3010 BS with several zones. Deactivate this parameter (---) when using pack controllers of other type.	↑, ↓, or numbers (---, Z1, Z2)	---
Temp. Zones X	Number of temperature zones. Single-zone operation (tandem mode) Two-zone operation	↑, ↓, or numbers (1, 2)	2
No. Sensors XX	Displays number of temperature sensors connected. After pressing ↵, sensor scan is performed and number of sensors is redefined.	↵	

It must be ensured that the correct pack number has been selected, i.e. the correct Refr. Sys. type has been set, otherwise this can result in damage to the installation or goods. Furthermore, the parameter *Corr.off* t_0 (menu 6-3) must not be set to ”--” if the t_0 from the pack controller is to be used for regulating.

A meaningful name that describes the refrigeration point in more detail should be entered, e.g. Cheese Counter 2 and CC2. Entry is made in the screens on system centre, store computer or operator terminal. Direct entry cannot be made in the controller screens displayed on the operator terminal. Entry cannot be made either on operator interface BT 300.

- Menu 6-2 Controller

CONTROLLER POS: XXXXX	
1 Type and Version	Move to menu 6-2-1
2 Temp. Display	Move to menu 6-2-2
3 Alarm Delay	Move to menu 6-2-3
4 230V Inputs	Move to menu 6-2-4
5 Sensor Type	Move to menu 6-2-5
6 Analog inputs	Move to menu 6-2-6
7 eev ctrlr zone1	Move to menu 6-2-7; shown only when Superuser mode is activated system centre / store computer / operator terminal (see Section Operation)
8 eev ctrlr zone2	Move to menu 6-2-8; shown only when Superuser mode is activated system centre / store computer / operator terminal (see Section Operation)

- Menu 6-2-1 Type and Version

VERSION POS: XXXXX		Entry	Default
Ctrlr. Type XXXXXXX	Set on DIP Switch S3		UA141E
Software Ver.: XXXX	Software version of case controller		
Serial No.: XXXXXX	Device No. of case controller (from EEPROM)		
Master/Sl. Mode XXX	Synchronized defrosting in master/slave mode	↑, ↓, (ON/OFF)	OFF

- Menu 6-2-2 Temperature Display

DISPLAY POS: XXXXX		Entry	Default
Offset XX K	Offset for temperature display	-10..10	0 K
Alarmsymbol XX	Show alarm symbol on BT 30 Temperature Display	↑, ↓, (ON/OFF)	N

- Menu 6-2-3 Alarm Delay

ALARMDELAY POS: XXXXX		Entry	Default
Sensor Fault XX m	Sensor break alarm delay	0..30	15 min
High/Low Temp. XX m	High/low temperature alarm delay	0..120	90 min
No Defrost XX h	No defrost alarm delay	--, 2..168	50 h
Selfholding X	Alarm latching with manual alarm cancelling (YES) or automatic cancelling on send (NO)	↑, ↓, (Y/N)	N

- Menu 6-2-4 230V Inputs

Only trained personnel should be allowed to change digital inputs, as changes can affect other functions.

230V INPUT POS: XXXXX		Entry	Default
Entry1: XXXXXXXXXX	Function of digital input 1 D11/D12	1)	DEFR.TIMER
Entry2: XXXXXXXXXX	Function of digital input 2 D21/D22	2)	TOGGLE SETP.
Entry3: XXXXXXXXXX	Function of digital input 3 D31/D32	3)	PANE HTR SW.
Entry4: XXXXXXXXXX	Function of digital input 4 D41/D42	4)	Extern.Alarm
XXXXXXXXXXXXXXXXXXX	Freely configurable alarm text for digital input 4, the default text is “CO2-Alarm”	Text	CO2-ALARM
Inv. D1 XXX	Inverting of digital input 1	↑, ↓, (ON/OFF)	OFF
Inv. D2 XXX	Inverting of digital input 2		OFF
Inv. D3 XXX	Inverting of digital input 3		OFF
Inv. D4 XXX	Inverting of digital input 4		OFF

Possible settings for the digital inputs:

1)	DEFR.TIMER	Defrost timer*
	MANUAL OFF.	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
	TOGGLE SETP.	Toggle setpoint
2)	TOGGLE SETP	Toggle setpoint *
	MANUAL OFF	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
3)	PANE HTR SW.	Pane heater switch *
	MANUAL OFF	Manual shutoff both zones *
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
4)	EXT ALARM	External Alarm *
	MANUAL OFF	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
	TOGGLE SETP	Toggle setpoint

* Factory setting

- Menu 6-2-5 Sensor Type

Selection is made according to entry. Checkmark shows current setting.

SENSORS POS: XXXXX		Entry	Default
L243 √	Temperature range -50 °C .. 50 °C	↲	√
K277	Temperature range -50 °C .. 50 °C	↲	
5K3A1	Temperature range 0 °C .. 100 °C	↲	

- Menu 6-2-6 Analog inputs

ANALOG INPUTS POS: XXXXX		Entry	Default
AIN1 activ x	Analogue input Z1 use (=Y) do not use (=N)	(Y,N)	N
Refrig.Z 1 xxxx	Selection of refrigerant zone 1	None R404a .. R438A*	None
LP Z1 Min xxx bar	Smallest pressure value for pressure monitoring at 4mA	0.0 .. 2.0 bar	0.0 bar
LP Z1 Max xxx bar	Largest pressure value for pressure monitoring at 20 mA	8.0 .. 200.0 bar	10.0 bar
AIN1 Send CAN	This parameter is used to instruct the case controller to make the local t0 (AIN1) available via CAN bus. ONLY possible when the parameter AIN1 active = Y	(Y,N)	N
AIN1 Rcv. CAN xx	CAN bus address of the remote case controller from which the t_0 is received.	1..99	--
AIN1 Rcv. Inp x	This parameter is used to specify the zone from which the t0 is taken. (refers to the parameter *AIN1 Rcv. Inp*)	1,2	1
AIN2 activ x	Analogue input Z2 use (=Y) do not use (=N)	(Y,N)	N
Refrig.Z 2 xxxx	Selection of refrigerant zone 2	None R404a .. R438A*	None
Fct. AIN2 xxxxx	Function of the analogue input zone 2 t0Z2 For recording only t0Z2ctl For regulation	t0Z2, toZ2ctl, Humidity, tc	
HP Z2 Min xxx bar	Smallest pressure value for pressure monitoring at 4mA	0.0 .. 2.0 bar	0.0 bar
HP Z2 Max xxx bar	Largest pressure value for pressure monitoring at 20 mA	8.0 .. 200.0 bar	10.0 bar
AIN2 Send CAN	This parameter is used to instruct the case controller to make the locally measured value of analogue input 2 (AIN2) available via CAN bus. ONLY possible when the parameter AIN2 active = Y	(Y,N)	N
AIN2 Rcv. CAN xx	CAN bus address of the remote case controller which provides the locally measured analogue value.	1..99	--
AIN2 Rcv. Inp x	This parameter is used to specify the zone from which the locally measured analogue value is taken. (refers to the parameter *AIN2 Rcv. Inp*)	1,2	2

* Supported refrigerants:
R404A, R744 (CO_2), R134a, R410A, R717 (NH3), R22, R290, R407C, R507, R1270, R402A, R502, R407F, R422A, R422D, R408A, R407D, R407A, R427A, R438A*, R152a, R170, R600, R600a

Praxis tip using the example of the ”connection of a pressure transmitter - 1 .. 7 bar”:
Here the indication on the pressure transmitter is clear (-> -1 bar) relative to the ambient pressure The adjustment of the pressure transmitter in the controller is carried out using absolute pressure values (the absolute pressure cannot be negative). In order to parameterise the above pressure transmitter with the relative pressure indication - 1 bar (at 4 mA, i.e. 0 V) at 7 bar (at 20mA, i.e. 10 V) the ambient pressure (1 bar) must be added.
The entry is carried out as follows: 0..8 bar.

- Menu 6-2-7 EEV Controller Zone 1

This menu is only visible if
- the “Master” mode is activated in the system centre, i.e.
- the “Superuser mode” is activated in the store computer.
For details see the Operation chapter.

EEV ZONE 1 POS: XXXXX		Entry	Default
Pc Z 1: XX.XX	Temperature control Zone 1, P-part	0..99.99	7.00
Ic Z 1: XX.XX	Temperature control Zone 1, I-part If parameter I_c is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.30
Dc Z 1: XX.XX	Temperature control Zone 1, D-part	0..99.99	5.00
offs OD cab. XX %	Percentage valve opening degree offset for temperature control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	30 %
Psh Z 1: XX.XX	Superheat control Zone 1, P-part	0..99.99	5.00
Ish Z 1: XX.XX	Superheat control Zone 1, I-part If parameter I_{sh} is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.10
Dsh Z 1: XX.XX	Superheat control Zone 1, D-part	0..99.99	5.00
offs OD SH XX %	Percentage valve opening degree offset for superheat control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
emerg.c-o OD XX %	Maximum emergency valve opening degree	0..50	20 %
delay min SH XX s	Delay on drop of superheat below set minimum	9..600	9 sec
setuptime XX.X m	Setup time following the switching on of the controller or following a defrost or in the event of a blockade of the regulation. The value entered must not be less than the current ”*inject.time*” parameter, otherwise the smallest valid value will be used. Further details about “Fixed valve opening degree in pumpdown/feed-in phase” see chapter 4.4.14.	0..100.0	2.0 min
inject.time XX.X m	Injection time following the switching on of the controller or following a defrost or in the event of a blockade of the regulation. The value entered must not be greater than the current ”*setuptime*” parameter, otherwise the largest valid value will be used. Further details about “Fixed valve opening degree in pumpdown/feed-in phase” see chapter 4.4.14.	0..100.0	1.0 min

EEV ZONE 1 POS: XXXXX		Entry	Default
OD over CAN XXX	Send opening degree via CAN bus (is employed when a demand dependent setpoint evaluation / to shift via consumer” is parameterised in the corresponding pack controller)	↑, ↓, (ON/OFF)	ON
15s Archiv X	A few statuses and values are additionally archived at 15 second intervals in the system centre / store computer when this parameter is set to “J”. WARNING: This setting increases the memory requirement and should only be activated when needed / for diagnostic purposes.	↑, ↓, (Y/N)	N
OD 3s interv XXX	Select interval for output of opening degree. OFF = 6s ON = 3s Control is suspended for 6 seconds when toggling.	↑, ↓, (ON/OFF)	OFF
Reset I-Sum XXX	Reset I-sum (to zero) if superheat drops below set minimum for longer than time set by ”delay min SH” parameter. OFF = I-sum not reset to zero ON = I-sum is reset to zero	↑, ↓, (ON/OFF)	ON
edit op.deg. XXX	Manual entry of valve opening degree	↑, ↓, (ON/OFF)	OFF
op.deg. Z 1 XXX %	Current valve opening degree Zone 1; can be edited when manual entry is activated	0..100	Default by controller
Maximum OD xxx %	Sets an upper limit to the opening degree output by the case controller	20..100	100%
Lo Temp to xxK	Monitoring of the t_0 transmitted by the pack controller for unsuitably low values NOTE: Following commissioning this value can be set to ”-”.	10..60, --	28K
to VS corr. XXX °C	Displays current corrected suction pressure temperature on pack controller (assigned by Pack No.)		

- Menu 6-2-8 EEV Controller Zone 2

This menu is only visible if
- the “Master” mode is activated in the system centre, i.e.
- the “Superuser mode” is activated in the store computer.
For details see the Operation chapter.

EEV ZONE 2 POS: XXXXX		Entry	Default
Pc Z 2: XX.XX	Temperature control Zone 2, P-part	0..99.99	7.00
Ic Z 2: XX.XX	Temperature control Zone 2, I-part If parameter I_c is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.30
Dc Z 2: XX.XX	Temperature control Zone 2, D-part	0..99.99	5.00
offs OD cab. XX %	Percentage valve opening degree offset for temperature control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	30 %
Psh Z 2: XX.XX	Superheat control Zone 2, P-part	0..99.99	5.00
Ish Z 2: XX.XX	Superheat control Zone 2, I-part If parameter I_{sh} is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.10
Dsh Z 2: XX.XX	Superheat control Zone 2, D-part	0..99.99	5.00
offs OD SH XX %	Percentage valve opening degree offset for superheat control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
emerg.c-o OD XX %	Maximum valve opening degree	0..50	20 %
delay min SH XX s	Delay on drop of superheat below set minimum	9..600	9 sec
edit op.deg. XXX	Manual entry of valve opening degree	↑, ↓, (ON/OFF)	OFF
op.deg. Z 2 XXX %	Current valve opening degree Zone 2; can be edited when manual entry is activated.	0..100	Default ctrlr.

- Menu 6-3 Cooling

COOLING POS: XXXXX		Entry	Default
corr.off to XX K	Correction offset for pressure loss in suction line **IMPORTANT:** in stand alone operation must be set to ”--”!	--, 0..20	2 K
Cont Cool Mon. XX m	Continuous run monitoring	--, 0..15	--
EnablingRel XXX	Switching to “Enable Operation“: OFF Opening degree is transmitted via the solid state relay (SSR) ON The two SSRs are no longer clocking, they are switched on if the case controller requires refrigeration, i.e. switched off again if no refrigeration is required.	↑, ↓, (ON/OFF)	OFF

- Menu 6-4 Language

Selection is made according to entry. Checkmark shows current setting.

LANGUAGE POS: XXXXX		Entry	Default
Deutsch D √		↵	√
English GB		↵	
Francais F		↵	
Espanyol ESP		↵	
Finnish FIN		↵	
Cesky CZ		↵	

- Menu 6-5 Alarm Priorities

ALARMPRIOS POS: XXXXX		Entry	Default
Prio.Refrig. Pt. X	Global setting of alarm priority via refrigeration point priority (Menu 6-1) (Y)	↑, ↓, (Y/N)	Y
Priority: XX	Displays refrigeration point priority (Menu 6-1); only shown when refrigeration point priority is st to Y		
Following parameters are only shown when refrigeration point priority is set to N. Meaning of valid entries for alarm priority is as follows: *- = Event ignored* *0 = Message (enterd only in message log)* *1 = Priority 1 alarm* *..* *99 = Priority 99 alarm*			
Low Temp.	Temperature below low alarm limit. Priority applies to alarms *Low Temp. Zone 1, Low Temp. Zone 2*	-, 0..99	1
High Temp.	Temperature above high alarm limit. Priority applies to alarms *High Temp. Zone 1, High Temp. Zone 2*	-, 0..99	1
Sensor Fault	Temperature sensor failure	-, 0..99	1
No Defrost	No defrost within alarm delay time. Priority applies to *No Defrost* alarm	-, 0..99	1
Timer-Term. Defrost	Defrosting terminated by safe defrost time	-, 0..99	0
Power Failure	Start following power failure	-, 0..99	0
First Start	Controller Startup (basic settings are loaded!)	-, 0..99	1
Manual Shutoff	Manual switch Input D31/D32 set OFF	-, 0..99	0
Hardware Fault	Internal hardware defect. Priority applies to alarms *EEPROM Defective, RTC Defective, Flash Memory Defective*	-, 0..99	1
Setpoint Change	Message generated when changing setpoints	0..99	0
Refrig.Pt.Dis.	Cooling interrupted by VS pack controller via CAN bus	-, 0..99	0
Battery Voltage	Battery low	-, 0..99	0
Check t0	The pack controller to is not received via CAN bus; priority is given to the messages *Check to Z1, Check to Z2* (see also chapter 10.1.3 "Low Temperature Monitoring to")	-, 0..99	1
Sensor Fault eev	EEV Control sensor failure. Priority applies to alarms *Sensor Break EEV Z1, Sensor Break EEV Z2*	-, 0..99	1

ALARMPRIOS POS: XXXXX		Entry	Default
eev ctrl block	EEV control stalled. Priority applies to alarms *EEV Stall Detect Z1, EEV Stall Detect Z2*	-, 0..99	0
wrong ctrlr type	Configuration error: Invalid controller type set on DIP Switch S3. Priority applies to *Wrong Controller Type* alarm	-, 0..99	1
emerg.cut-out SH	Superheat drop below minimum level for duration of delay time	-, 0..99	0
OD manual	Valve opening degree defined by manual entry. Priority applies to alarms *VO Manual Zone 1, VO Manual Zone 2*	-, 0..99	0
config:M/S w HG	Configuration error: Simultaneous setting of parameters for master-slave mode and discharge gas defrosting	-, 0..99	1
Check OD	Alarm due to implausible opening degree (see chapter 10.1.10)	-, 0..99	1
Extern.Alarm	Alarm for registering external alarms, default text is "CO2-Alarm"	-, 0..99	0

- Menu 6-6 Em.Powersupply (Emergency Power supply)

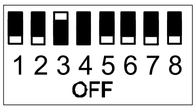
EM.POW.SUP POS: XXXXX		Entry	Default
Cool.funct.OFF xxx	Functionality of the cooling switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Defr.funct.OFF xxx	Functionality of the defrosting switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Fan funct. OFF xxx	Functionality of the fan switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Frame fct.OFF xxx	Functionality of the frame heater off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Light fct. OFF xxx	Functionality of the light during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N

- Menu 6-7 COPT+

COPT+ POS: XXXXX		Entry	Default
COPT+ xxx	Principle participation of the controller in the suction pressure shift. (function COPT+). Note: This is transmitted via a CAN bus telegram and intervenes in the regulation!	↑, ↓, (ON/OFF)	OFF
Inact.a.Def xxm	Delay time following completion of the defrost before the controller actively intervenes in the shift.	0..40	30 min
Dely_HystON xxxxm	Delay time for the reduction request with active cooling and overshoot of the hysteresis.	0..10	2.5 min
HiTmpZ1 dwn xxm	Delay time before the elapse of the high temperature alarm delay in zone 1, before the reduction is requested.	0..15	5 min.
HiTmpZ2 dwn xxm	Delay time before the elapse of the high temperature alarm delay in zone 2, before the reduction is requested.	0..15	5 min.
TolOvHystZ1 xxK	Tolerance limit above the setpoint plus hysteresis in zone 1. Influences when it is switched from stop to reduce.	0..20	2 K
TolOvHystZ2 xxK	Tolerance limit above the setpoint plus hysteresis in zone 2. Influences when it is switched from stop to reduce.	0..20	2 K
SwtchSupRet xxx	Switching from supply air to return air and the reverse with temperature alarm delay time.	↑, ↓, (ON/OFF)	OFF
Dely_Switch xxxm	Switching from supply to return air: determines when it is switched within the delay time for the high temperature alarm.	0..15	5 min.
Add.Values xxx	Creation of additional (additive) “Debug” actual value archives in the system centre / store computer. **Warning**: This can force a reorganisation of the actual value archives – for this reason **only** use when required!	↑, ↓, (ON/OFF)	OFF
Incl_UpLim xxxK	Upper limit of the neutral zone for determining the incline.	0..5	0.3 K
Incl_LwLim xxxK	Lower limit of the neutral zone for determining the incline.	0..5	0.2 K
SDS Hyst Z 1 xxxK	Determines the hysteresis used during the shift from this value and the P-quota Möbelreg. Zone 1. (*)	1..10	5 K
SDS Hyst Z 2 xxxK	Determines the hysteresis used during the shift from this value and the P-quota Möbelreg. Zone 2. (*)	1..10	5 K
SDS RMode virtSet	Please always leave this value on “virtSwt”	-	virtSwt

(*) The lower this parameter, then the earlier the pack controller is instructed to lower the suction pressure, which increases the accuracy with which the controller can maintain its setpoint. In addition the case controllers P-quota is also employed. The higher the case controller’s P-quota, then the earlier the pack controller is instructed to lower the suction pressure, which increases the accuracy with which the controller can maintain its setpoint.

8.4 Contr. Type UR 141 NE - Menu tree



1: OFF
2: OFF
3: ON
4: ON/OFF = Master-/Slave-Modus ON/OFF
5..8: OFF

Level 1	Level 2	Level 3	Menu No.	Menu Name
Main Menu			0	REFR. PT.
Actual Values			1	ACT VALUES
	Temperature Sensors		1-1	TEMPERATUR
	Cooling Zone 1		1-2	COOLING 1
	Defrost Zone 1		1-3	DEFROST 1
	Fan Zone 1		1-4	FANS 1
	Alarm		1-5	ALARM
	Frame Heater		1-6	MODE
	Cooling Zone 2		1-7	COOLING 2
	Defrost Zone 2		1-8	DEFROST 2
	Fan Zone 2		1-9	FANS 2
Setpoints			2	SETPOINTS
	Cooling		2-1	COOLING
		Zone 1	2-1-1	COOLING 1
		Zone 2	2-1-2	COOLING 2
		Zone 1T Toggle	2-1-3	COOLING 1A
		Zone 2T Toggle	2-1-4	COOLING 2A
	Defrost		2-2	DEFROST
		Zone 1	2-2-1	DEFROST 1
		Zone 2	2-2-2	DEFROST 2
		Zone 1T Toggle	2-2-3	DEFROST 1A
		Zone 2T Toggle	2-2-4	DEFROST 2A
	Fan		2-3	FANS
		Zone 1	2-3-1	FANS 1
		Zone 2	2-3-2	FANS 2
		Zone 1T Toggle	2-3-3	FANS 1A
		Zone 2T Toggle	2-3-4	FANS 2A
	Alarm		2-4	ALARM
		Zone 1	2-4-1	ALARM 1
		Zone 2	2-4-2	ALARM 2
		Zone 1T Toggle	2-4-3	ALARM 1A
		Zone 2T Toggle	2-4-4	ALARM 2A

Level 1	Level 2	Level 3	Menu No.	Menu Name
Setpoints	Frame Heater		2-5	FRAME HTR
		Frame Mode	2-5-1	MODE
		Frame Setpoints	2-5-2	SETPOINTS
		Toggle Mode	2-5-3	MODE ALT
		Setpoint Toggle	2-5-4	TOG. SETP.
Clock			3	Clock
	Current Time		3-1	CLOCK
	Defrost Timer		3-2	DEFR.TIMER
		Defrost Timer Z2	3-2-a	DEF.TIM.Z2
	Setpoint Toggle		3-3	TOGGLE
Messages			4	MESSAGES
	View Messages		4-1	MESSAGES
	Cancel Messages		4-2	MESSAGES
	Delete Messages		4-3	MESSAGES
Archive			5	ARCHIVE
Configuration			6	CONFIGURAT
	Refrigeration Point		6-1	REFR. PT.
	Controller		6-2	CONTROLLER
		Type and Version	6-2-1	VERSION
		Temperature Display	6-2-2	DISPLAY
		Alarm Delay	6-2-3	ALARMDELAY
		230V Inputs	6-2-4	230V INPUT
		Sensor Type	6-2-5	SENSORS
		Analog inputs*	6-2-6	ANALOG INPUTS
		EEV Controller Zone 1	6-2-7	EEV ZONE 1
		EEV Controller Zone 2	6-2-8	EEV ZONE 2
	Cooling		6-3	COOLING
	Language		6-4	LANGUAGE
	Alarm Priorities		6-5	ALARMPRIOS
	Em.Powersupply		6-6	EM.POW.SUP
	COPT+		6-7	COPT+

* Only UA 410 E AC

8.4.1 Menu 0 Main Menu

REFR. PT. POS: XXXXX	
1 Actual Values	Move to menu 1
2 Setpoints	Move to menu 2
3 Clock	Move to menu 3
4 Messages	Move to menu 4
5 Archive	Move to menu 5
6 Configuration	Move to menu 6

8.4.2 Menu 1 Actual Values

ACT VALUES POS: XXXXX	
1 Temp. Sensor	Move to menu 1-1
2 Cooling Zone 1	Move to menu 1-2
3 Defrost Zone 1	Move to menu 1-3
4 Fans Zone1	Move to menu 1-4
5 Alarm	Move to menu 1-5
6 Frame Heater	Move to menu 1-6
7 Cooling Zone 2	Move to menu 1-7: Menu item is shown only when two-zone operation is set (Menu 6-1).
8 Defrost Zone 2	Move to menu 1-8: Menu item is shown only when two-zone operation is set (Menu 6-1).
9 Fans Zone2	Move to menu 1-9: Menu item is shown only when two-zone operation is set (Menu 6-1).

