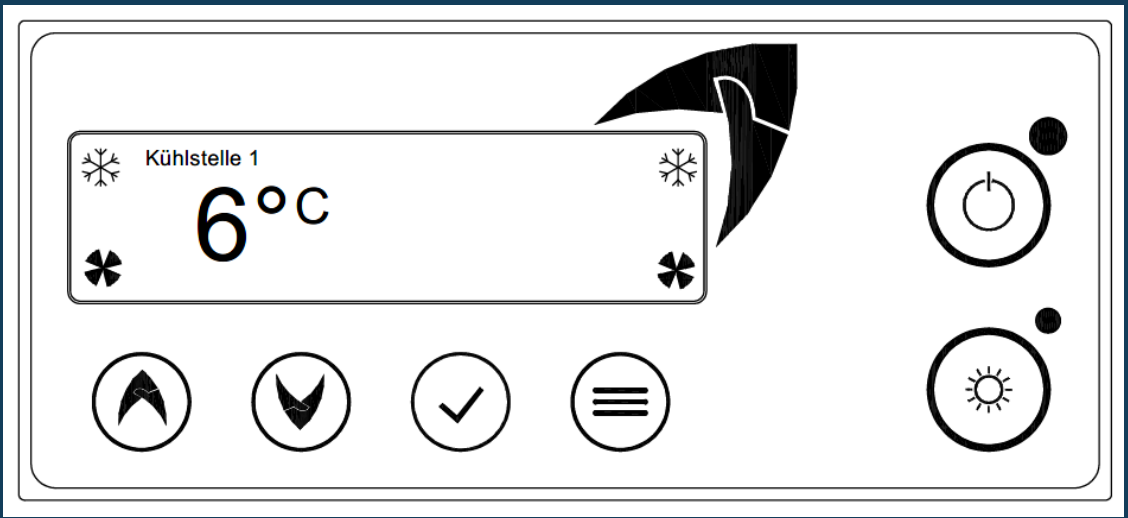
V1.1/2023/03

Translation of the Original

Programming manual

For

IDEAL temperature control circuit board EKP, GN and AK



Notes on this document

Follow these instructions for proper and safe use.
Keep for future reference.

Translation of the original Operating instructions

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We reserve the right to make changes in the sense of technical improvements.

This documentation is the translation of the original documentation.

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1. General Information

These programming manual describs the installation, operation and maintenance of the unit, are part of the scope of delivery and only apply to the unit types listed.

Knowledge of all the safety information and instructions contained in this manual is a precondition for safe and proper operation of the unit.

Observe the local accident prevention regulations and general safety regulations applicable to the area of use of the unit.

The programming manual is an integral part of the product and must be kept in the immediate vicinity of the unit so that they are accessible at all times to the installation, operating and maintenance personnel.

The unit is built according to the currently valid rules of technology. However, hazards may arise from this appliance if it is used improperly or not as intended.

Knowledge of the contents of the programming manual is one of the preconditions for protecting you against hazards and avoiding errors, and thus for operating the unit safely and without malfunctions. To avoid hazards and to ensure optimum performance, no modifications or conversions may be made to the unit that have not been explicitly approved by the manufacturer. The unit may only be operated in a technically perfect and operationally safe condition.

1.1. Scope of application

This programming manual applies to the following models:

IDEAL Steuerung Platine EKP, GN und AK

1.2. Warranty and liability

Our general terms and conditions of payment and delivery apply, which you can find in our general terms and conditions at www.ideal-ake.at.

Warranty and liability claims are void due to:

- Improper use of the appliance.
- Non-conforming installation, commissioning, operation and maintenance of the unit.
- Operating the appliance with defective safety components or safety components that have not been properly installed and are not operational.
- Failure to comply with the information in the operating instructions regarding installation, commissioning, maintenance, assembly and transport of the unit.
- Unauthorised mechanical or technical modifications to the unit.
- Inadequate maintenance and cleaning of the working and wearing parts.
- Unauthorised repairs.
- Acts of nature or force majeure.

1.3. Symbols and signal words used

Symbols used in the operating instructions:

In this programming manual, the following names and symbols for dangerous situations are used in accordance with the harmonisation of ISO 3864-2 and ANSI Z535.6.

Table 1 : Symbols used programming manual

	Danger indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	Warning indicates a hazardous situation which, if not avoided, may result in death or serious injury.
	Caution indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.
NOTICE	Signal word to indicate a situation that could cause damage to property.
	Recommendation to ensure efficient and trouble-free condition of the unit.
	Warning of electric voltage
	Warning of flammable substance Propane R290
	Follow instructions
	Skilled person required
	Do not dispose of the appliance with household waste in accordance with the applicable regulations 2012/19/EU WEEE.

Symbols used on the device:

Table 2: Symbols used on the device

	Warning of electrical hazards.	On the unit next to the danger zone.
	Obligation to read the operating instructions.	On the display of the control unit and on the slip-in pocket for the operating manual
	Protective grounding	Next to protective earth connection.
	Correct disposal of the appliance.	Do not dispose of the appliance with household waste in accordance with the applicable regulations 2012/19/EU WEEE.

1.4. Target group and previous knowledge

These programming instructions are addressed to service technicians in the field of cooling units as well as to installation and maintenance personnel.
The unit may only be operated by trained personnel to be determined by the operator.

- It is essential that you observe the trade and safety regulations applicable on site.
- Reading and understanding this documentation is a precondition.
- Only skilled personnel authorised by the manufacturer may carry out maintenance and repair work.
- Only instructed personnel may operate and clean the unit.

2. Safety

2.1. General safety instructions

This section provides an overview of all important safety aspects.
In the individual chapters, specific safety instructions for avoiding dangers are given and marked with symbols.
The pictograms, signs and labels on the unit must be followed and kept in a readable condition at all times.
Following all safety instructions provides optimum protection against hazards and ensures safe and trouble-free operation of the unit.

In general, the following safety regulations apply when handling the unit:

- In the case of faults in the electrical power supply, the unit must be switched off immediately.
- Parts of the system on which maintenance and repair work is being carried out must be disconnected from the power supply and secured against reconnection. Insulate adjacent live parts.
- Covers with warning notices may only be opened by skilled personnel.
- Do not remove protective covers and devices, otherwise there is a risk of injury.
- The control unit housing may only be opened by skilled personnel.
- Components may only be replaced by original parts.

WARNING

Danger due to electrical voltage on live parts.

The unit must be disconnected from the power supply until maintenance, inspection and repair have been completed. Unintentional reconnection must be prevented.

NOTICE

Technical changes and adjustments to the level service may only be carried out by qualified personnel.

2.2. Residual hazards

Even with maximum care in the design and construction of the equipment and with consideration of all safety-relevant facts, residual hazards may exist which are evaluated by applying a risk assessment.

WARNING

Danger of crushing and falling objects when handling/adjusting/positioning heavy individual components.

When handling heavy objects, be aware of possible crushing hazards, also for third parties. If possible, use both hands when handling heavy objects. If necessary, enlist the help of another person. Wear protective gloves and safety shoes when handling/adjusting/positioning heavy individual components.

WARNING

Danger due to leaking refrigerant from a damaged evaporator.

