Packaged air-cooled water chillers
INTRODUCTION

This operation manual concerns packaged air-cooled water chillers of the Daikin EWAD-MBYNN series. These units are provided for outdoor installation and used for cooling applications. The EWAD units can be combined with Daikin fan coil units or air handling units for air conditioning purposes. They can also be used for supplying water for process cooling.

This manual has been prepared to ensure adequate operation and maintenance of the unit. It will tell you how to use the unit properly and will provide help if problems occur. The unit is equipped with safety devices, but they will not necessarily prevent all problems caused by improper operation or inadequate maintenance.

In case of persisting problems contact your local Daikin dealer.

Before starting up the unit for the first time, make sure that it has been properly installed. It is therefore necessary to carefully read the installation manual supplied with the unit and the recommendations listed in "Checks before initial start-up" on page 5.

Operation manual

READ THIS MANUAL ATTENTIVELY BEFORE STARTING UP THE UNIT. DO NOT THROW IT AWAY. KEEP IT IN YOUR FILES FOR FUTURE REFERENCE.

Technical specifications (1)

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Electrical specifications (1)

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(1) Refer to the engineering data book for the complete list of specifications.
DESCRIPTION

The EWAD air-cooled water chillers are available in 6 standard sizes.

EWAD120~170

EWAD240~340

Figure - Main components

1  Evaporator
2  Condenser
3  Compressor 1 (M1C)
4  Discharge stopvalve
5  Suction stopvalve (optional)
6  Liquid stopvalve
7  Chilled water in (Victaulic® coupling)
8  Chilled water out (Victaulic® coupling)
9  Water drain evaporator
10  Air purge evaporator
11  Leaving water temperature sensor (R4T)
12  Entering water temperature sensor (R3T)
13  Ambient temperature sensor (R5T)
14  Drier + charge valve
15  Power supply intake
16  Emergency stop (S5E)
17  Switchbox
18  Digital display controller
19  Field wiring intake
20  Main isolator switch (optional - S13S)
21  Compressor 2 (M2C)
22  Transportbeam
23  Counterpipe for welding
24  Flowswitch

Required space around the unit for service and air intake
Function of the main components

As the refrigerant circulates through the unit, changes in its state or condition occur. These changes are caused by the following main components:

- **Compressor**
  The compressor (M*C) acts as a pump and circulates the refrigerant in the refrigeration circuit. It compresses the refrigerant vapour coming from the evaporator at the pressure at which it can easily be liquefied in the condenser.

- **Condenser**
  The function of the condenser is to change the state of the refrigerant from gaseous to liquid. The heat gained by the gas in the evaporator is discharged through the condenser to the ambient air, and the vapour condenses to liquid.

- **Filter/drier**
  The filter installed behind the condenser removes small particles from the refrigerant to prevent blockage of the tubes. The drier takes the water out of the system.

- **Evaporator**
  The main function of the evaporator is to take heat from the water that flows through it. This is done by turning the liquid refrigerant, coming from the condenser, into gaseous refrigerant.

- **Water in/outlet connection**
  The water inlet and outlet connection allow an easy connection of the unit to the water circuit of the air handling unit or industrial equipment.

- **Flowswitch**
  The flowswitch protects the evaporator of the unit against freezing when there is no waterflow or when the waterflow is too low.

**Safety devices**

The unit is equipped with three kinds of safety device:

1. **General safety devices**
   General safety devices shut down all circuits and stop the whole unit. For this reason the unit has to be manually put on again after a general safety occurred.

2. **Circuit safety devices**
   Circuit safety devices shut down the circuit they protect, while the other circuits remain activated.

3. **Part safety devices**
   Part safety devices shut down the part they protect.

An overview of all safety devices is given below:

- **Overcurrent relay (circuit safety devices)**
  The overcurrent relays (K*S) are located in the switchbox of the unit and protect the compressor motors in case of overload, phase failure or too low voltage. The relays are factory-set and may not be adjusted. When activated, they must be reset manually, followed by a reset of the controller.

- **Compressor thermal protectors (circuit safety devices)**
  The compressor motors are equipped with thermal protectors (Q*M). The protectors are activated when the compressor motor temperature becomes too high. When temperature returns to normal, the protectors reset automatically, but the controller needs to be reset manually.
Fan motor thermal protector (part safety devices)
The condenser fan motors are equipped with thermal protectors (Q°F). The protectors are activated when the temperature becomes too high. When temperature returns to normal, the protectors reset automatically.

Flowswitch (general safety devices)
The unit is protected by a flowswitch (S8L).
When the water flow becomes lower than the minimum allowed water flow, the flowswitch shuts down the unit. When the water flow becomes normal, the protection resets automatically but the controller still needs to be reset manually.

Discharge thermal protectors (circuit safety devices)
The unit is equipped with discharge thermal protectors (S*T). The protectors are activated when the temperature of the refrigerant leaving the compressor becomes too high. When the temperature returns to normal the protector resets automatically and the controller needs to be reset manually.

Freeze-up protection (general safety devices)
The freeze-up protection prevents the water in the evaporator from freezing during operation. When the outlet water temperature is too low, the controller shuts down the unit. When the outlet water temperature returns to normal, the controller needs to be reset manually.

Low pressure safety (circuit safety devices)
When the suction pressure of a circuit is too low, the circuit controller shuts down the circuit. When the pressure returns to normal, the safety device can be reset on the controller.

Pressure relief safety valve (general safety devices)
The safety valve is activated when the pressure in the refrigerant system becomes too high. If this occurs, shut down the unit and contact your local dealer.

High pressure switch (circuit safety devices)
Each circuit is protected by two high pressure switches (S*PH) which measure the condenser pressure (pressure at the outlet of the compressor). They are installed in the compressor housing of the circuit. When the pressure becomes too high, the pressure switches are activated and the circuit stops.

The switches are factory-set and may not be adjusted. When activated, they must be reset by means of a screwdriver. The controller still needs to be reset.

Reverse phase protector (circuit safety devices)
The reverse phase protectors (R*P) prevent the screw compressors from running in the wrong direction. If the compressors do not start, two phases of the power supply must be inverted.

Internal wiring - Parts table
Refer to the internal wiring diagram supplied with the unit. The abbreviations used are listed below:

- A1,A2........... " Current transfo/A-meter for circuit 1, circuit 2
- A1P.................... PCB controller
- A11P................. Expansion board controller
- B1P,B4P.............. Low pressure transmitter for circuit 1, circuit 2
- B2P,B5P.............. High pressure transmitter for circuit 1, circuit 2
- C1–C3............... Capacitor
- E1HC,E2HC......... Crankcase heater compressor circuit 1, circuit 2
- E3H,E4H............. Evaporator heater circuit 1, circuit 2
- F1U–F3U.......... # Main fuses
- F4U,F5U............ Fuses for evaporator heater
- F6B............... Fuse for primary of TR1
- F7B............... Fuse for secondary of TR1
- F8U............... Surge proof fuse of TR1
- F9B............... Fuse for secondary of TR2
- F10S,F11S........ Circuit breakers with fuses for circuit 1, circuit 2
- F12B,F13B........ Autofuse for fanmotors circuit 1, circuit 2
- H1P............ * Indication lamp general operation
- H2P............ * Indication lamp alarm
- H3PH4P........ * Indication lamp operation compressor 1, compressor 2
- H5P............ * Changeable output
- J1......................... Power supply
- J2,J3,J6............ Analog input
- J4......................... Analog output
- J5,J7,J8,J19........... Digital input
- J11,J23........ RS485 connection
- J12–J18,J21,J22.... Digital output
- K1A,K4A............ Auxiliary relay for safety circuit 1, circuit 2
- K2A,K5A............ Auxiliary relay compressor thermal protector circuit 1, circuit 2
- K3A,K6A............ Auxiliary relay for discharge thermal protector circuit 1, circuit 2
- K7A,K8A............ Auxiliary relay for safety high pressure circuit 1, circuit 2
- K1M,K4M............ Linecontactor for circuit 1, circuit 2
- K2M,K5M............ Deltacontactor for circuit 1, circuit 2
- K3M,K6M............ Starcontactor for circuit 1, circuit 2
- K7F,K10F........... Fancontactor for circuit 1, circuit 2
- K8F,K11F........... Fancontactor for circuit 1, circuit 2
- K9F,K12F........... Fancontactor for circuit 1, circuit 2
- K17S,K18S........ Overcurrent relay for circuit 1, circuit 2
- L1,L2,L3........... Main supply terminals
- M1C,M2C........... Compressor motors circuit 1, circuit 2
- M1S,M2S........... Stepless capacity control compressor circuit 1, circuit 2
- M11F-M14F........ Fan motors circuit 1
- M21F-M24F........ Fan motors circuit 2
- PE.................... Main earth terminal
- Q1M,Q2M........... Thermal protector compressor motor circuit 1, circuit 2
- Q11F-Q14F........ Thermal protectors fan motors circuit 1
- Q21F-Q24F........ Thermal protectors fan motors circuit 2
- R1,R2............. Auxiliary resistance for feedback
- R1F,R2F............ Feedback resistance for circuit 1, circuit 2
- R1P,R2P........... Reverse phase protector circuit 1, circuit 2
- R3T................. Sensor for evaporator inlet water temperature
- R4T................. Sensor for evaporator outlet water temperature
- R5T................. Sensor for ambient temperature
- R7T................. Sensor for mixed outlet water temperature
- R8T................. Sensor for common leaving water in a DICN system
- S1PH,S2PH........... High pressure switch circuit 1, circuit 2
- S3T,S4T........... Discharge thermal protector circuit 1, circuit 2
- S5E................. Emergency stop push button
- S6S............ * Changeable switch for remote function (e.g. remote start/stop)
- S8L................. Flowswitch
- S9L............ # Contact that closes if the pump is working
- S10S............ * Changeable switch for remote function (e.g. dual setpoint)
- S11S............ * Changeable switch for remote function (e.g. enable/disable capacity limitation 1)
- S12S............ * Changeable switch for remote function (e.g. enable/disable capacity limitation 2)
- S13S........ ....# Main isolator switch