• Menu 1-1 Temp. Sensor

TEMPERATUR XXXXX	
Temp. R4.1 XXX °C	Displays current room air temperature Input Z21/Z22
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Temp. R5.1 XXX °C	Displays current evaporator inlet temperature Input Z41/Z42
Temp. R6.1 XXX °C	Displays current evaporator outlet temperature Input Z51/Z52
Temp. R4.2 XXX °C	Displays current room air temperature Input Z71/Z72
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Temp. R5.2 XXX °C	Displays current evaporator inlet temperature Input Z91/Z92
Temp. R6.2 XXX °C	Displays current evaporator outlet temperature Input Z01/Z02
to VS corr. XXX °C	Displays current corrected suction pressure temperature on VS pack controller (assigned by Pack No.)
t0 locale Z1 xxx °C	Displays current t_0 $_t$emperature zone 1 [1)]
t0 locale Z2 xxx °C	Displays current t_0 $_t$emperature zone 2 [1) 2)]
tc xxx °C	Displays current tc $_t$emperature [1) 2)]
Humidite xx %	Displays current, relative humidity [1) 2)]

1): Only UA 410 E AC
2): The value is **only** recorded in the system centre / store computer via the CAN bus - it is **not** used for control purposes! Exception: Use of function „*toZ2Ctl.*", parameter „*Fct. AIN2*" (menu 6-2-6).

• Menu 1-2 Cooling Zone 1

COOLING 1 XXXXX	
Cooling XXX	Displays current OFF/ON status of cooling
op.deg. Z 1 XX %	Displays current valve opening degree Zone 1
OD med. 24h XX %	displays mean valve opening degree Zone 1 for past day
Temp. R4.1 XXX °C	Displays current room air temperature Input Z21/Z22
Setpoint R4.1 XXX °C	Displays room air temperature setpoint for comparison
Hystersis R4.1 XXX K	Displays room air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)
SH Z 1 XXX °C	Displays current superheat temperature Zone 1
Heatg. Circuit XXX	Displays current status of heating circuit control; shown only when single-zone operation is set (Menu 6-1)
Ht. Cir. Setp. XXX °C	Displays heating circuit control setpoint; shown only when single-zone operation is set (Menu 6-1)
Ht. Cir. Hyst. XX K	Displays heating circuit control hysteresis; shown only when single-zone operation is set (Menu 6-1)
sup air ctrl XXX	Displays current OFF/ON status of supply or room air control
MOP op. XXX	Displays OFF/ON setpoint of MOP mode
Status light XXX	Status lighting control (ON/OFF)

- Menu 1-3 Defrost Zone 1

DEFROST 1 XXXXX	
Defrost XXX	Displays current OFF/ON status of defrosting
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82; shown only when single-zone operation is set (Menu 6-1)
Def. End. Tmp. XXX °C	Displays defrost termination temperature setpoint for comparison
Wait Time XX m	Displays waiting time setpoint
Drip Time XX m	Displays drip time setpoint
2.Defrst Level XXX °C	Displays 2nd defrost stage setpoint; shown only when single-zone operation is set (Menu 6-1)
Last Defrst XX hh:mm	Displays time (day, time of day) of last defrost cycle started
M/S Nof. Sl.	Number of parameterised and accessible MA slaves
M/S Lost Sl.	CAN address of the first MA slave which was not accessible during the last defrost
M/S Defr.Sl.	Number of slaves currently undergoing a defrost
M/S DSlMat	List of MA slaves currently undergoing a defrost (can be scrolled through using ENTER)
DSq Nof. Sl.	Number of DS slaves (only in the case of DS master)
DSq Lost Sl.	CAN address of the first FA slave which was not accessible during the last defrost
DSq Defr.Sl.	Number of slaves currently undergoing defrost
DSq DSlMat	List of FA slaves currently undergoing a defrost (can be scrolled through using ENTER)

- Menu 1-4 Fan Zone 1

FANS 1 XXXXX	
Fans XXX	Displays current fan status
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Fan Delay XXX °C	Displays fan start temperature setpoint

- Menu 1-5 Alarm

ALARM	XXXXX	
Alarm Relay	XXX	Displays current OFF/ON status of alarm output Terminal 15/16/18
Hi Temp Setp.1	XX °C	Displays high temperature setpoint Zone 1
Lo Temp Setp.1	XX K	Displays low temperature setpoint Zone 1
Hi Temp Setp.2	XX °C	Displays high temperature setpoint Zone 2; shown only when two-zone operation is set (Menu 6-1)
Lo Temp Setp.2	XX K	Displays low temperature setpoint Zone 2; shown only when two-zone operation is set (Menu 6-1)
Coldroom Door 1	XXX	Displays current OFF/ON status of coldroom door input Terminal D31/D32
Coldroom Door 2	XXX	Displays current OFF/ON status of coldroom door input Terminal D21/D22

- Menu 1-6 Frame Heater

MODE	XXXXX	
Frame Heater	XXX	Displays current OFF/ON status of frame heater output Terminal 91/92/93
Run Time	XXX %	Displays current frame heater on time
Hunidity	XXX %	Displays current room air humidity (transmitted via CAN bus from VS pack controller with fitted humidity sensor)
Room temp.	XX °C	Displays current room air temperature (transmitted via CAN bus from VS pack controller with fitted room air temperature sensor)

- Menu 1-7 Cooling Zone 2

COOLING 2	XXXXX	
Cooling	XXX	Displays current OFF/ON status of cooling
op.deg. Z 2	XX %	Displays current valve opening degree Zone 2
OD med. 24h	XX %	Displays mean valve opening degree Zone 2 for past day
Temp. R4.2	XXX °C	Displays current room air temperature Input Z71/Z72
Setpoint R4.2	XXX °C	Displays room air temperature setpoint for comparison
Hystersis R4.2	XXX K	Displays room air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)
SH Z 2	XXX °C	Displays current superheat temperature Zone 2
sup air ctrl	XXX	Displays current OFF/ON status of supply or room air control
MOP op.	XXX	Displays OFF/ON setpoint of MOP mode

- Menu 1-8 Defrost Zone 2

DEFROST 2 XXXXX	
Defrost XXX	Displays currentOFF/ON status of defrosting
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Def. End. Tmp. XXX °C	Displays defrost termination temperature setpoint for comparison
Wait Time XX m	Displays waiting time setpoint
Drip Time XX m	Displays drip time setpoint
Last Defrst XX hh:mm	Displays time (day, time of day) of last defrost cycle started

- Menu 1-9 Fan Zone 2

FANS 2 XXXXX	
Fans XXX	Displays current fan status
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Fan Delay XXX °C	Displays fan start temperature setpoint

8.4.3 Menu 2 Setpoints

SETPOINTS POS: XXXXX	
1 Cooling	Move to menu 2-1; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-1-1
2 Defrost	Move to menu 2-2; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-2-1
3 Fans	Move to menu 2-3; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-3-1
4 Alarm	Move to menu 2-4; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-4-1
5 Frame Heater	Move to menu 2-5

- Menu 2-1 Cooling

COOLING POS: XXXXX	
1 Zone 1	Move to menu 2-1-1
2 Zone 2	Move to menu 2-1-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-1-3; not shown when setpoint toggle is deactivated (Menu 3-3)
3 Zone 2T Toggle	Move to menu 2-1-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-1-1 Zone 1

COOLING 1 POS: XXXXX		Entry	Default
Setpoint R4.1 XXX °C	Room air temperature setpoint	--, -10..30	5 °C
Hystersis R4.1 X K	Room air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	2 K
Ht. Cir. Setp.	Heating circuit control setpoint; shown only when single-zone is set (Menu 6-1)	--, -10..30	5 °C
Ht. Cir. Hyst.	Heating circuit control hysteresis setpoint;; shown only when single-zone is set (Menu 6-1)	1..8	2 K
Superheat XXX K	Superheat setpoint Zone 1	0..20	6 K
Min. SH XX K	Minimum superheat setpoint, below which cooling relay switches off in Zone 1. I-sum (not I-part) is set to zero when the *Reset I-Sum* parameter is set to ON.	0..10	2 K
Two pos.ctrl XXX	Switch between on-off control (ON) and continuous control (OFF)	↑, ↓ (ON/OFF)	OFF
MOP-point XXX °C	Starting setpoint for MOP mode	--, -50..50	-- °C

- Menu 2-1-2 Zone 2

COOLING 2 POS: XXXXX		Entry	Default
Setpoint R4.2 XXX °C	Room air temperature setpoint	--, -10..30	5 °C
Hystersis R4.2 X K	Room air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	2 K
Superheat XXX K	Superheat setpoint Zone 2	0..20	6 K
Min. SH XX K	Minimum superheat setpoint, below which cooling relay switches off in Zone 2. I-sum (not I-part) is set to zero when the *Reset I-Sum* parameter is set to ON.	0..10	2 K
Two pos.ctrl XXX	Switch between on-off control (ON) and continuous control (OFF)	↑, ↓ (ON/OFF)	OFF
MOP-point XXX °C	Starting setpoint for MOP mode	--, -50..50	-- °C

- Menu 2-1-3 Zone 1T Toggle

COOLING 1A POS: XXXXX		Entry	Default
Setpoint R4.1 XXX °C	Room air temperature setpoint	--, -10..30	3 °C
Hystersis R4.1 X K	Room air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..8	1 K
Ht. Cir. Setp.	Heating circuit control setpoint; shown only when single-zone operation is set (Menu 6-1)	--, -10..30	3 °C
Ht. Cir. Hyst.	Heating circuit control hysteresis setpoint; shown only when single-zone operation is set (Menu 6-1)	1..8	1 K

- Menu 2-1-4 Zone 2T Toggle

COOLING 2A POS: XXXXX		Entry	Default
Setpoint R4.2 XXX °C	Room air temperature setpoint	--, -10..30	3 °C
Hystersis R4.2 X K	Room air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..8	1 K

- Menu 2-2 Defrost

DEFROST POS: XXXXX	
1 Zone 1	Move to menu 2-2-1
2 Zone 2	Move to menu 2-2-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-2-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-2-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-2-1 Zone 1

DEFROST 1 POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 0..30	5 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min
2.Defrst Level XXX °C	2nd defrost stage setpoint; shown only when single-zone operation is set (Menu 6-1)	--, -20..30	--
M/S Degiv.Fct. XXX	Configuration of the defrost via CAN bus function. For details see chapter 4.5.5.	OFF, MASTR, SLAVE	OFF
M/S CAN Adr. XXX	Selection of the controller (1..99) participating in the defrost via CAN bus which is the master. “--“, if this controller is itself master (Parameter *M/S Degiv.Fct..* = MASTR)	---, 1..99	--
DS-Function XXX	Configuration of the defrost sequenz function (DS). For details see chapter 4.5.6.	OFF, MASTR, SLAVE	OFF
DS-Group XXX	Selection of which group a defrost sequenz of this controller (1..99) belongs to.	---, 1..99	--
DS-Master XXX	Selection of which controller (1..99) participating in the defrost sequenz is the master. “--“, if this controller is itself the master (Parameter *DS-Function* = MASTR)	---, 1..99	--
DS-Wait time XXXm	Wait time for the defrost sequenz	0..127	1 min

- Menu 2-2-2 Zone 2

DEFROST 2 POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 0..30	5 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min

- Menu 2-2-3 Zone 1T Toggle

DEFROST 1A POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 0..30	5 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min
2.Defrst Level XXX °C	2nd defrost stage setpoint; shown only when single-zone operation is set (Menu 6-1)	--, -20..30	--

- Menu 2-2-4 Zone 2T Toggle

DEFROST 2A POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 0..30	5 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min

- Menu 2-3 Fan

FANS POS: XXXXX	
1 Zone 1	Move to menu 2-3-1
2 Zone 2	Move to menu 2-3-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-3-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-3-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-3-1 Zone 1

FANS 1 POS: XXXXX		Entry	Default
Fan Delay XXX °C	Fan start temperature setpoint	--, -20..20	-- °C

- Menu 2-3-2 Zone 2

FANS 2 POS: XXXXX		Entry	Default
Fan Delay XXX °C	Fan start temperature setpoint	--, -20..20	-- °C

- Menu 2-3-3 Zone 1T Toggle

FANS 1A POS: XXXXX		Entry	Default
Fans Delay XXX °C	Fan start temperature setpoint	--, -20..20	-- °C

- Menu 2-3-4 Zone 2T Toggle

FANS 2A POS: XXXXX		Entry	Default
Fans Delay XXX °C	Fan start temperature setpoint	--, -20..20	-- °C

- Menu 2-4 Alarm

ALARM POS: XXXXX	
1 Zone 1	Move to menu 2-4-1
2 Zone 2	Move to menu 2-4-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-4-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-4-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-4-1 Zone 1

ALARM 1 POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Tempeature* alarm is generated	0..30	10 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	2 K

- Menu 2-4-2 Zone 2

ALARM 2 POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Tempeature* alarm is generated	0..30	10 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	2 K

- Menu 2-4-3 Zone 1T Toggle

ALARM 1A POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Tempeature* alarm is generated	0..30	8 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	2 K

- Menu 2-4-4 Zone 2T Toggle

ALARM 2A POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Tempeature* alarm is generated	0..30	8 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..6	2 K

- Menu 2-5 Frame Heater

FRAME HTR POS: XXXXX	
1 Mode frm htr	Move to menu 2-5-1
2 Setpoint frm htr	Move to menu 2-5-2
3 Mode altern.	Move to menu 2-5-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Setpoint altern.	Move to menu 2-5-4; not shown when setpoint toggle is deactivated (Menu 3-3)

- Menu 2-5-1 Frame Mode

Selection is made according to entry. Checkmark shows current setting.

MODE POS: XXXXX		Entry	Default
Fixed run time √		↵	√
Enthalpy-ctrl rtm		↵	

- Menu 2-5-2 Frame Setpoints

SETPOINTS POS: XXXXX		Entry	Default
Mod: xxxxxxxxxxxx	Displays set pane mode (Menu 2-5-1)		fixed run time
Run Time XXX %	Fixed on time, shown only when mode set to Fixed OT (Menu 2-5-1)	--, 0..100	100 %
emerg.run time XXX %	On time in loss of humidity or room air temperature (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-1)	--, 0..100	100 %
enthalp. offs. XXX %	Offset for on time when enthalpy control is activated (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-1)	-50..50	0 %
Invert Output xxx	Inversion of the function of the frame heater output (terminals 91/92)	↑, ↓, (ON/OFF)	ON

- Menu 2-5-3 Toggle Mode

Selection is made according to entry. Checkmark shows current setting.

MODE ALT. POS: XXXXX		Entry	Default
Fixed run time √		↲	√
Enthalpy-ctrl rtm		↲	

- Menu 2-5-4 Setpoint Toggle

TOG. SETP. POS: XXXXX		Entry	Default
Mod: xxxxxxxxxxxx	Displays set pane mode (Menu 2-5-3)		fixed run time
Run Time XXX %	Fixed on time, shown only when mode set to Fixed OT (Menu 2-5-3)	--, 0..100	100 %
emerg.run time XXX %	On time in loss of humidity or room air temperature (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-3)	--, 0..100	100 %
enthalp. offs. XXX %	Offset for on time when enthalpy control is activated (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-3)	-50..50	0 %

8.4.4 Menu 3 Clock

CLOCK POS: XXXXX	
1 Current Time	Move to menu 3-1
2 Defrost Timer	Move to menu 3-2
3 Toggle Setpoints	Move to menu 3-3

- Menu 3-1 Current Time

☞ Time is defined by time master (system centre / store computer / operator terminal) when CAN bus is connected. Any entry made will then be overwritten by the defined value.

CLOCK POS: XXXXX		Entry	Default
Date: XX dd.mm.yy	Display and entry of current weekday, date	dd.mm.yy	
Time: hh.mm	Display and entry of current time	hh.mm	
Daylight Saving X	Display and entry of automatic daylight saving time change (Y/N)	↑, ↓, (Y/N)	Y

- Menu 3-2 Defrost Timer

DEFR.TIMER POS: XXXXX		Entry	Default
Defrost Timer XXX	Defrost initiation via Input D11/12 (EXT) oder internal (INT)	↑, ↓, (EXT, INT)	INT
Safe Defr Time XXX m	Safe defrost time, i.e. max. allowed duration of defrosting (internal defrost only); shown only when paramter defrost timer = INT	0..120	90 min
Manual Defrost XXX	Status (ON/OFF) of auxiliary manual defrost *)	↑, ↓ (ON/OFF)	OFF
Def.Tim.Z2 →	Separate defrost timer for zone 2	Menu 3-2-a	
Defr. 1 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter defrost timer = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 01:00
...			
Defr. 14 xxxxx hh:mm			

*) Parameter is **NOT** automatically set to ON at first start.

- Menu 3-2-a Def.Tim.Z2

DEFR.TIMER POS: XXXXX		Entry	Default
Defrost Timer XXX	Setting for how temperature zone 2 should defrost: - MitZ1 Together with zone 1 - INT Internally - EXT Externally – the defrost of both temperature zones is started simultaneously via the external signal	↑, ↓, (ViaZ1(ViaZ1, EXT, INT)	ViatZ1
Safe Defr Time XXX m	Safe defrost time, i.e. max. allowed duration of defrosting (internal defrost only)	0..120	60 min
Manual Defrost XXX	Status (ON/OFF) of auxiliary manual defrost *)	↑, ↓, (ON/OFF)	OFF
Defr. 1 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter *defrost timer* = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 01:00
...			
Defr. 14 xxxxx hh:mm			

• Menu 3-3 Toggle Setpoints

TOGGLE POS: XXXXX		Entry	Default
Status XXX	Setpoint toggle for alternative set of setpoints (setpoint set toggle)		
Toggle Setp. XXX	Setpoint toggle via - EXT digital input D21/22 - INT internal timer - CAN CAN bus - „--" deactivated Note: Care should be taken that the corresponding digital input D21/D22 is set to SOLLW.UMSCH (menu 6-2-4)	↑, ↓, (EXT, INT, CAN, --)	EXT
Toggle interv. X m	The interval for the cyclical toggling between standard and alternative setpoint data records; only appears when the internal setpoint toggling is activated (menu 3-3).	--, 10..60	-- min
Alt ON: xxxxx hh:mm	Start time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 21:00
AltOFF: xxxxx hh:mm	End time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 05:00
Alt ON: xxxxx hh:mm	End time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Su 05:00
AltOFF: xxxxx hh:mm	End time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Su 21:00
...	A total of 7 different ON, OFF toggle times can be entered. Toggle time will only be obeyed when a **matched pair** of ON and OFF time is set.		

8.4.5 Menu 4 Messages

MESSAGES POS: XXXXX	
1 View	Move to menu 4-1 View Messages
2 Acknowledge	Messages in log are cancelled, press ESC to exit after cancel is confirmed
3 Delete	Move to menu 4-3

• Menu 4-1 View Messages

MESSAGES POS: XXXXX	
Error text 1:	Fault message Fault 1
dd.mm.yy hh:mm ON	Start of Fault 1
dd.mm.yy hh:mm OFF	End of Fault 1 (only when Fault 1 has ended)
...	
Error text n:	Fault message Fault n
dd.mm.yy hh:mm ON	Start of Fault n
dd.mm.yy hh:mm OFF	End of Fault n (only when Fault n has ended)

• Menu 4-2 Cancel Messages

This displays the *Alarms Cancelled!* message.

• Menu 4-3 Delete Messages

MESSAGES POS: XXXXX		Entry
Delete ! Are you sure ? No: ESC YES: ↵	Safety prompt for deleting messages; press ESC to exit after confirming or cancelling deleite	↵, ESC

8.4.6 Menu 5 Archive

ARCHIVE POS: XXXXX	
dd.mm.yy hh:mm	Time of archiving Data Record 1
Zone 1: abcdef x °C	Status and temperature of Zone 1, see note *)
Zone 2: abcdef x °C	Status und Temperatur von Zone 2, see note *); shown only when two-zone operation is set (Menu 6-1)
...	
dd.mm.yy hh:mm	Time of archiving Data Record n
Zone 1: abcdef x °C	Status and temperature of Zone 1, see note *)
Zone 2: abcdef x °C	Status und Temperatur von Zone 2, see note *); shown only when two-zone operation is set (Menu 6-1)

*) Status abcdef covers following states of refrigeration point. The entry at this position is - when a state is not active.

Example `Zone 1: abcdef x °C`

	Single-zone operation resp. Operator interface BT 300	Two-zone operation
a	O = Operation	O = Operation
b	R = Refrigeration / Cooling	R = Refrigeration / Cooling
c	R = Refrigeration/ Cooling	D = Defrost
d	D = Defrost	G = Gate / Door (coldroom controller only)
e	G = Gate / Door (coldroom controller only)	A = Alarm
f	A = Alarm	

8.4.7 Menu 6 Configuration

CONFIGURAT POS: XXXXX	
1 Refriger. Point	Move to menu 6-1
2 Controller	Move to menu 6-2
3 Cooling	Move to menu 6-3
4 Language	Move to menu 6-4
5 Alarm priorities	Move to menu 6-5
6 Em.Powersupply	Move to menu 6-6
7 COPT+	Move to menu 6-7

- Menu 6-1 Refrigeration Point

REFR. PT. POS: XXXXX		Entry	Default
Refr. Pt. Name:	Text only		
xxxxxxxxxxxxxxx	Free text entry describing refrigeration point (see note at end of table)		Case Controller
Item ID: XXXXX	Free text entry shown after Position (POS:) in screens (see note at end of table)		UA400
Priority: XX	Priorityx of alarms in failure of refrigeration point or when setting global controller priority (Menu 6-5)	↑, ↓, or numbers (0..99)	1
Refr. Sys. No.: XX	Pack No. of pack controller assigned to case controller. The controller cannot receive the suction pressure value for control functions before the Pack No. of the associated pack controller has been selected on the case controller	↑, ↓, or numbers (--, 1..9)	--
Refr. Sys. Type XXX	Allocation to compressor pack. Parameter only required for linking to VS 3010 BS with several zones. Deactivate this parameter (---) when using pack controllers of other type.	↑, ↓, or numbers (---, Z1, Z2)	---
Temp. Zones X	Number of temperature zones Single-zone operation (tandem mode) Two-zone operation	↑, ↓, or numbers (1, 2)	2
No. Sensors XX	Displays number of temperature sensors connected. After pressing ↵, sensor scan is performed and number of sensors is redefined.	↵	

It must be ensured that the correct pack number has been selected, i.e. the correct Refr. Sys. type has been set, otherwise this can result in damage to the installation or goods. Furthermore, the parameter *Corr.off* t_0 (menu 6-3) must not be set to ”--” if the t_0 from the pack controller is to be used for regulating.

A meaningful name that describes the refrigeration point in more detail should be entered, e.g. Cheese Counter 2 and CC2. Entry is made in the screens on system centre, store computer or operator terminal. Direct entry cannot be made in the controller screens displayed on the operator terminal. Entry cannot be made either on operator interface BT 300.