Do not use sharp objects to clean the evaporator fins. The evaporator fins may only be cleaned with products specified by the manufacturer.

WARNING

Electrical hazard.

Make sure that the mains connection cable of the units is not damaged. If it is damaged, it must be replaced by the distributor or its customer service in order to avoid hazards.

WARNING

Risk of ignition due to sparks generated by electricity or friction and hot surfaces.

With refrigerant propane R290, explosive gas-air mixtures can arise as a result of possible leaks in the cooling system. Accidental ignition is possible due to the spark of a vacuum cleaner or other electrical appliance. No hot surfaces may be present or generated. Only use equipment that complies with the valid ATEX directive for cleaning, maintenance and servicing activities!

CAUTION

Risk of slipping due to condensation water escaping at leakages.

Pay attention to possible slipping hazards in the area of the unit due to leaking liquids. During installation, make sure that the siphon is fitted properly and is tight.

CAUTION

Risk of impact on the units during assembly, cleaning and maintenance activities.

Watch out for possible shock hazards on the unit.

3. Technical data

Information on the type plate:

Table 3: Information on the type plate

Details	Information
Serial No..	Serial number of the unit
220-240V AC~50Hz	Rated voltage at specified mains frequency
Max. connected load	Max. connected load in watts
Cooling capacity	
Refrigerant	Refrigerant for cooling
CO2e/GWP	Global warming potential
Climate class	Climate class Climate class according to DIN EN ISO 23953
	Back-up fuse
Protection class I	I / protective grounding
Protection class	IP protection class according to EN 60529
CE	conformity mark
	Electrical or electronic equipment that must be disposed of separately in accordance with Directive 2012/19/EU WEEE.

3.1. Datasheet

Supply voltage:	AC 100-240 V / 50-60 Hz (max. 13A at 50°C)
max. power consumption:	max. 13 A / 2990 W
ext. Fuse protection:	with automatic circuit breaker max. 13 A
Protection class (display front):	IP67
Protection class:	I / protective earthing
Power consumption:	see type plate
Ambient temperature:	+5 to +50°C
Storage temperature:	-25 to +70°C
Ambient relative humidity:	30 to 90%
Display resolution:	256x64 pixels 16 greyscales
Panel cut-out:	71x29mm

3.2. Intended use

The temperature regulator has been developed for controlling and monitoring up to 3 cooling points or heating units. In addition, it is possible to target the humidity at a cooling point.

It is also possible to measure the temperature of goods (HACCP).

The control has two user levels:

User and Service

The circuit board with complete HIGHEND EKMA equipment is described below.

The available functions depend on the features of the curcuit board..

3.3. Foreseeable misuse

- Alteration, modification or improper repair.
- Operation of equipment that performs a safety function of a machine, system or device.
- Use of a faulty control system.

NOTICE

Technical modifications and adjustments to the level service may only be carried out by Qualified Technicians. Any modification must be authorised by the manufacturer.

3.4. Key assignment and display

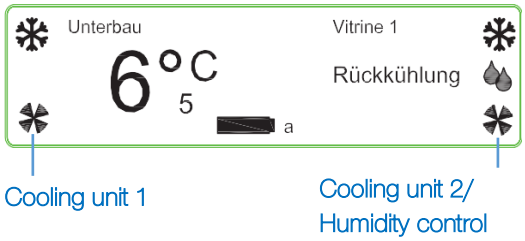
Table 4: Key assignment

Key	Designation	Function
1	UP	Increase value Select menu item or open a roller blind
2	DOWN	Reduce value, Select menu item or close roller blind
3	OK	Save settings/changes; acknowledge alarm; **setpoint adjustment**: press 2 seconds
4	MENU/EXIT	Unit settings; close menu item
5	LIGHT	Light on (LED lights up);light off, **hold for 4seconds** for dimming (available depending on model))
6	ON/OFF/STANDBY	ON -LED lights green; OFF -LED lights up red **Standby:** press button for 4 seconds

Figure 1: Satellite display

Table 5: Display symbols

Symbol	Display	Meaning
6°C	Large display	Current temperature value
5	Small display	Core temperature of the product
°C	degrees Celsius	°F, adjustable by Service
❄ / ♨	Permanent light	Cooling/heating running
❄ / ♨	Flashing	Cooling/heating demand, countdown of switch-on delay
✻		Evaporator fan running
💧	Permanent lights	Defrosting in progress
💧	Flashing	Delayed switch-on countdown
💾	Display in case of change	Saving takes place after exiting the menu
▬		USB-stick detected
a		Indication of executed alarm message



3.5. Inputs/outputs/interfaces

Inputs:

- 2 x digital input from external, potential-free switch (X104, X801)
- Voltage of external switch: X104: 250 V; X801: min. 32 V
- Signal OFF [0]: external switch open
- Signal ON [1]: external switch closed
- Input current: max. 4mA
- 1 x digital input potential-free for external 230 V (X105)
- Functional range: 90 V to 250 V AC/DC
- Signal OFF [0]: 0 V to 50 V
- Signal ON [1]: 80 V to 250 V
- Input current: max. 1.5mA
- 7 x temperature input
- Sensor type: PT1000, PTC, NTC [2K].
- - Measuring range: -50°C to 150°C
- Resolution: 0.1°C
- Accuracy: +/- 0.2°C + sensor tolerance
- Repeatability: 0.1°C
- 1 x current measuring input
- Sensor type: e.g. external humidity sensor
- Measuring range: 4mA to 20mA (X608)
- Resolution: 20µA
- Accuracy: +/- 200µA (+ sensor tolerance)
- Repeatability: 100µA

Outputs:

- 1 x relay max. 1 A (max. 250W/230V) (X201)
- 1 x relay max. 6.5 A (max. starting current 25A/230V) (X202(L'R1))
- 1 x relay max. 8.5 A (max. 2500W/230V) (X303)
- 4 x relay max. 6 A (max. 1300W/230V) ((X202(L'R2), X304, X305, X306)
- 2 x relays max. 6 A (max. starting current 17A/230V) (X307, X308)
- 1 x relay max. 5 A (max. 1100W/230V) potential-free (X302)
- 2 x relays max. 4A (max. 900W/230V) (X301)
- 4 x voltage output adjustable, each plug max. 2 A/24VDC (X503)
- 1 x output DC for extension module (X402)
- 2 x output 24 V adjustable with PWM for fan/humidifier, total max. 2.5A/24V (X501, X502) 4 x output 24 V adjustable with PWM for LED, total max. 6A/24V (X504)

Interface:

- 4 x RJ45 interface (e.g. for control panel)
- Cable: CAT6
- 1 x interface for USB, type A
- 1 x interface RS485
- Terminating resistor: integrated, 120 Ohm

Additional:

- 2 x data memory on EEPROM for configuration and data logger
- 1 x real time clock

The specifications may differ from the listed values depending on the model.

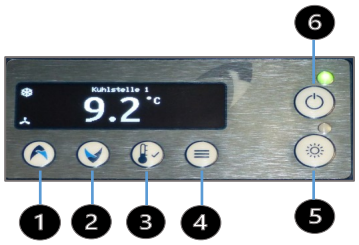
3.6. HACCP

If a USB stick is connected to the USB interface, the temperature controller records data relevant to HACCP monitoring at regular intervals of 30 minutes and saves it in a CSV file; the HACCP_EEPROM.csv file is generated automatically.