DAIKIN
Operation manual
EWAD120–340MBYNN
Packaged air-cooled water chillers
4PW2283-1
Checks before initial start-up

- Make sure that the circuit breaker on the power supply panel of the unit is switched off.

After the installation of the unit, check the following before switching on the circuit breaker:

1. Field wiring
   - Make sure that the field wiring between the local supply panel and the unit has been carried out according to the instructions described in the installation manual, according to the wiring diagrams and according to European and national regulations.

2. Additional pump interlock contact
   - Additional interlock contacts (S*L) should be provided (e.g. flowswitch, contact of pump motor contactor). Make sure that they have been installed between the appropriate terminals (refer to the wiring diagram supplied with the unit). They should be normal open contacts.

3. Fuses or protection devices
   - Check that the fuses or the locally installed protection devices are of the size and type specified in the installation manual. Make sure that neither a fuse nor a protection device has been bypassed.

4. Earth wiring
   - Make sure that the earth wires have been connected properly and that the earth terminals are tightened.

5. Internal wiring
   - Visually check the switch box on loose connections or damaged electrical components.

6. Fixation
   - Check that the unit is properly fixed, to avoid abnormal noises and vibrations when starting up the unit.

7. Damaged equipment
   - Check the inside of the unit on damaged components or squeezed pipes.

8. Refrigerant leak
   - Check the inside of the unit on refrigerant leakage. If there is a refrigerant leak, call your local dealer.

9. Oil leak
   - Check the compressor on oil leakage. If there is an oil leak, call your local dealer.

10. Stop valves
    - Open the liquid line, discharge and suction (if provided) stop valves completely.

11. Air inlet/outlet
    - Check that the air inlet and outlet of the unit is not obstructed by paper sheets, cardboard, or any other material.

12. Power supply voltage
    - Check the power supply voltage on the local supply panel. The voltage should correspond to the voltage on the identification label of the unit.

13. Water connection
    - Check water piping system and circulating pumps. Check if a water filter is installed correctly in front of the evaporator water inlet.

Water supply

Fill the water piping, taking into account the minimum water volume required by the unit. Refer to the "Installation manual".

Make sure that the water is of the quality as mentioned in the installation manual.

Purge the air at the high points of the system and check the operation of the circulation pump and the flowswitch.

Power supply connection and crankcase heating

In order to avoid compressor damage, it is necessary to switch on the crankcase heater for at least 8 hours before starting the compressor after a long period of standstill.

To switch on the crankcase heater proceed as follows:

1. Switch on the circuit breaker on the local supply panel. Make sure that the unit is "OFF".

2. The crankcase heater is switched on automatically.

3. Check the supply voltage on the supply terminals L1, L2, L3, by means of a voltmeter. The voltage must correspond to the voltage indicated on the identification label of the unit. If the voltmeter reads values which are not within the ranges specified in the technical data, check the field wiring and replace the supply cables if necessary.

4. Check the LED on the reverse phase protectors. If it lights up, the phase order is correct. If not, switch off the circuit breaker and call a licensed electrician to connect the wires of the power supply cable in the correct phase order.

5. Check if the crankcase heaters are warming up.

After 8 hours, the unit is ready for operation.

General recommendations

Before switching on the unit, read following recommendations:

1. When the complete installation and all necessary settings have been carried out, close all front panels of the unit.

2. The service panels of the switch boxes may only be opened by a licensed electrician for maintenance purposes.

3. To prevent the evaporator from freezing and to avoid damage to the LCD displays of the digital controller, never switch off the power supply during winter.
**Operation**

The EWAD units are equipped with a digital controller offering a user-friendly way to set up, use and maintain the unit.

This part of the manual has a task-oriented, modular structure. Apart from the first section, which gives a brief description of the controller itself, each section or subsection deals with a specific task you can perform with the unit.

Depending on the model there are one or two cooling circuits in the system. The models EWAD240–340 exist out of two circuits, whereas the models EWAD120–170 only have one circuit. These circuits are generally named C1 and C2 in the following descriptions. So all information about circuit 2 (C2) is not applicable for EWAD120–170 models.

**Digital controller**

**User interface**

The digital controller consists of an alphanumeric display, labelled keys which you can press and a number of LEDs.

- **Digital built-in controller**

![Digital built-in controller](image1)

**Figure - Digital built-in controller**

- **key**, to enter the main menu
- **key**, to start up or to shut down the unit.
- **key**, to enter the safeties menu or to reset an alarm.
- **keys**, to scroll up or down through the screens of a menu (only in case , , or appears) or to raise, respectively lower a setting.
- **key**, to confirm a selection or a setting.

- **Digital remote controller (to be ordered separately)**

![Digital remote controller](image2)

**Figure - Digital remote controller**

- **key**, to start up or to shut down the unit.
- **key**, to enter the safeties menu or to reset an alarm.
- **key**, to enter the readout menu.
- **key**, to enter the setpoints menu.
- **key**, to enter the user settings menu.
- **key**, to enter the timers menu.
- **key**, to enter the history menu.
- **key**, to enter the info menu.
- **key**, to enter the input/output status menu.

- **key**, to enter the DICN menu, also referred to as network menu.
- **key**, to enter the DICN menu, also referred to as network menu.
- **key**, has no effect on EWAD units.

**NOTE**

Temperature readout tolerance: ±1°C.

Legibility of the alphanumeric display may decrease in direct sunlight.

**How to enter a menu**

- **Digital built-in controller**

Scroll through the main menu using the and keys to move the > mark in front of the menu of your choice. Push the key to enter the selected menu.

- **Digital remote controller**

Press the corresponding menu key indicated in "User interface", paragraph "Digital remote controller" on page 6

**Connection of a remote digital controller to the unit**

For a remote digital controller a cable length of up to 600 metres between the remote digital controller and the unit is allowed. This gives the opportunity to control the unit from a considerable distance. Refer to "Cable for remote digital controller" in the installation manual for cable specifications.

For units in a DICN configuration, the remote digital controllers of the units can be installed at a distance of up to 50 metres by using a 6-ray telephone cable with a maximum cable resistance of 0.1 Ω/m.

**NOTE**

When a remote digital controller is connected to a stand-alone unit, the address of the remote digital controller has to be set to 2 by means of the DIP-switches on the back of the remote digital controller. Refer to the installation manual "Setting the addresses on the remote digital controller" for setting the address.

When a remote digital controller is connected to a unit that is part of a DICN network, the addresses have to be set according to the instructions in the installation manual.

**Working with the unit**

This chapter deals with the everyday usage of the unit. Here, you will find how to perform routine tasks, such as:

- **"Setting the language" on page 6**
- **"Switching the unit on" on page 7**
- **"Consulting actual operational information" on page 7**
- **"Adjusting the temperature setpoint" on page 8**
- **"Resetting the unit" on page 8**

**Setting the language**

If desired, the operating language can be changed to any of the following languages: English, German, French, Spanish or Italian.