- Menu 6-2 Controller

CONTROLLER POS: XXXXX	
1 Type and Version	Move to menu 6-2-1
2 Temp. Display	Move to menu 6-2-2
3 Alarm Delay	Move to menu 6-2-3
4 230V Inputs	Move to menu 6-2-4
5 Sensor Type	Move to menu 6-2-5
6 Analog inputs	Move to menu 6-2-6
7 eev ctrlr zone1	Move to menu 6-2-7; shown only when Superuser mode is activated system centre / store computer / operator terminal (see Section Operation)
8 eev ctrlr zone2	Move to menu 6-2-8; shown only when Superuser mode is activated system centre / store computer / operator terminal (see Section Operation)

- Menu 6-2-1 Type and Version

VERSION POS: XXXXX		Entry	Default
Ctrlr. Type XXXXXXX	Set on DIP Switch S3		UR141NE
Software Ver.: XXXX	Software version of case controller		
Serial No.: XXXXXX	Device No. of case controller (from EEPROM)		
Master/Sl. Mode XXX	Synchronized defrosting in master/slave mode	↑, ↓, (ON/OFF)	OFF

- Menu 6-2-2 Temperature Display

DISPLAY POS: XXXXX		Entry	Default
Offset XX K	Offset for temperature display	-10..10	0 K
Alarmsymbol XX	Show alarm symbol on BT 30 Temperature Display	↑, ↓, (ON/OFF)	N

- Menu 6-2-3 Alarm Delay

ALARMDELAY POS: XXXXX		Entry	Default
Sensor Fault XX m	Sensor break alarm delay	0..30	15 min
High/Low Temp. XX m	High/low temperature alarm delay	0..150	90 min
Door Open XX m	Alarm time delay for open coldroom door (also acts on automatic starting of cooling and fan). This alarm is active only when the corresponding digital input D21/D22 or D31/D32 is set to DOOR CONTACT (Menu 6-2-4)	0..60	60 min
No Defrost XX h	No defrost alarm delay	--, 2..168	30 h
Selfholding X	Alarm latching with manual alarm cancelling (YES) or automatic cancelling on send (NO)	↑, ↓, (Y/N)	N

- Menu 6-2-4 230V Inputs

Only trained personnel should be allowed to change digital inputs, as changes can affect other functions.

230V INPUT POS: XXXXX		Entry	Default
Entry1: XXXXXXXXXX	Function of digital input 1 D11/D12	1)	DEFR.TIMER
Entry2: XXXXXXXXXX	Function of digital input 2 D21/D22	2)	TOGGLE SETP.
Entry3: XXXXXXXXXX	Function of digital input 3 D31/D32	3)	DOOR CON-TACT
Entry4: XXXXXXXXXX	Function of digital input 4 D41/D42	4)	Extern.Alarm
XXXXXXXXXXXXXXXXXXX	Freely configurable alarm text for digital input 4, the default text is “CO2-Alarm”	Text	CO2-ALARM
Inv. D1 XXX	Inverting of digital input 1	↑, ↓, (ON/OFF)	OFF
Inv. D2 XXX	Inverting of digital input 2		OFF
Inv. D3 XXX	Inverting of digital input 3		OFF
Inv. D4 XXX	Inverting of digital input 4		OFF

Possible settings for the digital inputs:

1)	DEFR.TIMER	Defrost timer*
	MANUAL OFF.	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
	TOGGLE SETP.	Toggle setpoint
2)	TOGGLE SETP	Toggle setpoint *
	DOOR CONTACT	Door contact
	MANUAL OFF	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
3)	DOOR CONTACT	Door contact *
	MANUAL OFF	Manual shutoff both zones *
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
4)	EXT ALARM	External Alarm *
	MANUAL OFF	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
	TOGGLE SETP	Toggle setpoint

* Factory setting

- Menu 6-2-5 Sensor Type

Selection is made according to entry. Checkmark shows current setting.

SENSORS POS: XXXXX		Entry	Default
L243 √	Temperature range -50 °C .. 50 °C	↵	√
K277	Temperature range -50 °C .. 50 °C	↵	
5K3A1	Temperature range 0 °C .. 100 °C	↵	

- Menu 6-2-6 Analog inputs

ANALOG INPUTS POS: XXXXX		Entry	Default
AIN1 activ x	Analogue input Z1 use (=Y) do not use (=N)	(Y,N)	N
Refrig.Z 1 xxxx	Selection of refrigerant zone 1	None R404a .. R438A*	None
LP Z1 Min xxx bar	Smallest pressure value for pressure monitoring at 4mA	0.0 .. 2.0 bar	0.0 bar
LP Z1 Max xxx bar	Largest pressure value for pressure monitoring at 20 mA	8.0 .. 200.0 bar	10.0 bar
AIN1 Send CAN	This parameter is used to instruct the case controller to make the local t0 (AIN1) available via CAN bus. ONLY possible when the parameter AIN1 active = Y	(Y,N)	N
AIN1 Rcv. CAN xx	CAN bus address of the remote case controller from which the t_0 is received.	1..99	--
AIN1 Rcv. Inp x	This parameter is used to specify the zone from which the t0 is taken. (refers to the parameter *AIN1 Rcv. Inp*)	1,2	1
AIN2 activ x	Analogue input Z2 use (=Y) do not use (=N)	(Y,N)	N
Refrig.Z 2 xxxx	Selection of refrigerant zone 2	None R404a .. R438A*	None
Fct. AIN2 xxxxx	Function of the analogue input zone 2 t0Z2 For recording only t0Z2ctl For regulation	t0Z2, toZ2ctl, Humidity, tc	
HP Z2 Min xxx bar	Smallest pressure value for pressure monitoring at 4mA	0.0 .. 2.0 bar	0.0 bar
HP Z2 Max xxx bar	Largest pressure value for pressure monitoring at 20 mA	8.0 .. 200.0 bar	10.0 bar
AIN2 Send CAN	This parameter is used to instruct the case controller to make the locally measured value of analogue input 2 (AIN2) available via CAN bus. ONLY possible when the parameter AIN2 active = Y	(Y,N)	N
AIN2 Rcv. CAN xx	CAN bus address of the remote case controller which provides the locally measured analogue value.	1..99	--
AIN2 Rcv. Inp x	This parameter is used to specify the zone from which the locally measured analogue value is taken. (refers to the parameter *AIN2 Rcv. Inp*)	1,2	2

* Supported refrigerants:
R404A, R744 (CO_2), R134a, R410A, R717 (NH3), R22, R290, R407C, R507, R1270, R402A, R502, R407F, R422A, R422D, R408A, R407D, R407A, R427A, R438A*, R152a, R170, R600, R600a

Praxis tip using the example of the ”connection of a pressure transmitter - 1 .. 7 bar”:
Here the indication on the pressure transmitter is clear (-> -1 bar) relative to the ambient pressure The adjustment of the pressure transmitter in the controller is carried out using absolute pressure values (the absolute pressure cannot be negative). In order to parameterise the above pressure transmitter with the relative pressure indication - 1 bar (at 4 mA, i.e. 0 V) at 7 bar (at 20mA, i.e. 10 V) the ambient pressure (1 bar) must be added.
The entry is carried out as follows: 0..8 bar.

- Menu 6-2-7 EEV Controller zone 1

This menu is only visible if
- the “Master” mode is activated in the system centre, i.e.
- the “Superuser mode” is activated in the store computer.
For details see the Operation chapter.

EEV ZONE 1 POS: XXXXX		Entry	Default
Pc Z 1: XX.XX	Temperature control Zone 1, P-part	0..99.99	7.00
Ic Z 1: XX.XX	Temperature control Zone 1, I-part If parameter I_c is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.30
Dc Z 1: XX.XX	Temperature control Zone 1, D-part	0..99.99	5.00
offs OD cab. XX %	Percentage valve opening degree offset for tempera-ture control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	30 %
Psh Z 1: XX.XX	Superheat control Zone 1, P-part	0..99.99	5.00
Ish Z 1: XX.XX	Superheat control Zone 1, I-part If parameter I_{sh} is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.10
Dsh Z 1: XX.XX	Superheat control Zone 1, D-part	0..99.99	5.00
offs OD SH XX %	Percentage valve opening degree offset for superheat control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
emerg.c-o OD XX %	Maximum emergency valve opening degree	0..50	20 %
delay min SH XX s	Delay on drop of superheat below set minimum	9..600	9 sec
setuptime XX.X m	Setup time following the switching on of the controller or following a defrost or in the event of a blockade of the regulation. The value entered must not be less than the current ”*inject.time*” parameter, otherwise the smallest valid value will be used. Further details about “Fixed valve opening degree in pumpdown/feed-in phase” see chapter 4.4.14.	0..100.0	2.0 min
inject.time XX.X m	Injection time following the switching on of the control-ler or following a defrost or in the event of a blockade of the regulation. The value entered must not be greater than the current ”*setuptime*” parameter, otherwise the largest valid value will be used. Further details about “Fixed valve opening degree in pumpdown/feed-in phase” see chapter 4.4.14.	0..100.0	1.0 min

EEV ZONE 1 POS: XXXXX		Entry	Default
OD over CAN XXX	Send opening degree via CAN bus (is employed when a demand dependent setpoint evaluation / to shift via consumer" is parameterised in the corresponding pack controller)	↑, ↓, (ON/OFF)	ON
15s Archiv X	A few statuses and values are additionally archived at 15 second intervals in the system centre / store computer when this parameter is set to "J". WARNING: This setting increases the memory requirement and should only be activated when needed / for diagnostic purposes.	↑, ↓, (Y/N)	N
OD 3s interv XXX	Select interval for output of opening degree. OFF = 6s ON = 3s Control is suspended for 6 seconds when toggling.	↑, ↓, (ON/OFF)	OFF
Reset I-Sum XXX	Reset I-sum (to zero) if superheat drops below set minimum for longer than time set by "delay min SH" parameter. OFF = I-sum not reset to zero ON = I-sum is reset to zero	↑, ↓, (ON/OFF)	ON
edit op.deg. XXX	Manual entry of valve opening degree	↑, ↓, (ON/OFF)	OFF
op.deg. Z 1 XXX %	Current valve opening degree Zone 1; can be edited when manual entry is activated	0..100	Default by controller
Maximum OD xxx %	Sets an upper limit to the opening degree output by the case controller	20..100	100%
Lo Temp to xxK	Monitoring of the t_0 transmitted by the pack controller for unsuitably low values NOTE: Following commissioning this value can be set to "-".	10..60, --	28K
to VS corr. XXX °C	Displays current corrected suction pressure temperature on pack controller (assigned by Pack No.)		

- Menu 6-2-8 EEV Controller Zone 2

☞ This menu is only visible if
- the "Master" mode is activated in the system centre, i.e.
- the "Superuser mode" is activated in the store computer.
For details see the Operation chapter.

EEV ZONE 2 POS: XXXXX		Entry	Default
Pc Z 2: XX.XX	Temperature control Zone 2, P-part	0..99.99	7.00
Ic Z 2: XX.XX	Temperature control Zone 2, I-part If parameter I_c is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.30
Dc Z 2: XX.XX	Temperature control Zone 2, D-part	0..99.99	5.00
offs OD cab. XX %	Percentage valve opening degree offset for temperature control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	30 %
Psh Z 2: XX.XX	Superheat control Zone 2, P-part	0..99.99	5.00
Ish Z 2: XX.XX	Superheat control Zone 2, I-part If parameter I_{sh} is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.10

EEV ZONE 2 POS: XXXXX		Entry	Default
Dsh Z 2: XX.XX	Superheat control Zone 2, D-part	0..99.99	5.00
offs OD SH XX %	percentage valve opening degree offset for superheat control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
emerg.c-o OD XX %	Maximum valve opening degree	0..50	20 %
delay min SH XX s	Delay on drop of superheat below set minimum	9..600	9 sec
edit op.deg. XXX	Manual entry of valve opening degree	↑, ↓, (ON/OFF)	OFF
op.deg. Z 2 XXX %	Current valve opening degree Zone 2; can be edited when manual entry is activated	0..100	Default ctrlr.

- Menu 6-3 Cooling

COOLING POS: XXXXX		Entry	Default
corr.off to XX K	Correction offset for pressure loss in suction line **IMPORTANT:** in stand alone operation must be set to "--"!	--, 0..20	2 K
Cont Cool Mon. XX m	Continuous run monitoring	--, 0..15	0 min
EnablingRel XXX	Switching to "Enable Operation": OFF Opening degree is transmitted via the solid state relay (SSR) ON The two SSRs are no longer clocking, they are switched on if the case controller requires refrigeration, i.e. switched off again if no refrigeration is required.	↑, ↓, (ON/OFF)	OFF

- Menu 6-4 Language

Selection is made according to entry. Checkmark shows current setting.

LANGUAGE POS: XXXXX		Entry	Default
Deutsch D √		↵	√
English GB		↵	
Francais F		↵	
Espanyol ESP		↵	
Finnish FIN		↵	
Cesky CZ		↵	

- Menu 6-5 Alarm Priorities

ALARMPRIOS POS: XXXXX		Entry	Default
Prio.Refrig. Pt. X	Global setting of alarm priority via refrigeration point priority (Menu 6-1) (Y)	↑, ↓, (Y/N)	N
Priority: XX	Displays refrigeration point priority (Menu 6-1); only shown when refrigeration point priority is set to Y		

ALARMPRIOS POS: XXXXX		Entry	Default
Following parameters are only shwon when refrigeration point priority is set toN. Meaning of vaild entries for alarm priority is as follows: *-* = *Event ignored* *0* = *Message (enterd only in message log)* *1* = *Priority 1 alarm* *..* *99* = *Priority 99 alarm*			
Low Temp.	Temperature below low alarm limit. Priority applies to alarms *Low Temp. Zone 1, Low Temp. Zone 2*	-, 0..99	2
High Temp.	Temperature above high alarm limit. Priority applies to alarms *High Temp. Zone 1, High Temp. Zone 2*	-, 0..99	1
Sensor Fault	Temperature sensor failure	-, 0..99	2
Door Open	Coldroom door open longer than time delay; priority applies to *Coldroom Door Open* alarm	-, 0..99	2
No Defrost	No defrost within alarm delay time. Priority applies to *No Defrost* alarm	-, 0..99	2
Timer-Term. Defrost	Defrosting terminated by safe defrost time	-, 0..99	0
Power Failure	Start following power failure	-, 0..99	0
First Start	Controller Startup (basic settings are loaded!)	-, 0..99	2
Manual Shutoff	Manual switch Input D31/D32 set OFF	-, 0..99	0
Hardware Fault	Internal hardware defect. Priority applies to alarms *EEPROM Defective, RTC Defective, Flash Memory Defective*	-, 0..99	1
Setpoint Change	Message generated when changing setpoints	0..99	0
Refrig.Pt.Dis.	Cooling interrupted by VS pack controller via CAN bus	-, 0..99	0
Battery Voltage	Battery low	-, 0..99	0
Check t0	The pack controller to is not received via CAN bus; priority is given to the messages *Check to Z1*, *Check to Z2* (see also chapter 10.1.3 "Low Temperature Monitoring to")	-, 0..99	2
Sensor Fault eev	EEV Control sensor failure. Priority applies to alarms *Sensor Break EEV Z1, Sensor Break EEV Z2*	-, 0..99	2
eev ctrl block	EEV control stalled. Priority applies to alarms *EEV Stall Detect Z1, EEV Stall Detect Z2*	-, 0..99	0
wrong ctrlr type	Configuration error: Invalid controller type set on DIP Switch S3. Priority applies to *Wrong Controller Type* alarm	-, 0..99	0
emerg.cut-out SH	Superheat drop below minimum level for duration of delay time	-, 0..99	0
OD manual	Valve opening degree defined by manual entry. Priority applies to alarms *VO Manual Zone 1, VO Manual Zone 2*	-, 0..99	0
config:M/S w HG	Configuration error: Simultaneous setting of parameters for master-slave and discharge gas defrosting	-, 0..99	2
Check OD	Alarm due to implausible opening degree (see chapter 10.1.10)	-, 0..99	0
Extern.Alarm	Alarm for registering external alarms, default text is "CO2-Alarm"	-, 0..99	0

- Menu 6-6 Em.Powersupply (Emergency Power supply)

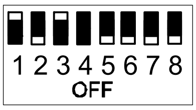
EM.POW.SUP POS: XXXXX		Entry	Default
Cool.funct.OFF xxx	Functionality of the cooling switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Defr.funct.OFF xxx	Functionality of the defrosting switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Fan funct. OFF xxx	Functionality of the fan switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Frame fct.OFF xxx	Functionality of the frame heater off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Light fct. OFF xxx	Functionality of the light during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N

- Menu 6-7 COPT+

COPT+ POS: XXXXX		Entry	Default
COPT+ xxx	Principle participation of the controller in the suction pressure shift. (function COPT+). Note: This is transmitted via a CAN bus telegram and intervenes in the regulation!	↑, ↓, (ON/OFF)	OFF
Inact.a.Def xxm	Delay time following completion of the defrost before the controller actively intervenes in the shift.	0..40	30 min
Dely_HystON xxxxm	Delay time for the reduction request with active cooling and overshoot of the hysteresis.	0..10	2.5 min
HiTmpZ1 dwn xxm	Delay time before the elapse of the high temperature alarm delay in zone 1, before the reduction is requested.	0..15	5 min.
HiTmpZ2 dwn xxm	Delay time before the elapse of the high temperature alarm delay in zone 2, before the reduction is requested.	0..15	5 min.
TolOvHystZ1 xxK	Tolerance limit above the setpoint plus hysteresis in zone 1. Influences when it is switched from stop to reduce.	0..20	2 K
TolOvHystZ2 xxK	Tolerance limit above the setpoint plus hysteresis in zone 2. Influences when it is switched from stop to reduce.	0..20	2 K
SwtchSupRet xxx	Switching from supply air to return air and the reverse with temperature alarm delay time.	↑, ↓, (ON/OFF)	OFF
Dely_Switch xxxm	Switching from supply to return air: determines when it is switched within the delay time for the high temperature alarm.	0..15	5 min.
Add.Values xxx	Creation of additional (additive) “Debug” actual value archives in the system centre / store computer. **Warning**: This can force a reorganisation of the actual value archives – for this reason **only** use when required!	↑, ↓, (ON/OFF)	OFF
Incl_UpLim xxxK	Upper limit of the neutral zone for determining the incline.	0..5	0.3 K
Incl_LwLim xxxK	Lower limit of the neutral zone for determining the incline.	0..5	0.2 K
SDS Hyst Z 1 xxxK	Determines the hysteresis used during the shift from this value and the P-quota Möbelreg. Zone 1. (*)	1..10	5 K
SDS Hyst Z 2 xxxK	Determines the hysteresis used during the shift from this value and the P-quota Möbelreg. Zone 2. (*)	1..10	5 K
SDS RMode virtSet	Please always leave this value on “virtSwt”	-	virtSwt

(*) The lower this parameter, then the earlier the pack controller is instructed to lower the suction pressure, which increases the accuracy with which the controller can maintain its setpoint. In addition the case controllers P-quota is also employed. The higher the case controller’s P-quota, then the earlier the pack controller is instructed to lower the suction pressure, which increases the accuracy with which the controller can maintain its setpoint.

8.5 Contr. Type UR 141 TE - Menu tree



1: **ON**
2: **OFF**
3: **ON**
4: **ON/OFF = Master-/Slave-Modus ON/OFF**
5..8: **OFF**

Level 1	Level 2	Level 3	Menu No.	Menu Name
Main Menu			0	REFR. PT.
Actual Values			1	ACT VALUES
	Temperature Sensors		1-1	TEMPERATUR
	Cooling Zone 1		1-2	COOLING 1
	Defrost Zone 1		1-3	DEFROST 1
	Fan Zone 1		1-4	FANS 1
	Alarm		1-5	ALARM
	Frame Heater		1-6	MODE
	Cooling Zone 2		1-7	COOLING 2
	Defrost Zone 2		1-8	DEFROST 2
	Fan Zone 2		1-9	FANS 2
Setpoints			2	SETPOINTS
	Cooling		2-1	COOLING
		Zone 1	2-1-1	COOLING 1
		Zone 2	2-1-2	COOLING 2
		Zone 1T Toggle	2-1-3	COOLING 1A
		Zone 2T Toggle	2-1-4	COOLING 2A
	Defrost		2-2	DEFROST
		Zone 1	2-2-1	DEFROST 1
		Zone 2	2-2-2	DEFROST 2
		Zone 1T Toggle	2-2-3	DEFROST 1A
		Zone 2T Toggle	2-2-4	DEFROST 2A
	Fan		2-3	FANS
		Zone 1	2-3-1	FANS 1
		Zone 2	2-3-2	FANS 2
		Zone 1T Toggle	2-3-3	FANS 1A
		Zone 2T Toggle	2-3-4	FANS 2A
	Alarm		2-4	ALARM
		Zone 1	2-4-1	ALARM 1
		Zone 2	2-4-2	ALARM 2
		Zone 1T Toggle	2-4-3	ALARM 1A
		Zone 2T Toggle	2-4-4	ALARM 2A

Level 1	Level 2	Level 3	Menu No.	Menu Name
Setpoints	Frame Heater		2-5	FRAME HTR
		Frame Mode	2-5-1	MODE
		Frame Setpoints	2-5-2	SETPOINTS
		Toggle Mode	2-5-3	MODE ALT
		Setpoint Toggle	2-5-4	TOG. SETP.
Clock			3	Clock
	Current Time		3-1	CLOCK
	Defrost Timer		3-2	DEFR.TIMER
		Defrost Timer Z2	3-2-a	DEF.TIM.Z2
	Setpoint Toggle		3-3	TOGGLE
Messages			4	MESSAGES
	View Messages		4-1	MESSAGES
	Cancel Messages		4-2	MESSAGES
	Delete Messages		4-3	MESSAGES
Archive			5	ARCHIVE
Configuration			6	CONFIGURAT
	Refrigeration Point		6-1	REFR. PT.
	Controller		6-2	CONTROLLER
		Type and Version	6-2-1	VERSION
		Temperature Display	6-2-2	DISPLAY
		Alarm Delay	6-2-3	ALARMDELAY
		230V Inputs	6-2-4	230V INPUT
		Sensor Type	6-2-5	SENSORS
		Analog inputs*	6-2-6	ANALOG INPUTS
		EEV Controller Zone 1	6-2-7	EEV ZONE 1
		EEV Controller Zone 2	6-2-8	EEV ZONE 2
	Cooling		6-3	COOLING
	Language		6-4	LANGUAGE
	Alarm Priorities		6-5	ALARMPRIOS
	Em.Powersupply		6-6	EM.POW.SUP
	COPT+		6-7	COPT+

* Only UA 410 E AC

8.5.1 Menu 0 Main Menu

REFR. PT. POS: XXXXX	
1 Actual Values	Move to menu 1
2 Setpoints	Move to menu 2
3 Clock	Move to menu 3
4 Messages	Move to menu 4
5 Archive	Move to menu 5
6 Configuration	Move to menu 6

8.5.2 Menu 1 Actual Values

ACT VALUES POS: XXXXX	
1 Temp. Sensor	Move to menu 1-1
2 Cooling Zone 1	Move to menu 1-2
3 Defrost Zone 1	Move to menu 1-3
4 Fans Zone 1	Move to menu 1-4
5 Alarm	Move to menu 1-5
6 Frame Heater	Move to menu 1-6
7 Cooling Zone 2	Move to menu 1-7: Menu item is shown only when two-zone operation is set (Menu 6-1).
8 Defrost Zone 2	Move to menu 1-8: Menu item is shown only when two-zone operation is set (Menu 6-1).
9 Fans Zone2	Move to menu 1-9: Menu is shown only when two-zone operation is set (Menu 6-1).