For each cooling point, the determined cold room temperature and, if applicable, humidity are stored together with the time of measurement.

Use a USB extension cable to be able to plug in the USB stick outside the electrical connection box.

4. Settings



1. Press the On/Off switch to switch on the cooling unit.

Set the temperature setpoint:

1. Press and hold button 3 for 2 seconds, cooling unit 1 will flash.
2. Increase the temperature with button 1, decrease the temperature with button 2.
3. Confirm the changes with button 3.
4. If available, cooling point 2 starts flashing.

Stand-By-Betrieb (STB):

1. Press and hold the ON/OFF button for approx. 3 seconds to switch the unit to standby mode.
2. If there are several active cooling points, a selection appears above buttons 1 to 4:
    a. Button 1 deactivates cooling point 1, Button 2 cooling point 2, Button 3 cooling point 3 and Button 4 all cooling points.
3. To switch on again, proceed in the same way.

Light (not available in all units):

1. Press button 5 to switch the light on/off.
2. If the built-in lamps are dimmable, the brightness can be changed continuously up to the set maximum/minimum value by pressing button 5 for a prolonged period.
3. When the button is pressed a further time, the brightness is dimmed in the opposite direction.
4. After releasing the button, the set brightness value remains saved.

Night blind (not available in all units):

1. Press button 1 to raise the blind.
2. Press button 2 to lower the blind.
3. Press the respective button until the blind has reached the desired position.

4.1. Unit settings

Two user levels are available:

- User
- Service – password entry required

Press key 4 to access the menu items:

- Setpoint
- Actual value
- Alarm
- Error messages
- Maturing process
- Date/time
- Light
- Night blind
- Defrost
- Operating hours counter
- Service indicator
- Condenser cleaning
- Settings
- Versions

1. Press the MENU button to enter the submenu:
2. Press the UP or DOWN button to select the corresponding menu item.
3. Press the OK button to open the desired menu item.
   a. The value highlighted in white can be changed by pressing the UP/DOWN button or
4. another submenu is displayed.
5. Press the OK button to confirm the entry.

Pressing the MENU button closes the menu item; the change is only saved if the OK button is pressed beforehand and the settings menu is closed completely by pressing the MENU button several times. After 30 minutes without input, the display returns to normal operating mode.

Setpoint

Setpoint/Temperature/Control setpoint for cooling point:

- Temperature value for the individual cooling points can be set.
- Service level: the adjustable value range can be narrowed down in the menu under *Settings*.

Setpoint/Humidity:

- For units with implemented humidity control, the desired humidity of cooling point 1 can be set.
- Service level: the adjustable value range can be narrowed down in the menu under *Settings*.

Actual value

- The current values of the activated sensors are displayed.

4.2. Alarms

Alarms are indications of irregularities.

If they occur repeatedly, they may indicate a technical defect.

If the preset temperature/humidity limits are exceeded or not reached, an alarm is shown in the display alternating with the normal operating display:

Table 6: Alarms

Alarm	Display	Solution
Alarm/current alarm	Type of alarm, date, time	Acknowledge and confirm with button 3.
Last alarms/number	Number 1 to 9	Last alarms can be accessed by number selection.

Is the reason for the alarm no longer present, the message disappears and "a" is displayed at the bottom as an indication of unacknowledged but completed alarms.

4.3. Error messages

Error messages are shown in the display alternately with the normal operating display in the event of errors / defects / faults detected by the control unit. An error message can only be resolved in the "Service" level..

Error messages/current error message:

- The type of error as well as the time and date are displayed.
- Service level: acknowledge the error by selecting Acknowledge and confirm with button 3.

Error messages/last error messages: ***Number***

- The last 9 errors can be called up, where 1 stands for the current error and 9 for the eldest..

NOTICE

In case of error messages, contact a cooling technician.

Failure to observe error messages or frequently occurring alarm messages may result in loss of goods.

4.4. Maturing process

Settings:

Maturing process/status	Display operating status
Start	Starts the maturing process
Stop	ends the maturing process
Pause	starts/ends an interruption of the maturing process
Settings	Menu Set maturing process

Symbol	Display
	Maturing process in progress
	Dehumidification mode
	Humidification mode

- Temperature and humidity values are displayed.

Set menu maturing process:

Step:	0-19; up to 19 different ripening steps can be entered.
Activated:	yes/no; determines whether the ripening step is active
Set temperature:	selected room temperature for the selected ripening step in °C
Set humidity:	selected humidity for the selected ripening step in %RH
Duration:	desired duration of a ripening step in min, after the time has elapsed the next step is carried out;
Exception last step:	selected setting is retained.
Fan:	0-24V; setting of the fan intensity for the selected ripening step..

The settings for the maturing process should be made by qualified personnel. Note the required equipment.

4.5. Date / Time

Adjustable: *Day* *Hour*
Month *Minute*
Year *Weekday*

4.6. Light *(if activ)*

Light/time ON:

- If automatic ON is activated, the switch-on time (hours/minutes) for the lighting can be set..
- Automatic lighting weekend can be activated.

Light/time OFF:

- If automatic OFF is activated, the switch-off time (hours/minutes) for the lighting can be set.
- Automatic lighting weekend can be deactivated.

Set the date and time for this function beforehand.

4.7. Night blind

4.7.1. Night blind/time HIGH:

- If automatic HIGH is activated, the opening time (hours/minutes) for the night blind can be set.
- The opening times for weekends can be selected..

4.7.2. Night blind/time DOWN

- If automatic DOWN is activated, the closing time (hours/minutes) for the night blind can be set.
- The closing times for weekends can be selected.

The function of the UP/DOWN buttons is not affected by these settings.

4.8. Defrost

Defrosting is carried out fully automatically by the electronic thermostat.

The duration of a defrosting phase can be limited.

NOTE

Changes to the defrosting time may only be carried out by a qualified technician .

4th8th1st Start defrost/manual defrost KS x:

With confirmation by button 3, defrosting at the selected cooling point is initiated prematurely.

Service level:

Start test defrost KS x:

- Press button 6 for 5 seconds.
- In addition to button 6, press button 3 to initiate a defrost with evaporator end temperature 35°C at the selected cooling point.
- To test the function of the defrost heater.

4.9. Next defrost KS x in: x min

Time remaining until the next regular defrost.

If the evaporator is heavily iced up despite automatic defrosting, manual defrosting must be initiated.

Alternatively, the unit can be switched off completely for defrosting until the evaporator is completely defrosted.

Please note that during this time the cooling of the goods is not guaranteed and sensitive goods may spoil. Store them in another cooled place until this time.

To defrost, remove all goods from the interior and switch the appliance off overnight.

4.10. Operating hours counter

Here you can check how long the individual main components have been in operation since initial commissioning (or since the last reset by the service technician).

4.11. Service display

Here you can read how much time has passed since the last service:

last service before: *x h*

NOTICE

Make sure that service work is carried out regularly and by a qualified technician.

Service level:

Reset time Confirmation with button 3 resets the value to 0

4.12. Condenser cleaning

The time period for condenser cleaning can be activated and set here.

Service level:

Activated: yes/no

Cleaning after: x days

When the set time is reached, an alarm message appears in the display (can be acknowledged by the user).

The condenser must be cleaned regularly on plug-in units; heavy soiling shortens the service life of the cooling unit..

4.13. Settings

Service level only:

Settings/User level/Current: User (default).
Service (password required)

To be able to enter the code to access the user level Service, select:

Settings/User level/Code: 0 (User)
15 (Service))

4.14. Version

Display of the software version.

The software version is composed of the values Major and Minor,1.21. The values of the decimal switches indicate the selected basic setting.

Major: Value

Minor: Value

Decimal switch 1: Value

Decimal switch 2: Value

Service level:

Service level:

- Start Update
- To perform an update, the file boot.bin must be loaded onto a USB stick. File will be provided on request).
- Plug in the USB stick with the control activated.
- The following symbol appears at the bottom of the display
- Select Menu/Version/Start Update and confirm with button 3.
- The update is carried out and the control unit restarts after completion.
- Check the settings - if necessary, upload the desired configuration.
- If the settings are not/not correctly displayed after the update, set the decimal switch in the connection box to "0 0".“

4.15. Overview of service level settings:

- Sensor configuration
- Frame heating
- Tub heating
- Light
- Night blind
- Door contact
- Defrosting cooling point1-3
- Compressor 1-2
- Evaporator fan cooling point 1-3
- Alarm messages
- Emergency operation of cooling point 1-3
- Error messages
- Language
- USB
- User level

4.16. Sensor configuration

4.16.1. Room sensor / return air sensor

The sensor is located on the side of the evaporator where the warm room air is sucked in by the evaporator.

Activated:	yes/no
Actual value:	display of the value currently measured at the sensor
Type:	PT1000/NTC/PTC
Setpoint:	in °C/°F (depending on basic setting)
Start protection:	in seconds (time between switching off the compressor and switching it on again)
Hysteresis:	in K (temperature interval between switching on and switching off the compressor)
Lower limit:	in °C/°F (minimum value for temperature setting)
Upper limit:	in °C/°F (maximum value for temperature setting)
Sensor correction:	in K (corrects the measured temperature by the set value)
Mode:	cool / cool or heat / heat
Heating switch-on point:	in K (< switch-off point, only for cool and heat modes)
Heating switch-off point:	in K (> switch-on point, only for cooling and heating mode)

4.16.2. Room sensor / supply air sensor

The sensor is located on the side of the evaporator where the cold air is blown from the evaporator into the cold room.

Activated:	yes/no
Actual value:	display of the value currently measured at the sensor
Type:	PT1000/NTC/PTC
Weighting 2 –> 1	in % (sensor's share of the calculated mean value from the temperatures at sensors 1 and 2)
Sensor correction:	in K

4.16.3. Evaporator sensor

The sensor is located in the evaporator and is required for controlled defrosting.

Activated:	yes/no
Actual value:	Display of the current value measured at the sensor.
Type:	PT1000/NTC/PTC
End of defrost:	in °C/°F (at this temperature measured in the evaporator, defrosting is ended)
Sensor correction:	in K

NOTICE

Centrally cooled units must be calibrated by a qualified technician before initial operation by calibration of the sensors.

4.17. Temperature changeover

The temperature can be changed - e.g. for day - night operation.

Activated:	yes after input day/night (X104, external control, - no door contact switch possible)
	yes after input pot-free (X105, change-over switch)
	yes according to time
	no
Setpoint:	in °C/°F (depending on basic setting), temperature value 2
also at weekends:	yes/no

If "according to time" is selected:

Time ON:	in hours/minutes (start of temperature change)
Time OFF:	in hours/minutes (end of temperature changeover)

4.18. Cooling point 2

The room sensor/return air sensor- is located on the side of the evaporator where the warm room air is sucked in by the evaporator.

Activated:	yes/no
Actual value:	display of the value currently measured at the sensor
Type:	PT1000/NTC/PTC
Setpoint:	in °C/°F (depending on basic setting)
Hysteresis:	in K (temperature gap between switch-on and switch-off time of the compressor on)
Start protection:	in seconds (time between switching off the compressor and switching it on again)
Lower limit:	in °C/°F (minimum value for temperature setting)
Upper limit:	in °C/°F (maximum value for temperature setting)
Sensor correction:	in K (corrects the measured temperature by the set value)
Mode:	solenoid valve / compressor
Output:	230 V / 24 V
Name:	the name of the cooling point can be selected from a list.

4.19. Cooling point 2; evaporator sensor

The sensor is located in the evaporator and is required for controlled defrosting.

Activated:	yes/no
Actual value:	Display of the value currently measured at the sensor.
Type:	PT1000/NTC/PTC
End of defrost:	in °C/°F (at this temperature measured in the evaporator, defrosting is ended)
Sensor correction:	in K
Core temperature measurement:	(optional)

The core temperature measurement for cooling point 1 and 2 can be activated. (Additional sensors required) By activating the core temperature measurement, the operation of a 3rd cooling point is no longer possible.

Cooling point 1:	yes/no
Type:	PT1000/NTC/PTC
Cooling point 2:	yes/no
Type:	PT1000/NTC/PTC

4.20. Cooling point 3; winter circuit.

Room sensor/return air sensor: located on the side of the evaporator where the warm room air is drawn in by the evaporator.
Winter circuit: the sensor is located on the unit capsule.

Activated:	yes/cooling point3 / no/winter circuit (a winter circuit can be activated here)
Actual value:	display of the value currently measured at the sensor
Type:	PT1000/NTC/PTC
Setpoint:	in °C/°F (depending on basic setting)
Hysteresis:	in K (temperature interval between switch-on and switch-off of the compressor)
Start protection:	in seconds (time between switching off the compressor and switching it on again)
Lower limit:	in °C/°F (minimum value for temperature setting)
Upper limit:	in °C/°F (maximum value for temperature setting)
Sensor correction:	in K (corrects the measured temperature by the set value)
Name:	the name of the cooling point can be selected from a list.

4.21. Cooling point 3; evaporator sensor

The sensor is located in the evaporator and is required for controlled defrosting.
Winter circuit: the sensor is located at the condenser fan

Activated:	yes/no
Actual value:	display of the value currently measured at the sensor
Type:	PT1000/NTC/PTC
Defrost end:	in °C/°F (at this temperature measured in the evaporator, defrosting is ended)
Sensor correction:	in K
Condenser fan on:	in °C/°F (temperature measured at the sensor of the winter circuit at which the condenser fan switches on)
Condenser fan off:	in °C/°F (temperature measured at the sensor of the winter circuit at which the condenser fan switches off)

4.22. 4-20mA Sensor

Measures the values of a corresponding sensor (pressure transmitter, humidity sensor) or used for reading or recording.

Activated:	yes/no
Actual value:	Display of the value currently measured at the sensor.
Switch-on point:	-9999 ... 9999
Switch-off poin:	-9999 ... 9999
Upper limit value:	-9999 ... 9999
Lower limit value:	-9999 ... 9999

4.23. Humidity sensor

Measures the current humidity in the room in %rH.