1. Enter the usersettings menu. Refer to chapter "How to enter a menu" on page 6

2. Go to the appropriate screen of the usersettings menu using the and keys.

3. Press to change the operating language until the desired language is active.
Switching the unit on

1. Press the key on the controller.
   Depending on whether or not a remote ON/OFF switch has been configured (refer to the installation manual), the following conditions may occur:
   - If no remote ON/OFF switch is configured:
     - Press the key on the controller.
     - The LED inside the key goes out.
   - If a remote ON/OFF switch is configured:
     - Press the key on the controller or switch the unit off using the remote ON/OFF switch.
     - The LED inside the key goes out in the first case and starts blinking in the second case.

   In case of emergency, switch off the unit by pushing the emergency stop button.

   **NOTE** Also consult "Defining the schedule timer" on page 12 and "Customization in the service menu" chapter "Setting of the changeable inputs and outputs" in the installation manual.

Switching units ON/OFF in a DICN system

If the key is pressed on a unit with status NORMAL or STANDBY, all other units with status NORMAL or STANDBY will be ON or OFF.

If the key is pressed on a unit with status DISCONNECT ON/OFF, only this unit will be ON or OFF.

**NOTE** When a remote ON/OFF switch is configured, the remote ON/OFF contact for all units with status NORMAL or STANDBY of a DICN network is the contact connected to the master unit.

For units with status DISCONNECT ON/OFF, the remote contact is the contact connected to this unit.

**NOTE** If the user wants 1 unit to operate on his command only, this unit is to be set to DISCONNECT ON/OFF.

It is recommended not to select the master unit for this purpose. Even if the status of the master is set to DISCONNECT ON/OFF, it will still be the contact connected to the master which will switch ON/OFF the other units in NORMAL or STANDBY mode. It would therefore never be possible to only switch the master unit OFF remotely.

Switching OFF the master unit only, should in this case be done by the local ON/OFF key on the master unit.

Consulting actual operational information

1. Enter the readout menu. Refer to the chapter "How to enter a menu" on page 6.
   The controller automatically shows the first screen of the readout menu which provides the following information:
   - MANUAL MODE or INLEASTP1/2 or OUTLEASTP1/2: manual/automatic control mode operation. If the automatic control mode is selected, the controller will indicate the active temperature setpoint. Depending on the status of the remote contact, setpoint one or setpoint two is active.
   - INL WATER E: actual evaporator inlet water temperature.
   - OUTL WATER E: actual evaporator outlet water temperature.

   **NOTE** For a DICN system, the INLET WATER, OUTLET WATER values are the values of the individual units, not of the system. Temperatures of the system can be consulted in the first screen of the network menu.

2. Press the key to enter the next screen of the readout menu.
   The UNIT STATUS screen of the readout menu provides information concerning the status of the different circuits.
   - C1: actual status of circuit 1.
   - C2: actual status of circuit 2.
   When the circuit is ON, the following status information may appear:
     - C1: 40% - this percentage refers to the activated capacity of that specific circuit.

   **NOTE** When a circuit is in is in a high pressure setback, the indication of capacity will be flashing. A high pressure setback is a prevention of load-up or a forced load-down caused by a too high pressure.

   When a circuit is OFF, the following status information may appear.
   - SAFETY ACTIVE: one of the circuit safety devices is activated (refer to "Troubleshooting" on page 15).
   - <LIMIT>: the circuit is limited by a remote contact.
   - TIMERS BUSY: the actual value of one of the software timers is not zero (refer to "Timers menu" on page 9).
   - CAN STARTUP: the circuit is ready to start up when extra cooling load is needed.

   The preceding OFF messages are written down in order of priority. If one of the timers is busy and one of the safeties is active, the status information says SAFETY ACTIVE.

   The UNIT CAPACITY is written down on the bottom of the screen. The percentage is the actual cooling capacity of the unit.

3. Press the key to enter the next screen of the readout menu.
   The ACTUAL PRESSURES screen of the readout menu provides information concerning the pressures of circuit.

   - HP1:2: high pressure of the refrigerant in circuit 1/2. The first number stands for the pressure in bar, the second number stands for the bubble point saturation temperature in degrees Celsius.
   - LP1:2: low pressure of the refrigerant in circuit 1/2. The first number stands for the pressure in bar, the second number stands for the dew point saturation temperature in degrees Celsius.

4. Press the key to enter the next screen of the readout menu.
   To consult actual operational information about the ambient temperature and the total running hours of the compressor.

5. Press the key to return to the other readout menus.
Adjusting the temperature setpoint

The unit provides definition and selection of four independent temperature setpoints. Two setpoints are reserved for inlet control, the other two are reserved for outlet control.

- **INLSETP1E**: inlet water temperature of evaporator, setpoint 1.
- **INLSETP2E**: inlet water temperature of evaporator, setpoint 2.
- **OUTLSETP1E**: outlet water temperature of evaporator, setpoint 1.
- **OUTLSETP2E**: outlet water temperature of evaporator, setpoint 2.

The selection between setpoint 1 and 2 is done by a remote dual setpoint switch (to be installed by the customer). The actual active setpoint can be consulted in the readout menu.

### NOTE

The customer is also allowed to define a setpoint in function of an analog input.

### NOTE

Refer to “Customization in the service menu” chapter “Setting of the changeable inputs and outputs” in the installation manual.

If the manual control mode is selected (refer to “Usersettings menu” on page 9), none of the above-mentioned setpoints will be active.

**To adjust a setpoint, proceed as follows:**

1. **Enter the setpoints menu.** Refer to the chapter “How to enter a menu” on page 6.
   
   If the user password is disabled for setpoint modifications (refer to “Usersettings menu” on page 9), the controller will immediately enter the setpoints menu.
   
   If the user password is enabled for setpoint modifications, enter the correct code using the 'p' and 'g' keys (refer to “User password menu” on page 11). Press 'p' to confirm the password and to enter the setpoints menu.
   
2. **Select the setpoint to be adjusted using the 'g' key.**
   
   A setpoint is selected when the cursor is blinking behind the setpoint’s name. The “>” sign indicates the actual active temperature setpoint.
   
3. **Press the 'a' and 'g' keys to adjust the temperature setting.**
   
   The default, limit and step values for the cooling temperature setpoints are:

<table>
<thead>
<tr>
<th>SETP IN E</th>
<th>SETP OUT E</th>
</tr>
</thead>
<tbody>
<tr>
<td>default value</td>
<td>12°C</td>
</tr>
<tr>
<td>limit values</td>
<td>7°C to 23°C</td>
</tr>
<tr>
<td>step value</td>
<td>0.1°C</td>
</tr>
</tbody>
</table>

   (a) For glycol treated units, the lower limit of the cooling temperature setpoint can be adapted by changing the minimum operating temperature in the service menu (refer to the installation manual). The following values apply:

   - **SETP IN E**: 5°C, 3°C, –2°C, –7°C
   - **SETP OUT E**: 2°C, 0°C, –5°C, –10°C

4. **Press 'p' to save the adjusted temperature setpoint.**
   
   When the setting has been confirmed, the cursor switches to the next setpoint.
   
5. **To adjust other setpoints, repeat from step 2.**

### NOTE

When a setpoint on a unit in a DICN system is set, this setpoint will be transferred to all other units.

### NOTE

Also consult “Defining the schedule timer” on page 12 and “Defining the floating setpoint settings” on page 12.

## Resetting the unit

The units are equipped with three kinds of safety devices: unit safeties, circuit safeties and network safeties.

When a unit or circuit safety occurs, the compressor is shut down. The safeties menu will indicate which safety is activated. The UNIT STATUS screen of the readout menu will indicate OFF - SAFETY ACTIVE. The red LED inside the “p” key lights up and the buzzer inside the controller is activated.

When a network safety occurs in a DICN configuration, the slaves not detected by the network will function as stand alone units.

- If a slave unit can not be found by the network, the red light inside the “p” key of the master lights up and the buzzer inside the control is activated.

- If the master can not be found by the network, the red light inside the “p” key of all the slaves light up and the buzzer inside their controls are activated. All units will work as stand alone units.

If the unit has been shut down due to a power failure, it will carry out an autoreset and restart automatically when the electrical power is restored.

**To reset the unit, proceed as follows:**

1. **Press the “p” key to acknowledge the alarm.**
   
   The buzzer is deactivated. The controller automatically switches to the corresponding screen of the safeties menu: unit safety or circuit safety or network safety.
   
2. **Find the cause of shutdown and correct.**
   
   Refer to “Listing activated safeties and checking the unit status” on page 14 and “Troubleshooting” on page 15.
   
   When a safety can be reset, the LED under the “p” key starts blinking.