- Menu 1-1 Temp. Sensor

TEMPERATUR XXXXX	
Temp. R4.1 XXX °C	Displays current room air temperature Input Z21/Z22
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Temp. R5.1 XXX °C	Displays current evaporator inlet temperature Input Z41/Z42
Temp. R6.1 XXX °C	Displays current evaporator outlet temperature Input Z51/Z52
Temp. R4.2 XXX °C	Displays current room air temperature Input Z71/Z72
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Temp. R5.2 XXX °C	Displays current evaporator inlet temperature Input Z91/Z92
Temp. R6.2 XXX °C	Displays current evaporator outlet temperature Input Z01/Z02
to VS corr. XXX °C	Displays current corrected suction pressure temperature on VS pack controller (assigned by Pack No.)
t0 locale Z1 xxx °C	Displays current t_0 $_t$emperature zone 1 [1)]
t0 locale Z2 xxx °C	Displays current t_0 $_t$emperature zone 2 [1) 2)]
tc xxx °C	Displays current tc $_t$emperature [1) 2)]
Humidite xx %	Displays current, relative humidity [1) 2)]

[1)]: Only UA 410 E AC
[2)]: The value is **only** recorded in the system centre / store computer via the CAN bus - it is **not** used for control purposes! Exception: Use of function „*toZ2Ctl.*“, parameter „*Fct. AIN2*“ (menu 6-2-6).

- Menu 1-2 Cooling Zone 1

COOLING 1 XXXXX	
Cooling XXX	Displays currentOFF/ON status of cooling
op.deg. Z 1 XX %	Displays current valve opening degree Zone 1
OD med. 24h XX %	Displays mean valve opening degree Zone 1 for past day
Temp. R4.1 XXX °C	Displays current room air temperature Input Z21/Z22
Setpoint R4.1 XXX °C	Displays room air temperature setpoint for comparison
Hystersis R4.1 XXX K	Displays room air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)
SH Z 1 XXX °C	Displays current superheat temperature Zone 1
Heatg. Circuit XXX	Displays current status of heating circuit control; shown only when single-zone operation is set (Menu 6-1)
Ht. Cir. Setp. XXX °C	Displays heating circuit control setpoint; shown only when single-zone operation is set (Menu 6-1)
Ht. Cir. Hyst. XX K	Displays heating cirucit control hysteresis; shown only when single-zone operation is set (Menu 6-1)
sup air ctrl XXX	Displays current OFF/ON status of supply or room air control
MOP op. XXX	Displays OFF/ON setpoint of MOP mode
Status light XXX	Status lighting control (ON/OFF)

- Menu 1-3 Defrost Zone 1

DEFROST 1 XXXXX	
Counting Rate X	Displays setpoint for time during which evaporator defrost termination temperature may be within band around 0°C before defrost counter counts down
Defrost Counter X	Displays count for number of defrost cycles to be skipped
Defrost XXX	Displays current OFF/ON status of Defrost Relay 1
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82; shown only when single-zone operation is set (Menu 6-1)
Def. End. Tmp. XXX °C	Displays defrost termination temperature setpoint for comparison
Wait Time XX m	Displays waiting time setpoint
Drip Time XX m	Displays drip time setpoint
2.Defrst Level XXX °C	Displays 2nd defrost stage setpoint; shown only when single-zone operation is set (Menu 6-1)
Last Defrst XX hh:mm	Displays time (day, time of day) of last defrost cycle started
M/S Nof. Sl.	Number of parameterised and accessible MA slaves
M/S Lost Sl.	CAN address of the first MA slave which was not accessible during the last defrost
M/S Defr.Sl.	Number of slaves currently undergoing a defrost
M/S DSlMat	List of MA slaves currently undergoing a defrost (can be scrolled through using ENTER)
DSq Nof. Sl.	Number of DS slaves (only in the case of DS master)
DSq Lost Sl.	CAN address of the first FA slave which was not accessible during the last defrost
DSq Defr.Sl.	Number of slaves currently undergoing defrost
DSq DSlMat	List of FA slaves currently undergoing a defrost (can be scrolled through using ENTER)

- Menu 1-4 Fan Zone1

FANS 1 XXXXX	
Fans XXX	Displays current fan status
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Fans Delay XXX °C	displays fan start temperature setpoint

- Menu 1-5 Alarm

ALARM XXXXX	
Alarm Relay XXX	Displays current OFF/ON status of alarm output Terminal 15/16/18
Hi Temp Setp.1 XX °C	Displays high temperature setpoint Zone 1
Lo Temp Setp.1 XX K	Displays low temperature setpoint Zone 1
Hi Temp Setp.2 XX °C	Displays high temperature setpoint Zone 2; shown only when two-zone operation is set (Menu 6-1)
Lo Temp Setp.2 XX K	Displays low temperature setpoint Zone 2; shown only when two-zone operation is set (Menu 6-1)
Coldroom Door 1 XXX	Displays current OFF/ON status of coldroom door input Terminal D31/D32
Coldroom Door 2 XXX	Displays current OFF/ON status of coldroom door input Terminal D21/D22

- Menu 1-6 Frame Heater

MODE XXXXX	
Frame Heater XXX	Displays current OFF/ON status of frame heater output Terminal 91/92/93
Run Time XXX %	Displays current frame heater on time
Humidity XXX %	Displays current room air humidity (transmitted via CAN bus from VS pack controller with fitted humidity sensor)
Room temp. XX °C	Displays current room air temperature (transmitted via CAN bus from VS pack controller with fitted room air temperature sensor)

- Menu 1-7 Cooling Zone 2

COOLING 2 XXXXX	
Cooling XXX	Displays current OFF/ON status of cooling
op.deg. Z 2 XX %	Displays current valve opening degree Zone 2
OD med. 24h XX %	Displays mean valve opening degree Zone 2 for past day
Temp. R4.2 XXX °C	Displays current room air temperature Input Z71/Z72
Setpoint R4.2 XXX °C	Displays room air temperature setpoint for comparison
Hysteresis R4.2 XXX K	Displays room air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)
SH Z 2 XXX °C	Displays current superheat temperature Zone 2
sup air ctrl XXX	Displays current OFF/ON status of supply or room air control
MOP op. XXX	Displays OFF/ON setpoint of MOP mode

- Menu 1-8 Defrost Zone 2

DEFROST 2 XXXXX	
Counting Rate X	Displays setpoint for time during which evaporator defrost termination temperature may be within band around 0°C before defrost counter counts down
Defrost Counter X	Displays count for number of defrost cycles to be skipped
Defrost XXX	Displays current OFF/ON status of Defrost Relay 2
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Def. End. Tmp. XXX °C	Displays defrost termination temperature setpoint for comparison
Wait Time XX m	Displays waiting time setpoint
Drip Time XX m	Displays drip time setpoint
Last Defrst XX hh:mm	Displays time (day, time of day) of last defrost cycle started

- Menu 1-9 Fan Zone2

FANS 2 XXXXX	
Fans XXX	Displays current fan status
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Fan Delay XXX °C	Displays fan start temperature setpoint

8.5.3 Menu 2 Setpoints

SETPOINTS POS: XXXXX	
1 Cooling	Move to menu 2-1; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-1-1
2 Defrost	Move to menu 2-2; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-2-1
3 Fans	Move to menu 2-3; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-3-1
4 Alarm	Move to menu 2-4; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-4-1
5 Frame Heater	Move to menu 2-5

- Menu 2-1 Cooling

COOLING POS: XXXXX	
1 Zone 1	Move to menu 2-1-1
2 Zone 2	Move to menu 2-1-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-1-3; not shown when setpoint toggle is deactivated (Menu 3-3)
3 Zone 2T Toggle	Move to menu 2-1-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-1-1 Zone 1

COOLING 1 POS: XXXXX		Entry	Default
Setpoint R4.1 XXX °C	Room air temperature setpoint	--, -45..40	-20 °C
Hysteresis R4.1 X K	Room air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..10	2 K
Ht. Cir. Setp.	Heating circuit control setpoint; shown only when single-zone operation is set (Menu 6-1)	--, -45..40	-20 °C
Ht. Cir. Hyst.	Heating circuit control hysteresis setpoint; shown only when single-zone operation is set (Menu 6-1)	1..10	2 K
Superheat XXX K	Superheat setpoint Zone 1	0..20	6 K
Min. SH XX K	Minimum superheat setpoint, below which cooling relay switches off in Zone 1. I-sum (not I-part) is set to zero when the *Reset I-Sum* parameter is set to ON.	0..10	2 K
Two pos.ctrl XXX	Switch between on-off control (ON) and continuous control (OFF)	↑, ↓ (ON/OFF)	OFF
MOP-point XXX °C	Starting setpoint for MOP mode	--, -50..50	-- °C

- Menu 2-1-2 Zone 2

COOLING 2 POS: XXXXX		Entry	Default
Setpoint R4.2 XXX °C	Room air temperature setpoint	--, -45..40	-20 °C
Hysteresis R4.2 X K	Room air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..10	2 K
Superheat XXX K	Superheat setpoint Zone 2	0..20	6 K
Min. SH XX K	Minimum superheat setpoint, below which cooling relay switches off in Zone 2. I-sum (not I-part) is set to zero when the *Reset I-Sum* parameter is set to ON.	0..10	2 K
Two pos.ctrl XXX	Switch between on-off control (ON) and continuous control (OFF)	↑, ↓ (ON/OFF)	OFF
MOP-point XXX °C	Starting setpoint for MOP mode	--, -50..50	-- °C

- Menu 2-1-3 Zone 1T Toggle

COOLING 1A POS: XXXXX		Entry	Default
Setpoint R4.1 XXX °C	Room air temperature setpoint	--, -45..40	-24 °C
Hysteresis R4.1 X K	Room air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..10	2 K
Ht. Cir. Setp.	Heating circuit control setpoint; shown only when single-zone operation is set (Menu 6-1)	--, -45..40	-24 °C
Ht. Cir. Hyst.	Heating circuit control hysteresis setpoint; shown only when single-zone operation is set (Menu 6-1)	1..10	2 K

- Menu 2-1-4 Zone 2T Toggle

COOLING 2A POS: XXXXX		Entry	Default
Setpoint R4.2 XXX °C	Room air temperature setpoint	--, -45..40	-24 °C
Hysteresis R4.2 X K	Room air temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..10	2 K

- Menu 2-2 Defrost

DEFROST POS: XXXXX	
1 Zone 1	Move to menu 2-2-1
2 Zone 2	Move to menu 2-2-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-2-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-2-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-2-1 Zone 1

DEFROST 1 POS: XXXXX		Entry	Default
Counting Rate X	Setpoint of time during which evaporator defrost termination temperature may be within band around 0°C before defrost counter counts down	0..15	0
Defrost Counter X	Setpoint of count for number of defrost cycles to be skipped. By pressing the ↵ key the value can be set to 1 until it is automatically reset to the basic settings.	↵	1
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 0..30	10 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	3 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	5 min
2.Defrst Level XXX °C	2nd defrost stage setpoint; shown only when single-zone operation is set (Menu 6-1)	--, -20..30	--
M/S Degiv.Fct. XXX	Configuration of the defrost via CAN bus function. For details see chapter 4.5.5.	OFF, MASTR, SLAVE	OFF
M/S CAN Adr. XXX	Selection of the controller (1..99) participating in the defrost via CAN bus which is the master. “--“, if this controller is itself master (Parameter *M/S Degiv.Fct.*. = MASTR)	---, 1..99	--
DS-Function XXX	Configuration of the defrost sequenz function (DS). For details see chapter 4.5.6.	OFF, MASTR, SLAVE	OFF
DS-Group XXX	Selection of which group a defrost sequenz of this controller (1..99) belongs to.	---, 1..99	--
DS-Master XXX	Selection of which controller (1..99) participating in the defrost sequenz is the master. “--“, if this controller is itself the master (Parameter *DS-Function* = MASTR)	---, 1..99	--
DS-Wait time XXXm	Wait time for the defrost sequenz	0..127	1 min

- Menu 2-2-2 Zone 2

DEFROST 2 POS: XXXXX		Entry	Default
Counting Rate X	Setpoint of time during which evaporator defrost termination temperature may be within band around 0°C before defrost counter counts down	0..15	0
Defrost Counter X	Setpoint of count for number of defrost cycles to be skipped. By pressing the ↵ key the value can be set to 1 until it is automatically reset to the basic settings.	↵	1
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 0..30	10 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	3 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	5 min

- Menu 2-2-3 Zone 1T Toggle

DEFROST 1A POS: XXXXX		Entry	Default
Counting Rate X	Setpoint of time during which evaporator defrost termination temperature may be within band around 0°C before defrost counter counts down	0..15	0
Defrost Counter X	Setpoint of count for number of defrost cycles to be skipped. By pressing the ↲ key the value can be set to 1 until it is automatically reset to the basic settings.	↲	1
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 0..30	10 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	3 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	5 min
2.Defrst Level XXX °C	2nd defrost stage setpoint; shown only when single-zone operation is set (Menu 6-1)	--, -20..30	--

- Menu 2-2-4 Zone 2T Toggle

DEFROST 2A POS: XXXXX		Entry	Default
Counting Rate X	Setpoint of time during which evaporator defrost termination temperature may be within band around 0°C before defrost counter counts down	0..15	0
Defrost Counter X	Setpoint of count for number of defrost cycles to be skipped. By pressing the ↲ key the value can be set to 1 until it is automatically reset to the basic settings.	↲	1
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 0..30	10 °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	3 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	5 min

- Menu 2-3 Fan

FANS POS: XXXXX	
1 Zone 1	Move to menu 2-3-1
2 Zone 2	Move to menu 2-3-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-3-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-3-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-3-1 Zone 1

FANS 1 POS: XXXXX		Entry	Default
Fan Delay XXX °C	Fan start temperature setpoint	--, -20..20	0 °C

- Menu 2-3-2 Zone 2

FANS 2 POS: XXXXX		Entry	Default
Fan Delay XXX °C	Fan start temperature setpoint	--, -20..20	0 °C

- Menu 2-3-3 Zone 1T Toggle

FANS 1A POS: XXXXX		Entry	Default
Fan Delay XXX °C	Fan start temperature setpoint	--, -20..20	0 °C

- Menu 2-3-4 Zone 2T Toggle

FANS 2A POS: XXXXX		Entry	Default
Fan Delay XXX °C	Fan start temperature setpoint	--, -20..20	0 °C

- Menu 2-4 Alarm

ALARM POS: XXXXX	
1 Zone 1	Move to menu 2-4-1
2 Zone 2	Move to menu 2-4-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-4-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-4-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-4-1 Zone 1

ALARM 1 POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-35..50	-12 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..10	2 K

- Menu 2-4-2 Zone 2

ALARM 2 POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-35..50	-12 °C
Low Temp Setp. XX K	Sollwert Temperatur (Differenz unter dem Sollwert der Temperaturregelung), bei dem der Alarm *Untertemperatur* ausgelöst wird	--, 0..10	2 K

- Menu 2-4-3 Zone 1T Toggle

ALARM 1A POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-35..50	-12 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..10	2 K

- Menu 2-4-4 Zone 2T Toggle

ALARM 2A POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-35..50	-12 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..10	2 K

- Menu 2-5 Frame Heater

FRAME HTR POS: XXXXX	
1 Mode frm htr	Move to menu 2-5-1
2 Setpoint frm htr	Move to menu 2-5-2
3 Mode altern.	Move to menu 2-5-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Setpoint altern.	Move to menu 2-5-4; not shown when setpoint toggle is deactivated (Menu 3-3)

- Menu 2-5-1 Mode frm htr

Selection is made according to entry. Checkmark shows current setting.

MODE POS: XXXXX		Entry	Default
Fixed run time √		↵	√
Enthalpy-ctrl rtm		↵	

- Menu 2-5-2 Frame Setpoints

SETPOINTS POS: XXXXX		Entry	Default
Mod: xxxxxxxxxxxx	Displays set pane mode (Menu 2-5-1)		fixed run time
Run Time XXX %	Fixed on time; shown only when mod is set to Fixed OT (Menu 2-5-1)	--, 0..100	100 %
emerg.run time XXX %	On time in loss of humidity or room air temperature (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-1)	--, 0..100	100 %
enthalp. offs. XXX %	Offset for on time when enthalpy control is activated (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-1)	-50..50	0 %
Invert Output xxx	Inversion of the function of the frame heater output (terminals 91/92)	↑, ↓, (ON/OFF)	ON

- Menu 2-5-3 Toggle Mode

Selection is made according to entry. Checkmark shows current setting.

MODE ALT. POS: XXXXX		Entry	Default
Fixed run time √		↵	√
Enthalpy-ctrl rtm		↵	

- Menu 2-5-4 Setpoint Toggle

TOG. SETP. POS: XXXXX		Entry	Default
Mod: xxxxxxxxxxxx	Displays set pane mode (Menu 2-5-3)		fixed run time
Run Time XXX %	Fixed on time; shown only when mod is set to Fixed OT (Menu 2-5-3)	--, 0..100	100 %
emerg.run time XXX %	On time in loss of humidity or room air temperature (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-3)	--, 0..100	100 %
enthalp. offs. XXX %	Offset for on time when enthalpy control is activated (via CAN bus); shown only when mode set to Enthalpy Control (Menu 2-5-3)	-50..50	0 %

8.5.4 Menu 3 Clock

CLOCK POS: XXXXX	
1 Current Time	Move to menu 3-1
2 Defrost Timer	Move to menu 3-2
3 Toggle Setpoints	Move to menu 3-3

- Menu 3-1 Current Time

☞ Time is defined by time master (system centre / store computer / operator terminal) when CAN bus is connected. Any entry made will then be overwritten by the defined value.

CLOCK POS: XXXXX		Entry	Default
Date: XX dd.mm.yy	Display and entry of current weekday, date	dd.mm.yy	
Time: hh.mm	Display and entry of current time	hh.mm	
Daylight Saving X	Display and entry of automatic daylight saving time change (Y/N)	↑, ↓, (Y/N)	Y

- Menu 3-2 Defrost Timer

DEFR.TIMER POS: XXXXX		Entry	Default
Defrost Timer XXX	Defrost initiation via Input D11/12 (EXT) oder internal (INT)	↑, ↓, (EXT, INT)	EXT
Safe Defr Time XXX m	Safe defrost time, i.e. max. allowed duration of defrosting (internal defrost only); shown only when paramter defrost timer = INT	0..120	60 min
Manual Defrost XXX	Status (ON/OFF) of auxiliary manual defrost *)	↑, ↓, (ON/OFF)	OFF
Def.Tim.Z2 →	Separate defrost timer for zone 2	Menu 3-2-a	
Defr. 1 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter defrost timer = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 07:00
...			
Defr. 14 xxxxx hh:mm			

*) Parameter is **NOT** automatically set to ON at first start

- Menu 3-2-a Def.Tim.Z2

DEFR.TIMER POS: XXXXX		Entry	Default
Defrost Timer XXX	Setting for how temperature zone 2 should defrost: - MitZ1 Together with zone 1 - INT Internally - EXT Externally – the defrost of both temperature zones is started simultaneously via the external signal	↑, ↓, (ViaZ1(ViaZ1, EXT, INT)	ViatZ1
Safe Defr Time XXX m	Safe defrost time, i.e. max. allowed duration of defrosting (internal defrost only)	0..120	60 min
Manual Defrost XXX	Status (ON/OFF) of auxiliary manual defrost *)	↑, ↓, (ON/OFF)	OFF
Defr. 1 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter *defrost timer* = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 01:00
...			
Defr. 14 xxxxx hh:mm			

- Menu 3-3 Toggle Setpoints

TOGGLE POS: XXXXX		Entry	Default
Status XXX	Setpoint toggle for alternative set of setpoints (setpoint set toggle)		
Toggle Setp. XXX	Setpoint toggle via - EXT digital input D21/22 - INT internal timer - CAN CAN bus - „--" deactivated Note: Care should be taken that the corresponding digital input D21/D22 is set to SOLLW.UMSCH (menu 6-2-4)	↑, ↓, (EXT, INT, CAN, --)	EXT
Toggle interv. X m	The interval for the cyclical toggling between standard and alternative setpoint data records; only appears when the internal setpoint toggling is activated (menu 3-3).	--, 10..60	-- min
Alt ON: xxxxx hh:mm	Start time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 21:00
AltOFF: xxxxx hh:mm	End time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)		Mo-Su 05:00
Alt ON: xxxxx hh:mm	Start time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Su 05:00
AltOFF: xxxxx hh:mm	End time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)		Su 21:00
...	A total of 7 different ON, OFF toggle times can be entered. Toggle time will only be obeyed when a ***matched pair*** of ON and OFF time is set.		

8.5.5 Menu 4 Messages

MESSAGES POS: XXXXX	
1 View	Move to menu 4-1 View Messages
2 Acknowledge	Messaages in log are cancelled, press ESC to exit after cancel is confirmed
3 Delete	Move to menu 4-3

- Menu 4-1 View Messages

MESSAGES POS: XXXXX	
`Error text 1:`	Fault message Fault 1
`dd.mm.yy hh:mm ON`	Start of Fault 1
`dd.mm.yy hh:mm OFF`	End of Fault 1 (only when Fault 1 has ended)
`...`	
`Error text n:`	Fault message Fault n
`dd.mm.yy hh:mm ON`	Start of Fault n
`dd.mm.yy hh:mm OFF`	End of Fault n (only when Fault n has ended)

- Menu 4-2 Cancel Messages

This displays the *Alarms Cancelled!* message.

- Menu 4-3 Delete Messages

MESSAGES POS: XXXXX		Entry

`Delete !`
`Are you sure ?`
`No: ESC YES: ↵`
	Safety prompt for deleting messages;
	press ESC to exit after confirming or cancelling delete
		↵, ESC

8.5.6 Menu 5 Archive

ARCHIVE POS: XXXXX	
dd.mm.yy hh:mm	Time of archiving Data Record 1
Zone 1: abcdef x °C	Status and temperature of Zone 1, see note *)
Zone 2: abcdef x °C	Status und Temperatur von Zone 2, s. Anmerkung *); shown only when two-zone operation is set (Menu 6-1)
...	
dd.mm.yy hh:mm	Time of archiving Data Record n
Zone 1: abcdef x °C	Status and temperature of Zone 1, see note *)
Zone 2: abcdef x °C	Status und Temperatur von Zone 2, s. Anmerkung *); shown only when two-zone operation is set (Menu 6-1)

☞ *) Status abcdef covers following states of refrigeration point. The entry at this position is - when a state is not active.