Activated:	yes/no
Actual value unaveraged:	Display of the current value measured at the sensor.
Actual value averaged:	Display of the average value over a defined period of time
Average duration:	in minutes (depending on basic setting)
Setpoint:	in %rH
Lower limit:	in %rH (minimum value for humidity setting)
Upper limit value:	in %rH (maximum value for humidity setting)
Humidification switch-on point:	in %rH (Δ to setpoint, < setpoint)
Humidification switch-off point:	in %rH (Δ to setpoint, > switch-on point)
Dehumidification Switch-on point:	in %rH (Δ to setpoint, > setpoint)
Dehumidification switch-off point:	in %rH (Δ to setpoint, < switch-on point)
Sensor correction:	in %rH

Note: For dehumidification, a heater must be connected to X308, for humidification a fogger to X501.

4.24. Frame heating

A frame heater can be activated and the heating behaviour controlled.

Activated:	yes/no
Mode:	according to set values / according to climate class 5
	according to climate class 4 / according to climate class 3
Pulsing ON:	in minutes (time the RH runs)
Pulsation OFF:	in minutes (time the RH is off)

If "according to climate class" is selected, the preset times for this climate class are used..

4.25. Trough heating

A trough heater for condensation tray / drains can be activated and the heating behaviour can be controlled.

Activated:	yes/no
post-run tray heating:	in seconds (post-run heating time after the end of defrosting so that dripping water can drain off)
Cooling point:	Number of the cooling point

4.26. Light

The lighting can be activated and various parameters can be set.

Activated:	yes/no
Intensity current:	in % of the maximum luminosity (dimmable lamps)
Minimum intensity:	in %.
Strength maximum:	in %

4.27. Night blind

An electric night blind can be activated.

Activated:	yes/no

4.28. Door contact

A door contact can be activated and the alarm behaviour can be set.

Activated:	yes, with light (evaporator fan and interior light)
	yes, without light (only evaporator fan)
	no
Cooling point:	Number of the cooling point
Alarm after:	in minutes (delay before alarm is displayed)

4.29. Defrosting of cooling point 1

Defrost behaviour settings for cooling point 1

Enabled:	yes/no
Defrost type*:	Electric / Air / Hot gas
Interval:	in minutes (period between 2 defrosts)
Duration:	in minutes (maximum duration)
Drip time:	in minutes (time between end of defrost and restart of cooling)
Re-cooling delay type:	temperature/time
Temperature:	in K (temperature difference to the control setpoint before the fans start)
Time:	in minutes (waiting time after defrost until the fans start)
Eco mode active:	yes/no (sensor-controlled extension of defrost intervals)

4.30. Defrosting of cooling point 2 (only if KS 2 is active)

Defrost behaviour settings for cooling point 1

Activated:	yes/no
Defrost type*:	Electric / Air / Hot gas
Interval:	in minutes (period between 2 defrosts)
Duration:	in minutes (maximum duration)
Drip time:	in minutes (time between end of defrost and restart of cooling)
Re-cooling delay type:	temperature/time
Temperature:	in K (temperature difference to the control setpoint before the fans start)
Time:	in minutes (waiting time after defrost until the fans start)
Eco mode active:	yes/no (sensor-controlled extension of defrost intervals)
Defrost error:	yes/no (after 3 incorrect defrosts in a row)

4.31. Defrosting of cooling point 3 (only if KS 3 is active)

Settings for defrosting of cooling point 3 (air defrosting)

Activated:	yes/no
Interval:	in minutes (period between 2 defrosts)
Duration:	in minutes (maximum duration)
Defrost error:	yes/no (after 3 incorrect defrosts in a row an alarm message is displayed)

Notes:

For electric defrost, the evaporator fan runs for 3 minutes before the heating element is switched on.

With hot gas defrosting, no dripping time is possible; after re-cooling, "forced cooling" is initiated for at least 30 seconds.

With recirculating defrost, no heater/solenoid valve should be connected to X303 (KS 2: X301), as the relay always picks up.

4.32. Compressor

Settings for the cooling unit of cooling point 1

Activated:	yes / no(=centrally cooled)
Minimum running time:	in seconds
Minimum run-down time:	in seconds (period between 2 switch-on processes)
Condenser fan run-on:	in seconds (time the fan runs after the unit is switched off; overheating protection)
Winter circuit:	yes/no (yes = KS 3 must be set to WS)
Winter circuit temperature:	in °C/°F (switch-on temperature of WS)
Low pressure switch present:	yes/no (only for pump-down circuit)

4.33. Compressor 2

Settings for the cooling aggregate of cooling point 2

Activated:	yes / no(=centrally cooled)
Minimum running time:	in seconds
Minimum off time:	in seconds (period between 2 switch-on processes))

4.34. Evaporator fans, cooling point 1

Settings for the evaporator fans

Activated:	yes/no
Output:	24V DC/ 230 V AC(power supply of the fans- only 2 cooling points can be operated at the same time with the same fan voltage; the setting of cooling point 1 overrides that of cooling point 3)
Modulating mode:	continuous operation/pulsing/compressor Continuous operation = always on Pulsing = on/off in defined periods (see below) Compressor = on when compressor on
Speed setpoint:	0-24V (24 V fans only)
Start boost duration:	in seconds (time the fan runs at higher speed at start-up, 24 V fan only)
Start boost intensity:	0-24V (24 V fans only)
Defrost intensity:	0-24V (fan voltage/speed during defrost, 24 V fans only)
Dehumidification intensity:	0-24V (fan voltage/speed during dehumidification, 24 V fans only)
Pulsing ON:	in seconds (only if control mode = pulsing)
Pulsation OFF:	in seconds (only if control mode = pulsation) Minimum current consumption: in mA (serves to monitor the fan function/defects, value is calculated from number of fans, max. current consumption and lowest intensity in V)
Current consumption actual:	in mA (display of current consumption value) Defrost water disposal

4.35. Evaporator fans, cooling points 2 and 3

Activated:	yes/no
Output:	24V DC */ 230 V AC (power supply of the fans) (* 24 V only possible if 230 V is selected for cooling point 1 or 3, and vice versa)
Control mode:	Continuous operation/pulsing/compressor Continuous operation = always on Pulsing = on/off in defined periods (see below) Compressor = on when compressor on
Speed setpoint:	in % of maximum fan speed (24 V fans only)
Start boost duration:	in seconds (time the fan runs at higher speed at start-up, 24 V fans only)
Start boost intensity:	in % of the maximum fan speed (24 V fans only)
Defrost intensity:	in % of maximum speed (fan speed during defrost, 24 V fans only)
Pulsing ON:	in seconds (only if control mode = pulsing)
Pulsation OFF:	in seconds (only if control mode = pulsation)

4.36. Alarm messages

Alarms can be activated and alarm limits can be controlled.

Activate temperature alarm:	yes/no
Activate humidity alarm:	yes/no
Upper limit temperature:	in K (relative to setpoint)
Lower limit temperature:	in K (relative to setpoint)
Upper limit humidity:	in %rH (relative to setpoint)
Lower limit humidity:	in %rH (relative to setpoint)
Alarm delay temperature:	in minutes (for this time alarm messages are suppressed after the alarm reason has occurred)
Alarm delay restart:	in minutes (for this time alarm messages are suppressed after the cooling has been switched on)

4.37. Emergency operation cooling point 1-3

The parameters for emergency operation can be set here.

This can be activated, for example, in the event of a defect in the coldroom sensor, in order to ensure emergency cooling of the goods until the fault is rectified.

activated:	yes/no
Emergency operation mode:	time / evaporator temperature

If "Time" is selected, the time during which cooling is activated can be set:

Emergency operation mode time cooling ON:	in minutes
Emergency operation mode time cooling OFF:	in minutes

If "Evaporator temperature" is selected, the temperature measured at the evaporator sensor is set as the switch-on value for cooling (if the sensor is defective or missing, "Time" is automatically activated):

Emergency operation Setpoint:	in °C
Emergency operation Hysteresis:	in K (relative to setpoint)

In emergency mode, correct cooling of the goods is not guaranteed, sensitive goods may spoil. Store them in another cooled place until the fault has been corrected.

NOTICE

If the emergency mode is activated, a qualified technician must be contacted as soon as possible..

4.38. Error messages

Error messages can be activated.

Compressor error:	Overtemperature in the compressor or pressure exceeded.
activated:	yes/no

4.39. Language

The language displayed can be set.

Language:	German / English / French / Nederlands (currently available).

4.40. USB

A configuration can be loaded or saved using a USB stick. If a USB stick is detected,it is displayed.

Control–> USB:	when confirmed (button 3), all settings are saved on the USB stick under "configsaved.idb".
USB–> Control:	when confirmed (button 3), all settings from the file "configtoload.idb" (on USB) are saved.
Load multi configurations:	when confirmed (button 3), a set of factory settings (adjustable via decimal switch) is loaded from the USB from a file set (function requires PC software).)

If you want to load a saved configuration back onto the new circuit board, e.g. when changing the circuit board, it is necessary to rename the file previously saved on the USB stick from *configsaved.idb* to *configtoload.idb*. Alternatively, you can copy the saved file and rename it.

4.41. Mod Bus

By means of MODBUS (RS 485), a master (e.g. a PC) and several slaves (e.g. measuring and control systems) can be connected.)

4.41.1. Addresses of the refrigeration points

Each of the 3 refrigeration points is assigned a Modbus address via the configuration on the display. This means that there is one asset per address on the bus.

The address on the display is set to decimal. (The address set on the display may have to be converted to hex. Depending on the software used).

The respective refrigeration point can then be addressed via the Modbus using the set address.

4.41.2. Settings Menu

The Modbus settings can only be made in the "Service" operating level.

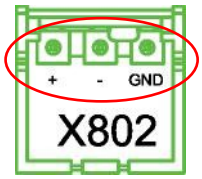
Settings –> Modbus –> activated: Yes/No To activate the Modbus communication.

Settings –> Modbus –> Asset 1: 0-255 To set the modbus address of asset 1 in decimal

Settings –> Modbus –> Asset 2: 0-255 Set the modbus address of Asset 2 in decimal

Settings –> Modbus –> Asset 3: 0-255 Setting the modbus address of asset 3 in decimal form

Observe the correct pin assignment:



In order for the remote monitoring to communicate with the control, it is necessary to activate the "Modbus" function and enter a serial address for each cooling point.

The address assignment and setting must be carried out by the administrator of the remote monitoring unit.

Cooling Unit 1	Enter the serial address
Cooling Unit 2	Enter the serial address
Cooling Unit 3	Enter the serial address

Caution: When selecting the controller on the Dixell XWEB interface, it is essential to specify the following for each asset

XR77CX 44(002C) / 2.6 (001A) / 1.6 (0010)

must be selected.

For more information on remote monitoring, see the separate Dixell XWEB documentation and the ModBus documentation

5. Alarms and error messages

5.1. Alarms and error messages on the display

The following alarms can be displayed on the display and provide information about a condition that the unit is going through or inform about any errors.

Alarms:

- Temperature of cooling point 1 too high
- Temperature of cooling point 1 too low
- Temperature of cooling point 2 too high
- Temperature of cooling point 2 too low
- Temperature of cooling point 3 too high
- Temperature of cooling point 3 too low
- Humidity too high
- Humidity too low
- Condenser cleaning necessary
- Defrosting failed KS 1
- Defrosting failed KS 2
- Defrosting failed KS 33

If the alarms occur frequently, a cooling technician should be consulted as there may be a malfunction.

Failure to respond to alarms may result in loss of goods.

5.2. Alarm and error messages audible

A signalling device can be connected to slot X302 to give a signal in case of alarm or error messages. For this, cooling point 3 and the winter circuit must be deactivated. To deactivate the acoustic alarm, press and hold the Menu button for approx. 5 seconds. It is possible to fit a separate switch to acknowledge the acoustic alarm, please refer to the separately available installation instructions. The error or alarm message in the display must always be acknowledged separately.

Error:

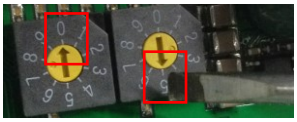
- Compressor not running
- Room sensor / return air sensor
- Room sensor / supply air sensor
- Evaporator sensor KS 1
- Sensor KS 2
- Evaporator sensor KS 2
- Sensor KS 3 / winter circuit
- Evaporator sensor KS 3
- Humidity sensor

In case of error messages, contact a cooling technician.

6. Setting values

6.1. Factory settings

For example: 0 5



Please note that individual settings are lost when selecting a basic setting via the rotary switches. If necessary, save your values beforehand with a USB stick.

7. Spare parts

7.1. Spare part list

To obtain spare parts, contact your supplier or specialist dealer.
Each unit is provided with a type plate. Give the listed unit data to your authorised specialist.
The type and serial number as well as the date of manufacture are required for assignment.
pare parts lists for your unit can be found in the Downloads menu at www.ideal-ake.at

7.2. Overview parts

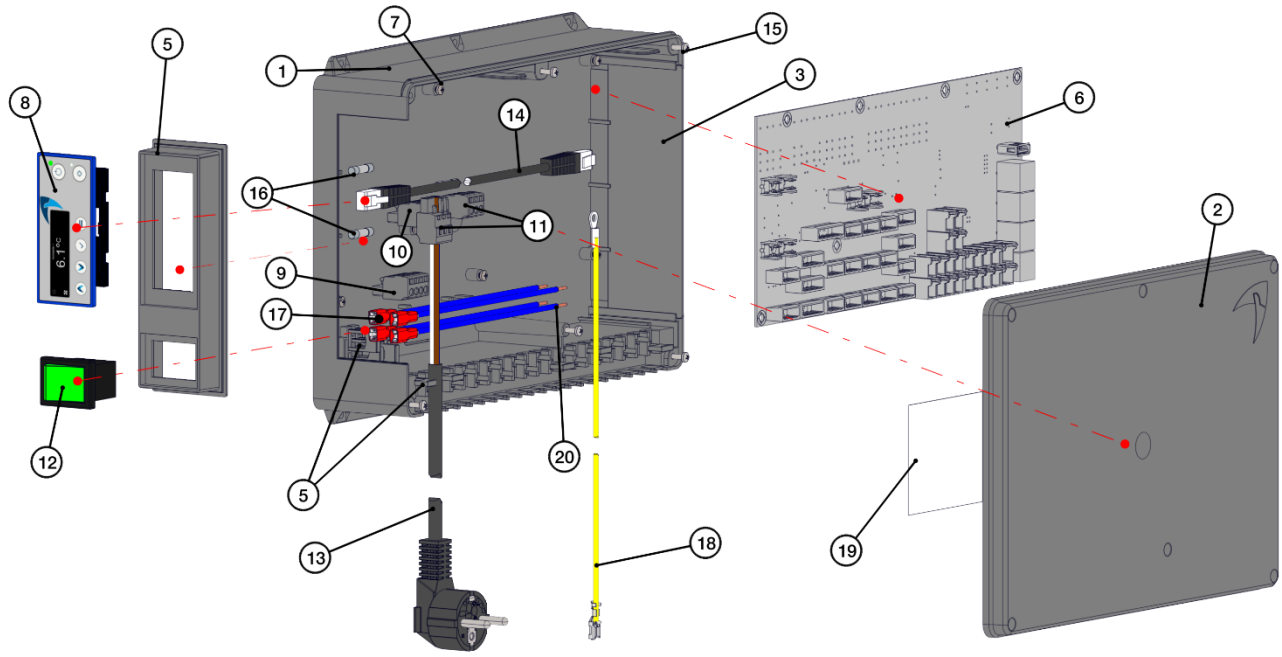


Figure 1: Part overview

Table 7: Part overview

ID	Description	Quantity	ID	Description	Quantity
1	Circuit board housing bottom	1	11	Multiconnector 3-poles	2
2	Circuit board housing top	1	12	Toggle switch	1
3	Blank panel	1	13	Mains power cable	1
4	Display cover	1	14	Patch cable	1
5	Strain relief	10	15	Thermoplastic screw	5
6	Control board HighEnd	1	16	Micro fuse	3
7	Screw 3x8	8	17	Flat connectors	4
8	Display module	1	18	Grounding wire	1
9	Multipoint connector 4-poles	1	19	Sticker pin assignment	1
10	Multipoint connector 5-poles	1	20	Pull-in wire insulated	4

7.3. Support

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In der Schörihub 28
4810 Gmunden
Österreich
+43 7612 660 61
ersatzteile@ideal-ake.at
www.ideal-ake.at

8. Circuit boards

8.1. EKP, AK

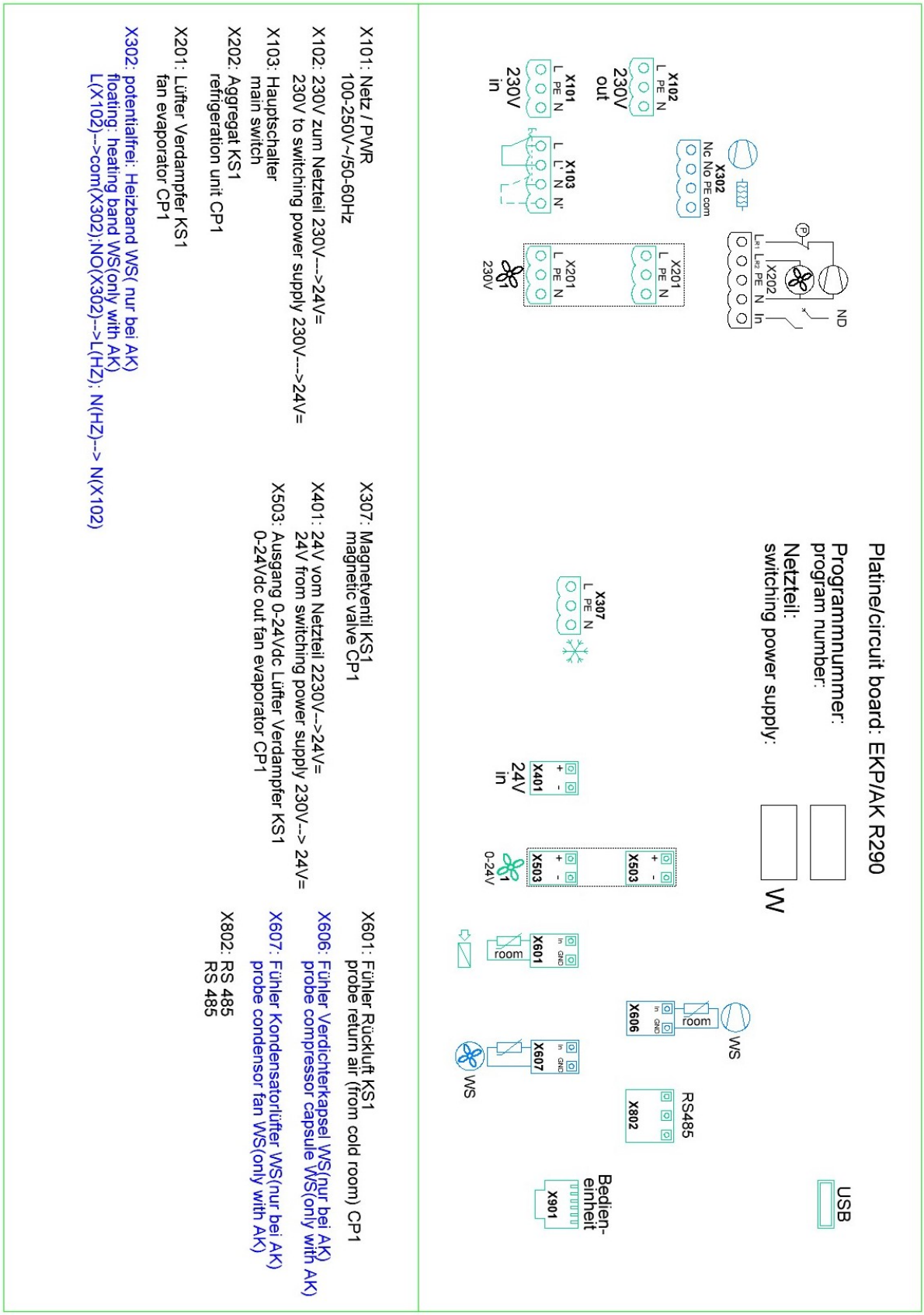


Figure 3: Circuit EKP, AK

8.2. GN

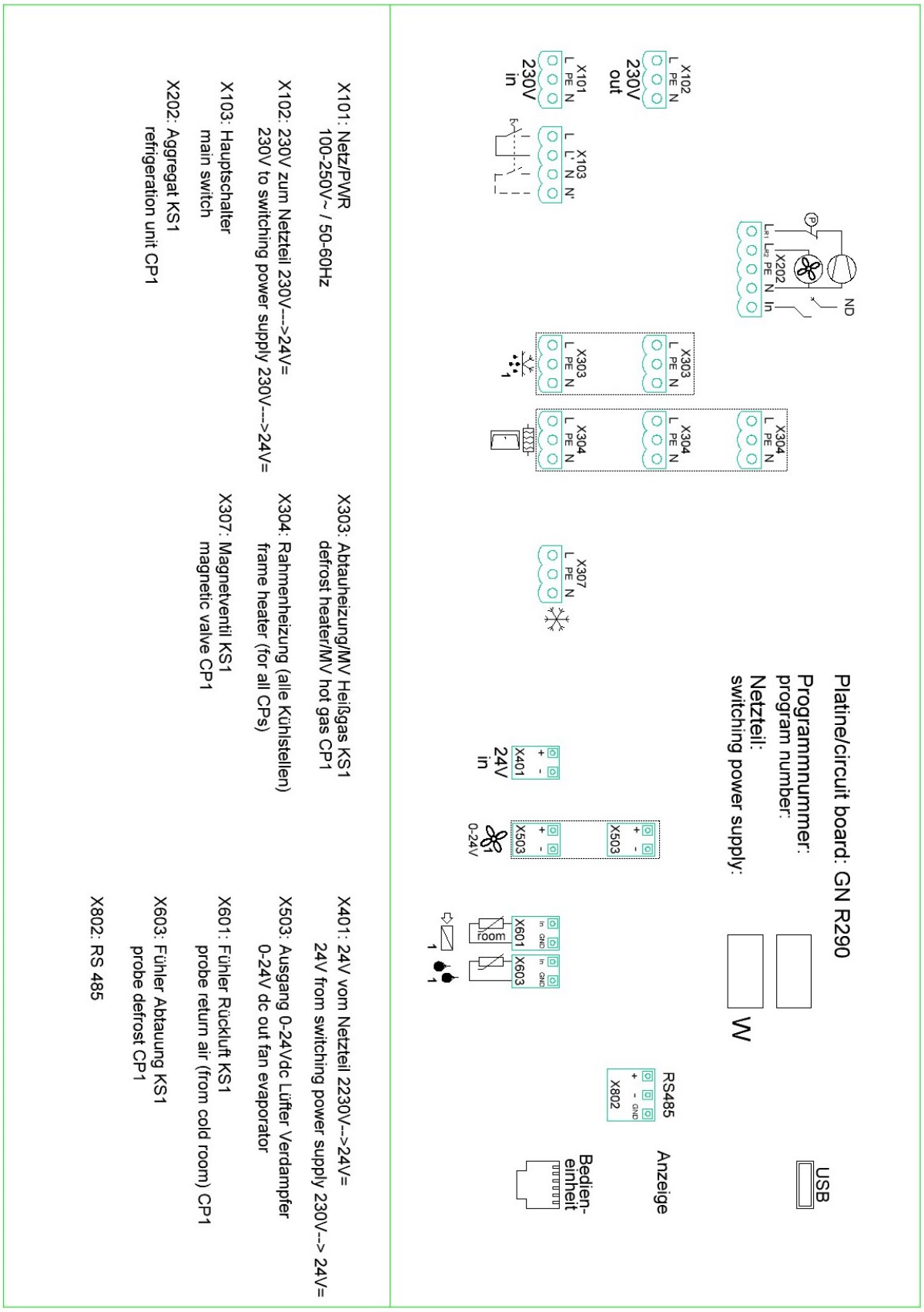
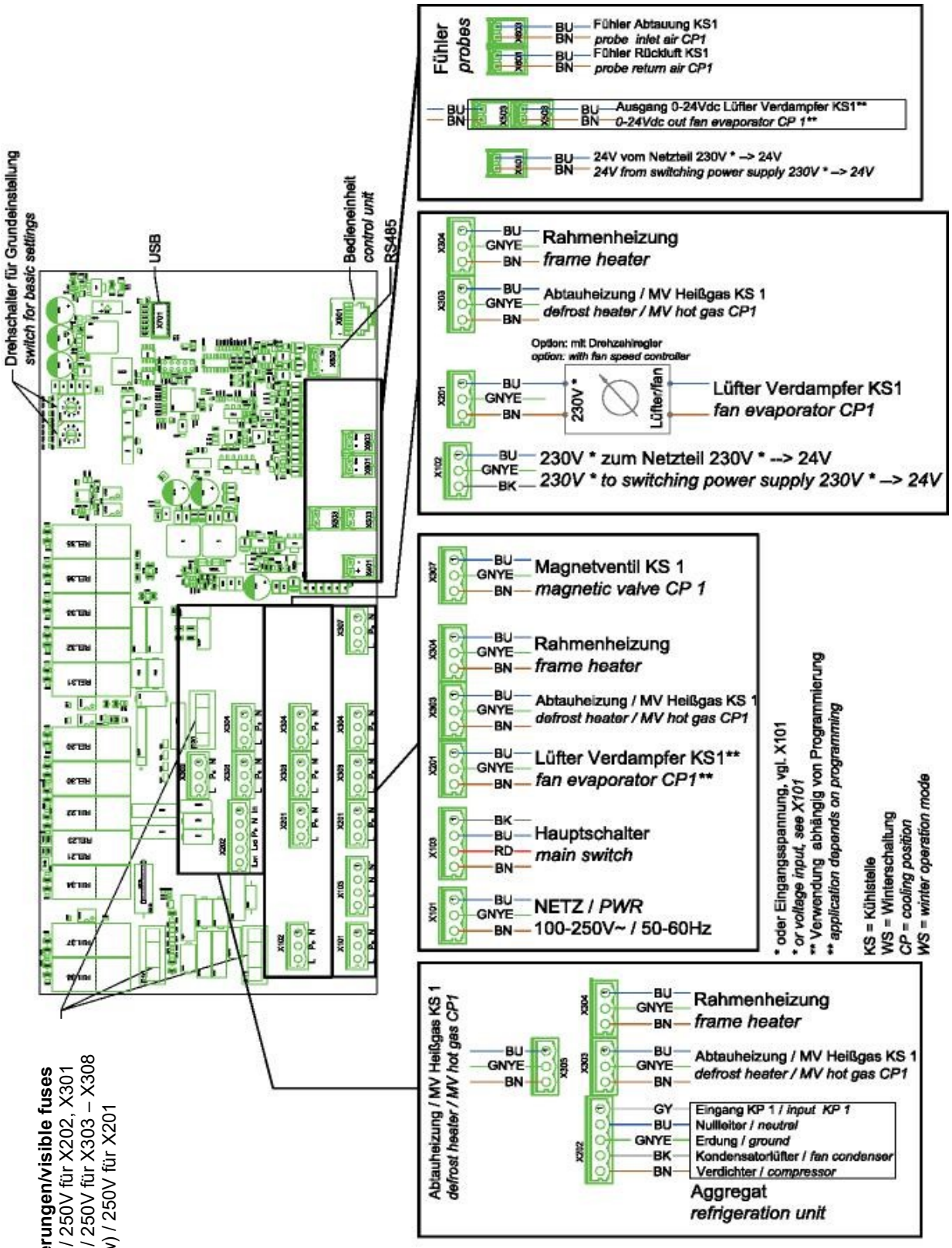


Figure 4: Circuit GN

8.3. Circuit board overview



20mm Glasrohrsicherungen/visible fuses
F10: 10A (träge/slow) / 250V für X202, X301
F11. 10A (träge/slow) / 250V für X303 – X308
F20: 3,15A (träge/slow) / 250V für X201

Figure 5: Circuit overview

9. Appendix

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