3. **Press the “p” key to reset the safeties that are no longer active.**
   
   If required, enter the USER PASSWORD or the SERVICE PASSWORD. (Refer to the installation manual “Setting the password for safety reset”.)
   
   Once all safety devices are deactivated and reset, the LED under the “p” key goes out. If one of the safeties is still active, the LED under the “p” key goes on again. In this case, return to step 2.

4. **It will only be necessary to switch the “p” key on again if a unit safety occurs.**

### NOTE

If the user shuts down the power supply in order to repair a safety, the safety will automatically be reset after power-up.

### NOTE

The history information, i.e. the number of times a unit safety or a circuit safety occurred and the unit status at the moment of shutdown, can be checked by means of the history menu.
Advanced features of the digital controller

This chapter gives an overview and a brief functional description of the screens provided by the different menus. In the following chapter, you will find how you can set up and configure the unit using the various menu functions.

All menus are directly accessible using the corresponding key on the digital controller or through the main menu (refer to "How to enter a menu" on page 6). The down arrow V on the display indicates that you can go to the next screen of the current menu using the ○ key.

The up arrow ^ on the display indicates that you can go to the previous screen of the current menu using the @ key. If ÷ is displayed, this indicates that you can either return to the previous screen or go to the next screen.

Readout menu

To consult actual operational information about the control mode, the inlet and outlet water temperature (see first screen).

Note that for a DICN system, the INLET WATER and OUTLET WATER values are the values of the individual units, not of the system. Temperatures of the system can be consulted in the first screen of the network menu.

To consult information about the unit status.

To consult information about the pressures of circuit 1.

To consult information about the pressures of circuit 2 (only for EWAD240–340).

To consult actual operational information about the ambient temperature, the total running hours of the compressor and the number of compressor starts.

Setpoints menu

Depending upon the settings in the user settings menu, the "setpoints" menu can either be entered directly or by means of the user password.

To define the temperature setpoints.

Usersettings menu

The "usersettings" menu, protected by the user password, allows a full customization of the units.

To define the manual settings and to activate or deactivate manual control mode.

To define the thermostat settings.

To define the capacity limitations. (first screen)

To define the capacity limitations. (second screen)

Timers menu

To check the actual value of the general software timer.

To check the actual value of the compressor timer. (first screen)

To check the actual value of the compressor timer. (second screen)

To check the actual value of the compressor startup timer and the stop timer.
The “safeties” menu provides useful information for trouble shooting purposes. The following screens contain basic information.

**UNIT SAFETY**

To consult information about the unit safety which caused the shutdown.

**CIRCUIT SAFETY**

To consult information about the circuit 1 safety which caused the shutdown.

**NETWORK SAFETY**

To consult information about the network safety which caused the shutdown.

**UNIT WARNING**

To consult information about the dual pump which caused the shutdown.

Along with the basic information, more detailed information screens can be consulted while the safety menu is active. Press the \( \varphi \) key. Screens similar to the following will appear.

**UNIT HISTORY**

To check the time and control mode at the moment of the unit shutdown.

To check which were the evaporator and condenser inlet water temperature and the evaporator outlet water temperature.

To check which was the status of the compressors at the moment of shutdown.

To check which were the pressures of the circuit 1 at the moment of shutdown.

To check which were the pressures of the circuit 2 at the moment of shutdown (only for EWAD240–340).

To check which were the total amount of running hours of the compressor and the ambient temperature at the moment of shutdown.

**Input/output menu**

The “input/output” menu gives the status of all the digital inputs and the relay outputs of the unit.

To check whether or not the emergency stop device is active and if there is any water flow to the evaporator.

To check the status of the high pressure switch, the reverse phase protector and the overcurrent relay of circuit 1.

To check the status of the discharge thermal protector and the compressor thermal protector of circuit 1.

To check the status of the high pressure switch, the reverse phase protector and the overcurrent relay of circuit 2 (only for EWAD240–340).

To check the status of the discharge thermal protector and the compressor thermal protector of circuit 2 (only for EWAD240–340).

To check the status of the changeable digital inputs.

Note that for a unit in a DICN system, the inputs apply to this unit. It will be the remote input on the master unit however, that will be determining for the operation of the unit.

To check the status of the power relays of circuit 1.

To check the status of the power relays of circuit 2 (only for EWAD240–340).

To check the capacity mode and feedback of circuit 1.

To check the capacity mode and feedback of circuit 2 (only for EWAD240–340).

To check the status of the fanspeed relays of circuit 1.

**History menu**

The “history” menu contains all the information concerning the latest shutdowns. The structure of those menus is identical to the structure of the safeties menu. Whenever a failure is solved and the operator performs a reset, the concerning data from the safeties menu is copied into the history menu.

Additionally the number of safeties that already occurred, can be consulted on the first line of the history screens.

**Info menu**

To consult time and date information.

To consult additional information about the unit such as the unit type and the refrigerant used.

To consult information about the controller’s software version.

To consult information about the PCB.
To check the status of the fanspeed relays of circuit 2 (only for EWAD240~340).

To check the status of the pump, the alarm and the evaporator heater voltage free contacts.

To check the status of the changeable relay output.

Tasks of the user settings menu

Entering the user settings menu

The user settings menu is protected by the user password, a 4-digit number between 0000 and 9999.

1. Enter the USER SETTINGS MENU. (Refer to the chapter "How to enter a menu" on page 6).
   The controller will request the password.

2. Enter the correct password using the $\uparrow$ and $\downarrow$ keys.

3. Press $\uparrow$ to confirm the password and to enter the user settings menu.
   The controller automatically enters the first screen of the user settings menu.

To define settings of a certain function:

1. Go to the appropriate screen of the user settings menu using the $\uparrow$ and $\downarrow$ keys.

2. Position the cursor behind the parameter to be modified using the $\uparrow$ key.

3. Select the appropriate setting using the $\uparrow$ and $\downarrow$ keys.

4. Press $\uparrow$ to confirm the selection.
   When the selection has been confirmed, the cursor switches to the next parameter which can now be modified.

5. Repeat from instruction 2 onwards to modify the other parameters.

Defining and activating the control mode

The unit is equipped with a thermostat which controls the cooling capacity of the unit. Three different control modes exist:

- **manual control mode**: the operator controls the capacity of the cooling water by setting:
  - FI1, FI2 (air flow in manual mode): off, low, medium or high of circuit 1/2.
  - CIR1/2 (capacity step in manual mode): 0%, 30%~100% of circuit 1/2.

- **inlet control mode**: uses the evaporator entering water temperature to control the capacity of the unit. INLET WATER

- **outlet control mode**: uses the evaporator leaving water temperature to control the capacity of the unit. OUTLET WATER

**NOTE**

To activate manual control mode, select MANUAL as present mode. To deactivate the manual control mode, select INLET WATER or OUTLET WATER as present mode.

For units in a DICN configuration:

- When changing the control mode on one of the units, it is automatically transferred to all other units.
- Manual control mode however can only be selected on units with status DISCONNECT ON/OFF.

Defining the thermostat settings

When automatic control mode is selected, the unit uses a thermostat function to control the cooling capacity. However, the thermostat parameters are not fixed and can be modified via the THERMOST Setting screen of the user settings menu.

The default, limit and step values for the thermostat parameters are shown in "Annex I" on page 18.

**NOTE**

- If changed on one of the units in a DICN configuration, this setting is transferred to all other units in the network.
- A functional diagram showing the thermostat parameters can be found in "Annex I" on page 18.

Defining the capacity limitation settings

In the CAP. LIM. SETTINGS screen up to four possible capacity limitation settings can be configured.

A capacity limitation can be activated:

**MODE**

- SCHEDULE TIMER: see "Defining the schedule timer" on page 12.
- REMOTE DIG INF: when a changeable input is configured as capacity limitation.

**NOTE**

Refer to "Customization in the service menu", chapter "Setting of the changeable digital inputs and outputs" in the installation manual

- LIM1: to activate capacity limitation 1.
- NOT ACTIVE: the capacity limitation is not active.
- L1/L2/L3/L4 CIR 1/2: capacity limitation value of circuit 1/2 in case of capacity limitation 1/2/3/4.
Defining the pump control settings

The PUMP\CONTROL screen of the user settings menu allows the user to define the pump-leadtime and pump-lagtime.

- **PUMP\LATETIME**: used to define the time that the pump must run before the unit (or the compressor in case PUMP\ON\IF: COMPR ON is selected in a DICIN configuration) can start up.
- **PUMP\LAGTIME**: used to define the time that the pump keeps running after the unit (or the compressor in case PUMP\ON\IF: COMPR ON is selected in a DICIN configuration) has been stopped.