Example `Zone 1: abcdef x °C`

	Single-zone operation resp. Operator interface BT 300	Two-zone operation
a	O = Operation	O = Operation
b	R = Refrigeration / Cooling	R = Refrigeration / Cooling
c	R = Refrigeration/ Cooling	D = Defrost
d	D = Defrost	G = Gate / Door (coldroom controller only)
e	G = Gate / Door (coldroom controller only)	A = Alarm
f	A = Alarm	

8.5.7 Menu 6 Configuration

CONFIGURAT POS: XXXXX	
1 Refriger. Point	Move to menu 6-1
2 Controller	Move to menu 6-2
3 Cooling	Move to menu 6-3
4 Language	Move to menu 6-4
5 Alarm priorities	Move to menu 6-5
6 Em.Powersupply	Move to menu 6-6
7 COPT+	Move to menu 6-7

- Menu 6-1 Refrigeration Point

REFR. PT. POS: XXXXX		Entry	Default
Refr. Pt. Name:	Text only		
xxxxxxxxxxxxxxx	Free text entry describing refrigeration point (see note at end of table)		Case Controller
Item ID: XXXXX	Free text entry shown after Position (POS:) in screens (see note at end of table)		UA400
Priority: XX	Priority of alarms in failure of refrigeration point or when setting global controller priority (Menu 6-5)	↑, ↓, or numbers (0..99)	1
Refr. Sys. No.: XX	Pack No. of pack controller assigned to case controller. The controller cannot receive the suction pressure value for control functions before the Pack No. of the associated pack controller has been selected on the case controller	↑, ↓, or numbers (--, 1..9)	--
Refr. Sys. Type XXX	Allocation to compressor pack. Parameter only required for linking to VS 3010 BS with several zones. Deactivate this parameter (---) when using pack controllers of other type.	↑, ↓, or numbers (---, Z1, Z2)	Z2
Temp. Zones X	Number of temperature zones. Single-zone operation Two-zone operation	↑, ↓, or numbers (1, 2)	2
No. Sensors XX	Displays number of temperature sensors connected. After pressing ↲, sensor scan is performed and number of sensors is redefined.	↲	

It must be ensured that the correct pack number has been selected, i.e. the correct Refr. Sys. type has been set, otherwise this can result in damage to the installation or goods. Furthermore, the parameter *Corr.off t_0* (menu 6-3) must not be set to ”--” if the t_0 from the pack controller is to be used for regulating.

A meaninful name that describes the refrigeration point in more detail should be entered, e.g. Cheese Counter 2 and CC2. Entry is made in the screens on system centre, store computer or operator terminal. Direct entry cannot be made in the controller screens displayed on the operator terminal. Entry cannot be made either on operator interface BT 300.

- Menu 6-2 Controller

CONTROLLER POS: XXXXX	
1 Type and Version	Move to menu 6-2-1
2 Temp. Display	Move to menu 6-2-2
3 Alarm Delay	Move to menu 6-2-3
4 230V Inputs	Move to menu 6-2-4
5 Sensor Type	Move to menu 6-2-5
6 Analog inputs	Move to menu 6-2-6
7 eev ctrlr zone1	Move to menu 6-2-7; shown only when Superuser mode is activated system centre / store computer / operator terminal (see Section Operation)
8 eev ctrlr zone2	Move to menu 6-2-8; shown only when Superuser mode is activated system centre / store computer / operator terminal (see Section Operation)

- Menu 6-2-1 Type and Version

VERSION POS: XXXXX		Entry	Default
Ctrlr. Type XXXXXXX	Set on DIP Switch S3		UR141TE
Software Ver.: XXXX	Software version of case controller		
Serial No.: XXXXXX	Device No. of case controller (from EEPROM)		
Master/Sl. Mode XXX	Synchronisierte Abtauung im Master-/Slave-Modus	↑, ↓, (ON/OFF)	OFF

- Menu 6-2-2 Temperature Display

DISPLAY POS: XXXXX		Entry	Default
Offset XX K	Offset for temperature display	-10..10	0 K
Alarmsymbol XX	Show alarm symbol on BT 30 Temperature Display	↑, ↓, (ON/OFF)	N

- Menu 6-2-3 Alarm Delay

ALARMDELAY POS: XXXXX		Entry	Default
Sensor Fault XX m	Sensor break alarm delay	0..30	15 min
High/Low Temp. XX m	High/low temperature alarm delay	0..150	90 min
Door Open XX m	Alarm time delay for open coldroom door (also acts on automatic starting of cooling and fan). This alarm is active only when the corresponding digital input D21/D22 or D31/D32 is set to DOOR CONTACT (Menu 6-2-4)	0..60	60 min
No Defrost XX h	No defrost alarm delay	--, 2..168	30 h
Selfholding N	Alarm latching with manual alarm cancelling (YES) or automatic cancelling on send (NO)	↑, ↓, (Y/N)	N

- Menu 6-2-4 230V Inputs

Only trained personnel should be allowed to change digital inputs, as changes can affect other functions.

230V INPUT POS: XXXXX		Entry	Default
Entry1: XXXXXXXXXX	Function of digital input 1 D11/D12	1)	DEFR.TIMER
Entry2: XXXXXXXXXX	Function of digital input 2 D21/D22	2)	TOGGLE SETP.
Entry3: XXXXXXXXXX	Function of digital input 3 D31/D32	3)	DOOR CON-TACT
Entry4: XXXXXXXXXX	Function of digital input 4 D41/D42	4)	Extern.Alarm
XXXXXXXXXXXXXXXXXX	Freely configurable alarm text for digital input 4, the default text is “CO2-Alarm”	Text	CO2-ALARM
Inv. D1 XXX	Inverting of digital input 1	↑, ↓, (ON/OFF)	OFF
Inv. D2 XXX	Inverting of digital input 2		OFF
Inv. D3 XXX	Inverting of digital input 3		OFF
Inv. D4 XXX	Inverting of digital input 4		OFF

Possible settings for the digital inputs:

1)	DEFR.TIMER	Defrost timer*
	MANUAL OFF.	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
	TOGGLE SETP.	Toggle setpoint
2)	TOGGLE SETP	Toggle setpoint *
	DOOR CONTACT	Door contact
	MANUAL OFF	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
3)	DOOR CONTACT	Door contact *
	MANUAL OFF	Manual shutoff both zones *
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
4)	EXT ALARM	External Alarm *
	MANUAL OFF	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
	TOGGLE SETP	Toggle setpoint

* Factory setting

- Menu 6-2-5 Sensor Type

Selection is made according to entry. Checkmark shows current setting.

SENSORS POS: XXXXX		Entry	Default
L243 √	Temperature range -50 °C .. 50 °C	↵	√
K277	Temperature range -50 °C .. 50 °C	↵	
5K3A1	Temperature range 0 °C .. 100 °C	↵	

- Menu 6-2-6 Analog inputs

ANALOG INPUTS POS: XXXXX		Entry	Default
AIN1 activ x	Analogue input Z1 use (=Y) do not use (=N)	(Y,N)	N
Refrig.Z 1 xxxx	Selection of refrigerant zone 1	None R404a .. R438A*	None
LP Z1 Min xxx bar	Smallest pressure value for pressure monitoring at 4mA	0.0 .. 2.0 bar	0.0 bar
LP Z1 Max xxx bar	Largest pressure value for pressure monitoring at 20 mA	8.0 .. 200.0 bar	10.0 bar
AIN1 Send CAN	This parameter is used to instruct the case controller to make the local t0 (AIN1) available via CAN bus. ONLY possible when the parameter AIN1 active = Y	(Y,N)	N
AIN1 Rcv. CAN xx	CAN bus address of the remote case controller from which the t_0 is received.	1..99	--
AIN1 Rcv. Inp x	This parameter is used to specify the zone from which the t0 is taken. (refers to the parameter *AIN1 Rcv. Inp*)	1,2	1
AIN2 activ x	Analogue input Z2 use (=Y) do not use (=N)	(Y,N)	N
Refrig.Z 2 xxxx	Selection of refrigerant zone 2	None R404a .. R438A*	None
Fct. AIN2 xxxxx	Function of the analogue input zone 2 t0Z2 For recording only t0Z2ctl For regulation	t0Z2, toZ2ctl, Humidity, tc	
HP Z2 Min xxx bar	Smallest pressure value for pressure monitoring at 4mA	0.0 .. 2.0 bar	0.0 bar
HP Z2 Max xxx bar	Largest pressure value for pressure monitoring at 20 mA	8.0 .. 200.0 bar	10.0 bar
AIN2 Send CAN	This parameter is used to instruct the case controller to make the locally measured value of analogue input 2 (AIN2) available via CAN bus. ONLY possible when the parameter AIN2 active = Y	(Y,N)	N
AIN2 Rcv. CAN xx	CAN bus address of the remote case controller which provides the locally measured analogue value.	1..99	--
AIN2 Rcv. Inp x	This parameter is used to specify the zone from which the locally measured analogue value is taken. (refers to the parameter *AIN2 Rcv. Inp*)	1,2	2

* Supported refrigerants:
R404A, R744 (CO_2), R134a, R410A, R717 (NH3), R22, R290, R407C, R507, R1270, R402A, R502, R407F, R422A, R422D, R408A, R407D, R407A, R427A, R438A*, R152a, R170, R600, R600a

Praxis tip using the example of the "connection of a pressure transmitter - 1 .. 7 bar":
Here the indication on the pressure transmitter is clear (-> -1 bar) relative to the ambient pressure The adjustment of the pressure transmitter in the controller is carried out using absolute pressure values (the absolute pressure cannot be negative). In order to parameterise the above pressure transmitter with the relative pressure indication - 1 bar (at 4 mA, i.e. 0 V) at 7 bar (at 20mA, i.e. 10 V) the ambient pressure (1 bar) must be added.
The entry is carried out as follows: 0..8 bar.

- Menu 6-2-7 EEV Controller Zone 1

This menu is only visible if
- the “Master” mode is activated in the system centre, i.e.
- the “Superuser mode” is activated in the store computer.
For details see the Operation chapter.

EEV ZONE 1 POS: XXXXX		Entry	Default
Pc Z 1: XX.XX	Temperature control Zone 1, P-part	0..99.99	7.00
Ic Z 1: XX.XX	Temperature control Zone 1, I-part If parameter I_c is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.30
Dc Z 1: XX.XX	Temperature control Zone 1, D-part	0..99.99	5.00
offs OD cab. XX %	Percentage valve opening degree offset for temperature control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	30 %
Psh Z 1: XX.XX	Superheat control Zone 1, P-part	0..99.99	5.00
Ish Z 1: XX.XX	Superheat control Zone 1, I-part If parameter I_{sh} is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.10
Dsh Z 1: XX.XX	Superheat control Zone 1, D-part	0..99.99	5.00
offs OD SH XX %	Percentage valve opening degree offset for superheat control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
emerg.c-o OD XX %	Maximum emergency valve opening degree	0..50	20 %
delay min SH XX s	Delay on drop of superheat below set minimum	9..600	9 sec
setuptime XX.X m	Setup time following the switching on of the controller or following a defrost or in the event of a blockade of the regulation. The value entered must not be less than the current ”*inject.time*” parameter, otherwise the smallest valid value will be used. Further details about “Fixed valve opening degree in pumpdown/feed-in phase” see chapter 4.4.14.	0..100.0	2.0 min
inject.time XX.X m	Injection time following the switching on of the controller or following a defrost or in the event of a blockade of the regulation. The value entered must not be greater than the current ”*setuptime*” parameter, otherwise the largest valid value will be used. Further details about “Fixed valve opening degree in pumpdown/feed-in phase” see chapter 4.4.14.	0..100.0	1.0 min
OD over CAN XXX	Send opening degree via CAN bus (is employed when a demand dependent setpoint evaluation / to shift via consumer” is parameterised in the corresponding pack controller)	↑, ↓, (ON/OFF)	ON
15s Archiv X	A few statuses and values are additionally archived at 15 second intervals in the system centre / store computer when this parameter is set to “J”. WARNING: This setting increases the memory requirement and should only be activated when needed / for diagnostic purposes.	↑, ↓, (Y/N)	N
OD 3s interv XXX	Select interval for output of opening degree. OFF = 6s ON = 3s Control is suspended for 6 seconds when toggling.	↑, ↓, (ON/OFF)	OFF

EEV ZONE 1 POS: XXXXX		Entry	Default
Reset I-Sum XXX	Reset I-sum (to zero) if superheat drops below set minimum for longer than time set by "delay min SH" parameter. OFF = I-sum not reset to zero ON = I-sum is reset to zero	↑, ↓, (ON/OFF)	ON
edit op.deg. XXX	Manual entry of valve opening degree	↑, ↓, (ON/OFF)	OFF
op.deg. Z 1 XXX %	Current valve opening degree Zone 1; can be edited when manual entry is activated	0..100	Default by controller
Maximum OD xxx %	Sets an upper limit to the opening degree output by the case controller	20..100	100%
Lo Temp to xxK	Monitoring of the t_0 transmitted by the pack controller for unsuitably low values NOTE: Following commissioning this value can be set to "-".	10..60, --	28K
to VS corr. XXX °C	Displays current corrected suction pressure temperature on pack controller (assigned by Pack No.)		

- Menu 6-2-8 EEV Controller Zone 2

This menu is only visible if
- the "Master" mode is activated in the system centre, i.e.
- the "Superuser mode" is activated in the store computer.
For details see the Operation chapter.

EEV ZONE 2 POS: XXXXX		Entry	Default
Pc Z 2: XX.XX	Temperature control Zone 2, P-part	0..99.99	7.00
Ic Z 2: XX.XX	Temperature control Zone 2, I-part If parameter I_c is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.30
Dc Z 2: XX.XX	Temperature control Zone 2, D-part	0..99.99	5.00
offs OD cab. XX %	Percentage valve opening degree offset for temperature control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	30 %
Psh Z 2: XX.XX	Superheat control Zone 2, P-part	0..99.99	5.00
Ish Z 2: XX.XX	Superheat control Zone 2, I-part If parameter I_{sh} is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.10
Dsh Z 2: XX.XX	Superheat control Zone 2, D-part	0..99.99	5.00
offs OD SH XX %	Percentage valve opening degree offset for superheat control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
emerg.c-o OD XX %	Maximum valve opening degree	0..50	20 %
delay min SH XX s	Delay on drop of superheat below set minimum	9..600	9 sec
edit op.deg. XXX	Manual entry of valve opening degree	↑, ↓, (ON/OFF)	OFF
op.deg. Z 2 XXX %	Current valve opening degree Zone 2; can be edited when manual entry is activated	0..100	Default ctrlr.

- Menu 6-3 Cooling

COOLING POS: XXXXX		Entry	Default
corr.off to XX K	Correction offset for pressure loss in suction line **IMPORTANT:** in stand alone operation must be set to ”--”!	--, 0..20	2 K
Cont Cool Mon. XX m	Continuous run monitoring	--, 0..15	0 min
EnablingRel XXX	Switching to “Enable Operation“: OFF Opening degree is transmitted via the solid state relay (SSR) ON The two SSRs are no longer clocking, they are switched on if the case controller requires refrigeration, i.e. switched off again if no refrigeration is required.	↑, ↓, (ON/OFF)	OFF

- Menu 6-4 Language

Selection is made according to entry. Checkmark shows current setting.

LANGUAGE POS: XXXXX		Entry	Default
Deutsch D √		↵	√
English GB		↵	
Francais F		↵	
Espanyol ESP		↵	
Finnish FIN		↵	
Cesky CZ		↵	

- Menu 6-5 Alarm priorities

ALARMPRIOS POS: XXXXX		Entry	Default
Prio.Refrig. Pt. X	Global setting of alarm priority via refrigaration point priority (Menu 6-1) (Y)	↑, ↓, (Y/N)	N
Priority: XX	Displays refrigeration point priority (Menu 6-1); only shown when refrigeration point priority is set to Y		
Following parameters are only shown when refrigeration point priority is set to N. Meaning of valid entries for alarm priority is as follows: *- = Event ignored* *0 = Message (enterd only in message log)* *1 = Priority 1 alarm* *..* *99 = Priority 99 alarm*			
Low Temp.	Temperature below low alarm limit. Priority applies to alarms *Low Temp. Zone 1, Low Temp. Zone 2*	-, 0..99	2
High Temp.	Temperature above high alarm limit. Priority applies to alarms *High Temp. Zone 1, High Temp. Zone 2*	-, 0..99	1
Sensor Fault	Temperature sensor failure	-, 0..99	2
Door Open	Coldroom door open longer than time delay; pririty applies to *Coldroom Door Open* alarm	-, 0..99	2

ALARMPRIOS POS: XXXXX		Entry	Default
No Defrost	No defrost within alarm delay time. Priority applies to *No Defrost* alarm	-, 0..99	0
Timer-Term. Defrost	Defrosting terminated by safe defrost time	-, 0..99	0
Power Failure	Start following power failure	-, 0..99	0
First Start	Controller Startup (basic settings are loaded!)	-, 0..99	2
Manual Shutoff	Manual switch Input D31/D32 set OFF	-, 0..99	0
Hardware Fault	Internal hardware defect. Priority applies to alarms *EEPROM Defective, RTC Defective, Flash Memory Defective*	-, 0..99	1
Setpoint Change	Message generated when changing setpoints	0..99	0
Refrig.Pt.Dis.	Cooling interrupted by VS pack controller via CAN bus	-, 0..99	0
Battery Voltage	Battery low	-, 0..99	0
Check t0	The pack controller to is not received via CAN bus; priority is given to the messages Check to Z1, Check to Z2 (see also chapter 10.1.3 ”Low Temperature Monitoring to”)	-, 0..99	2
Sensor Fault eev	EEV Control sensor failure. Priority applies to alarms *Sensor Break EEV Z1, Sensor Break EEV Z2*	-, 0..99	2
eev ctrl block	EEV control stalled. Priority applies to alarms *EEV Stall Detect Z1, EEV Stall Detect Z2*	-, 0..99	0
wrong ctrlr type	Configuration error: Invalid controller type set on DIP Switch S3. Priority applies to *Wrong Controller Type* alarm	-, 0..99	0
emerg.cut-out SH	Superheat drop below minimum level for duration of delay time	-, 0..99	0
OD manual	Valve opening degree defined by manual entry. Priority applies to alarms *VO Manual Zone 1, VO Manual Zone 2*	-, 0..99	0
config:M/S w HG	Configuration error: Simultaneous setting of parameters for master-slave mode and discharge gas defrosting	-, 0..99	2
Check OD	Alarm due to implausible opening degree (see chapter 10.1.10)	-, 0..99	0
Extern.Alarm	Alarm for registering external alarms, default text is “CO2-Alarm”	-, 0..99	0

- Menu 6-6 Em.Powersupply (Emergency Power supply)

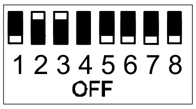
EM.POW.SUP POS: XXXXX		Entry	Default
Cool.funct.OFF xxx	Functionality of the cooling switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Defr.funct.OFF xxx	Functionality of the defrosting switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Fan funct. OFF xxx	Functionality of the fan switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Frame fct.OFF xxx	Without function	↑, ↓, (Y/N)	N
Light fct. OFF xxx	Functionality of the light during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N

- Menu 6-7 COPT+

COPT+ POS: XXXXX		Entry	Default
COPT+ xxx	Principle participation of the controller in the suction pressure shift. (function COPT+). Note: This is transmitted via a CAN bus telegram and intervenes in the regulation!	↑, ↓, (ON/OFF)	OFF
Inact.a.Def xxm	Delay time following completion of the defrost before the controller actively intervenes in the shift.	0..40	30 min
Dely_HystON xxxxm	Delay time for the reduction request with active cooling and overshoot of the hysteresis.	0..10	2.5 min
HiTmpZ1 dwn xxm	Delay time before the elapse of the high temperature alarm delay in zone 1, before the reduction is reques-ted.	0..15	5 min.
HiTmpZ2 dwn xxm	Delay time before the elapse of the high temperature alarm delay in zone 2, before the reduction is reques-ted.	0..15	5 min.
TolOvHystZ1 xxK	Tolerance limit above the setpoint plus hysteresis in zone 1. Influences when it is switched from stop to reduce.	0..20	2 K
TolOvHystZ2 xxK	Tolerance limit above the setpoint plus hysteresis in zone 2. Influences when it is switched from stop to reduce.	0..20	2 K
SwtchSupRet xxx	Switching from supply air to return air and the reverse with temperature alarm delay time.	↑, ↓, (ON/OFF)	OFF
Dely_Switch xxxm	Switching from supply to return air: determines when it is switched within the delay time for the high tempera-ture alarm.	0..15	5 min.
Add.Values xxx	Creation of additional (additive) “Debug” actual value archives in the system centre / store computer. **Warning**: This can force a reorganisation of the actual value archives – for this reason **only** use when requi-red!	↑, ↓, (ON/OFF)	OFF
Incl_UpLim xxxK	Upper limit of the neutral zone for determining the in-cline.	0..5	0.3 K
Incl_LwLim xxxK	Lower limit of the neutral zone for determining the in-cline.	0..5	0.2 K
SDS Hyst Z 1 xxxK	Determines the hysteresis used during the shift from this value and the P-quota Möbelreg. Zone 1. (*)	1..10	5 K
SDS Hyst Z 2 xxxK	Determines the hysteresis used during the shift from this value and the P-quota Möbelreg. Zone 2. (*)	1..10	5 K
SDS RMode virtSet	Please always leave this value on “virtSwt”	-	virtSwt

(*) The lower this parameter, then the earlier the pack controller is instructed to lower the suction pressure, which increases the accuracy with which the controller can maintain its setpoint. In addition the case controllers P-quota is also employed. The higher the case controller’s P-quota, then the earlier the pack controller is in-structed to lower the suction pressure, which increases the accuracy with which the controller can maintain its setpoint.

8.6 Contr. Type UK 100 E - Menu tree



1: **OFF**
2: **ON**
3: **ON**
4: **ON/OFF = Master-/Slave-Modus ON/OFF**
5..8: **OFF**

Level 1	Level 2	Level 3	Menu No.	Menu Name
Main Menu			0	REFR. PT.
Actual Values			1	ACT VALUES
	Temperature Sensors		1-1	TEMPERATUR
	Cooling Zone 1		1-2	COOLING 1
	Defrost Zone 1		1-3	DEFROST 1
	Alarm		1-5	ALARM
	Cooling Zone 2		1-7	COOLING 2
	Defrost Zone 2		1-8	DEFROST 2
Setpoints			2	SETPOINTS
	Cooling		2-1	COOLING
		Zone 1	2-1-1	COOLING 1
		Zone 2	2-1-2	COOLING 2
		Zone 1T Toggle	2-1-3	COOLING 1A
		Zone 2T Toggle	2-1-4	COOLING 2A
	Defrost		2-2	DEFROST
		Zone 1	2-2-1	DEFROST 1
		Zone 2	2-2-2	DEFROST 2
		Zone 1T Toggle	2-2-3	DEFROST 1A
		Zone 2T Toggle	2-2-4	DEFROST 2A
	Alarm		2-4	ALARM
		Zone 1	2-4-1	ALARM 1
		Zone 2	2-4-2	ALARM 2
		Zone 1T Toggle	2-4-3	ALARM 1A
		Zone 2T Toggle	2-4-4	ALARM 2A
Clock			3	Clock
	Current Time		3-1	CLOCK
	Defrost Timer		3-2	DEFR.TIMER
		Defrost Timer Z2	3-2-a	DEF.TIM.Z2
	Setpoint Toggle		3-3	TOGGLE

Level 1	Level 2	Level 3	Menu No.	Menu Name
Messages			4	MESSAGES
	View Messages		4-1	MESSAGES
	Cancel Messages		4-2	MESSAGES
	Delete Messages		4-3	MESSAGES
Archive			5	ARCHIVE
Configuration			6	CONFIGURAT
	Refrigeration Point		6-1	REFR. PT.
	Controller		6-2	CONTROLLER
		Type and Version	6-2-1	VERSION
		Temperature Display	6-2-2	DISPLAY
		Alarm Delay	6-2-3	ALARMDELAY
		230V Inputs	6-2-4	230V INPUT
		Sensor Type	6-2-5	SENSORS
		Analog inputs*	6-2-6	ANALOG INPUTS
		EEV Controller Zone 1	6-2-7	EEV ZONE 1
		EEV Controller Zone 2	6-2-8	EEV ZONE 2
	Cooling		6-3	COOLING
	Language		6-4	LANGUAGE
	Alarm Priorities		6-5	ALARMPRIOS
	Em.Powersupplyv		6-6	EM.POW.SUP
	COPT+		6-7	COPT+

* Only UA 410 E AC

8.6.1 Menu 0 Main Menu

REFR. PT. POS: XXXXX	
1 Actual Values	Move to menu 1
2 Setpoints	Move to menu 2
3 Clock	Move to menu 3
4 Messages	Move to menu 4
5 Archive	Move to menu 5
6 Configuration	Move to menu 6

8.6.2 Menu 1 Actual Values

ACT VALUES POS: XXXXX	
1 Temp. Sensor	Move to menu 1-1
2 Cooling Zone 1	Move to menu 1-2
3 Defrost Zone 1	Move to menu 1-3
4	
5 Alarm	Move to menu 1-5
6	
7 Cooling Zone 2	Move to menu 1-7: Menu item is shown only when two-zone operation is set (Menu 6-1).
8 Defrost Zone 2	Move to menu 1-8: Menu item is shown only when two-zone operation is set (Menu 6-1).

- Menu 1-1 Temp. Sensor

TEMPERATUR XXXXX	
Temp. R4.1 XXX °C	Displays current refrigerant temperature Input Z21/Z22
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Temp. R5.1 XXX °C	Displays current evaporator inlet temperature Input Z41/Z42
Temp. R6.1 XXX °C	Displays current evaporator outlet temperature Input Z51/Z52
Temp. R4.2 XXX °C	Displays current refrigerant temperature Input Z71/Z72
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Temp. R5.2 XXX °C	Displays current evaporator inlet temperature Input Z91/Z92
Temp. R6.2 XXX °C	Displays current evaporator outlet temperature Input Z01/Z02
to VS corr. XXX °C	Displays current corrected suction pressure temperature on VS pack controller (assigned by Pack No.)
t0 locale Z1 xxx °C	Displays current t_0 temperature zone 1 [1)]
t0 locale Z2 xxx °C	Displays current t_0 temperature zone 2 [1) 2)]
tc xxx °C	Displays current tc temperature [1) 2)]
Humidite xx %	Displays current, relative humidity [1) 2)]
tc LT xxx °C	Display of current t_c-temperature [1) 2)] used for regulation

1): Only UA 410 E AC
2): The value is **only** recorded in the system centre / store computer via the CAN bus - it is **not** used for control purposes! Exception: Use of function „*toZ2Ctl.*“, parameter „*Fct. AIN2*“ (menu 6-2-6).

- Menu 1-2 Cooling Zone 1

COOLING 1 XXXXX	
Cooling XXX	Displays current OFF/ON status of cooling
op.deg. Z 1 XX %	Displays current valve opening degree Zone 1
OD med. 24h XX %	Displays mean valve opening degree Zone 1 for past day
Temp. R4.1 XXX °C	Displays current refrigerant temperature Input Z21/Z22
Setpoint R4.1 XXX °C	Displays refrigerant temperature setpoint for comparison
Hystersis R4.1 XXX K	Displays refrigerant temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)
SH Z 1 XXX °C	Displays current superheat temperature Zone 1
sup air ctrl XXX	Displays current OFF/ON status of supply or refrigerant control
MOP op. XXX	Displays OFF/ON setpoint of MOP mode
Status light XXX	Status lighting control (ON/OFF)

- Menu 1-3 Defrost Zone 1

DEFROST 1 XXXXX	
Defrost XXX	Displays current OFF/ON status of Defrost Relay 1
Temp. R1.1 XXX °C	Displays current evaporator defrost termination temperature Input Z31/Z32
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82; shown only when single-zone operation is set (Menu 6-1)
Def. End. Tmp. XXX °C	Displays defrost termination temperature setpoint for comparison
Wait Time XX m	Displays waiting time setpoint
Drip Time XX m	Displays drip time setpoint
Last Defrst XX hh:mm	Displays time (day, time of day) of last defrost cycle started
M/S Nof. Sl.	Number of parameterised and accessible MA slaves
M/S Lost Sl.	CAN address of the first MA slave which was not accessible during the last defrost
M/S Defr.Sl.	Number of slaves currently undergoing a defrost
M/S DSlMat	List of MA slaves currently undergoing a defrost (can be scrolled through using ENTER)
DSq Nof. Sl.	Number of DS slaves (only in the case of DS master)
DSq Lost Sl.	CAN address of the first FA slave which was not accessible during the last defrost
DSq Defr.Sl.	Number of slaves currently undergoing defrost
DSq DSlMat	List of FA slaves currently undergoing a defrost (can be scrolled through using ENTER)

- Menu 1-4 Not used with this controller type.

- Menu 1-5 Alarm

ALARM XXXXX	
Alarm Relay XXX	Displays current OFF/ON status of alarm output Terminal 15/16/18
Hi Temp Setp.1 XX °C	Displays high temperature setpoint Zone 1
Lo Temp Setp.1 XX K	Displays low temperature setpoint Zone 1
Hi Temp Setp.2 XX °C	Displays high temperature setpoint Zone 2; shown only when two-zone operation is set (Menu 6-1)
Lo Temp Setp.2 XX K	Displays low temperature setpoint Zone 2; shown only when two-zone operation is set (Menu 6-1)

- Menu 1-6 Not used with this controller type.

- Menu 1-7 Cooling Zone 2

COOLING 2 XXXXX	
Cooling XXX	Displays current OFF/ON status of cooling
op.deg. Z 2 XX %	Displays current valve opening degree Zone 2
OD med. 24h XX %	Displays mean valve opening degree Zone 2 for past day
Temp. R4.2 XXX °C	Displays current refrigerant temperature Input Z71/Z72
Setpoint R4.2 XXX °C	Displays refrigerant temperature setpoint for comparison
Hysteresis R4.2 XXX K	Displays refrigerant temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)
SH Z 2 XXX °C	Displays current superheat temperature Zone 2
sup air ctrl XXX	Displays current OFF/ON status of supply or refrigerant control
MOP op. XXX	Displays OFF/ON setpoint of MOP mode

- Menu 1-8 Defrost Zone 2

DEFROST 2 XXXXX	
Defrost XXX	Displays current OFF/ON status of Defrost Relay 2
Temp. R1.2 XXX °C	Displays current evaporator defrost termination temperature Input Z81/Z82
Def. End. Tmp. XXX °C	Displays defrost termination temperature setpoint for comparison
Wait Time XX m	Displays waiting time setpoint
Drip Time XX m	Displays drip time setpoint
Last Defrst XX hh:mm	Displays time (day, time of day) of last defrost cycle started

8.6.3 Menu 2 Setpoints

SETPOINTS POS: XXXXX	
1 Cooling	Move to menu 2-1; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-1-1
2 Defrost	Move to menu 2-2; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-2-1
3	
4 Alarm	Move to menu 2-4; **Special case:** When one-zone (tandem) operation is set (Menu 6-1) and setpoint toggle is deactivated (Menu 3-3), Continue to 2-4-1

- Menu 2-1 Cooling

COOLING POS: XXXXX	
1 Zone 1	Move to menu 2-1-1
2 Zone 2	Move to menu 2-1-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-1-3; not shown when setpoint toggle is deactivated (Menu 3-3)
3 Zone 2T Toggle	Move to menu 2-1-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-1-1 Zone 1

COOLING 1 POS: XXXXX		Entry	Default
Setpoint R4.1 XXX °C	Refrigerant temperature setpoint	--, -45..40	5 °C
Hystersis R4.1 X K	Refrigerant temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..10	2 K
Superheat XXX K	Superheat setpoint Zone 1	0..20	8 K
Min. SH XX K	Minimum superheat setpoint, below which cooling relay switches off in Zone 1. I-sum (not I-part) is set to zero when the *Reset I-Sum* parameter is set to ON.	0..10	2 K
Two pos.ctrl XXX	Switch between on-off control (ON) and continuous control (OFF)	↑, ↓ (ON/OFF)	OFF
MOP-point XXX °C	Starting setpoint for MOP mode	--, -50..50	-- °C

- Menu 2-1-2 Zone 2

COOLING 2 POS: XXXXX		Entry	Default
Setpoint R4.2 XXX °C	Refrigerant temperature setpoint	--, -45..40	5 °C
Hystersis R4.2 X K	Refrigerant temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..10	2 K
Superheat XXX K	Superheat setpoint Zone 2	0..20	8 K
Min. SH XX K	Minimum superheat setpoint, below which cooling relay switches off in Zone 2. I-sum (not I-part) is set to zero when the *Reset I-Sum* parameter is set to ON.	0..10	2 K
Two pos.ctrl XXX	Switch between on-off control (ON) and continuous control (OFF)	↑, ↓ (ON/OFF)	OFF
MOP-point XXX °C	Starting setpoint for MOP mode	--, -50..50	-- °C

- Menu 2-1-3 Zone 1T Toggle

COOLING 1A POS: XXXXX		Entry	Default
Setpoint R4.1 XXX °C	Refrigerant temperature setpoint	--, -45..40	5 °C
Hystersis R4.1 X K	Refrigerant temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-1)	1..10	2 K

- Menu 2-1-4 Zone 2T Toggle

COOLING 2A POS: XXXXX		Entry	Default
Setpoint R4.2 XXX °C	Refrigerant temperature setpoint	--, -45..40	5 °C
Hysteresis R4.2 X K	Refrigerant temperature hysteresis setpoint; shown only when on-off control is set (Menu 2-1-2)	1..10	2 K

- Menu 2-2 Defrost

DEFROST POS: XXXXX	
1 Zone 1	Move to menu 2-2-1
2 Zone 2	Move to menu 2-2-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-2-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-2-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-2-1 Zone 1

DEFROST 1 POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 0..30	-- °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min
M/S Degiv.Fct. XXX	Configuration of the defrost via CAN bus function. For details see chapter 4.5.5.	OFF, MASTR, SLAVE	OFF
M/S CAN Adr. XXX	Selection of the controller (1..99) participating in the defrost via CAN bus which is the master. “--“, if this controller is itself master (Parameter *M/S Degiv.Fct.*. = MASTR)	---, 1..99	--
DS-Function XXX	Configuration of the defrost sequenz function (DS). For details see chapter 4.5.6.	OFF, MASTR, SLAVE	OFF
DS-Group XXX	Selection of which group a defrost sequenz of this controller (1..99) belongs to.	---, 1..99	--
DS-Master XXX	Selection of which controller (1..99) participating in the defrost sequenz is the master. “--“, if this controller is itself the master (Parameter *DS-Function* = MASTR)	---, 1..99	--
DS-Wait time XXXm	Wait time for the defrost sequenz	0..127	1 min

- Menu 2-2-2 Zone 2

DEFROST 2 POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 0..30	-- °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min

- Menu 2-2-3 Zone 1T Toggle

DEFROST 1A POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 0..30	-- °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min

- Menu 2-2-4 Zone 2T Toggle

DEFROST 2A POS: XXXXX		Entry	Default
Def. End. Tmp. XX °C	Defrost termination temperature setpoint	--, 0..30	-- °C
Wait Time XX m	Waiting time setpoint between cooling and defrost	0..15	0 min
Drip Time X m	Waiting time (drip time) setpoint between defrost and cooling	0..15	0 min

- Menu 2-3 Not used with this controller type.

- Menu 2-4 Alarm

ALARM POS: XXXXX	
1 Zone 1	Move to menu 2-4-1
2 Zone 2	Move to menu 2-4-2; shown only when two-zone operation is set (Menu 6-1)
3 Zone 1T Toggle	Move to menu 2-4-3; not shown when setpoint toggle is deactivated (Menu 3-3)
4 Zone 2T Toggle	Move to menu 2-4-4; shown only when two-zone operation is set (Menu 6-1) and when setpoint toggle is not deactivated (Menu 3-3)

- Menu 2-4-1 Zone 1

ALARM 1 POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-35..45	45 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..10	-- K

- Menu 2-4-2 Zone 2

ALARM 2 POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-35..45	45 °C
Low Temp Setp. XX K	Sollwert Temperatur (Differenz unter dem Sollwert der Temperaturregelung), bei dem der Alarm *Untertemperatur* ausgelöst wird	--, 0..10	-- K

- Menu 2-4-3 Zone 1T Toggle

ALARM 1A POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-35..45	45 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..10	-- K

- Menu 2-4-4 Zone 2T Toggle

ALARM 2A POS: XXXXX		Entry	Default
High Temp Setp XX °C	High temperature setpoint at which *High Temperature* alarm is generated	-35..45	45 °C
Low Temp Setp. XX K	Temperature setpoint (difference below temperature control setpoint) at which *Low Temperature* alarm is generated	--, 0..10	-- K

8.6.4 Menu 3 Clock

CLOCK POS: XXXXX	
1 Current Time	Move to menu 3-1
2 Defrost Timer	Move to menu 3-2
3 Toggle Setpoints	Move to menu 3-3

- Menu 3-1 Current Time

☞ Time is defined by time master (system centre / store computer / operator terminal) when CAN bus is connected. Any entry made will then be overwritten by the defined value.

CLOCK POS: XXXXX		Entry	Default
Date: XX dd.mm.yy	Display and entry of current weekday, date	dd.mm.yy	
Time: hh.mm	Display and entry of current time	hh.mm	
Daylight Saving X	Display and entry of automatic daylight saving time change (Y/N)	↑, ↓, (Y/N)	Y

- Menu 3-2 Defrost Timer

DEFR.TIMER POS: XXXXX		Entry	Default
Defrost Timer XXX	Defrost initiation via Input D11/12 (EXT) oder internal (INT)	↑, ↓, (EXT, INT)	EXT
Safe Defr Time XXX m	Safe defrost time, i.e. max. allowed duration of defrosting (internal defrost only); shown only when paramter defrost timer = INT	0..120	60 min
Manual Defrost XXX	Status (ON/OFF) of auxiliary manual defrost *)	↑, ↓, (ON/OFF)	OFF
Def.Tim.Z2 →	Separate defrost timer for zone 2	Menu 3-2-a	

☞ *) Parameter is **NOT** automatically set to ON at first start

- Menu 3-2-a Def.Tim.Z2

DEFR.TIMER POS: XXXXX		Entry	Default
Defrost Timer XXX	Setting for how temperature zone 2 should defrost: - MitZ1 Together with zone 1 - INT Internally - EXT Externally – the defrost of both temperature zones is started simultaneously via the external signal	↑, ↓, (ViaZ1(ViaZ1, EXT, INT)	ViatZ1
Safe Defr Time XXX m	Safe defrost time, i.e. max. allowed duration of defrosting (internal defrost only)	0..120	60 min
Manual Defrost XXX	Status (ON/OFF) of auxiliary manual defrost *)	↑, ↓, (ON/OFF)	OFF
Defr. 1 xxxxx hh:mm	Defrost start time for internal defrost; weekday, time of day; shown only when paramter *defrost timer* = INT	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 01:00
...			
Defr. 14 xxxxx hh:mm			

• Menu 3-3 Toggle Setpoints

TOGGLE POS: XXXXX		Entry	Default
Status XXX	Setpoint toggle for alternative set of setpoints (setpoint set toggle)		
Toggle Setp. XXX	Setpoint toggle via - EXT digital input D21/22 - INT internal timer - CAN CAN bus - „--“ deactivated	↑, ↓, (EXT, INT, CAN, --)	EXT
Toggle interv. X m	The interval for the cyclical toggling between standard and alternative setpoint data records; only appears when the internal setpoint toggling is activated (menu 3-3).	--, 10..60	-- min
Alt ON: xxxxx hh:mm	Start time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Mo-Su 21:00
AltOFF: xxxxx hh:mm	End time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)		Mo-Su 05:00
Alt ON: xxxxx hh:mm	Start time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)	↑, ↓, (Mo-Su) or numbers (hh:mm)	Su 05:00
AltOFF: xxxxx hh:mm	End time for toggle to alternative set of setpoints, weekday from-to DD-DD, time hh:mm; shown only when internal setpoint toggle is activated (Menu 3-3)		Su 21:00
...	A total of 7 different ON, OFF toggle times can be entered. Toggle time will only be obeyed when a ***matched pair*** of ON and OFF time is set.		

8.6.5 Menu 4 Messages

MESSAGES POS: XXXXX	
1 View	Move to menu 4-1 View Messages
2 Acknowledge	Messaages in log are cancelled, press ESC to exit after cancel is confirmed
3 Delete	Move to menu 4-3

• Menu 4-1 View Messages

MESSAGES POS: XXXXX	
Error text 1:	Fault message Fault 1
dd.mm.yy hh:mm ON	Start of Fault 1
dd.mm.yy hh:mm OFF	End of Fault 1 (only when Fault 1 has ended)
...	
Error text n:	Fault message Fault n
dd.mm.yy hh:mm ON	Start of Fault n
dd.mm.yy hh:mm OFF	End of Fault n (only when Fault n has ended)

• Menu 4-2 Cancel Messages

This displays the *Alarms Cancelled!* message.

• Menu 4-3 Delete Messages

MESSAGES POS: XXXXX		Entry
Delete ! Are you sure ? No: ESC YES: ↵	Safety prompt for deleting messages; press ESC to exit after confirming or cancelling delete	↵, ESC

8.6.6 Menu 5 Archive

ARCHIVE POS: XXXXX	
dd.mm.yy hh:mm	Time of archiving Data Record 1
Zone 1: abcdef x °C	Status and temperature of Zone 1, see note *)
Zone 2: abcdef x °C	Status und Temperatur von Zone 2, s. Anmerkung *); shown only when two-zone operation is set (Menu 6-1)
...	
dd.mm.yy hh:mm	Time of archiving Data Record n
Zone 1: abcdef x °C	Status and temperature of Zone 1, see note *)
Zone 2: abcdef x °C	Status und Temperatur von Zone 2, s. Anmerkung *); shown only when two-zone operation is set (Menu 6-1)

*) Status abcdef covers following states of refrigeration point. The entry at this position is - when a state is not active.

Example `Zone 1: abcdef x °C`

	Single-zone operation resp. Operator interface BT 300	Two-zone operation
a	O = Operation	O = Operation
b	R = Refrigeration / Cooling	R = Refrigeration / Cooling
c	R = Refrigeration/ Cooling	D = Defrost
d	D = Defrost	G = Gate / Door (coldroom controller only)
e	G = Gate / Door (coldroom controller only)	A = Alarm
f	A = Alarm	

8.6.7 Menu 6 Configuration

CONFIGURAT POS: XXXXX	
1 Refriger. Point	Move to menu 6-1
2 Controller	Move to menu 6-2
3 Cooling	Move to menu 6-3
4 Language	Move to menu 6-4
5 Alarm priorities	Move to menu 6-5
6 Em.Powersupply	Move to menu 6-6
7 COPT+	Move to menu 6-7

- Menu 6-1 Refrigeration Point

REFR. PT. POS: XXXXX		Entry	Default
Refr. Pt. Name:	Text only		
xxxxxxxxxxxxxxx	Free text entry describing refrigeration point (see note at end of table)		Case Controller
Item ID: XXXXX	Free text entry shown after Position (POS:) in screens (see note at end of table)		UA400
Priority: XX	Priority of alarms in failure of refrigeration point or when setting global controller priority (Menu 6-5)	↑, ↓, or numbers (0..99)	1
Refr. Sys. No.: XX	Pack No. of pack controller assigned to case controller. The controller cannot receive the suction pressure value for control functions before the Pack No. of the associated pack controller has been selected on the case controller	↑, ↓, or numbers (--, 1..9)	--
Refr. Sys. Type XXX	Allocation to compressor pack. Parameter only required for linking to VS 3010 BS with several zones. Deactivate this parameter (---) when using pack controllers of other type.	↑, ↓, or numbers (---, Z1, Z2)	Z2
Temp. Zones X	Number of temperature zones. Single-zone operation (tandem mode) Two-zone operation	↑, ↓, or numbers (1, 2)	2
No. Sensors XX	Displays number of temperature sensors connected. After pressing ↵, sensor scan is performed and number of sensors is redefined.	↵	

It must be ensured that the correct pack number has been selected, i.e. the correct Refr. Sys. type has been set, otherwise this can result in damage to the installation or goods. Furthermore, the parameter *Corr.off t_0* (menu 6-3) must not be set to ”--” if the t_0 from the pack controller is to be used for regulating.

A meaninful name that describes the refrigeration point in more detail should be entered, e.g. Cheese Counter 2 and CC2. Entry is made in the screens on system centre, store computer or operator terminal. Direct entry cannot be made in the controller screens displayed on the operator terminal. Entry cannot be made either on operator interface BT 300.

- Menu 6-2 Controller

CONTROLLER POS: XXXXX	
1 Type and Version	Move to menu 6-2-1
2 Temp. Display	Move to menu 6-2-2
3 Alarm Delay	Move to menu 6-2-3
4 230V Inputs	Move to menu 6-2-4
5 Sensor Type	Move to menu 6-2-5
6 Analog inputs	Move to menu 6-2-6
7 eev ctrlr zone1	Move to menu 6-2-7; shown only when Superuser mode is activated system centre / store computer / operator terminal (see Section Operation)
8 eev ctrlr zone2	Move to menu 6-2-8; shown only when Superuser mode is activated system centre / store computer / operator terminal (see Section Operation)

- Menu 6-2-1 Type and Version

VERSION POS: XXXXX		Default
Ctrlr. Type XXXXXXX	Set on DIP Switch S3	UK100E
Software Ver.: XXXX	Software version of case controller	
Serial No.: XXXXXX	Device No. of case controller (from EEPROM)	

- Menu 6-2-2 Temperature Display

DISPLAY POS: XXXXX		Entry	Default
Offset XX K	Offset for temperature display	-10..10	0 K
Alarmsymbol XX	Show alarm symbol on BT 30 Temperature Display	↑, ↓, (ON/OFF)	N

- Menu 6-2-3 Alarm Delay

ALARMDELAY POS: XXXXX		Entry	Default
Sensor Fault XX m	Sensor break alarm delay	0..30	15 min
High/Low Temp. XX m	High/low temperature alarm delay	0..150	90 min
No Defrost XX h	No defrost alarm delay	--, 2..168	--- h
Selfholding N	Alarm latching with manual alarm cancelling (YES) or automatic cancelling on send (NO)	↑, ↓, (Y/N)	N

- Menu 6-2-4 230V Inputs

Only trained personnel should be allowed to change digital inputs, as changes can affect other functions.

230V INPUT POS: XXXXX		Entry	Default
Entry1: XXXXXXXXXX	Function of digital input 1 D11/D12	1)	DEFR.TIMER
Entry2: XXXXXXXXXX	Function of digital input 2 D21/D22	2)	TOGGLE SETP.
Entry3: XXXXXXXXXX	Function of digital input 3 D31/D32	3)	MANUAL OFF.
Entry4: XXXXXXXXXX	Function of digital input 4 D41/D42	4)	Extern.Alarm
XXXXXXXXXXXXXXXXXXX	Freely configurable alarm text for digital input 4, the default text is “CO2-Alarm”	Text	CO2-ALARM
Inv. D1 XXX	Inverting of digital input 1	↑, ↓, (ON/OFF)	OFF
Inv. D2 XXX	Inverting of digital input 2		OFF
Inv. D3 XXX	Inverting of digital input 3		OFF
Inv. D4 XXX	Inverting of digital input 4		OFF

Possible settings for the digital inputs:

1)	DEFR.TIMER	Defrost timer*
	MANUAL OFF.	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
	TOGGLE SETP.	Toggle setpoint
2)	TOGGLE SETP	Toggle setpoint *
	MANUAL OFF	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
3)	MANUAL OFF	Manual shutoff both zones *
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
4)	EXT ALARM	External Alarm *
	MANUAL OFF	Manual shutoff both zones
	MANUAL OFF. Z1	Manual shutoff only Z1
	MANUAL OFF. Z2	Manual shutoff only Z2
	TOGGLE SETP	Toggle setpoint

* Factory setting

- Menu 6-2-5 Sensor Type

Selection is made according to entry. Checkmark shows current setting.