Defining the schedule timer

To activate the screens of the schedule timer or holiday period, these first need to be enabled by changing their setting to Y in the appropriate screen. To de-activate the schedule timer or holiday period, their setting needs to be reset to N. (See "Usersettings menu" on page 9.)

The SCHEDULE\ TIMER screen of the user settings menu allows the user to define the schedule timer settings.

Each day of the week can be appointed to a group. The actions defined in a group will be executed in each day belonging to that group.

- MON, TUE, WED, THU, FRI, SAT and SUN: used to define to which group each day of the week belongs (∼G1,G2,G3,G4).
- For each of the four groups up to nine actions can be set, each with their respective timing. Actions include: putting the unit on (ON), putting the unit off (OFF), setting a setpoint (ISP\ E, ISP\ E, O\S\P\ E, ISP\ E) and setting capacity limitation (LIM1, LIM2, LIM3, LIM4, NO LIM).
- Beside these four groups there is also a holiday period group which is set the same way as the other groups. Up to 12 holiday periods can be entered in the HD\ PERIOD\ screen. During these periods the schedule timer will follow the settings of the holiday period group.

**NOTE** A functional diagram showing the schedule timer working can be found in "Annex II" on page 18.

In case of a DICIN network, defining the schedule timer will only be possible through the master unit. In case of power failure of the master unit, the slave units however, will still operate according to settings of the schedule timer.

**Defining dual evaporator pump control**

The DUAL\ EVAP\PUMP screen of the user settings menu allows the user to define the steering of two evaporator pumps (for this to be possible a changeable digital output has to be configured for a second evaporator pump in the service menu). Refer to the installation manual.

- **MODE**: used to define which kind of control will be used for the two evaporator pumps. When automatic rotation is chosen the offset on running hours also has to be entered.
  - **AUTO**: pump 1 and pump 2 will alternate to the offset on RH.
  - **PUMP 1\PUMP 2**: pump 1 will always start up first.
  - **PUMP 2\PUMP 1**: pump 2 will always start up first.
- **OFFSET ON RH**: used to define the offset in running hours between the two pumps. Used to switch over between pumps when they work in automatic rotation mode.

**Defining the floating setpoint settings**

The FLOATING\ SETPOINT screen of the user settings menu allows the active setpoint to be modified in function of the user. The source and settings of the floating setpoint can be configured by the user.

- **SOURCE**: used to define the mode of the floating setpoint.
  - **NOT PRESENT**: floating setpoint is not activated.
  - **AMBIENT**: floating setpoint is altered based on the ambient temperature.
- **MAX. VALUE**: used to define maximum value that can be added to the active setpoint.
- **D1**: used to define the ambient (source) at which the floating setpoint value is equal to zero.
- **D2**: used to define the rise in floating setpoint value for 10°C drop in ambient.

**NOTE** A functional diagram showing the floating setpoint working can be found in "Annex III" on page 19.

**Defining the display settings**

The DISPLAY\ SETTINGS screens of the usersettings menu allows the user to define the choice of language, time and date.

- **LANGUAGE**: used to define the language of the displayed information of the controller (on the first screen). (Push the button repeatedly to change the operating language).
- **TIME**: used to define the present time (on the second screen).
- **DATE**: used to define the present date (on the second screen).

**Defining free cooling**

The FREE\ COOLING screen of the usersettings menu allows the user to control a 3-way water valve when the unit is in free cooling state. To make this possible a changeable digital output has to be configured for free cooling in the service menu. (Refer to the installation manual.)

- **MODE**: used to define the free cooling mode.
  - **NOT ACTIVE**: free cooling is not active.
  - **AMBIENT**: free cooling is based on ambient temperature.
  - **INLET-AMBIENT**: free cooling is based on the difference between inlet water temperature and ambient temperature.
- **SP**: setting of the free cooling setpoint.
- **D1**: setting of the free cooling difference.

**NOTE** A functional diagram showing the free cooling working can be found in "Annex IV" on page 19.

**Defining the network settings**

The NETWORK screen of the user settings menu allows the user to define the network settings.

- **NR\. OF SLAVES**: Define the number of slaves connected to the master (1 to 3). This menu can only be accessed at the “Master” unit.

The SETTINGS screen of the network menu allows the user to set the MODE of the unit, the OFFSET time and the condition when the pump must operate.

- **MODE**: Define the mode of the unit as NORMAL, STANDBY or DISCONNECT ON/OFF.
  - **NORMAL**: The unit is controlled by the network. Loading and unloading is decided by the central control of the network. Putting this unit ON or OFF will also put all other units ON or OFF, unless their status is DISCONNECT ON/OFF. (see Changing CONTROL\ SETTINGS or THERMOSTAT\ SETTINGS to this unit, will apply to all other units. MANUAL\ CONTROL on such a unit is not possible. Refer to “Defining and activating the control mode” on page 11.)
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Defining BMS control

BMS allows the user to control the unit from a supervisory system.

The BMS SETTINGS screen and BMSBOARD SETTINGS screen of the service menu have to be used to set BMS parameters. Refer to "Customization in the service menu" chapter "Defining the BMS settings" in the installation manual.

Tasks of the timers menu

Checking the actual value of the software timers

As a protective measure and to ensure correct operation, the controller’s software features several countdown timers:

- LOADUP (LOADUP – refer to the thermostat parameters): starts counting when a thermostat step change has occurred. During the countdown, the unit is not able to enter a higher thermostat step.
- LOADDOWN (OWN – refer to the thermostat parameters): starts counting when a thermostat step change has occurred. During the countdown, the unit will not be able to go to a lower thermostat step.
- FLOWSTART (FLOWSTART – 15 sec): counts down when the water flow through the evaporator is continuous and the unit is in standby. During the countdown, the unit cannot start up.
- FLOWSTOP (FLOWSTOP – 5 sec): starts counting when the water flow through the evaporator stops after the flowstart timer has reached zero. If the water flow has not restarted during the countdown, the unit will shut down.
- PUMPLEAD (PUMPLEAD – refer to the pump control settings): starts counting whenever the unit is switched on. During the countdown, the unit cannot start up.
- PUMPLAG (PUMPLAG – refer to the pump control settings): starts counting whenever the unit is switched off. During the countdown, the pump keeps running.
- STARTTIMER (COMP, STARTED – 10 sec): starts counting whenever a compressor starts up. During the countdown, no other compressor can start up.
- GUARDTIMER (G01/2 – 60 sec): starts counting when the compressor (circuit 1/2) has been shut down. During the countdown, the compressor cannot be restarted.
- ANTIRECYCLING (AREC1/2 – 600 sec): starts counting when the compressor (circuit 1/2) has started. During the countdown, the compressor cannot be restarted.
- STARTUPTIMER (STARTUPTIME1/2 – 180 sec): starts counting when the compressor (circuit 1/2) has started. During the countdown, the compressor is limited to a maximum capacity step of 30%.

To check the actual value of the software timers, proceed as follows:

1. Enter the TIMERS MENU. (Refer to the chapter "How to enter a menu" on page 6.)

   The controller displays the actual value of the GENERAL TIMERS: the loadup timer, the loaddown timer, the flowstart timer, the flowstop timer (when the unit is on and the flowstart timer has reached zero), the pumplead timer and the pumplag timer.

2. Press the key to check the compressor timers.

   The controller shows the actual value of the COMPRESSOR TIMERS: the guard timers (one per circuit) and the antirecycling timers (one per circuit).

3. Press the key to check the remaining timers.

   The controller shows the actual value of the STARTUP TIMERS.
Tasks of the safeties menu

**Listing activated safeties and checking the unit status**

If the alarm buzzer is activated and the user presses the ② key, the controller automatically enters the safeties menu.

- The controller will enter the UNIT SAFETY screen of the safeties menu when a unit safety was the cause of shutdown.
- The controller will enter the CIRCUIT 1/2 SAFETY screen of the safeties menu when a safety of the circuit 1/2 was activated.
- For a DICH system, the controller can also show: NETWORK SAFETY PCB COMMUN. PROBLEMS. This occurs when the wrong number of slave units is defined (refer to "Defining the network settings" on page 12) or when a slave unit is missing (because of bad connection or power supply failure). Make sure to define the correct number of slave units and to make correct connections.

**NOTE** You can check the "found" slave units in the 2nd screen of the network menu.

- When the unit is configured with a dual evaporator pump, the controller will enter the DUAL PUMP SAFETY screen of the safeties menu when a safety on the pump was the cause of shutdown.

1. Press the ② key when the alarm buzzer is activated.
   The appropriate safety screen with the basic information appears. Press the ② key to see the detailed information. These screens provide information about the unit status at the moment of shutdown (see "Safeties menu" on page 10).
2. If more than one kind of safety is active (indicated by means of ∧, ∨ or ②), use the ① and ③ keys to consult them.

**Tasks of the input/output menu**

**Checking the status of the inputs and outputs**

The input/output menu provides a means of checking the status of the digital inputs and the status of the relay outputs.

The locked digital inputs are:

- **EMERGENCY STOP**: whether the emergency button has been pressed.
- **FLOW SWITCH**: indicates the status of the flowswitch: activated or deactivated.
- **HIGH PRESSURE SWITCH 1/2**: indicates the actual status of this safety of circuit 1/2.
- **REVERSE PHASE PROTECTOR 1/2**: indicates the actual status of this safety of circuit 1/2.
- **OVERCURRENT 1/2**: indicates the actual status of this safety of circuit 1/2.
- **DISCHARGE THERMAL PROTECTOR 1, DISCHARGE THERMAL PROTECTOR 2**: indicates the actual status of this safety of circuit 1, circuit 2.
- **COMPRESSOR THERMAL PROTECTOR 1/2**: indicates the actual status of this safety of circuit 1/2.

The changeable digital inputs are:

- **CAP LIM 1/2-3/4**: indicates the position of the "enable/disable capacity limitation" switches.
- **DUAL SETPOINT**: indicates the position of the remote dual setpoint switch: setpoint 1 or setpoint 2.
- **REM. ON/OFF**: indicates the position of the remote on/off switch.
- **STATUS**: indicates the position of the connected switch.

The locked relay outputs are:

- **CIRCUIT 1/2 ON**: indicates whether the circuit 1/2 is on or off.
- **CIRCUIT 1/2 STAR**: indicates whether the circuit 1/2 is in starmode or not.
- **CIRCUIT 1/2 DELTA**: indicates whether the circuit 1/2 is in deltamode or not.
- **C1/2 12%**: indicates if the 12% capacity valve of the circuit 1/2 is activated.
- **C1/2 CPUP**: indicates if the UP of the capacity control motor of the circuit 1/2 is activated.
- **C1/2 CPDOWN**: indicates if the DWN of the capacity control motor of the circuit 1/2 is activated.
- **C1/2 FEEDBACK**: indicates the FEEDBACK of the potentiometer of the circuit 1/2 (Ω).
- **C1/2 FANSTEP 1**: indicates if the fans of fanstep 1 for the circuit 1/2 are on or not.
- **C1/2 FANSTEP 2**: indicates if the fans of fanstep 2 for the circuit 1/2 are on or not.
- **C1/2 FANSTEP 3**: indicates if the fans of fanstep 3 for the circuit 1/2 are on or not.
- **PUMP CONTACT**: indicates the status of this voltage free contact. It is activated if the pump should be ON.
- **GEN. ALARM**: indicates the status of this voltage free contact. It is activated if there is any alarm on the unit.
- **EVAP. HEATER**: indicates the status of the evaporator heater.

The changeable relay outputs are:

- **2ND EVAP PUMP**: indicates the status of the second evaporator pump.
- **100% CAPACITY**: indicates when the unit is working at 100%.
- **FREE COOLING**: indicates the status of the 3-way water valve when the unit is in free cooling state.
- **1 (CLOSED)**: indicates the closed status of the changeable digital output.

**Tasks of the history menu**

**Checking the safety info and the unit status after a reset**

The information available in the safeties menu is also stored in the history menu, where it is stored after resetting the unit or the circuit. In this way, the history menu provides a means of checking the unit status at the moment of the latest shutdown.

1. **To check the safety info and the unit status, proceed as follows:**
   - Enter the HISTORY MENU. (Refer to the chapter "How to enter a menu" on page 6.)
   The controller enters the last HISTORY screen which contains basic information of the moment of this shutdown.
   - Press the ① and ③ keys to consult the other present HISTORY screens.
   - Press the ② key to see the detailed information.

**Tasks of the info menu**

**Consulting additional unit information**

1. Enter the INFO MENU through the main menu. (Refer to the chapter "How to enter a menu" on page 6.)
   The controller enters the TIME INFORMATION screen which contains the following information: the time and date.
2. Press ① to consult the first UNIT INFORMATION screen.
   This screen contains information about the unit name and the refrigerant used.
3. Press ③ to consult the next UNIT INFORMATION screen.
   This screen contains information about the controller's software version.
4. Press ② to consult the PCB INFORMATION screen.
   This screen contains information about the PCB.
The changeable analog inputs are:
- SETUP.SIGN. 0mV: indicates the status of the analog input
- SETUP.SIGN. 0-0: indicates the status of the analog input
- SETUP.SIGN. 0R: indicates the status of the analog input
- MS OUT E: indicates the status of the analog input

To check the inputs and outputs, proceed as follows:
1. Enter the I/O STATUS MENU. (Refer to the chapter “How to enter a menu” on page 6.)
   The controller enters the first DIGITAL INPUTS screen.
2. Consult the other screens of the input/output menu using the  or keys.

**Tasks of the user password menu**

**Changing the user password**

Access to the user settings menu and the setpoints menu is protected by the user password (a 4-digit number between 0000 and 9999).

**NOTE** The default user password is 1234.

To change the user password, proceed as follows:
1. Enter the USER PASSWORD MENU. (Refer to the chapter “How to enter a menu” on page 6.)
   The controller will request the password.
2. Enter the correct password using the  and keys.
3. Press  to confirm the password and to enter the password menu.
   The controller requests the new password.
4. Press  to start the modification.
   The cursor is positioned behind NEW PASSWORD.
5. Enter the new password using the  and keys.
6. Press  to confirm the new password.
   When the new password has been confirmed, the controller will ask to enter the new password a second time (for safety reasons). The cursor is positioned behind CONFIRM.
7. Enter the new password again using the  and keys.
8. Press  to confirm the new password.

**NOTE** The actual password will only be changed when the new password and the confirmed password have the same value.
If changed on one of the units in a DICN configuration, this setting is automatically transferred to all the other units in the network.

**Troubleshooting**

This section provides useful information for diagnosing and correcting certain troubles which may occur in the unit.

Before starting the troubleshooting procedure, carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.

Before contacting your local dealer, read this chapter carefully, it will save you time and money.

When carrying out an inspection on the supply panel or on the switch box of the unit, always make sure that the circuit breaker of the unit is switched off.

---

**Overview of safety messages**

<table>
<thead>
<tr>
<th>Message safety menu</th>
<th>Symptom</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT SAFETY</td>
<td>001 EMERGENCY STOP 3</td>
</tr>
<tr>
<td></td>
<td>0041 FLOW HAS STOPPED 5.7</td>
</tr>
<tr>
<td></td>
<td>0041 FREEZE UP 5.8</td>
</tr>
<tr>
<td></td>
<td>0C91 INL E SENSOR ERR 13</td>
</tr>
<tr>
<td></td>
<td>0C91 OUT E SENSOR ERR 13</td>
</tr>
<tr>
<td></td>
<td>0H91 AMB T SENSOR ERR 13</td>
</tr>
<tr>
<td></td>
<td>0U41 PCB E.2 COMM.ERR 14</td>
</tr>
<tr>
<td>CIRCUIT 1 SAFETY</td>
<td>1 UI1 REV PHASE PROT 5.6</td>
</tr>
<tr>
<td></td>
<td>IE3 I HIGH PRESSURE SW 5.3</td>
</tr>
<tr>
<td></td>
<td>IE5 I COMPRESSOR PROT 5.9</td>
</tr>
<tr>
<td></td>
<td>IE6 I OVERCURRENT 5.1</td>
</tr>
<tr>
<td></td>
<td>IF3 I DISCH PROT 5.6</td>
</tr>
<tr>
<td></td>
<td>IE4 L LOW PRESSURE 5.2</td>
</tr>
<tr>
<td></td>
<td>1JH HP TRANS PROT 13</td>
</tr>
<tr>
<td></td>
<td>1JCLP TRANS PROT 13</td>
</tr>
<tr>
<td></td>
<td>193 I CONTR. MOTOR ERR 11</td>
</tr>
<tr>
<td></td>
<td>194 I CONTR. MOTOR FUEL 12</td>
</tr>
<tr>
<td>NETWORK SAFETY</td>
<td>0U41 PCB COMM. PROBLEM 10</td>
</tr>
<tr>
<td></td>
<td>0C91 OUT E SENSOR ERR 13</td>
</tr>
<tr>
<td></td>
<td>0C91 INL E SENSOR ERR 13</td>
</tr>
<tr>
<td>UNIT WARNING</td>
<td>0041 FLOW HAS STOPPED 5.7</td>
</tr>
</tbody>
</table>

When a safety device was activated, stop the unit and find out why the safety device was activated before resetting it. Under no circumstances safety devices may be bridged or changed to a value other than the factory setting. If the cause of the problem cannot be found, call your local dealer.

**Symptom 1: The unit does not start, but the ON LED lights up**

<table>
<thead>
<tr>
<th>Possible causes</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The temperature setting is not correct.</td>
<td>Check the controller setpoint.</td>
</tr>
<tr>
<td>The flowstart timer is still running.</td>
<td>The unit will start after approx. 15 seconds. Make sure that water is flowing through the evaporator.</td>
</tr>
<tr>
<td>The circuit cannot start up.</td>
<td>Refer to Symptom 4: The circuit does not start up.</td>
</tr>
<tr>
<td>Unit is in manual mode (all compressors at 0%).</td>
<td>Check on the controller.</td>
</tr>
<tr>
<td>Power supply failure.</td>
<td>Check the voltage on the supply panel.</td>
</tr>
<tr>
<td>Blown fuse or interrupted protection device.</td>
<td>Inspect fuses and protection devices. Replace by fuses of the same size and type (refer to “Electrical specifications” on page 1).</td>
</tr>
<tr>
<td>Loose connections.</td>
<td>Inspect connections of the field wiring and the internal wiring of the unit. Tighten all loose connections.</td>
</tr>
<tr>
<td>Shorted or broken wires.</td>
<td>Test circuits using a tester and repair if necessary.</td>
</tr>
</tbody>
</table>

**Symptom 2: The unit does not start, but the ON LED is flashing**

<table>
<thead>
<tr>
<th>Possible causes</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The remote ON/OFF input is enabled and the remote switch is off.</td>
<td>Put the remote switch on or disable the remote ON/OFF input.</td>
</tr>
</tbody>
</table>

**Symptom 3: The unit does not start and the ON LED does not light up**

<table>
<thead>
<tr>
<th>Possible causes</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The unit is in failure mode.</td>
<td>Refer to Symptom 5: One of the following safety devices is activated.</td>
</tr>
<tr>
<td>One of the following safety devices is activated:</td>
<td>Refer to Symptom 5: One of the following safety devices is activated.</td>
</tr>
<tr>
<td>- Flowswitch (58L, 59L)</td>
<td></td>
</tr>
<tr>
<td>- Emergency stop</td>
<td></td>
</tr>
<tr>
<td>The ON LED is broken.</td>
<td>Contact your local dealer.</td>
</tr>
</tbody>
</table>
## Symptom 4: The circuit does not start up

### Possible Causes

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>One of the following safety devices is activated:</td>
<td>Check on the controller and refer to Symptom 5.</td>
</tr>
<tr>
<td>• Overcurrent relay (K*S)</td>
<td>Corrective action</td>
</tr>
<tr>
<td>• Compressor thermal protector (Q*M)</td>
<td></td>
</tr>
<tr>
<td>• Overcurrent relay (K*S)</td>
<td></td>
</tr>
<tr>
<td>• Discharge thermal protector (S*PH)</td>
<td></td>
</tr>
<tr>
<td>• Low pressure</td>
<td></td>
</tr>
<tr>
<td>• High pressure switch (S*PH)</td>
<td></td>
</tr>
<tr>
<td>• Reverse phase protector (R*P)</td>
<td></td>
</tr>
<tr>
<td>• Freeze-up</td>
<td></td>
</tr>
</tbody>
</table>

### Corrective Action

The anti-recycling timer is still active. The circuit can only start up after approximately 10 minutes.

The guard timer is still active. The circuit can only start up after approximately 1 minute.

The circuit is limited to 0%. Check the enable/disable capacity limitation remote contact.

### Symptom 5: One of the following safety devices is activated

#### Symptom 5.1: Overcurrent relay of compressor

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure of one of the phases.</td>
<td>Check fuses on the supply panel or measure the supply voltage.</td>
</tr>
<tr>
<td>Untouched.</td>
<td></td>
</tr>
<tr>
<td>Overload of motor.</td>
<td>Reset. If the failure persists, call your local dealer.</td>
</tr>
</tbody>
</table>

**RESET**

Push the blue button on the overcurrent relay inside the switch box and reset the controller.

#### Symptom 5.2: Low pressure

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterflow to water heat exchanger too low.</td>
<td>Increase the waterflow.</td>
</tr>
<tr>
<td>Water flow to the water heat exchanger too low.</td>
<td></td>
</tr>
<tr>
<td>Shortage of refrigerant.</td>
<td>Check for leaks and refill refrigerant. If necessary.</td>
</tr>
<tr>
<td>Insufficient refrigerant.</td>
<td></td>
</tr>
<tr>
<td>Unit is working out of its operation range.</td>
<td>Check the operation conditions of the unit.</td>
</tr>
<tr>
<td>Inlet temperature to the water heat exchanger too low.</td>
<td>Increase the inlet water temperature.</td>
</tr>
<tr>
<td>Dirty evaporator.</td>
<td>Clean the evaporator, or call your local dealer.</td>
</tr>
<tr>
<td>Low pressure safety setting too high.</td>
<td>Refer to the installation manual “Customization in the service menu”, paragraph “Setting of the minimum outlet water temperature” for correct values.</td>
</tr>
<tr>
<td>Flowswitch is not working or no waterflow.</td>
<td>Check the flowswitch and the water pump.</td>
</tr>
</tbody>
</table>

**RESET**

After pressure rise, this safety resets automatically, but the controller still needs to be reset.

#### Symptom 5.3: High-pressure switch

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condenser fan does not operate properly.</td>
<td>Check that the fans turn freely. Clean it necessary.</td>
</tr>
<tr>
<td>Dirty or partially blocked condenser.</td>
<td>Remove any obstacle and clean condenser coil using brush and blower.</td>
</tr>
<tr>
<td>Inlet air temperature of the condenser is too high.</td>
<td>The air temperature measured at the inlet of the condenser may not exceed 43°C.</td>
</tr>
<tr>
<td>Fan turning in the wrong direction.</td>
<td>Two phases of the power supply to the fan motor must be inverted (by a licensed electrician).</td>
</tr>
</tbody>
</table>

**RESET**

After pressure decrease, push the button on the high-pressure switch and reset the controller.

#### Symptom 5.4: Fan thermal protector is activated

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical failure (fan is blocked).</td>
<td>Check that the fan rotates freely.</td>
</tr>
<tr>
<td>Air flow in the unit too low or outdoor temperature too high.</td>
<td>Clean the air heat exchanger properly.</td>
</tr>
</tbody>
</table>

**RESET**

After temperature decrease, the thermal protector is reset automatically. If the protector is activated frequently, replace the motor or call your local dealer.

#### Symptom 5.5: Reverse phase protector is activated

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two phases of the power supply are connected in the wrong phase position.</td>
<td>Invert two phases of the power supply (by licensed electrician).</td>
</tr>
<tr>
<td>One phase is not connected properly.</td>
<td>Check the connection of all phases.</td>
</tr>
</tbody>
</table>

**RESET**

After inverting two phases or fixing the power supply cables properly, the protector is reset automatically, but the controller still needs to be reset.

#### Symptom 5.6: Discharge thermal protector is activated

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit is working outside the operation range.</td>
<td>Check the operation condition of the unit.</td>
</tr>
</tbody>
</table>

**RESET**

After temperature decrease, the thermal protector resets automatically but the controller still needs to be reset.

#### Symptom 5.7: Flowswitch is activated

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>No waterflow or too low waterflow.</td>
<td>Check the water pump and the water circuit for obstructions.</td>
</tr>
</tbody>
</table>

**RESET**

After finding the cause, the flowswitch is reset automatically, but the controller still needs to be reset.

#### Symptom 5.8: Freeze-up protection is activated

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterflow too low.</td>
<td>Increase the waterflow.</td>
</tr>
<tr>
<td>Inlet temperature to the evaporator is too low.</td>
<td>Increase the inlet water temperature.</td>
</tr>
<tr>
<td>Flowswitch is not working or no waterflow.</td>
<td>Check the flowswitch and the water pump.</td>
</tr>
</tbody>
</table>

**RESET**

After temperature increase the freeze-up is reset automatically, but the circuit controller needs to be reset.

#### Symptom 5.9: Compressor thermal protector is activated

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor motor coil temperature too high.</td>
<td>Compressor is not cooled sufficiently by the refrigerant medium.</td>
</tr>
</tbody>
</table>

**RESET**

After temperature decrease the thermal protector is reset automatically, but the circuit controller needs to be reset. If the protector is activated frequently, call your local dealer.

#### Symptom 6: Unit stops soon after operation

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The schedule timer is activated and is in off mode.</td>
<td>Work according to the settings in the schedule timer.</td>
</tr>
<tr>
<td>One of the safety devices is activated.</td>
<td>Check safety devices (refer to Symptom 5. One of the following safety devices is activated).</td>
</tr>
<tr>
<td>Voltage is too low.</td>
<td>Test the voltage in the supply panel and, if necessary, in the electrical compartment of the unit (voltage drop due to supply cables is too high).</td>
</tr>
</tbody>
</table>
**Symptom 7:** Unit runs continuously and the water temperature remains higher than the temperature set on the controller

<table>
<thead>
<tr>
<th>POSSIBLE CAUSES</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>The temperature setting on the controller is too low.</td>
<td>Check and adjust the temperature setting.</td>
</tr>
<tr>
<td>The heat production in the water circuit is too high.</td>
<td>The cooling capacity of the unit is too low. Call your local dealer.</td>
</tr>
<tr>
<td>Waterflow is too high.</td>
<td>Recalculate the waterflow.</td>
</tr>
</tbody>
</table>

**Symptom 8:** Excessive noises and vibrations of the unit

<table>
<thead>
<tr>
<th>POSSIBLE CAUSES</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit has not been fixed properly.</td>
<td>Fix the unit as described in the installation manual.</td>
</tr>
</tbody>
</table>

**Symptom 9:** The display shows NO LINK (only in a DICN system)

<table>
<thead>
<tr>
<th>POSSIBLE CAUSES</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>The addresses set on the PCB or controller are wrong.</td>
<td>Make sure to set the correct addresses. Refer to “Setting the addresses” in the installation manual.</td>
</tr>
</tbody>
</table>

**Symptom 10:** The NETWORK SAFETY message shows PCB COMMUN. PROBLEM

<table>
<thead>
<tr>
<th>POSSIBLE CAUSES</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A unit can not be found by the DICN system.</td>
<td>Make sure all units in the DICN system are powered or make sure the correct number of slaves is defined in the master unit.</td>
</tr>
</tbody>
</table>

**Symptom 11:** The alarm message shows CONTR. MOTOR ERR

<table>
<thead>
<tr>
<th>POSSIBLE CAUSES</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>The control motor is not reacting due to bad wiring to the motor or the motor is damaged.</td>
<td>Check if the wiring to the control motor is correct and not damaged or loose.</td>
</tr>
</tbody>
</table>

**Symptom 12:** The alarm message shows CONTR. MOTOR REV

<table>
<thead>
<tr>
<th>POSSIBLE CAUSES</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>The control motor is operating in reverse due to wrong wiring.</td>
<td>Check if the wiring is according to the wiring diagram.</td>
</tr>
</tbody>
</table>

**Symptom 13:** Sensor or transmitter error

<table>
<thead>
<tr>
<th>POSSIBLE CAUSES</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>The wiring is wrong.</td>
<td>Check if the wiring is according to the wiring diagram. Call your local dealer.</td>
</tr>
</tbody>
</table>

**Symptom 14:** The alarm message shows PCB EXP COMM. ERR

<table>
<thead>
<tr>
<th>POSSIBLE CAUSES</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>The expansion board controller (A11P) can not be found.</td>
<td>Check if the wiring to the expansion board controller (A11P) is according to the wiring diagram. Call your local dealer.</td>
</tr>
</tbody>
</table>

**Maintenance activities**

- **POSSIBLE CAUSES**
  - **CORRECTIVE ACTION**

**Disposal requirements**

**MAINTENANCE**

In order to ensure optimal availability of the unit, a number of checks and inspections on the unit and the field wiring have to be carried out at regular intervals.

If the unit is used for air conditioning application, the described checks must be executed at least once a year. In case the unit is used for other applications, the checks must be executed every 4 months.

Before carrying out any maintenance or repair activity, always switch off the circuit breaker on the supply panel, remove the fuses or open the protection devices of the unit.

Never clean the unit with water under pressure.
ANNEX I

Thermostat parameters

Inlet water temperature control

The figure below shows the thermostat diagram in case of inlet water temperature control.

The default value and the upper and lower limits of the thermostat parameters are listed in the table below.

<table>
<thead>
<tr>
<th>INLET CONTROL</th>
<th>Default value</th>
<th>Lower limit</th>
<th>Upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step difference - a (k)</td>
<td>0.8(a)</td>
<td>––</td>
<td>––</td>
</tr>
<tr>
<td>Step difference - b (k)</td>
<td>0.5(a)</td>
<td>––</td>
<td>––</td>
</tr>
<tr>
<td>Steplength - c (k)</td>
<td>0.2(a)</td>
<td>––</td>
<td>––</td>
</tr>
<tr>
<td>Loadup timer (sec)</td>
<td>48</td>
<td>12</td>
<td>300</td>
</tr>
<tr>
<td>Loaddown timer (sec)</td>
<td>24</td>
<td>12</td>
<td>300</td>
</tr>
<tr>
<td>Setpoint (°C)</td>
<td>12.0</td>
<td>7.0</td>
<td>23.0</td>
</tr>
</tbody>
</table>

(a) can only be modified in the service menu.

<table>
<thead>
<tr>
<th>OUTLET CONTROL</th>
<th>Default value</th>
<th>Lower limit</th>
<th>Upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step difference - a (k)</td>
<td>0.8(a)</td>
<td>––</td>
<td>––</td>
</tr>
<tr>
<td>Step difference - b (k)</td>
<td>0.5(a)</td>
<td>––</td>
<td>––</td>
</tr>
<tr>
<td>Steplength - c (k)</td>
<td>0.2(a)</td>
<td>––</td>
<td>––</td>
</tr>
<tr>
<td>Loadup timer (sec)</td>
<td>12</td>
<td>12</td>
<td>300</td>
</tr>
<tr>
<td>Loaddown timer (sec)</td>
<td>12</td>
<td>12</td>
<td>300</td>
</tr>
<tr>
<td>Setpoint (°C)</td>
<td>7.0</td>
<td>4.0</td>
<td>16.0</td>
</tr>
</tbody>
</table>

(a) can only be modified in the service menu.

- If the temperature is below the setpoint, the thermostat control will check every LOADDOWN TIMER. According to the deviation to the setpoint, no action, slow load down (–3%) or fast load down (–7%) is required.
- If the temperature is above the setpoint, the thermostat control will check every LOADUP TIMER. According to the deviation to the setpoint, no action, slow load up (+3%) or fast load up (+7%) is required.

ANNEX II

Schedule timer example

To come to the schedule above following settings have to be made:

All days assigned to the same group will work according to the settings of this group.

In this example setting:
- all Mondays, Tuesdays, Thursdays and Fridays will work according to the settings in group 1 (G1),
- all Wednesdays will work according to the settings in group 2 (G2),
- all Saturdays and Sundays will work according to the settings in group 3 (G3),
- all holiday days will work according to the settings in the holiday group (H).

All group settings of groups G1, G2, G3, G4 and H work similar as following example (settings for group 1):
ANNEX III

Floating setpoint working

The diagram and table below show the default value and the upper and lower limits of the floating setpoint parameters on the evaporator.

<table>
<thead>
<tr>
<th>Floating setpoint</th>
<th>Default value</th>
<th>Lower limit</th>
<th>Upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum value (°C)</td>
<td>3.0</td>
<td>0.0</td>
<td>5.0</td>
</tr>
<tr>
<td>D1 (°C)</td>
<td>20.0</td>
<td>20.0</td>
<td>43.0</td>
</tr>
<tr>
<td>D2 (°C)</td>
<td>5.0</td>
<td>0.0</td>
<td>10.0</td>
</tr>
</tbody>
</table>

(a) rise in floating setpoint value for 10°C drop in ambient

ANNEX IV

Free cooling working

Free cooling on ambient temperature

<table>
<thead>
<tr>
<th>Free cooling</th>
<th>default</th>
<th>minimum</th>
<th>maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP (°C)</td>
<td>5</td>
<td>-30</td>
<td>25</td>
</tr>
<tr>
<td>DI (°C)</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

Free cooling on difference between inlet water evaporator temperature and ambient temperature

<table>
<thead>
<tr>
<th>Free cooling</th>
<th>default</th>
<th>minimum</th>
<th>maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP (°C)</td>
<td>5</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>DI (°C)</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>