SENSORS POS: XXXXX		Entry	Default
L243 √	Temperature range -50 °C .. 50 °C	↵	√
K277	Temperature range -50 °C .. 50 °C	↵	
5K3A1	Temperature range 0 °C .. 100 °C	↵	

- Menu 6-2-6 Analog inputs

ANALOG INPUTS POS: XXXXX		Entry	Default
AIN1 activ x	Analogue input Z1 use (=Y) do not use (=N)	(Y,N)	N
Refrig.Z 1 xxxx	Selection of refrigerant zone 1	None R404a .. R438A*	None
LP Z1 Min xxx bar	Smallest pressure value for pressure monitoring at 4mA	0.0 .. 2.0 bar	0.0 bar
LP Z1 Max xxx bar	Largest pressure value for pressure monitoring at 20 mA	8.0 .. 200.0 bar	10.0 bar
AIN1 Send CAN	This parameter is used to instruct the case controller to make the local t0 (AIN1) available via CAN bus. ONLY possible when the parameter AIN1 active = Y	(Y,N)	N
AIN1 Rcv. CAN xx	CAN bus address of the remote case controller from which the t_0 is received.	1..99	--
AIN1 Rcv. Inp x	This parameter is used to specify the zone from which the t0 is taken. (refers to the parameter *AIN1 Rcv. Inp*)	1,2	1
AIN2 activ x	Analogue input Z2 use (=Y) do not use (=N)	(Y,N)	N
Refrig.Z 2 xxxx	Selection of refrigerant zone 2	None R404a .. R438A*	None
Fct. AIN2 xxxxx	Function of the analogue input zone 2 t0Z2 For recording only t0Z2ctl For regulation	t0Z2, toZ2ctl, Humidity, tc	
HP Z2 Min xxx bar	Smallest pressure value for pressure monitoring at 4mA	0.0 .. 2.0 bar	0.0 bar
HP Z2 Max xxx bar	Largest pressure value for pressure monitoring at 20 mA	8.0 .. 200.0 bar	10.0 bar
AIN2 Send CAN	This parameter is used to instruct the case controller to make the locally measured value of analogue input 2 (AIN2) available via CAN bus. ONLY possible when the parameter AIN2 active = Y	(Y,N)	N
AIN2 Rcv. CAN xx	CAN bus address of the remote case controller which provides the locally measured analogue value.	1..99	--
AIN2 Rcv. Inp x	This parameter is used to specify the zone from which the locally measured analogue value is taken. (refers to the parameter *AIN2 Rcv. Inp*)	1,2	2

ANALOG INPUTS POS: XXXXX		Entry	Default
RfrSy. tcLT xxx	Pack controller CAN bus address for receipt of tc via CAN bus Can also be used as backup option in the event of the failure of the local pressure transmitter Deactivated with '--' Can only be used when parameter ”Fct. AIN2” set to ”tc LT”.	--, 1..9	--
tcZ2-max xxx°C	tc maximum value for the dynamically determined tc setpoint	-10..10	-2 °C
tcZ2-min xxx°C	tc minimum value for the dynamically determined tc setpoint	-20..10	-10 °C
tcZ2-ramp/m xxxK	Maximum increase / change of the dynamically evaluated tc setpoint Dynamic evaluation of the tc setpoint switched off with '--'; in this case the setpoint R4.x is used. Can only be used when parameter ”Fct. AIN2” set to ”tc LT”.	--1..100	--
tcZ2-toZ1df xxxK	Difference between to and tc for the dynamic determination of the tc setpoint	0..20	5 K

* Supported refrigerants:
R404A, R744 (CO_2), R134a, R410A, R717 (NH3), R22, R290, R407C, R507, R1270, R402A, R502, R407F, R422A, R422D, R408A, R407D, R407A, R427A, R438A*, R152a, R170, R600, R600a

Praxis tip using the example of the ”connection of a pressure transmitter - 1 .. 7 bar”:
Here the indication on the pressure transmitter is clear (-> -1 bar) relative to the ambient pressure The adjustment of the pressure transmitter in the controller is carried out using absolute pressure values (the absolute pressure cannot be negative). In order to parameterise the above pressure transmitter with the relative pressure indication - 1 bar (at 4 mA, i.e. 0 V) at 7 bar (at 20mA, i.e. 10 V) the ambient pressure (1 bar) must be added.
The entry is carried out as follows: 0..8 bar.

• Menu 6-2-7 EEV Controller Zone 1

This menu is only visible if
- the “Master” mode is activated in the system centre, i.e.
- the “Superuser mode” is activated in the store computer.
For details see the Operation chapter.

EEV ZONE 1 POS: XXXXX		Entry	Default
Pc Z 1: XX.XX	Refrigeration temperature control Zone 1, P-part	0..99.99	4.00
Ic Z 1: XX.XX	Refrigerant temperature control Zone 1, I-part If parameter I_c is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.30
Dc Z 1: XX.XX	Refrigerant temperature control Zone 1, D-part	0..99.99	5.00
offs OD cab. XX %	Percentage valve opening degree offset for refrigerant temperature control. If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
Psh Z 1: XX.XX	Superheat control Zone 1, P-part	0..99.99	5.00
Ish Z 1: XX.XX	Superheat control Zone 1, I-part If parameter I_{sh} is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.10
Dsh Z 1: XX.XX	Superheat control Zone 1, D-part	0..99.99	5.00

EEV ZONE 1 POS: XXXXX		Entry	Default
offs OD SH XX %	Percentage valve opening degree offset for superheat control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
emerg.c-o OD XX %	Maximum emergency valve opening degree	0..50	10 %
delay min SH XX s	Delay on drop of superheat below set minimum	9..600	9 sec
setuptime XX.X m	Setup time following the switching on of the controller or following a defrost or in the event of a blockade of the regulation. The value entered must not be less than the current "*inject.time*" parameter, otherwise the smallest valid value will be used. Further details about "Fixed valve opening degree in pumpdown/feed-in phase" see chapter 4.4.14.	0..100.0	1.0 min
inject.time XX.X m	Injection time following the switching on of the controller or following a defrost or in the event of a blockade of the regulation. The value entered must not be greater than the current "*setuptime*" parameter, otherwise the largest valid value will be used. Further details about "Fixed valve opening degree in pumpdown/feed-in phase" see chapter 4.4.14.	0..100.0	0.5 min
OD over CAN XXX	Send opening degree via CAN bus (is employed when a demand dependent setpoint evaluation / to shift via consumer" is parameterised in the corresponding pack controller)	↑, ↓, (ON/OFF)	ON
15s Archiv X	A few statuses and values are additionally archived at 15 second intervals in the system centre / store computer when this parameter is set to "J". WARNING: This setting increases the memory requirement and should only be activated when needed / for diagnostic purposes.	↑, ↓, (Y/N)	N
OD 3s interv XXX	Select interval for output of opening degree. OFF = 6s ON = 3s Control is suspended for 6 seconds when toggling.	↑, ↓, (ON/OFF)	OFF
Reset I-Sum XXX	Reset I-sum (to zero) if superheat drops below set minimum for longer than time set by "delay min SH" parameter. OFF = I-sum not reset to zero ON = I-sum is reset to zero	↑, ↓, (ON/OFF)	ON
edit op.deg. XXX	Manual entry of valve opening degree	↑, ↓, (ON/OFF)	OFF
op.deg. Z 1 XXX %	Current valve opening degree Zone 1; can be edited when manual entry is activated	0..100	Default by controller
Maximum OD xxx %	Sets an upper limit to the opening degree output by the case controller	20..100	100%
Lo Temp to xxK	Monitoring of the t0 transmitted by the pack controller for unsuitably low values NOTE: Following commissioning this value can be set to "-".	10..60, --	28K
to VS corr. XXX °C	Displays current corrected suction pressure temperature on pack controller (assigned by Pack No.)		

• Menu 6-2-8 EEV Controller Zone 2

☞ This menu is only visible if
- the “Master” mode is activated in the system centre, i.e.
- the “Superuser mode” is activated in the store computer.
For details see the Operation chapter.

EEV ZONE 2 POS: XXXXX		Entry	Default
Pc Z 2: XX.XX	Refrigerant temperature control Zone 2, P-part	0..99.99	4.00
Ic Z 2: XX.XX	Refrigerant temperature control Zone 2, I-part If parameter I_c is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.30
Dc Z 2: XX.XX	Refrigerant temperature control Zone 2, D-part	0..99.99	5.00
offs OD cab. XX %	Percentage valve opening degree offset for refrigerant temperature control. If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
Psh Z 2: XX.XX	Superheat control Zone 2, P-part	0..99.99	5.00
Ish Z 2: XX.XX	Superheat control Zone 2, I-part If parameter I_{sh} is reduced, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..99.99	0.10
Dsh Z 2: XX.XX	Superheat control Zone 2, D-part	0..99.99	5.00
offs OD SH XX %	Percentage valve opening degree offset for superheat control If offset is changed, internal learned value (sum of I-part) is deleted and re-learned in due course.	0..100	10 %
emerg.c-o OD XX %	Maximum valve opening degree	0..50	10 %
delay min SH XX s	Delay on drop of superheat below set minimum	9..600	9 sec
edit op.deg. XXX	Manual entry of valve opening degree	↑, ↓, (ON/OFF)	OFF
op.deg. Z 2 XXX %	Current valve opening degree Zone 2; can be edited when manual entry is activated	0..100	Default ctrlr.

• Menu 6-3 Cooling

COOLING POS: XXXXX		Entry	Default
corr.off to XX K	Correction offset for pressure loss in suction line **IMPORTANT:** in stand alone operation must be set to ”--”!	--, 0..20	1 K
EnablingRel XXX	Switching to “Enable Operation“: OFF Opening degree is transmitted via the solid state relay (SSR) ON The two SSRs are no longer clocking, they are switched on if the case controller requires refrigeration, i.e. switched off again if no refrigeration is required.	↑, ↓, (ON/OFF)	OFF

- Menu 6-4 Language

Selection is made according to entry. Checkmark shows current setting.

LANGUAGE POS: XXXXX		Entry	Default
Deutsch D √		↵	√
English GB		↵	
Francais F		↵	
Espanyol ESP		↵	
Finnish FIN		↵	
Cesky CZ		↵	

- Menu 6-5 Alarm priorities

ALARMPRIOS POS: XXXXX		Entry	Default
Prio.Refrig. Pt. X	Global setting of alarm priority via refrigaration point priority (Menu 6-1) (Y)	↑, ↓, (Y/N)	N
Priority: XX	Displays refrigeration point priority (Menu 6-1); only shown when refrigeration point priority is set to Y		
Following parameters are only shown when refrigeration point priority is set to N. Meaning of valid entries for alarm priority is as follows: - = *Event ignored* *0* = *Message (enterd only in message log)* *1* = *Priority 1 alarm* .. *99* = *Priority 99 alarm*			
Low Temp.	Temperature below low alarm limit. Priority applies to alarms *Low Temp. Zone 1, Low Temp. Zone 2*	-, 0..99	2
High Temp.	Temperature above high alarm limit. Priority applies to alarms *High Temp. Zone 1, High Temp. Zone 2*	-, 0..99	1
Sensor Fault	Temperature sensor failure	-, 0..99	2
Door Open	Coldroom door open longer than time delay; pririty applies to *Coldroom Door Open* alarm	-, 0..99	1
No Defrost	No defrost within alarm delay time. Priority applies to *No Defrost* alarm	-, 0..99	0
Timer-Term. Defrost	Defrosting terminated by safe defrost time	-, 0..99	0
Power Failure	Start following power failure	-, 0..99	0
First Start	Controller Startup (basic settings are loaded!)	-, 0..99	2
Manual Shutoff	Manual switch Input D31/D32 set OFF	-, 0..99	0
Hardware Fault	Internal hardware defect. Priority applies to alarms *EEPROM Defective, RTC Defective, Flash Memory Defective*	-, 0..99	1
Setpoint Change	Message generated when changing setpoints	0..99	0
Refrig.Pt.Dis.	Cooling interrupted by VS pack controller via CAN bus	-, 0..99	0
Battery Voltage	Battery low	-, 0..99	0
Check t0	The pack controller to is not received via CAN bus; priority is given to the messages Check to Z1, Check to Z2 (see also chapter 10.1.3 "Low Temperature Monitoring to")	-, 0..99	2

ALARMPRIOS POS: XXXXX		Entry	Default
Sensor Fault eev	EEV Control sensor failure. Priority applies to alarms *Sensor Break EEV Z1, Sensor Break EEV Z2*	-, 0..99	2
eev ctrl block	EEV control stalled. Priority applies to alarms *EEV Stall Detect Z1, EEV Stall Detect Z2*	-, 0..99	0
wrong ctrlr type	Configuration error: Invalid controller type set on DIP Switch S3. Priority applies to *Wrong Controller Type* alarm	-, 0..99	0
emerg.cut-out SH	Superheat drop below minimum level for duration of delay time	-, 0..99	--
OD manual	Valve opening degree defined by manual entry. Priority applies to alarms *VO Manual Zone 1, VO Manual Zone 2*	-, 0..99	0
config:M/S w HG	Configuration error: Simultaneous setting of parameters for master-slave mode and discharge gas defrosting	-, 0..99	2
Check OD	Alarm due to implausible opening degree (see chapter 10.1.10)	-, 0..99	0
Extern.Alarm	Alarm for registering external alarms, default text is “CO2-Alarm”	-, 0..99	0

- Menu 6-6 Em.Powersupply (Emergency Power supply)

EM.POW.SUP POS: XXXXX		Entry	Default
Cool.funct.OFF xxx	Functionality of the cooling switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Defr.funct.OFF xxx	Functionality of the defrosting switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Fan funct. OFF xxx	Functionality of the fan switched off during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N
Frame fct.OFF xxx	Without function	↑, ↓, (Y/N)	N
Light fct. OFF xxx	Functionality of the light during emergency power supply? (Y/N)	↑, ↓, (Y/N)	N

- Menu 6-7 COPT+

COPT+ POS: XXXXX		Entry	Default
COPT+ xxx	Principle participation of the controller in the suction pressure shift. (function COPT+). Note: This is transmitted via a CAN bus telegram and intervenes in the regulation!	↑, ↓, (ON/OFF)	OFF
Inact.a.Def xxm	Delay time following completion of the defrost before the controller actively intervenes in the shift.	0..40	30 min
Dely_HystON xxxxm	Delay time for the reduction request with active cooling and overshoot of the hysteresis.	0..10	2.5 min
HiTmpZ1 dwn xxm	Delay time before the elapse of the high temperature alarm delay in zone 1, before the reduction is requested.	0..15	5 min.
HiTmpZ2 dwn xxm	Delay time before the elapse of the high temperature alarm delay in zone 2, before the reduction is requested.	0..15	5 min.
TolOvHystZ1 xxK	Tolerance limit above the setpoint plus hysteresis in zone 1. Influences when it is switched from stop to reduce.	0..20	2 K
TolOvHystZ2 xxK	Tolerance limit above the setpoint plus hysteresis in zone 2. Influences when it is switched from stop to reduce.	0..20	2 K
SwtchSupRet xxx	Switching from supply air to return air and the reverse with temperature alarm delay time.	↑, ↓, (ON/OFF)	OFF
Dely_Switch xxxm	Switching from supply to return air: determines when it is switched within the delay time for the high temperature alarm.	0..15	5 min.
Add.Values xxx	Creation of additional (additive) "Debug" actual value archives in the system centre / store computer. **Warning**: This can force a reorganisation of the actual value archives – for this reason **only** use when required!	↑, ↓, (ON/OFF)	OFF
Incl_UpLim xxxK	Upper limit of the neutral zone for determining the incline.	0..5	0.3 K
Incl_LwLim xxxK	Lower limit of the neutral zone for determining the incline.	0..5	0.2 K
SDS Hyst Z 1 xxxK	Determines the hysteresis used during the shift from this value and the P-quota Möbelreg. Zone 1. (*)	1..10	5 K
SDS Hyst Z 2 xxxK	Determines the hysteresis used during the shift from this value and the P-quota Möbelreg. Zone 2. (*)	1..10	5 K
SDS RMode virtSet	Please always leave this value on "virtSwt"	-	virtSwt

(*) The lower this parameter, then the earlier the pack controller is instructed to lower the suction pressure, which increases the accuracy with which the controller can maintain its setpoint. In addition the case controllers P-quota is also employed. The higher the case controller's P-quota, then the earlier the pack controller is instructed to lower the suction pressure, which increases the accuracy with which the controller can maintain its setpoint.

9 Decommissioning and disposal

9.1 Decommissioning / Demounting

The disassembly of the equipment is only to be carried out by trained and authorised personnel.

Warning - hazardous electrical voltage!
Danger of electric shock! During disassembly the same safety instructions and hazard warnings are to be observed as in the case of installation, commissioning and maintenance, see chapter 1, "Industrial safety notes".

During disassembly the reverse procedure is to be observed as that during assembly, see chapter "Installation and Startup".

9.2 Disposal

The scope of our delivery is designated as a component exclusively for further processing.

As a consequence of this fact, Eckelmann AG does not undertake any measures for the taking back or municipal recycling of this product as it is not supplied directly to the free market.

Never dispose of this product with other household waste. Please inform yourself of the local regulations for the separate disposal of electrical and electronic products. The correct disposal of your old equipment will protect people and the environment from possible negative effects.

The provisions and regulations for the disposal of the equipment are to be observed.
In accordance with the contractual agreement, the customer is beholden to dispose of electrical and electronic waste in compliance with the statutory regulations based on the Directive 2002/96/EC on waste electrical and electronic equipment.

Notice:

10 Alarms and Messages of UA 400 E / UA 410 E

The following table lists all fault reports that may be generated and their possible cause. Each fault is assigned a priority that can be set in the *Alarm Priorities* screen (Menu 6-5).

No.	Message	Cause	Correction
Hardware faults			
4	EEPROM Fault	Module for storage of configuration defective or configuration data in EEPROM not plausible.	Save parameters in LDSWin, where necessary initiate first start and reload parameters from LDSWin. If fault recurs, replace module.
6	Flash Fault	Flash memory defective.	Please contact Service Organization -Replace device
8	RTC Fault	Real-time clock defective.	Please contact Service Organization -Replace device
10	Battery Voltage	Battery to back up real-time clock and working memory is dead.	Replace battery (see Section 4 - Installation and Startup)
Messages			
50	First Start	Controller performed restart after power outage	--
51	Power Failure	Controller performed first start (basic settings loaded / sensor scan performed).	Check 230 V power supply.
120	Low Temp. Zone 1	Temperature below lower limit on monitored control sensors of Zone 1.	Check parameter setting, sensors, system
121	Low Temp. Zone 2	Temperature below lower limit on monitored control sensors of Zone 2.	Check parameter setting, sensors, system
122	High Temp Zone 1	Temperature above upper limit on monitored control sensors of Zone 1.	Check parameter setting, sensors, system
123	High Temp Zone 2	Temperature above upper limit on monitored control sensors of Zone 2.	Check parameter setting, sensors, system
124	Door open Door open Z1/Z2	Coldroom controllers only: Coldroom door i.e. Coldroom Z1 or Z2 open beyond alarm interval 1	Close door, check door switch or connecting cable
125	No Defrost	Defrosting not performed within alarm interval. - A defrost sequenz via CAN bus was not correctly configured - A master/slave defrost via CAN bus was not correctly configured	Check parameterisation: Check the internal/external defrost timer, defrost times, alarm delay time, configuration of the master/slave defrost via CAN bus (see chapter 4.5.4), check the configuration of the defrost sequenz via CAN bus (see chapter 4.5.6).
126	Timer-Term. Defrost	Defrosting terminated by safe defrost time. Heater defective, contactor defective, evaporator iced. Defrosting may be terminated by the safe defrost time one controllers designed for off-cycle defrosting. As a result, these controllers may regularly report the fault without it actually existing.	Check parameter settings: Low defrost termination temperature. Check evaporator for icing. Check location of defrost sensor. Set defrost termination temperature to "--".
127	Manual Shutoff	*Manual Shutdown* digital input actuated.	--

No.	Message	Cause	Correction
Messages			
128	Sensor Fault Fx	Sensor fault! Sensor disconnected, short-circuited or corrupted by external interference. Temperature on sensor outside set measuring range. Monitoring is performed on required or optional sensors recognized by controller as result of sensor scan.	Check connecting cable, Check cable shielding or Replace sensor(s) concerned: F1..F9 = Terminal /Z12..Z91/92 F10 = Terminal Z01/Z02
	Sensor Fault A1, A2	The message ”Sensor fault A1/A2” appears when in menu 6-2-6 the parameter ”AIN1” and ”AIN2” of the analogue inputs are set to ”Active=Yes” but no sensor is recognised. Note: A1/A2 = Analog input AIN1/AIN2	Check connecting cable, Check cable shielding, Replace sensor(s) concerned or set the parameter „AIN1“ resp. AIN2“ in the menu 6-2-6 to „AIN1/2 activ=no“
131	Controle OD	Control state obtained at which valve opening degree is no longer plausible (see chapter 10.1.10 - Implausible opening position alarm)	Check refrigeration point/controller for: - Electrical connection of cooling relay - Correct mechanical closing and opening of liquid solenoid valve. Where necessary, check control sensors for wiring fault.
138	Check to: Zone1 Check to: Zone2	The pack controller to is not received via CAN bus; priority is given to the messages to überprüfen Z1, to überprüfen Z2	Check Pack No. of case controller. Check setting of Corr.off. to parameter. Check CAN bus. See also section 10.1.3 Low temperature monitoring t0.
139	sens.fault eev Z1 sens.fault eev Z2	Break on sensors required for EEV control.	Replace defective sensors.
140	eev ctrl block Z1 eev ctrl block Z2	*Stall Detect* has occurred 3 times in succession and not corrected internally by controller.	Check correct position of control sensor. This fault report may occur when operating superheat control with two temperature sensors without t_0 via CAN bus although the fault does not exist. Alarm can then be removed by setting priority to 0.
141	wrong ctrlr type	Controller type set on DIP switch is not supported.	Change controller type (see section 4. Setting Controller Type)
142	emerg.cutout SH Z1 emerg.cutout SH Z2	The E valve is closed because the minimum permitted superheat has been undershot for a period longer than the parameterised delay time.	Check correct location of superheat control sensor.
143	OD manual zone 1 OD manual zone 2	Control function deactivated. Opening degree defined manually.	--
144	Config.: M/S w HG	Master/slave mode and discharge gas defrosting started simultaneously.	Check configuration. In master/slave mode, defrost relays are cut out only by temperature or safe defrost time. By contrast, in discharge gas defrosting the relays are also cut out when defrost command from pack controller via CAN is absent. These two conditions are irreconcilable.
179	CO2-Alarm	External alarm (specified as CO_2-Alarm in the basic settings)	--
189	Refrig. Pt. Disabl.	Refrigeration point enabling disabled.	--
240	Setpoint Change	Setpoint changed.	--

10.1 Alarm signaling and monitoring

10.1.1 Coldroom door open alarm

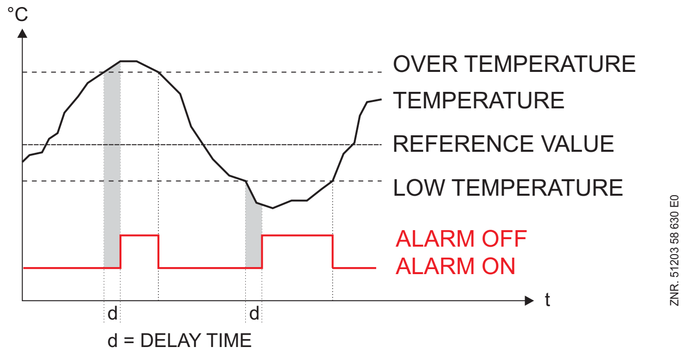
Controller type UR 141 NE, UR 141 TE

Alarm is generated if the coldroom door remains open for an adjustable time.

In the event of a permanently open door, an alarm is activated and the controller returns to cooling following the elapse of the adjustable alarm delay time.

10.1.2 High or low temperature alarm

Alarm is generated due to high or low temperature if the set alarm temperature is obtained on a supply air or return air sensor and the set time delay has expired.



Standard settings

The high temperature setpoint is entered in °C while the low temperature setpoint is entered as the difference to the cooling setpoint in K. High and low temperature setpoints can be set separately for each temperature zone. The time delay is common to all.

With controller type UA 141 E the return air coolers are monitored only for the low temperature setpoint. With all other controller types no differentiation is made between sensor type for alarm.

☞ This alarm is deactivated during defrosting. Any time delay that has expired in the meantime is reset at the start of defrosting and recommences at zero on completion of defrosting.
The parameter “*Temp.alarm*” must be set to the value “--“ (factory setting).

Advanced settings

Controller types UA 121, UA 131, UA 131 DD

For the supply air sensor an optional warning value can be used. In this case a separate alarm message is generated if the supply air exceeds this warning value.

In general, the case controller employs a common high temperature warning value for the supply and return air sensors. In special cases it may be desirable to configure a separate warning value for the supply air sensor (menu 2-4-1.. 2-4-4).

As soon as the parameter “*Temp.alarm.*” is set to a value other than “--“, the controller employs the separate warning values for supply and return air.

10.1.3 Low temperature monitoring t_0

This function initiates monitoring of the t_0 transmitted by the pack controller to check for inappropriately low values and serves, amongst other things, the early detection of instances where the case controller has been allocated to the ”wrong” pack controller (for allocation see menu 6-1).

The controller continually monitors whether the value of the t_0 transmitted by the pack controller are too low. For this purpose the supply air, return air, coldroom or sub cooler setpoint is used. When this setpoint, minus the parameter *Lo Temp t_0* (menu 6-2-7) for the delay time of one minute is greater than t_0 then the alarm *Check t_0* is activated. The alarm is deactivated with a hysteresis of 2K. The function can be switched off when the parameter is set to ”--”.

As long as the alarm *Check to* is effective, the case controller controls the superheat by the temperature sensors R5.x/R6.x and **not** by the value t_0 received from the pack controller.
Praxis tip: Following commissioning this value can be set to ”--”.

The following allocation applies to the setpoint employed for monitoring:

Controller type	Sensor
UA 121 E, UA 131 E, UA 131 E LS, UA 141 E	R2.1 / R2.2
UR 141 NE, UR 141 TE, UK 100 E	R4.1 / R4.2

The alarm employed t_0 überprüfen is also used to provide an alarm in the event of the allocated pack controller failing t_0 transmit any t_0 over the CAN bus.

10.1.4 Alarm in the event of the absence of a defrost

The Alarm „No Defrost“ is generated if defrosting does not take place within an adjustable time. No alarm is generated if defrosting is suppressed due to high temperature or by demand defrosting.

So as to avoid false alarm, the time delay for **No Defrost** alarm should not be set too short (**No Defrost** parameter in Menu 6-2-3). When the maximum interval between two set defrost times is 48 hours, for example (Menu 3-2), the **No Defrost** alarm time delay must be set at least one hour longer, i.e. to 49 hours.

Master/slave defrost / defrost sequenz via CAN bus

If the defrost is not conducted then the alarm message „*No Defrost*” is generated by both the master and slave controller. The generation of this message is coupled to the alarm delay time and thus is automatically sent by all affected controllers if no defrost takes place.

For defrost sequenz via CAN bus only: In master/slave operation the alarm “*No Defrost*“ can also mean that a slave no longer has any contact to the master. If a slave fails to receive a signal from its defrost master for a period longer than 60 minutes, then this message is generated.

10.1.5 Alarm in the event of the minimum permitted superheat being undershot

An alarm signal is sent when the limit value ”Minimum Superheat” is undershot following the end of the 10 minute delay time and the opening degree was greater than 0%.

10.1.6 Sensor break alarm

Alarm is generated after the set time delay if the controller detects sensor break or short circuit (menu 6-2-3).

Sensor break alarm is always generated in the case of sensors required for control functions. Sensor break is only alarmed on optional sensors when these sensors are not removed from monitoring by sensor scan (Menu 6-1).

The sensor failure message also applies to the pressure transmitter configured via parameters *AIN1 activ* i.e. *AIN2 activ* (menu 6-2-6) and is triggered after a set time delay of one minute. For sensor failures on the temperature sensors the set time delay continues to apply (menu 6-2-3).

10.1.7 Suppression of sensor break alarm during defrosting

While defrosting is in progress, temperature sensors and particularly the evaporator sensors may become heated to a temperature above the limits of the case/coldroom controller's temperature detection range. Sensor break alarm is accordingly suppressed for the duration of defrosting so as to avoid signalling of false alarms. The following conditions apply:

- Sensor break alarm effective prior to defrosting is NOT suppressed.
- Sensor break alarm takes place with the set delay during any drain time that may be defined.
- Sensor break occurring during defrosting and persisting beyond termination of defrosting is alarmed when the set delay expires.
- Sensor break alarm suppression is effective with all types of defrost (internal, external, discharge gas, manual and master/slave defrosting).
  With internal and manual defrosting, sensor break alarm is suppressed for the complete safe defrost time regardless of defrosting terminating before that.

In the most unfavorable instance, sensor break alarm is merely postponed. The longest possible delay would be $(2 * T_{\text{Sensor break delay}}) + T_{\text{Defrost}}$

If the delay time for the sensor failure alarm is set to zero minutes there is no alarm suppression and the alarm is generated immediately following detection of the sensor failure.
This setting is **not** recommended for the continuous operation of the controller!

10.1.8 No required sensor alarm

If the controller detects that controllers indispensable for regulation are not connected (evaporator output sensor, evaporator input sensor in the absence of t_0 from the pack controller; return air and supply air sensor simultaneously), then the alarm *Sensor Break EEV Z1/2* is triggered.

10.1.9 Stall detect alarm

EEV control stalled. This alarm is generated when the *Stall Detect* state occurs over a period of 3 restart repeats x 10 minutes = 30 minutes. Alarm is generated with Prio 0.

10.1.10 Implausible opening position alarm

Check OD (opening degree) alarm is generated in occurrence of either of the following conditions:

- Superheating drops below the minimum level for 30 minutes and defrosting is not due.
  This generally occurs when the solenoid valve for the refrigerant is permanently open, although the controller wants to shut the valve.

☞ Following a defrost the alarm delay time is extended to 60 minutes.

- 100% valve opening degree is maintained for 30 minutes while temperature on sensor R5.x is greater than the return air setpoint. No alarm takes place if sensor R5.x is not connected, regardless of 100% opening degree being maintained longer than 30 minutes.

Check OP alarm can be configured. Default setting is Priority 1.

☞ Priority of this alarm should be set to ”0” in on-off control mode so as to avoid false alarms.

10.1.11 Hardware alarm

Alarm is generated without time delay if the controller detects a hardware problem. Malfunction of following components is detected:

- Temperature measurement
- t_0 not received (alarmed with Prio 0 if control can continue at least with R5.x, otherwise with priority of controller)
- General fault
- Loss of setpoint (memory problem)
- Time/date
- First start

Priority for transmission of alarm depends on the controller priority and type of alarm.

10.2 Individual setting of priority

The controller allows of setting separate priority for most alarms. This permits specific signalling of alarm destinations and matching of alarms to individual requirements. Controller priority is used when the *Case Controller Prio* parameter is set to *YES* (Menu 6-5). It is also used at all times for alarming controller failure by the system centre / store computer.

The range of priority settings is 0 to 99, which means that it is now possible to distinguish among as many as 100 alarm destinations.

- The 1 and 2 priorities (1,11,21,...91 i.e. 2,12,22,...92) are reserved for high priority alarms which activate the alarm relays ”PRIO1” and ”PRIO2” as well as the LEDs ”PRIO1”, i.e. ”PRIO2” on the front of the store computer.
- The highest priority number in each group (9,19,29,...99) is reserved for low priority alarms which are only to generate local alarm messages (e.g. open coldroom door).
- All other priority numbers are designed for low priority alarms.
- The lowest priority number in each group (0,10,20,..90) is reserved for messages which are only recorded in the message list.
- If the priority is set to -- no message is generated.

This division into alarm groups (decades) facilitates a maintenance-group-oriented alarm management.

☞ The alarm priorities --, 0..2 correspond to the remote alarm messaging concept of older store computer versions with firmware versions <5.0. If priorities from 3..99 are configured in the controller then the store computer must be updated to a firmware version of 5.0 or higher. Further information is provided in the store computer operating manual.

The separate alarms (except refrigeration point priority and setpoint change) can also be set to ”--” so as to remove them entirely from the alarm system.

Individual priorities can be set after setting the *Refrigeration Point Priority* parameter to *NO*. When set to *YES*, alarm priorities are assigned at the refrigeration point priority according to the previous scheme. This simplifies configuration for standard applications.

Alarms are assigned as follows when applying global priority:

Global priority alarms	**Priority 0 alarms**
Low temperature	No defrost (UR 141 TE and UK 100 E only)
High temperature	Timer-terminated defrosting
Sensor break	Power failure
Coldroom door open (coldroom controllers only)	Manual shutdown
No defrost (all except UR 141 TE, UK 100 E)	Setpoint changed
First start	Refrigeration point disabled
EEPROM defective	Low battery power
RTC defective	Stall detect
Flash defective	Ermergency close
t_0 not received	Manual valve opening degree
EEV sensor break	External alarm (CO_2-Alarm)
Wrong controller type	
Hot gas with master/slave set Check opening degree	

Special condition: With controllers of type UR 141 TE and UK 100 E, the priority for *No Defrost* alarm is set to zero while the setting is equal to the global controller priority for all other controller types.

If an alarm of controller priority greater than 0 is active and this priority is set to 0 before the alarm is tagged as sent, the controller will be unable to reset the alarm on the Store Computer. It is therefore recommended to restart the controller after changing alarm priority to 0 or to make sure that alarms are not active at the time they are changed.

When using the case controller with Store Computers without extended assignment of priority, the priorities may only be assigned between 0 and 2 or as -- (see Store Computer User Guide for assigning priority). Alarm action of the Store Computer (especially with regard to assigning priorities to alarm destinations) is not defined if parameters are set incorrectly. This applies also to refrigeration point priority.

10.3 Termination of alarm

10.4 Alarm routes

When an alarm state is detected, it is transmitted by the case controller by the following routes:

- Controller alarm relay (terminals 15/16/18, zero-potential change-over contact)
- BT 300 local set-up unit connected to DISPLAYinterface
- via the CAN bus interface using a system centre / store computer / operator terminal in the E*LDS-System.

10.5 Termination of alarm

The conditions for terminating an alarm may be selected from either of two basic methods:

- Automatic reset of all alarms after the cause of fault is corrected
- Manual reset of all alarms after the cause of fault is corrected

The manual reset of the alarm / alarm state can be performed

- By switching off the controller, regardless of whether the alarm is still active,
- via a local BT 300 x Operator Interface connected to the display port,
- via the CAN bus interface using a system centre / store computer / operator terminal in the E*LDS-System.
- Via the manual shutdown (digital input 230 V AC). This can also be done while the alarm is still active.

10.6 Messages

States constituting abnormal working conditions but not an alarm state are reported via the interfaces and entered in the fault report list.

Examples of such messages:

- Power failure
- Setpoint change
- Manual shutdown
- Termination of defrosting by safe defrost time
- Failure of evaporating pressure measurement (detected and signalled by VS 3010 pack controller via CAN bus)
- Reporting of manual adjustment of valve opening degree (in Superuser mode only). If the user switches to manual definition of valve opening degree, control is interrupted and a warning message (Prio 0) is entered in the fault report list.

10.6.1 Transient alarms and messages

Transient alarms are alarms for one-time events and are not tagged with a send time stamp. As a result, transient alarms are not automatically cancelled after the alarm event and always need to be cancelled manually. This applies regardless of the setting made for *Selfhold* (Menu 6-2-3).

The following are transient alarms:

- Time termination of defrosting
- Setpoint change
- Power failure
- First start

10.7 Message log

A maximum of 25 alarms and messages with receive and send date and time are entered in the message log.

☞ The alarms and messages are stored in a ring buffer. When the ring buffer is full, the next new entry deletes the oldest entry.

Notice:

11 Specifications of UA 400 E / UA 410 E

11.1 Electrical data

Warning - hazardous electrical voltage!
Danger of electric shock!
Overvoltage category III (test voltage 4,0 kV) / pollution degree 2:
All device connections designed for use with 230 V AC supply voltage **must** be connected to the same phase conductor.

400 V AC between neighbouring connection terminals is **not** permitted!
Overvoltage category II (test voltage 2,5 kV) / pollution degree 2 or
Overvoltage category II (test voltage 2,5 kV) / pollution degree 1:
Different phase conductors may be used.
400 V AC between neighbouring connection terminals is permitted!

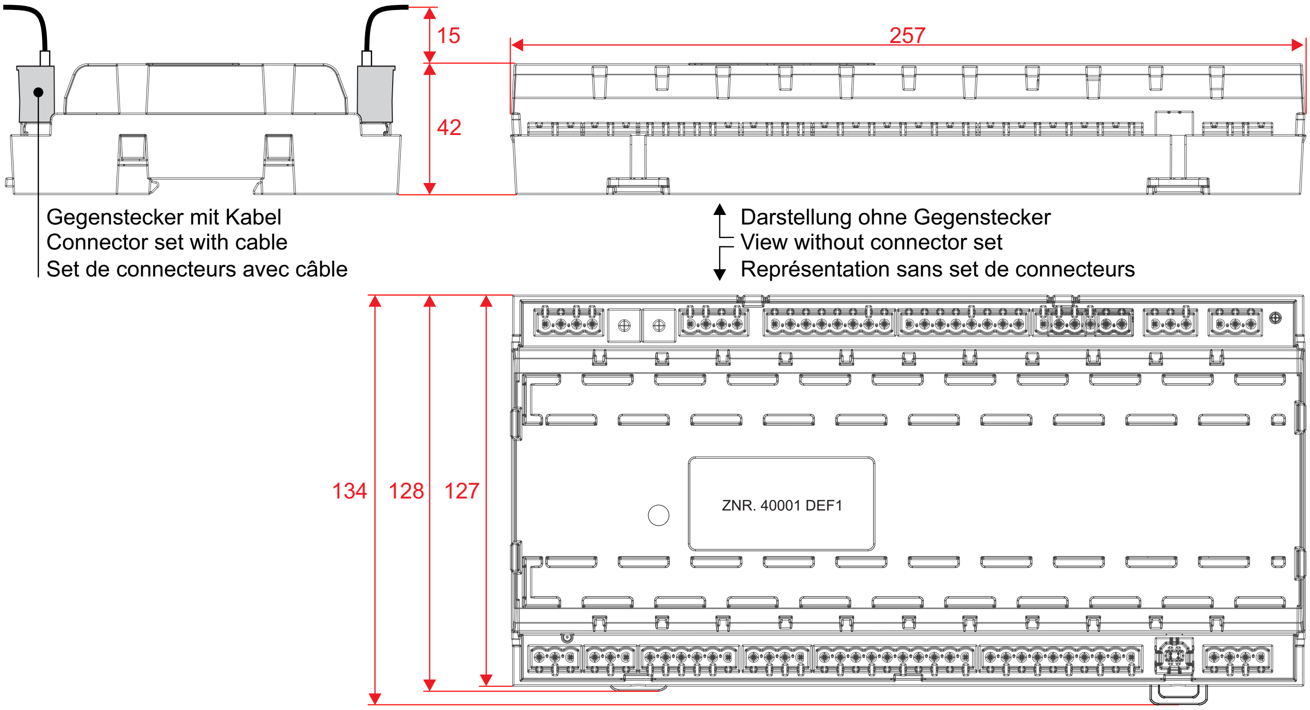
	UA 400 E CC / UA 410 E AC
Power supply	230 V AC (+/- 10%), 50/60 Hz (+/- 3 Hz)
Rated power	11 VA
Leakage current over PE	Max. 1 mA
Relay outputs	**Relay**: 4 (N.O.) x 230 V AC, floating, min 10 mA load type: ohmic max. 6 A inductively max. 3 A, $\cos \varphi = 0,4$ 1(O.C.) x 230 V AC, floating, min 10 mA load type: ohmic max. 6 A inductively max. 3 A, $\cos \varphi = 0,4$ **Semiconductor relay (SSR = Solid-State-Relay, N.O.)**: 2 x 230 V AC, 1 A, **every** SSR must be externally fused with a 1.25 A fast acting fuse (FF), nominal voltage 230 V AC, with a melting integral of << 10.4 A2s and a tripping time at 8.0 A < 10 ms (e.g., SIBA No. 70 001 40). **Note**: If large inductive loads (e.g. fan coils) are to be switched via the semi-conductor relay (relay 2/3) then protective devices appropriate to the loads must be connected (e.g. an RC element and a varistor) in order to prevent the destruction of the SSRs due to over-voltage. Information on suitable protective devices as well as measures for the minimisation of over-voltage can be obtained from the manufacturer.
Transistor outputs	2 x 24 V DC pulldown, Switching transistor with internal current limiting to 50 mA for lighting control
Digital inputs	4 x 230 V AC floating
Analogue inputs	10 temperature sensors, two-wire type for sensor types L243 / K243, K277, 5K3A1 (No shielding is required on sensor leads when installed exclusively inside the refrigerated display case and when external interference (for example from parallel power wires) is not to be expected) Only UA 410 E AC 2 x 4..20 mA *

	UA 400 E CC / UA 410 E AC
Analogue outputs*	Only UA 410 E AC 2 x 0..10 V short-circuit proof
Fieldbus port	CAN bus, floating
Data port	DISPLAY: BT 300x Operator terminal and up to 4 BT 30 Temperature displays
USB interface	1. For direct parameterisation of the case controller via LDSWin or 2. For carrying out a firmware update of the case controller or 3. The parameterisation of system components via CAN bus using LDSWin
Monitoring function	Watchdog
Realtime clock	Only UA 410 E AC Battery-backed, Lithium cell (type CR 2450N, 3V lithium, shelf life 10 years) Accuracy: typically 12 min/yr at 25 °C
Temperature range	Transport: -20 °C ... +80 °C / Operation: 0 °C ... +50 °C
Temperature change	Transport: max. 20 K/h / Operation: max. 10 K/h
Relative humidity (non-condensing)	Transport: 8 % ... 80 % / Operation: 20 % ... 80 %
Shock to DIN EN 60068-2-27	Transport and operation: 30 g
Vibration 10 - 150 Hz to DIN EN 60068-2-6	Transport and operation: 2 g
Atmospheric pressure	Transport: 660 hPa ... 1060 hPa / Operation: 860 hPa ... 1060 hPa
Weight	ca. 680 g
Enclosure	IP20
Standards	
Automatic action	Action type 1.K
CE conformity	2002/95/EG (RoHS) 2004/108/EG (EMC Directive) 2006/95/EG (Low Voltage Directive) (Software class A - EN 60730-1, appendix A)

11.2 Mechanical data

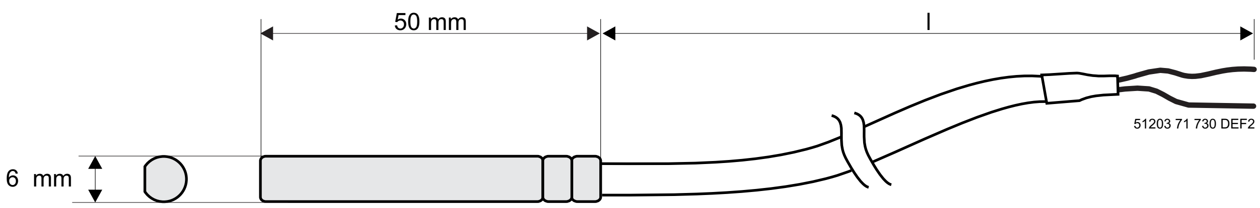
DIN rail mounting of UA 400 E CC / UA 410 E AC

C stands for *"In Cabinet"*, meaning DIN rail mounting.



All dimensions in mm

11.3 Mechanical data of the temperature sensor L243 / 5K3A1



All dimensions in mm.

Sensor type / lenght/ order number:

L243:	l = 3,0 m	(KGLZTEMP56)
	l = 5,8 m	(KGLZTEMP58)
5K3A1:	l = 8,5 m	(KGLZ5K3A1 / KGLZ5K3A1S)

For detailed information of the temperature sensors see data sheet “Temperature sensors”.

Notice:

12 Order numbers and accessories of UA 400 E / UA 410 E

12.1 Case Controller

Type	Description	Order number
UA 400 E CC	For 2 Electronic Expansion Valves, int. archive, for DIN rail mounting, with CAN bus	KGLUA4E012
UA 410 E AC	For 2 Electronic Expansion Valves, int. archive, for DIN rail mounting, with CAN bus, real time clock, internal archive, analog inputs and analog outputs	KGLUA4E016

12.2 Components

Component	Description	Order number
Temperature sensors (NTC)	L243 (Standard) 3,0 m 5,8 m 5K3A1 8,5 m L243 (K243) Block sensor (old design)	KGLZTEMP56 KGLZTEMP58 KGLZ5K3A1 KGLZL243
Pressure transmitter	Low pressure transmitter 0..10 bar 4..20 mA High pressure transmitter 1..26 bar 4..20 mA 1..61 bar 4..20 mA 1..161 bar 4..20 mA	KGLZDRUCK3 KGLZDRUCK4 KGLZDRUCK5 KGLZDRUCK6
Humidity and temperature sensor	Combined humidity sensor (4..20 mA) and temperature sensor (Pt1000 4-wire) for wall mounting	KGLZPTHYGR
BT 300 x Operator Interface and Temperature display	BT 300 M Operator Interface handheld operating terminal for customer service with 2,8 m connecting cable BT 300 S Operator Interface for panel mounting BT 300 C For cabinets and serve over counters	LIBDTUA052 LIBT300S51 LIBDTUA051
BT 30 Temperature display	Temperature display with 7 m connecting cable (RJ45) RJ45 splitter for the connection of up to four BT 30 on an case controller	BT30LC0002 KGLVERT001
USB-A-B cable	USB-A-B cable with ferrite core 1. For direct parameterisation of the case contr. via LDSWin or 2. For carrying out a firmware update of the case controller or 3. The parameterisation of system components via CAN bus using LDSWin	PCZKABUSB1
Connector set	Connector set for UA 400 E CC UA 410 E AC	STVSETUAB1 STVSETUAB2

Notice: