

OEM INSTRUCTION MANUAL

pCO⁵/pGD DIGITAL CONTROLLER

HEAT PUMPS

AirMaster, AquaMaster, EasyMaster, BoxAir

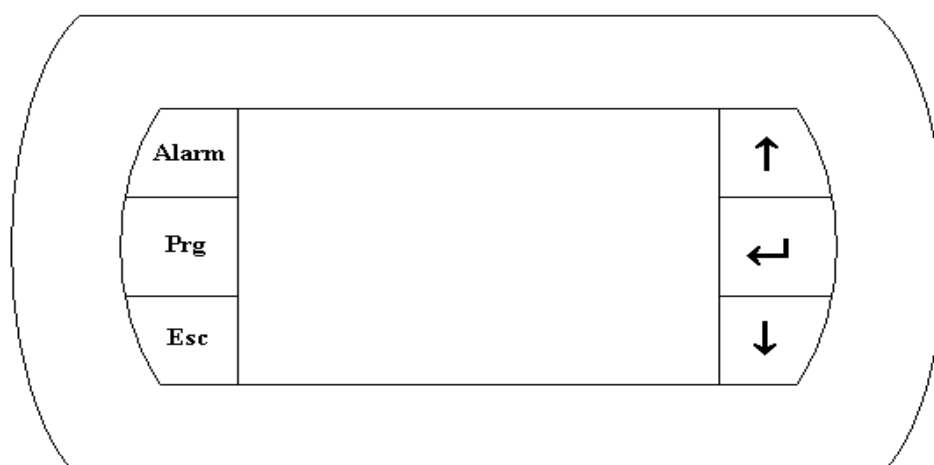


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1 Introduction

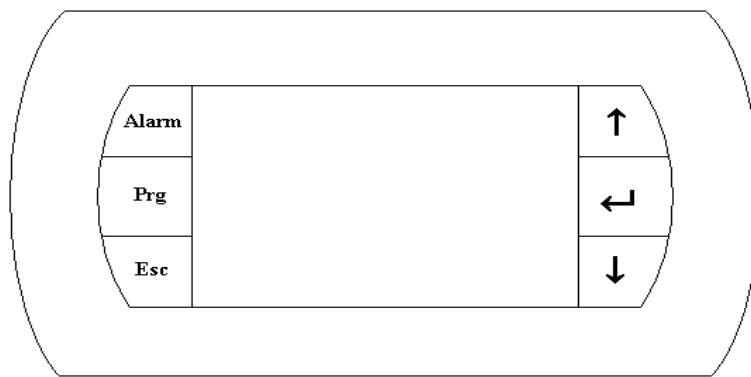
The pCO⁵ electronic controller with the PGD visual display unit is a programmable controller, enabling to control heat pumps.

The product range of heat pumps delivered by Master Therm CZ includes the controllers integrated in AIRMASTER, EASYMASTER, BOXAIR air/water heat pumps and AQUAMASTER water/water heat pumps.

2 Visual display unit

The communication with the regulator is made possible by the visual display unit with graphic display, keyboard, and indicators. It is possible to use the keyboard to take basic control of the heat pump such as:

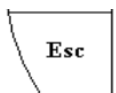
- Setting the mode of operation
- Solving emergency states
- Checking the state of the heat pump (indication of operation, operating temperature)



2.1 Display unit

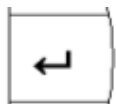
It is the graphic display unit with the resolution of 132x64 pixels. The unit displays operating and configuration parameters.

2.2 Denotation and functions of keyboard keys and backlighting



ESC key

- Is used for escaping from a menu or for jumping one level higher in the menu
- Backlighting indicates that the device is under voltage.



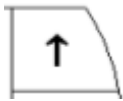
ENT key

- Is used for saving entered parameters and for jumping to another variable indicated on the screen
- Backlighting indicates that the device is under voltage.



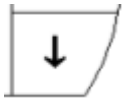
ALARM key

- A short press is designed for entering the alarm displayed
- If backlighting flashes on and off, an alarm is active
- If backlighting is lit steadily, the manual alarm reset is necessary (the same error 3x per hour).



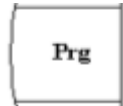
UP key

Moves the cursor up, lists in the menu, increments the parameter value
 - It starts the manual defrosting along with the DOWN key.



DOWN key

- Moves the cursor down, lists in the menu, decrements the parameter value
 - It starts the manual defrosting along with the UP key.



PRG key

- Is used for entering the detailed menu of the controller from the initial display
 - Is used for entering the menu to set up heating circuits (optional)
 - calls in Help in some screens.

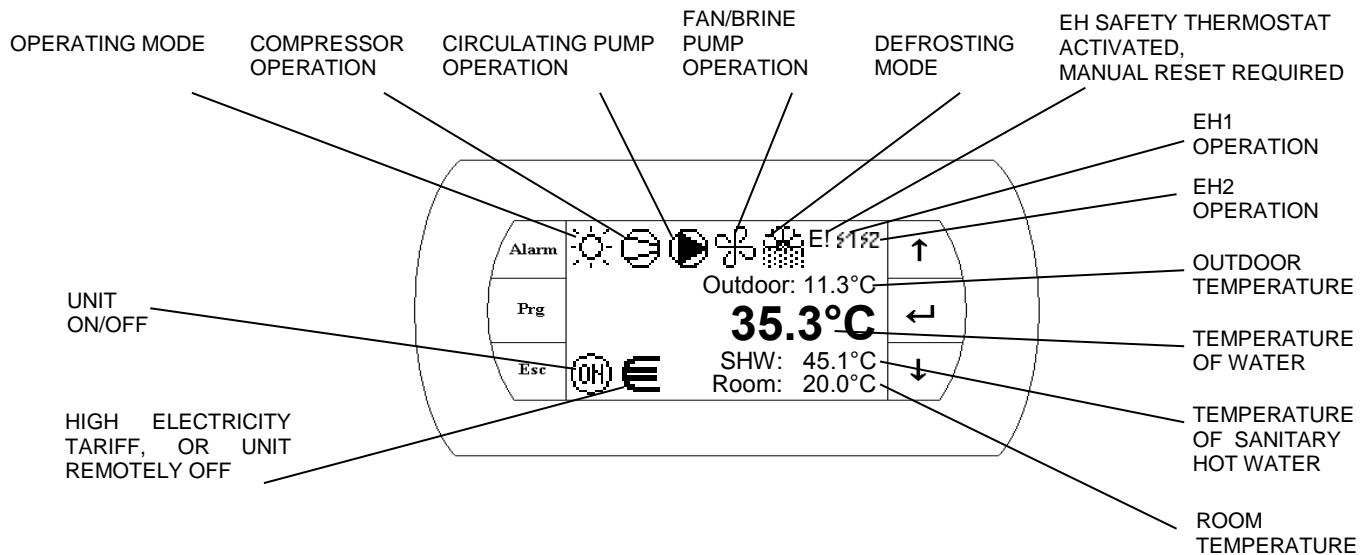
2.3 Language Change

Pressing keys ESC and ENTER simultaneously will change to the next available language.

3 Structure of the menu

3.1 Main screen

This screen is automatically activated after turning the main switch on. The main screen is also automatically activated after escaping from the detail menu of the control unit (ESC key). The main screen indicates the operating condition of the unit. The following icons are displayed in the main screen:



3.1.1 Operating Mode

Following operating modes are possible:

- Heating
- Heating – low outdoor temperature (aux. heaters only, compressor OFF)
- Cooling, or Passive Cooling (GSHP only)
- Cooling with Dew Point protection (no humidity condensation possible)


 Sanitary Hot Water preparation active

 Swimming Pool heating active

—When icon is FLASHING, unit is in the SUMMER MODE.

3.1.2 Compressor Operation

Following compressor indicators are possible:

 Compressor no. 1 in operation

 Compressor no. 2 in operation (2 compressor units only)

 Compressors 1 and 2 in operation (2 compressor units only)

 Recommended Unit Service Inspection

This situation is NOT ALARM and unit continues in normal operation.

After typical compressor time in operation, it is recommended refrigerant circuit service inspection. Typical time is 3000 operating hours, therefore we recommend service inspection in 6 months from service icon appearing.

3.1.3 Pump Operation

Following circulating pump indicators are possible:

 Heating Circulating Pump in operation

—When icon is flashing more than 10s after the circulating pump start, the flow did not start and pump was switched off to protect it from damaging. This situation is called “Pump Alarm”. System tries to restart the pump each compressor off time. This situation is usually connected to “Flow Alarm”, please see the “Alarms” chapter.

3.1.4 Fan/Brine Pump Operation

Following Fan (Air to Water), or Brine Pump (GSHP) indicators are possible

 Fan/Brine Pump in operation

3.1.5 Defrost Mode

Defrost status indication for Air/Water heat pumps.

—Flashing Icon indicates Temperature Condition for Defrost Mode, but minimum time from last defrost cycle has not elapsed

—Permanent Icon indicates Active Defrost Mode.


**During Defrost Mode “Steam/Fog” can appear in the area of outdoor unit.
This is standard behaviour.**


3.1.6 Electric Heater Operation and Safety Thermostat Activated

When the Electric (Auxiliary) Heater Safety Thermostat is activated the icon “E!” will appear on the main screen.

This situation could happen by the overheating of the electric heater, caused by insufficient water pressure in the heating system, or by heating circulation pump malfunction. This problem is also related “FLOW” Alarm.

When this situation occurs, it is necessary to manually reset the Safety Thermostat. Please see the “Troubleshooting” chapter for Safety Thermostat location and reset procedure.

 Heater no 1 in operation

 Heater no 2 in operation

When Icons are **FLASHING**, the system is requesting heater operation, but due to Safety Thermostat activation or “Pump Alarm” heater could not be started. Please reset the Safety Thermostat or fill the water to the heating system.

3.1.7 Outdoor Temperature

The real outdoor temperature is shown on the display in °C.

3.1.8 Temperature of Water

Actual heating water temperature is shown on the display in °C.

3.1.9 Sanitary Hot Water Temperature

When the Heat Pump is configured for preparing of Sanitary Hot Water, the display is showing actual Sanitary Hot Water temperature.


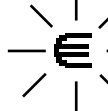
3.1.10 Room Temperature

When the Room Temperature Probe is used, it is shown on the main display.

When Room Terminal (pAD) is used, the temperature is not shown on the main display. In case pAD Room Terminal or, more pADs are used, please see the pAD menu (list using arrow down).

3.1.11 Electricity Teariff / Remote Off

Following situations are possible:

-  High Electricity Tariff is active (where applicable), or unit is Remotely OFF
-  Flashing symbol indicates High Electricity Tariff or Remote OFF, but Compressor operation is configured to ignore the command.

3.1.12 Unit On/Off

Following operators are possible:

 Unit is ON

 Unit is OFF

3.2 Auxiliary screens

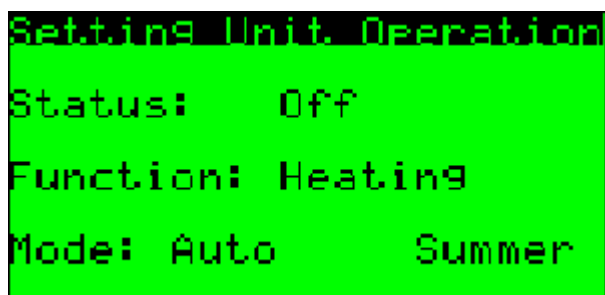
Auxiliary screens can be displayed by pressing the UP or DOWN keys. After the last screen has been displayed, the main screen with icons will be automatically reached when the UP or DOWN keys are pressed.

By pressing the ESC key in any of the auxiliary screens, the main screen with icons will be automatically reached.

Pressing PRG key will cause entering “deeper” menu, enabling more detailed setting.

3.2.1 Setting Unit Operation

This screen indicates the ON/OFF state, HEATING/COOLING function and AUTO/SUMMER/WINTER mode. This screen enables to change the operating mode of the heat pump.



By pressing the ENT key, the cursor moves to a variable that can then be edited with UP and DOWN keys – to change its value. After you have entered a desirable value, it is necessary to confirm it by pressing the ENT key, making the cursor move to another variable. After the last variable on the screen has been edited, the cursor returns to the top left corner of the screen. After that you can use the UP or DOWN keys to move to previous or next screens.

In this case, the unit can be switched from ON to OFF and vice versa, it is possible to change the function of the heat pump into HEATING or COOLING and change the operating mode to AUTO, WINTER, OR SUMMER. The function HEATING/COOLING can only be changed if the state “Status = OFF”.

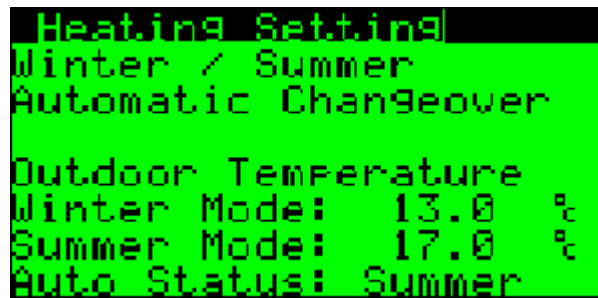
Parameters Setting:

| Parameter: | Range: | Unit | Description |
|------------|-----------------------------|------|---|
| Status | On Off | - | On: unit is ON. Off: unit is OFF. |
| Function | Auto Heating Cooling* | - | Auto: Function is automatically selected according to the Mode setting. Heating: All heating circuits are in operation. Cooling: All cooling circuits are in operation. Heating is disabled with exception of the Sanitary Hot Water and Swimming Pool. Mode is forced to Summer. |
| Mode | Auto Winter Summer | - | Auto: Mode is automatically selected according to the outdoor temperature. Winter: All heating circuits are in operation. Cooling is disabled. Summer: Heating is disabled with exception of the Sanitary Hot Water and Swimming Pool. |

* Cooling is available only for Reversible Heat Pump or GSHP with Passive Cooling Module.

3.2.1.1 Setting Automatic Changeover

Pressing PRG key from previous screen displays mask with automatic changeover.



```

Heating Setting
Winter / Summer
Automatic Changeover

Outdoor Temperature
Winter Mode: 13.0 °C
Summer Mode: 17.0 °C
Auto Status: Summer
  
```

Parameters Setting:

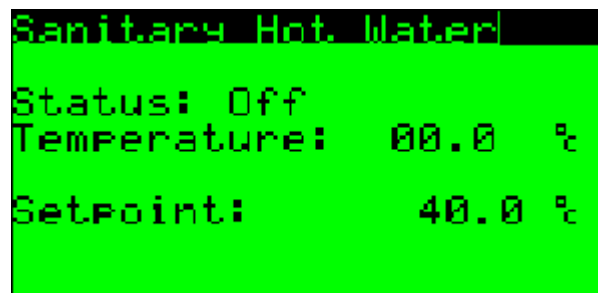
| Parameter: | Range/F.: | Unit | Description |
|-------------|--------------------------|------|--|
| Winter Mode | -20.0 40.0 F:+13.0 | °C | Outdoor temperature for activation of Winter Mode. Below this temperature, Winter Mode is activated. |
| Summer Mode | -20.0 40.0 F:+17.0 | °C | Outdoor temperature for activation of Summer Mode. Above this temperature, Summer Mode is activated. |
| Auto Status | Winter Summer | - | Result of the Automatic Changeover according to the setting above. |

Note: The mode is not changed according to actual outdoor temperature, but rather the “average” outdoor temperature, created inside the controller.

Pressing ESC key, the previous “Setting Unit Operation” screen is displayed.

3.2.2 Sanitary Hot Water

The next auxiliary screen is the Sanitary Hot Water (SHW) main display. This screen is available, when heat pump is configured to prepare SHW.



```

Sanitary Hot Water

Status: Off
Temperature: 00.0 °C
Setpoint: 40.0 °C
  
```

| Parameter: | Range/F.: | Unit | Description |
|-------------|--------------|------|---|
| Status | On Off | - | On: SHW function is activated. Off: SHW function is not activated. |
| Temperature | - | °C | Actual SHW temperature.. |
| Setpoint | 0 45(60*) | °C | Requested SHW temperature set by user. |

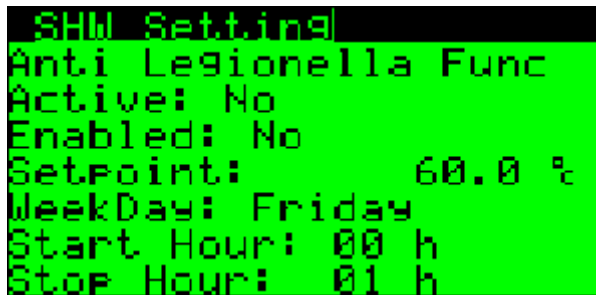
* When setpoint is higher than 45°C, it is possible, the electric heater will be activated to reach the requested temperature.

3.2.2.1 Antibacteria (Legionella) Function

Using PRG from previous screen, the Antilegionella setting screen is shown. Legionella is bacteria, generally present in tap cold water in small quantity. Small quantity is not dangerous for humans. When tap water temperature is in range between 25°C to 35°C, the Legionella bacteria is reproducing exponentially. When this temperature range is maintained for long period of time, the quantity of bacteria in some cases could reach level dangerous for humans in case of inhalation. This could happen an example during showering. Legionella could cause disease similar to pneumonia. Although the risk for healthy human is very low, it is dangerous for humans with decreased immunity.

From reasons listed above, we recommend to keep the SHW setpoint around 45°C (not lower than 40°C), when bacterial growth is 0 or very low.

Anyway it is possible to enable “Antilegionella” function. When function is enabled, the SHW setpoint is weekly automatically increased and maintained for programmed period of time. Sufficient is the temperature 60°C, that kills all Legionella bacteria present in the water in a few minutes.



```

SHW Settings
Anti Legionella Func
Active: No
Enabled: No
Setpoint: 60.0 °C
WeekDay: Friday
Start Hour: 00 h
Stop Hour: 01 h
  
```

| Parameter: | Range/F.: | Unit | Description |
|------------|--------------------|------|--|
| Active | No Yes | - | Showing the antibacterial function is actually in operation. |
| Enabled | No Yes F: No | - | Enabling the function. No: Function is not enabled. Yes: Function is enabled. |
| Setpoint | 0 65* | °C | Requested SHW temperature set for Antilegionella function by user. |
| WeekDay | Mo-Su F: Friday | - | Day of the week for function activation. |
| Start Hour | 0-23 F: 0 | h | Start hour of the increased SHW setpoint. |
| Stop Hour | 0-23 F: 2 | h | Stop hour of the increased SHW setpoint. We recommend 1 hour of time for each 100 l of the SHW tank volume. Example: SHW tank volume is up to 200 l . We recommend 2 hour period. SHW tank volume is 300 l . We recommend 3 hour period. |

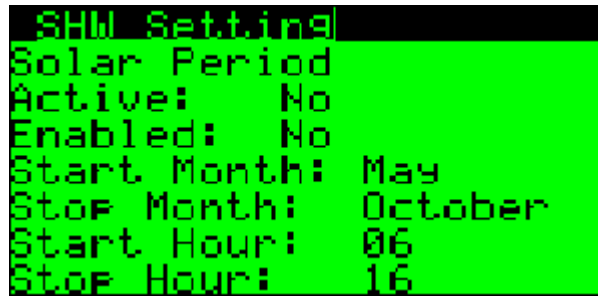
* Cause the setpoint is higher than 45°C, it is possible, the electric heater will be activated to reach the requested temperature.

Note: For correct function, the heat pump must be equipped with internal or external electric heater or gas boiler.

Using ESC key returns to the Main SHW display. Using UP/DOWN keys lists in SHW menu.

3.2.2.2 Solar Period function

Function to block SHW preparation by the heat pump according to simple timer setting.



| Parameter: | Range/F.: | Unit | Description |
|-------------|-----------|------|--|
| Active | Yes No | - | Yes: unit is in Solar Period No: unit is in normal mode |
| Enabled | Yes No | - | Yes: function is enabled No: function is disabled |
| Start Month | Jan-Dec | - | Month to start function |
| Stop Month | Jan-Dec | - | Month to stop function |
| Start Hour | 00-23 | h | Hour of the day to start function |
| Stop Hour | 00-23 | h | Hour of the day to stop function |

Simply set the timer to block SHW preparation to allow solar thermal energy heat up the SHW.

Using ESC key returns to the Main SHW display. Using UP/DOWN keys lists in SHW menu.

3.2.3 Heating/Cooling

This display informs about the main heat pump heating/cooling circuit status and enables the Automatic or Manual circuit operation.

```

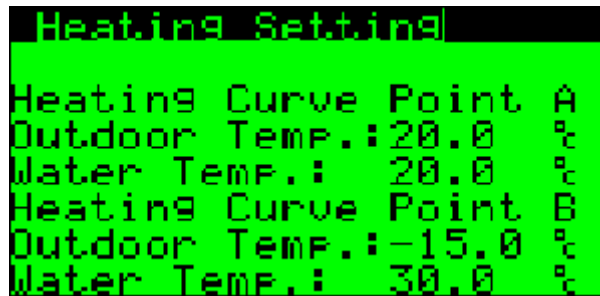
Heating/Cooling
Room Temperature
Requested:      20.00 °C
Actual:        00.0 °C
Water Temperature
Requested: 00.0 / 00.0 °C
Actual:       36.0 °C
Mode: Auto    00.0
  
```

| Parameter: | Range/F.: | Unit | Description |
|------------------------------|---------------------------|------|---|
| Room Temperature Requested | 6.0 32.0 F: 20.0 | °C | Requested Room temperature set by user. When Room probe is not used, this value is considered to adjust the water temperature. When pAD room terminal is used, entered value is automatically transferred to the pAD and vice versa. |
| Room Temperature Actual | -99.9 99.9 | °C | If room temperature probe is used or pAD room terminal is used, this value is showing the real room temperature (Main Zone) |
| Water Temperature Requested | -99.9 99.9 | °C | xx.x: The first value is the requested temperature according to the weather compensation setting of the main heating/cooling circuit. /xx.x: The second value is the result of all requests from the other heating/cooling circuits and exactly the real requested setpoint for Heat Pump. |
| Water Temperature Actual | -99.9 99.9 | °C | Actual heating/cooling water temperature. |
| Mode | Auto Manual F: Auto | - | Auto: Automatic operation according to the setting of the main weather compensation curve. Manual: Manual operation according to entered value. |
| Manual Requested Temperature | *-99.9 99.9 | °C | Requested heating/cooling water temperature set by user. |

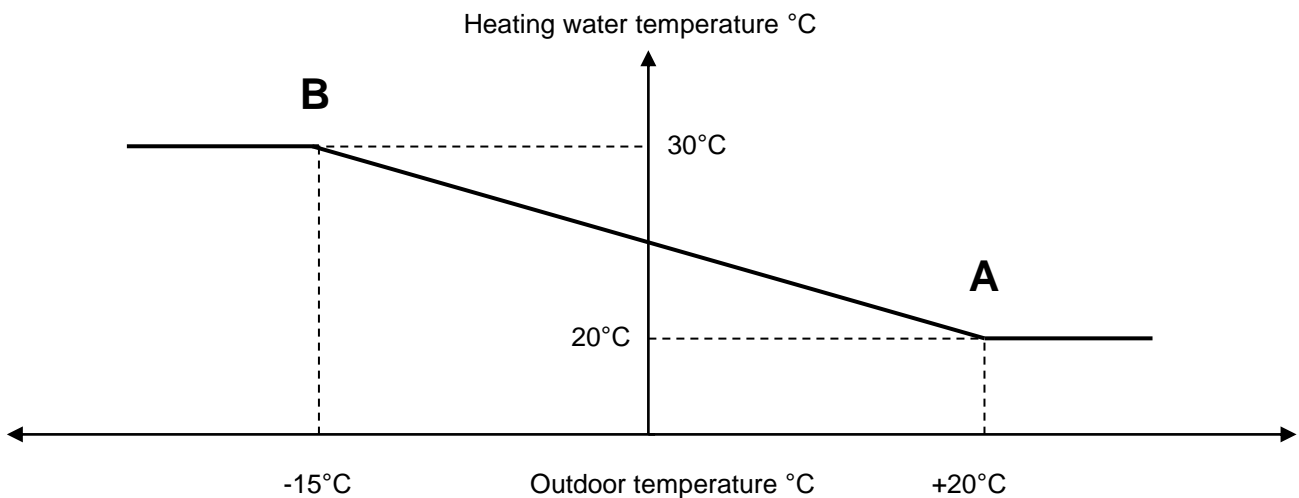
* The real temperature range is limited according to the setting during commissioning.

3.2.3.1 Heating Setting

Pressing PRG from previous screen will show Main Heating Weather Compensation Setting display.



Weather compensation parameters could be shown on following picture:



| Parameter: | Range/F.: | Unit | Description |
|-----------------------------|---------------------------|------|---|
| Point A Outdoor Temperature | -20.0 30.0 F: 20.0 | °C | Point A, outdoor temperature definition. |
| Point A Water Temperature | *20.0 47.5 F: 20.0 | °C | Point A, water temperature definition. Requested heating water temperature for defined Point A outdoor temperature. 20.0°C is typical setting for Under Floor Heating (UFH) and Radiators. |
| Point B Outdoor Temperature | -20.0 30.0 F: -15.0 | °C | Point B, outdoor temperature definition. |
| Point B Water Temperature | *20.0 47.5 F: 30.0 | °C | Point B, water temperature definition. Requested heating water temperature for defined Point B outdoor temperature. 30.0°C is typical setting for UFH. 40.0°C is typical setting for Radiators. |

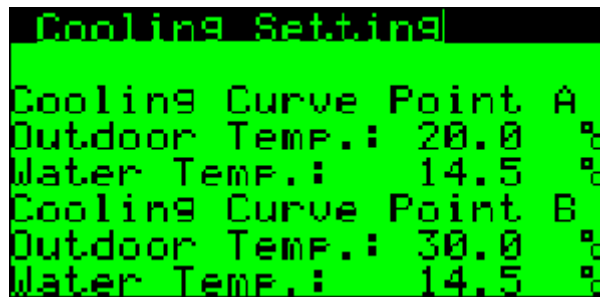
* The real temperature range is limited according to the setting during commissioning.

Use ESC key for return to previous display.

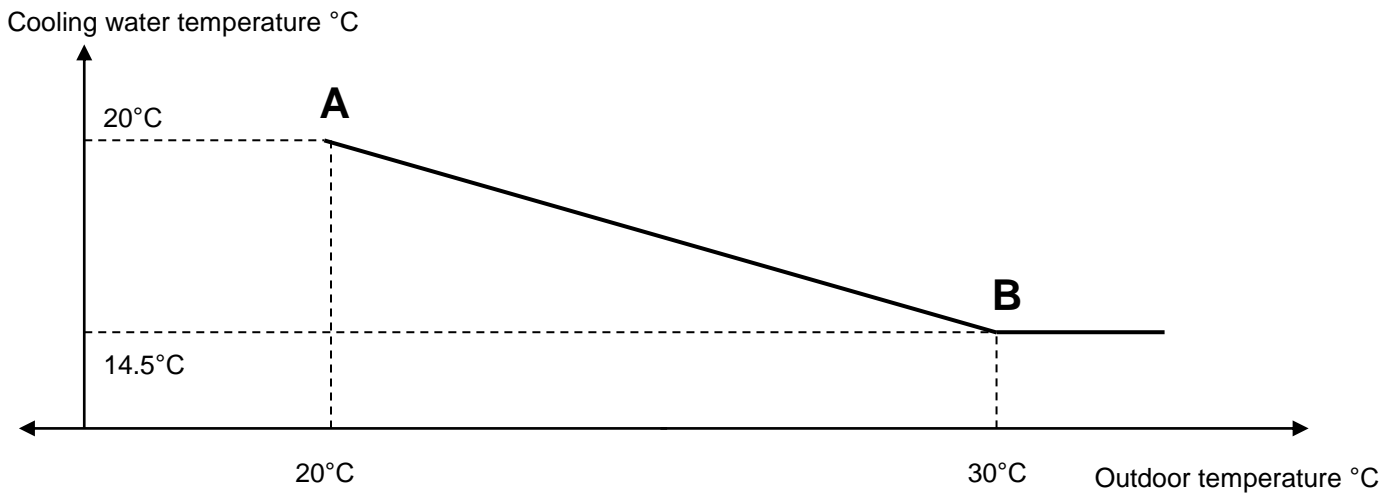
Use UP or DOWN key to reach the "Cooling Setting", for units with Cooling, or Passive Cooling only.

3.2.3.2 Cooling Setting

This display is available only for units with Cooling, or Passive Cooling (Optional Equipment). Display enables setting of the Main Cooling Weather Compensation.



Weather compensation parameters could be shown on following picture:



| Parameter: | Range/F.: | Unit | Description |
|-----------------------------|--------------------------|------|--|
| Point A Outdoor Temperature | 10.0 40.0 F: 20.0 | °C | Point A, outdoor temperature definition. |
| Point A Water Temperature | *14.5 30.0 F: 14.5 | °C | Point A, water temperature definition. Requested cooling water temperature for defined Point A outdoor temperature. 20.0°C is typical setting for Under Floor Heating (UFH) and FanCoils. |
| Point B Outdoor Temperature | 10.0 40.0 F: 30.0 | °C | Point B, outdoor temperature definition. |
| Point B Water Temperature | *14.5 30.0 F: 14.5 | °C | Point B, water temperature definition. Requested cooling water temperature for defined Point B outdoor temperature. 18.0°C is typical setting for UFH. 14.5°C is typical setting for FanCoils. |

* The real temperature range is limited according to the setting during commissioning. Additional limitation is possible due to the Dew Point protection if it is activated.

Use ESC key for return to the display Heating/Cooling.

3.2.4 Room Terminal pADxx

When pAD room terminal is installed, following display automatically appears in the menu.

```

pAD 01 Room Terminal
On/Off: PERMANENT OFF
Mode: None
Setpoint: 00.0°C
Temperature: 00.0°C
Rel.Humidity: 000%
  
```

Parameter could be adjusted directly on pAD room terminal or remotely on pGD display using this mask.

| Parameter: | Range/F.: | Unit | Description |
|---------------|------------------------------------|------|--|
| pAD | 01, 11-16 | - | pAD Identification Number. This Parameter is not adjustable. It is given by pAD Hardware Address. 01: Main Zone Room Terminal 11: Heating Circuit 1 Room Terminal 12: Heating Circuit 2 Room Terminal 13: Heating Circuit 3 Room Terminal 14: Heating Circuit 4 Room Terminal 15: Heating Circuit 5 Room Terminal 16: Heating Circuit 6 Room Terminal |
| On/Off | Permanent OFF OFF ON | - | Permanent OFF: Terminal is permanently OFF and heating/cooling of the zone is disabled. OFF: Terminal is OFF by the scheduler and heating/cooling of the zone is temporarily disabled. ON: Terminal is ON and heating/cooling of the zone is enabled. |
| Mode | Winter Summer | - | For pAD 01 it has the same meaning like the main Mode of the Heat Pump. When unit is equipped with cooling or passive cooling, with Mode change also Function is changed. For pAD11 to 16, the Mode setting has no effect and Mode is forced according to the Heat Pump Mode. Heat Pump has priority to pAD11 to 16. |
| Setpoint | 6.0 to 32.0 | °C | Requested Room Temperature set by user. |
| Temperature | -99.9 to 99.9 | °C | Real Room Temperature |
| Rel. Humidity | 0-100 | % | Real Room Relative Humidity |

Note: Terminal **pAD 01** – Main Room Terminal has absolute priority if it is installed.

Using PRG key enters detailed pAD setting menu.

3.2.4.1 pADxx Status

This mask is accessible pressing PRG key from the pADxx display.

```

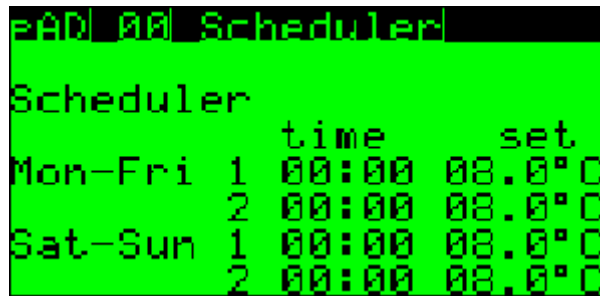
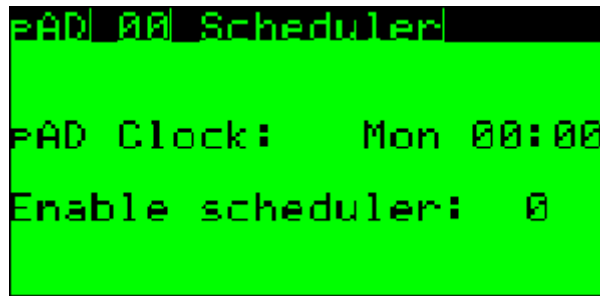
pAD 00 Status
Sleep Time: 0 Hour(s)
Setpoint Sleep: 00.0 °C
Temperature: 00.0°C
Rel. Humidity: 000 %
  
```

| Parameter: | Range/F.: | Unit | Description |
|----------------|---------------|------|--|
| pAD | 01, 11-16 | - | pAD Identification Number. This Parameter is not adjustable. It is given by pAD Hardware Address. 01: Main Zone Room Terminal 11: Heating Circuit 1 Room Terminal 12: Heating Circuit 2 Room Terminal 13: Heating Circuit 3 Room Terminal 14: Heating Circuit 4 Room Terminal 15: Heating Circuit 5 Room Terminal 16: Heating Circuit 6 Room Terminal |
| Sleep Time | 0-9 | h | Remaining time of the pAD Sleep Function. |
| Setpoint Sleep | 6.0 – 32.0 | °C | Room Temperature Setpoint for pAD Sleep Function. Temporary Room Setpoint for the Sleep Time set. When Sleep Time elapses, Setpoint is returned to standart value set on the pAD. |
| Temperature | -99.9 to 99.9 | °C | Real Room Temperature |
| Rel. Humidity | 0-100 | % | Real Room Relative Humidity |

ESC key returns to pADxx Room Terminal display.
Using UP/DOWN keys lists in the pAD menu.

3.2.4.2 pADxx Scheduler

Scheduler setting consists of 2 displays.

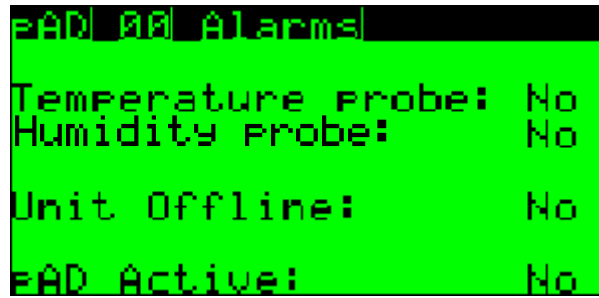


| Parameter: | Range/F.: | Unit | Description |
|------------------------|------------------------------------|--------------|--|
| pAD | 01, 11-16 | - | pAD Identification Number. This Parameter is not adjustable. It is given by pAD Hardware Address. 01: Main Zone Room Terminal 11: Heating Circuit 1 Room Terminal 12: Heating Circuit 2 Room Terminal 13: Heating Circuit 3 Room Terminal 14: Heating Circuit 4 Room Terminal 15: Heating Circuit 5 Room Terminal 16: Heating Circuit 6 Room Terminal |
| pAD Clock | Mo-Su 00:00-23:59 | d h:m | pAD actual time. Time is automatically synchronized with the main controller. |
| Enable Scheduler | 0 1 | - | 0: Scheduler is not enabled. 1: Scheduler is enabled. |
| Mon-Fri time 1 2 | 00:00-23:59 00:00-23:59 | h:m h:m | Start time of the first time zone for Monday to Friday. Start time of the second time zone for Mo to Fr. |
| Mon-Fri set 1 2 | Off/6.0-32.0/On Off/6.0-32.0/On | °C/- °C/- | Room Setpoint, or simple On/Off request for TZ 1. Room Setpoint, or simple On/Off request for TZ 2. |
| Sat-Sun time 1 2 | 00:00-23:59 00:00-23:59 | h:m h:m | Start time of the first time zone for Sat - Sun. Start time of the second time zone for Sat - Sun. |
| Sat-Sun set 1 2 | Off/6.0-32.0/On Off/6.0-32.0/On | °C/- °C/- | Room Setpoint, or simple On/Off request for TZ 1. Room Setpoint, or simple On/Off request for TZ 2. |

ESC key returns to pADxx Room Terminal display.
Using UP/DOWN keys lists in the pAD menu.

3.2.4.3 pADxx Alarms

If pAD is in Alarm Status it is possible to see it on this display.



| Parameter: | Range/F.: | Unit | Description |
|-------------------|-----------|------|--|
| pAD | 01, 11-16 | - | pAD Identification Number. This Parameter is not adjustable. It is given by pAD Hardware Address. 01: Main Zone Room Terminal 11: Heating Circuit 1 Room Terminal 12: Heating Circuit 2 Room Terminal 13: Heating Circuit 3 Room Terminal 14: Heating Circuit 4 Room Terminal 15: Heating Circuit 5 Room Terminal 16: Heating Circuit 6 Room Terminal |
| Temperature Probe | No Yes | - | No: Temperature probe is not in alarm. Yes: Temperature probe has active alarm. Contact Your installation company, pAD must be replaced. |
| Humidity Probe | No Yes | - | No: Humidity probe is not in alarm. Yes: Humidity probe has active alarm. Contact Your installation company, pAD must be replaced. |
| Unit Offline | No Yes | - | No: Unit is Online, no alarm. Yes: Unit is Offline = alarm Please check proper pAD location in the plastic frame on the wall. If the position is correct, please contact installation company. |

ESC key returns to pADxx Room Terminal display.

Using UP/DOWN keys lists in the pAD menu.

3.2.5 Heating Circuits

When additional Heating/Cooling Circuit or more Heating/Cooling Circuits are enabled during commissioning, following display(s) appears in the menu.

```

HCx1 -HHHHH
Status: Off
Room Temperature
Rq/Ac: 20000 /00.0 °C
Water Temperature
Rq/Ac: 00.0 /00.0 °C
Pump: Off Servo:000.0%
Mode: Auto 00.0
  
```

This display informs about the additional heating/cooling circuit status and enables the Automatic or Manual circuit operation.

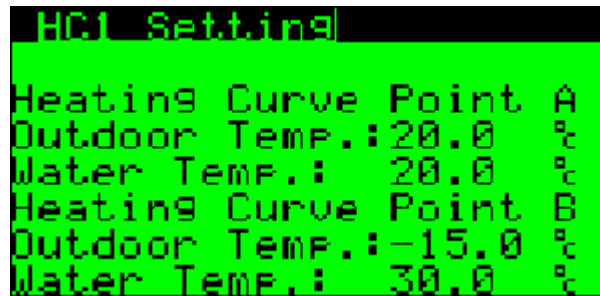
| Parameter: | Range/F.: | Unit | Description |
|------------------------------|---------------------------|------|---|
| HCx | 1-6 | - | Heating Circuit (HC) Identification |
| ----- | alphanumerical | - | Up to 6 characters for customized HC name |
| Room Temperature Rq | 6.0 32.0 F: 20.0 | °C | Requested Room temperature set by user. When Room probe is not used, this value is considered to adjust the water temperature. When pAD room terminal is used, entered value is automatically transferred to the pAD and vice versa. |
| Room Temperature Ac | -99.9 99.9 | °C | If room temperature probe is used or pAD room terminal is used, this value is showing the actual room temperature of the HCx Zone |
| Water Temperature Rq | -99.9 99.9 | °C | xx.x: The first value is the requested temperature according to the weather compensation setting of the main heating/cooling circuit. /xx.x: The second value is the result of all requests from the other heating/cooling circuits and exactly the real requested setpoint for Heat Pump. |
| Water Temperature Ac | -99.9 99.9 | °C | Actual HCx heating/cooling water temperature. |
| Pump | Off On | - | Off: HCx relay (pump) is not running. On: HCx relay (pump) is running. |
| Servo | 0-100.0 | % | Mixing valve position. |
| Mode | Auto Manual F: Auto | - | Auto: Automatic operation according to the setting of the main weather compensation curve. Manual: Manual operation according to entered value. |
| Manual Requested Temperature | *-99.9 99.9 | °C | Requested heating/cooling water temperature set by user. |

* The real temperature range is limited according to the setting during commissioning.

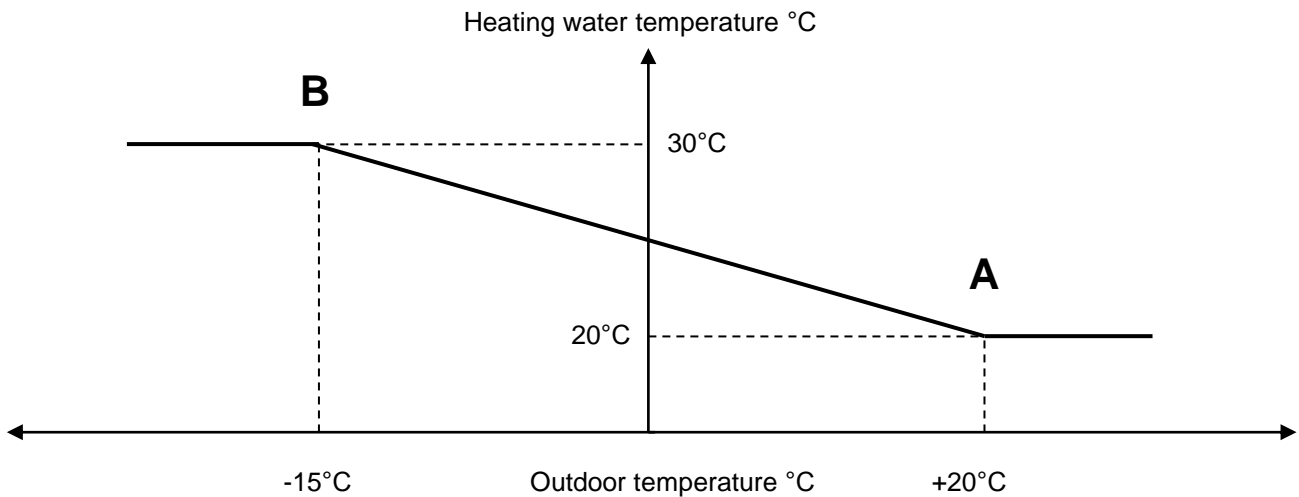
Key PRG opens Weather Compensation Curve setting for HCx.

3.2.5.1 HCx Heating Curve Setting

Pressing PRG from previous screen will show Main Heating Weather Compensation Setting display for Heating Circuit (HCx).



Weather compensation parameters could be shown on following picture:



| Parameter: | Range/F.: | Unit | Description |
|-----------------------------------|---------------------------|------|---|
| Point A Outdoor Temperature | -20.0 30.0 F: 20.0 | °C | Point A, outdoor temperature definition. |
| Point A Water Temperature | *20.0 47.5 F: 20.0 | °C | Point A, water temperature definition. Requested heating water temperature for defined Point A outdoor temperature. 20.0°C is typical setting for Under Floor Heating (UFH) and Radiators. |
| Point B Outdoor Temperature | -20.0 30.0 F: -15.0 | °C | Point B, outdoor temperature definition. |
| Point B Water Temperature | *20.0 47.5 F: 30.0 | °C | Point B, water temperature definition. Requested heating water temperature for defined Point B outdoor temperature. 30.0°C is typical setting for UFH. 40.0°C is typical setting for Radiators. |

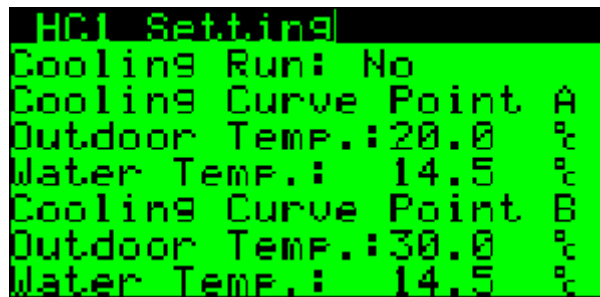
* The real temperature range is limited according to the setting during commissioning.

Use ESC key for return to previous display, HCx.

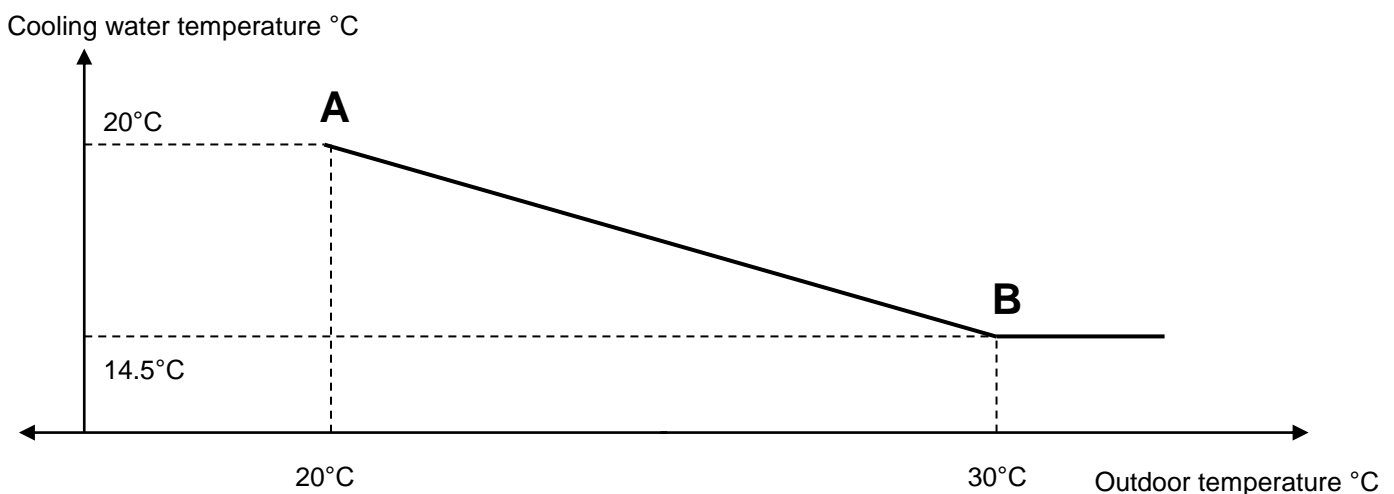
Use UP or DOWN key to reach the "HC1 Cooling Curve Setting", for units with Cooling, or Passive Cooling only.

3.2.5.2 HCx Cooling Curve Setting

This display is available only for units with Cooling, or Passive Cooling (Optional Equipment). Display enables setting of the HCx Cooling Weather Compensation.



Weather compensation parameters could be shown on following picture:



| Parameter: | Range/F.: | Unit | Description |
|-----------------------------|--------------------------|------|--|
| Cooling Run: | No Yes | - | No: HCx is not operating in Cooling Function. Yes: HCx is operating in Cooling Function |
| Point A Outdoor Temperature | 10.0 40.0 F: 20.0 | °C | Point A, outdoor temperature definition. |
| Point A Water Temperature | *14.5 30.0 F: 14.5 | °C | Point A, water temperature definition. Requested cooling water temperature for defined Point A outdoor temperature. 20.0°C is typical setting for Under Floor Heating (UFH) and FanCoils. |
| Point B Outdoor Temperature | 10.0 40.0 F: 30.0 | °C | Point B, outdoor temperature definition. |
| Point B Water Temperature | *14.5 30.0 F: 14.5 | °C | Point B, water temperature definition. Requested cooling water temperature for defined Point B outdoor temperature. 18.0°C is typical setting for UFH. 14.5°C is typical setting for FanCoils. |

* The real temperature range is limited according to the setting during commissioning. Additional limitation is possible due to the Dew Point protection if it is activated.

Use ESC key for return to previous display, HCx.

3.2.5.3 HCx Custom Name

Following display enables setting of the Custom Name for Heating Circuit.



Each dash could be substituted by alphanumerical character.

Example: "1FLOOR"

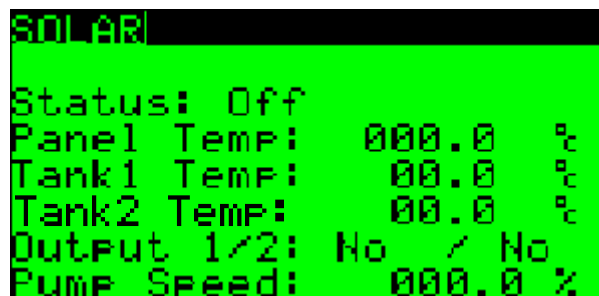
This HCx "Name" appears on the main HCx mask.

3.2.5.4 Heating/Cooling Circuits (HCx) General Principle

- It is possible to enable up to 6 heating/cooling circuits
- As the heating/cooling circuits are configured during commissioning, requested setpoints with corresponding offsets are automatically transferred to the Main Heating/Cooling Circuit (Heat Pump)
- Heat Pump is always supplying highest temperature requested in the Heating Function and the lowest temperature requested in the Cooling Function, up to it's absolute limits.
- Each circuit could be equipped with pAD Room Terminal, which enables Scheduler and automatic water temperature adjusting to reach requested Room (Zone) temperature.

3.2.6 Solar

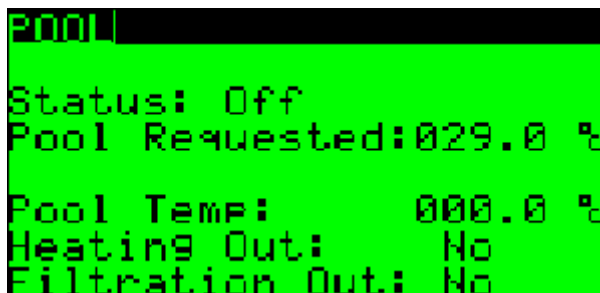
When Solar Thermal control is enabled, following display appears in the menu.



| Parameter: | Range/F.: | Unit | Description |
|--------------------|----------------|------|--|
| Status | Off On | - | Off: Control is disabled by the user. On: Control is enabled by the user. |
| Panel Temperature | -50.0 150.0 | °C | Real Solar Panel temperature |
| Tank 1 Temperature | -50.0 99.9 | °C | Real Storage Tank water temperature charged by Solar Thermal system. |
| Tank 2 Temperature | -50.0 99.9 | °C | Real Storage Tank no.2, or additional demand side water temperature charged by Solar Thermal system. This value is shown only, when Storage Tank no.2 or additional demand side is configured (an example Swimming Pool) |
| Output 1/2 | No, Yes | - | Relay Output no.1, or 2 status. No=Off, Yes=On |
| Pump Speed | 0-100.0 | % | Pump Speed, when Pump with variable speed is used. |

3.2.7 Swimming Pool

When Swimming Pool control is enabled, following screen appears in the menu.

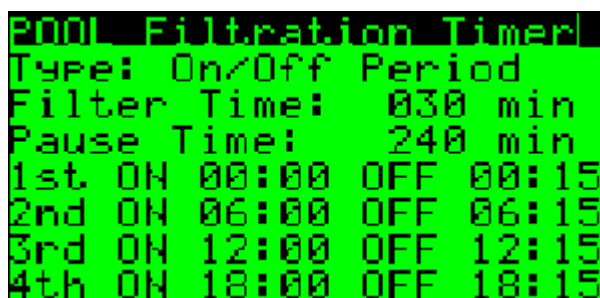


| Parameter: | Range/F.: | Unit | Description |
|----------------------------|---------------|------|--|
| Status | Off On | - | Off: Control is disabled by the user. On: Control is enabled by the user. |
| Pool Requested Temperature | 0.0 99.9 | °C | Requested Swimming Pool water temperature set by user. |
| Pool Temperature | -50.0 99.9 | °C | Real Swimming Pool water temperature. |
| Heating Out | No Yes | - | Yes: Swimming Pool heating is in operation |
| Filtration Out | No Yes | - | Yes: Filtration Pump in operation. |

Press PRG for additional Swimming Pool setting.

3.2.7.1 Pool Filtration Timer Setting

This display enables swimming pool filtration configuration.

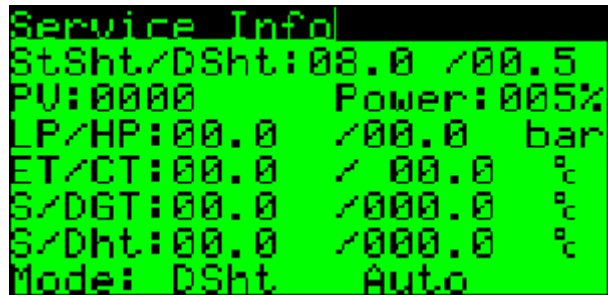


| Parameter: | Range/F.: | Unit | Description |
|---|----------------------------|------|---|
| Type | On/Off Period Scheduler | - | On/Off Period: Filtration pump is activated according to the Filter/Pause Time principle. Scheduler: Filtration pumps is activated according to the Scheduler. |
| Filter Time | 0 999 | min | Filtration pump run period. |
| Pause Time | 0 999 | min | Filtration pump stop period. |
| 1 st , 2 nd , 3 rd , 4 th ON/OFF | 00:00 23:59 | h:m | 1st, 2nd, 3rd and 4th On/Off time scheduler definition. |

Key ESC returns to the POOL mask.

3.2.8 Service Info

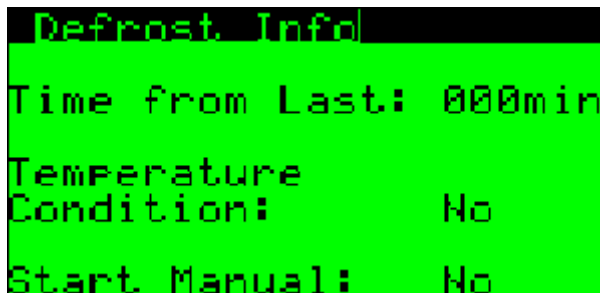
This is information display with refrigerant circuit operating parameters.



| Parameter: | Range/F.: | Unit | Description |
|------------|----------------|------|--|
| StSht | -99.9 99.9 | °C | Suction Superheat Setpoint. |
| StDSht | -99.9 99.9 | °C | Discharge Superheat Setpoint. |
| PV | 0 9999 | - | Electronic Expansion Valve Position. |
| Power | 0 100 | % | Electronic Expansion Valve capacity request. |
| LP/HP | -1.0 45.0 | bar | Actual Compressor Suction / Discharge Pressure. |
| ET/CT | -50.0 99.9 | °C | Actual Evaporating/Condensing Temperature. |
| S/DGT | -50.0 150.0 | °C | Actual Suction / Discharge Gas Temperature. |
| S/Dht | -50.0 99.9 | °C | Actual Suction / Discharge Superheat. |
| Mode | SSht DSht | °C | Actual Control type. SSht: Suction Superheat Control DSht: Discharge Superheat Control |

3.2.8.1 Defrost Info (Air/Water units only)

Pressing PRG key on previous screen opens Defrost Info mask.



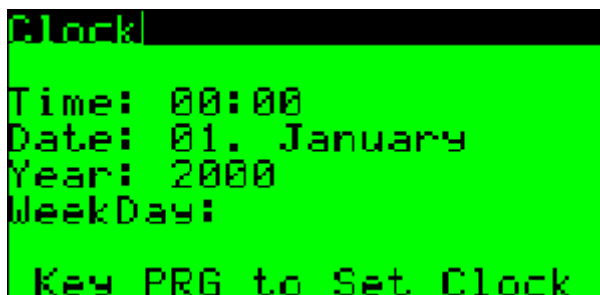
```

Defrost Info
Time from Last: 000min
Temperature
Condition:      No
Start Manual:   No
  
```

| Parameter: | Range/F.: | Unit | Description |
|-----------------------|------------|------|---|
| Time from Last Cycle | 000 200 | Min | Shows time from last defrost cycle. When period is longer than 200 minutes, the value is not increasing. |
| Temperature Condition | No Yes | - | Informs, if temperature condition starting the defrost cycle is met. |
| Start Manual | No Yes | - | When Temperature Condition is met, it is possible to manually activate the defrost cycle and bypass the minimum time between 2 defrost cycles, usually set to 45 minutes. |

3.2.9 Clock

Clock screen is the Last screen of the Auxiliary Menu.



```

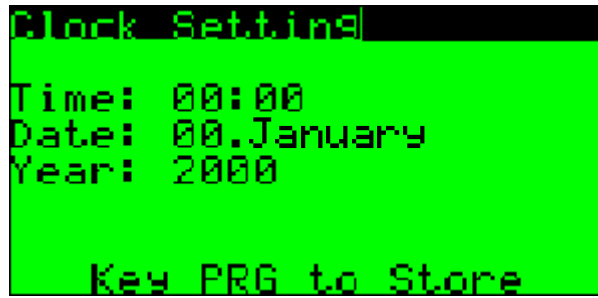
Clock
Time: 00:00
Date: 01. January
Year: 2000
WeekDay:
Key PRG to Set Clock
  
```

| Parameter: | Range/F.: | Unit | Description |
|------------|-----------------------------|------|--|
| Time | 00:00 23:59 | h:m | Shows actual hours and minutes of the day. |
| Date | 01. January 31. December | - | Day of the month and month. |
| Year | 2000 2099 | - | Shows actual year. |
| WeekDay | Monday Sunday | - | Shows day of the week. |

Press PRG to set the Clock.

3.2.9.1 Setting the Clock

This display appears after pressing PRG key on previous screen.



| Parameter: | Range/F.: | Unit | Description |
|------------|-----------------------------|------|-----------------------------------|
| Time | 00:00 23:59 | h:m | Setting of the new time. |
| Date | 01. January 31. December | - | Setting of the new day and month. |
| Year | 2000 2099 | - | Setting of the new year. |

Important: After setting the new values press **PRG** key to **STORE** them, otherwise the new setting is lost.

Note: New clock setting is automatically distributed into pAD terminals.

3.2.9.2 Setting the Daylight Saving Time

This mask enables setting the automatic Daylight Saving Time (DST) changeover. Mask could be reached using UP/DOWN keys from previous screen.

```

Clock Setting
SWZ:
DST:                ENABLE
Transition time:000min
Start:--EAST ***
in ---             at 00.00
End:  --EAST ***
in ---             at 00.00
    
```

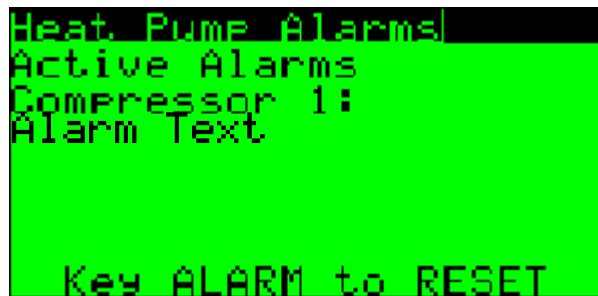
| Parameter: | Range/F.: | Unit | Description |
|-----------------|--|------|---|
| DST | Enable Disable | - | Enables or Disables automatic DST changeover. |
| Transition time | 0 999 | min | Time for changeover, when unit was not powered. |
| Start | First Second Third Forth Last Mon-Sun | - | Day of the Month to start the DST |
| At | 00:00 23:59 | h:m | Time to start DST |
| End | First Second Third Forth Last Mon-Sun | - | Day of the Month to stop DST |
| At | 00:00 23:59 | h:m | Time to stop DST |

4 Alarms

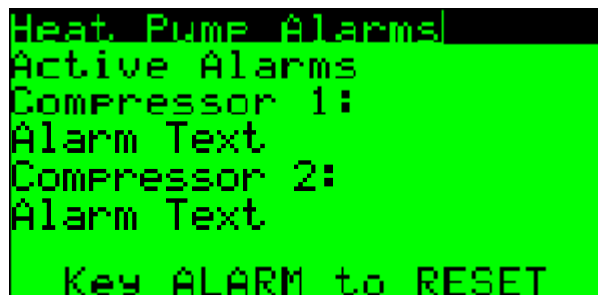
Alarms may occur while the unit is in operation. The control is drawn up in such a manner that the operation can be restarted automatically. If a problem is more serious, it is necessary to reset the unit manually.

If an alarm state occurred during the operation of the unit, the backlighting of ALR key flashes on and off. If the backlighting of the key is lit steadily, the unit has been blocked and it is necessary to reset it manually.

By pressing ALARM button, the screen with active alarms, or last active alarm will be displayed.



If the unit is equipped with 2 compressors, alarms are showing separately for each compressor.



4.1 Types of alarm

| Displayed Alarm Text | Alarm Code | Alarm description | Reset |
|-----------------------|------------|--|------------|
| Low Pressure | AL01 | compressor low suction pressure | aut.<3/hrs |
| High Pressure PT | AL02 | compressor high discharge pressure from pressure transducer | aut.<3/hrs |
| High Discharge Temp. | AL03 | high compressor discharge gas temperature | aut.<3/hrs |
| High Condensing Temp. | AL04 | too high refrigerant condensing temperature | aut.<3/hrs |
| Low Evaporating Temp. | AL05 | too low evaporating temperature | aut.<3/hrs |
| Antifreeze | AL06 | low water temperature with risk of freezing | aut.<3/hrs |
| Fan Thermal | AL07 | fan overheating, or circuit breaker activation brine pump overheating or circuit breaker activation | aut.<3/hrs |
| Compressor Thermal | AL08 | compressor overheating, or circuit breaker activation | aut.<3/hrs |
| Flow | AL09 | inufficient or no flow of water thru heat pump | aut.<3/hrs |
| Probes | AL10 | one of the important temperature sensor malfunction | automatic |
| High Pressure Switch | AL11 | compressor high discharge pressure from pressure high pressure switch | aut.<3/hrs |
| Low Pressure HP side | AL12 | too low pressure on high pressure side of the refrigerant circuit | aut.<3/hrs |
| DC Drive Alarm | AL13 | alarm of the compressor drive for inverter units | automatic |
| EVD Evo | AL14 | alarm of the Electronic Expansion Valve driver | aut.<3/hrs |

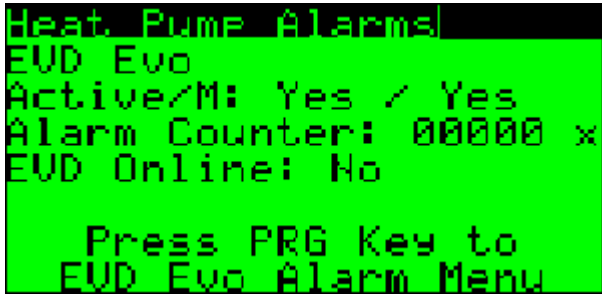
4.2 General Alarm Explanation

Heat Pump is complex device consisting of sensitive components. Therefore control system switches the operation off in case the operating conditions are not suitable for unit safe and long durability operation. Operating conditions are given externally, by the actual status of power supply, actual load and operating mode request. Alarms could occur during unit standard unit operation. Until unit is not in permanent alarm, or it does not require manual reset, there is no reason to concern.

4.3 Detailed Alarm Displays

Using UP/DOWN keys lists in the alarm menu. Detailed display is available for each alarm. It shows active or inactive alarm and total alarm counter.

| | |
|---|---|
| <pre>Heat Pump Alarms Low Pressure Active/M: Yes / Yes Alarm Counter: 00000 x High Pressure PT Active/M: Yes / Yes Alarm Counter: 00000 x</pre> | <pre>Heat Pump Alarms Flow Active/M: Yes / Yes Alarm Counter: 00000 x</pre> |
| <pre>Heat Pump Alarms High Discharge Temp. Active/M: / Yes Alarm Counter: 00000 x High Condensing Temp. Active/M: / Yes Alarm Counter: 00000 x</pre> | <pre>Heat Pump Alarms Probes Active/M: Yes / Yes Alarm Counter: - x Act Mem Water: No / No Antifreeze: No / No Outdoor: No / No</pre> |
| <pre>Heat Pump Alarms Low Evaporating Temp. Active/M: / Yes Alarm Counter: 00000 x Antifreeze Active/M: / Yes Alarm Counter: 00000 x</pre> | <pre>Heat Pump Alarms High Pressure Switch Active/M: Yes / Yes Alarm Counter: 00000 x Low Pressure HP side Active/M: Yes / Yes Alarm Counter: 00000 x</pre> |
| <pre>Heat Pump Alarms Fan Thermal Active/M: Yes / Yes Alarm Counter: 00000 x Compressor Thermal Active/M: Yes / Yes Alarm Counter: 00000 x</pre> | <pre>Heat Pump Alarms DC Drive Alarm Active/M: Yes / Yes Alarm Counter: 00000 x Online/M: No / No Press PRG Key to DC Drive Alarm Menu</pre> |

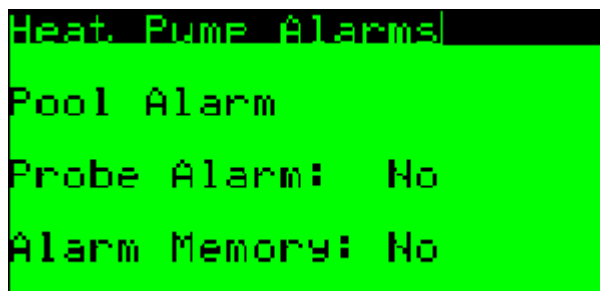
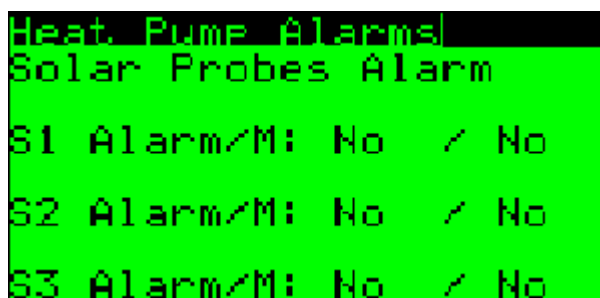
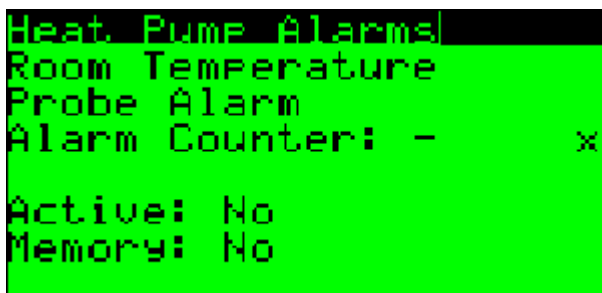
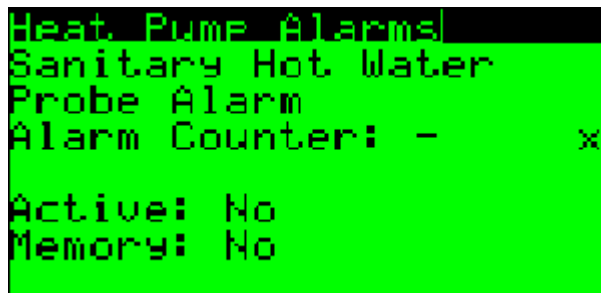
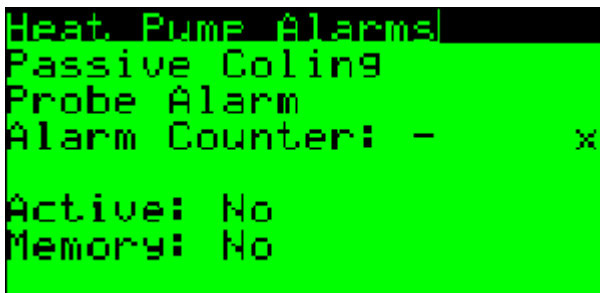


| Parameter: | Range/F.: | Unit | Description |
|----------------|------------|------|--|
| Active | No Yes | - | No: Alarm is not active. Yes: Alarm is actually active. |
| /M (Memory) | No Yes | - | No: Alarm is not active in memory Yes: Alarm is active in memory, control system is waiting minimum compressor Off time for recovery. |
| Alarm Counter | 0 32000 | - | Shows how many alarms of this type happened during unit operation from last counter reset. |

Note: For DC Drive and EVD Evo alarms it is possible to enter detailed alarm menu pressing PRG key. You can be asked to enter detailed alarm menu to assist with problem recognition before visit of the service dealer.

4.4 Warnings

Following alarms are not causing unit to stop, but some unit functions could be limited.



4.5 To reset alarms

All alarms are reset automatically if the count of one type does not reach 3 in 1 operating hour of the compressor.

4.6 Manual reset

The manual reset is carried out by entering the alarm menu after pressing the ALARM key. Additional pressing of the ALARM key on any alarm display performs Manual Reset

5 What to do if....

5.1 After power is on, the backlighting of the ALR key flashes

It is a normal operating state. The operation of the heat pump is restored after 6 minutes, unless any of the alarms is really active. During this period, all alarms on the alarm screen are displayed as active.

5.2 The main screen with icons shows the symbol flashing

It informs that the regular maintenance period for the unit has elapsed. This situation is NOT ALARM and unit continues in normal operation. After typical compressor time in operation, it is recommended refrigerant circuit service inspection. Typical time is 3000 operating hours, therefore we recommend service inspection in 6 months from service icon appearing.

5.3 The symbol is lit

It indicates the high electric power tariff or remote Off.

5.4 The backlighting of the ALARM key flashes

It informs about an active alarm. Press this key shortly to display the type of the alarm. If the key keeps flashing, automatic reset will be performed and the unit will be put into operation in 6 minutes.

5.5 The ALARM key is lit steadily

The operation of the unit has been blocked as the same active alarm has been detected 3x during 1 operating hour of the compressor.

Press the ALARM key to display the type of the alarm. Refer to the table „What to do in the case of difficulties“ as it must be a more serious failure.

Reset the unit manually according to Chapter 4.6.

5.6 Active icon

The outdoor temperature has dropped below the application limit of the compressor. The compressor is turned off and the heating function is taken over by both of the heating elements. When the outdoor temperature rises above the limit, the compressor will be restarted automatically.

5.7 Defrosting icon flashes

It informs that the temperature conditions to activate defrosting have been met, however, the necessary time between the defrosting cycles has not elapsed yet. It is a normal operating state.

5.8 Defrosting icon is steadily lit

It informs that the defrosting cycle is in progress. At first the compressor and fan are stopped, next the reverse valve is activated and then the compressor is restarted. The defrosting cycle is completed by starting the fan and switching the reversing valve into the heating mode. During this mode the steam/fog could appears in the area of the outdoor unit.

5.9 E! appears on the Main Screen

Safety thermostat of the electric heater was activated and heater could not be switched on. It is necessary to open the front cover and manually reset this device. Before resetting, please check water inlet filter strainer, sufficient heating water filling and pressure.

5.10 Pump symbol is flashing on the Main Screen

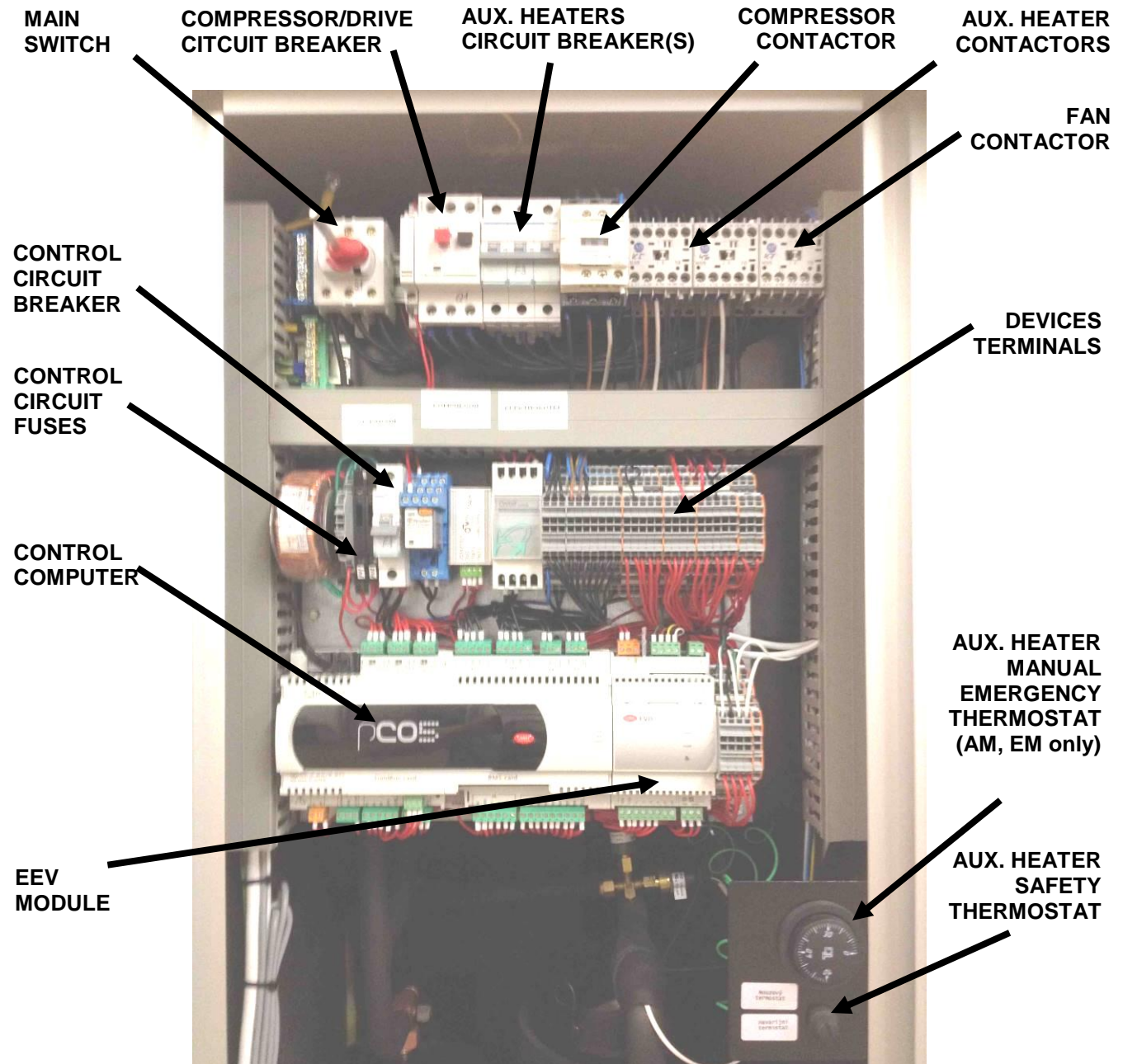


When icon is flashing more than 10s after the circulating pump start, the flow did not start and pump was switched off to protect it from damaging. This situation is called "Pump Alarm". System tries to restart the pump each compressor off time. This situation is usually connected to "Flow Alarm". Please check water inlet filter strainer, sufficient heating water filling and pressure.

6 Switchboard

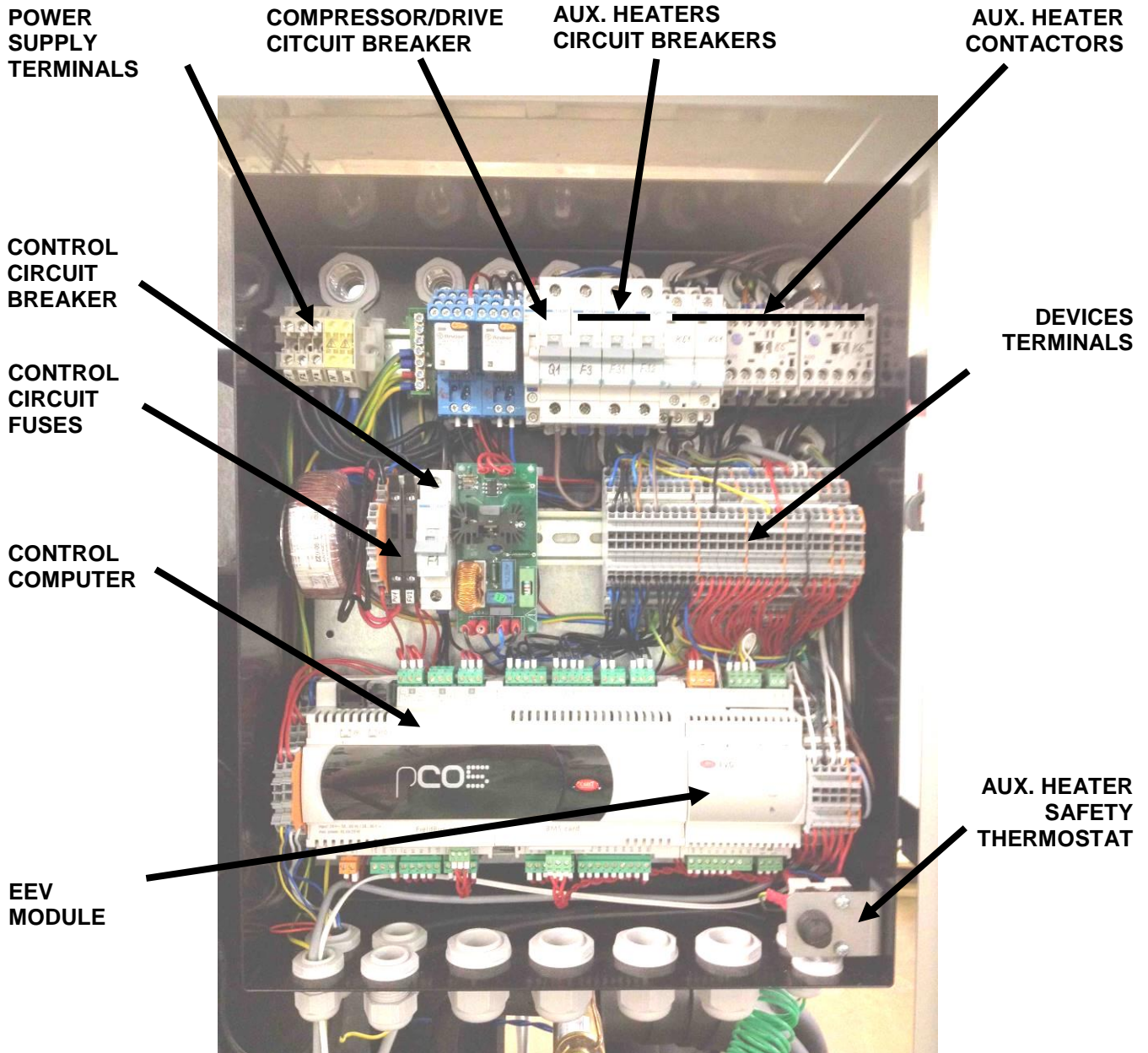
The switchboard is accessible after the main switch is off and the front door of the heat pump is opened. The switchboard comprises all power cut-out devices and electronics. The layout is presented in the following figure:

6.1 AirMaster, EasyMaster, AquaMaster



WARNING:
BEFORE OPENING THE FRONT COVER, DISCONNECT THE POWER SUPPLY TO THE UNIT IN THE HOUSE MAIN ELECTRIC DISTRIBUTOR !

6.2 BoxAir



WARNING:
BEFORE OPENING THE FRONT COVER, DISCONNECT THE POWER SUPPLY TO THE UNIT IN THE HOUSE MAIN ELECTRIC DISTRIBUTOR !

6.3 Main switch

It is used to turn off the power supply leading to the heat pump switchboard.

6.4 Control circuit breaker

It protects the control devices, circulating pumps, etc.

6.5 Control Circuit Fuses

There are 2 fuses for protecting the transformer. The first is on high voltage side and the second is on the low voltage side. Please check supplied wiring diagram for correct fuse sizing. From production there is always 1 spare fuse – both sides inside the fuse box.

6.6 Auxiliary Heater Safety Thermostat

It is used to block the heaters in the case of its overheating (more than 70°C). For units with integrated storage tank also auxiliary heater circuit breaker is tripped. If this protection is activated, it is necessary to unscrew the thermoregulator plastic cover (anti-clockwise) and press the button located under the cover. If this activation occurred, inform please the installation company about this event.

6.7 Emergency Auxiliary Heater Manual Thermostat

The purpose of the emergency thermoregulator is to ensure emergency operation in the case of compressor outage. The reset is done by turning the thermoregulator to the desired temperature of heating water. By default, the maximum temperature of the thermoregulator has been inhibited to 50°C.

6.8 Auxiliary Heater Circuit Breaker

It is the electric protection element for electric heating rods. The failure may happen for two reasons. Either it is due to excessively heated integrated storage vessel, refer to Chapter 6.6, or there is a short circuit in the electric circuit of the rods. In either case, contact the installation company should a failure like this occurs.

6.9 Compressor circuit breaker

It is a starting circuit breaker for the compressor motor with integrated thermal protection for winding. The manufacturer of the heat pump has adjusted the maximum service current for the compressor on the circuit breaker. It is not allowed to modify this setting. If the service current is adjusted incorrectly, the compressor may get damaged.

7 Troubleshooting

7.1 Water/Water, Brine/Water Heat Pumps

The following chart lists alarms and activities of the operator to rectify the error state.

| CODE | Meaning | Control action | Reason | Before you call service |
|------|---|--|--|---|
| AL01 | Low pressure | Switches off compressor and brine circulator | Low closed loop temperature, evaporator freezing, brine circulator malfunction, full closed loop strainer | Switch off unit, clean closed loop strainer, check brine pressure of the closed loop, repeated problem - call service |
| AL02 | High pressure PT | Switches off compressor and brine circulator | Too high water temperature, full water strainer, water circulator malfunction | Decrease requested water temperature, check deaerating and water filling, clean water strainer, repeated problem - call service |
| AL03 | High Discharge Temperature | Switches off compressor and brine circulator | Too high water temperature, full water strainer, water circulator malfunction. Could be caused also from slight refrigerant leaking, or temperature probe problem (AL10) | Decrease requested water temperature, check deaerating and water filling, clean water strainer, repeated problem - call service |
| AL04 | High Condensing Temperature in heating/cooling mode | Switches off compressor and brine circulator | Too high water/brine temperature, full water/brine strainer, water/brine circulator malfunction | Decrease requested water temperature, check deaerating and water/brine filling, clean water/brine strainer, repeated problem - call service |
| AL05 | Low Evaporating Temperature heating/cooling mode | Switches off compressor and brine circulator | Low closed loop/cooling water temperature, evaporator freezing, brine/water circulator malfunction, full closed loop/water strainer | Switch off unit, clean closed loop/water strainer, check brine/water pressure, repeated problem - call service |
| AL06 | Antifreeze water protection | Switches off compressor and brine circulator | Low heating/cooling water temperature | Could be caused during long electricity supply problem, or by low water temperature in cooling mode. Wait for heating of the water by auxiliary heater, increase requested water temperature if cooling mode. |
| AL07 | Brine Pump Malfunction (AQ120.2, 150.2, 180.2 only) | Switches off compressor and brine circulator | Brine circulator motor overheating problem, or circuit breaker activation. | Call service |

| CODE | Meaning | Control action | Reason | Before you call service |
|------|-------------------------------------|--|--|---|
| AL08 | Compressor Thermal Protection | Switches off compressor and brine circulator | Too high water temperature, power supply problem - missing phase, compressor motor malfunction | Switch on compressor circuit breaker, call service, if problem returns. |
| AL09 | Low cooling/heating water flow | Switches off compressor and brine circulator | Circulator malfunction, full strainer cooling/heating water | Switch unit off, check water strainer. Repeated problem - call service |
| AL10 | Temperature probe problem | Switches off compressor and brine circulator | Probe malfunction | Call service |
| AL11 | High Pressure Switch | See AL01, AL02 | See AL01, AL02 | See AL01, AL02 |
| AL12 | Low Pressure HP Side | See AL01, AL02 | See AL01, AL02 | See AL01, AL02 |
| AL13 | DC Drive Alarm, Inverter units only | Switches off compressor and brine circulator | Compressor DC Drive Error | Restart unit power supply, if problem returns, please call service |
| AL14 | EVD Evo Alarm | Switches off compressor and brine circulator | Malfunction of EVD Evo module | Restart unit power supply, if problem returns, please call service |

7.2 Air/Water Heat Pumps

The following chart lists alarms and activities of the operator to rectify the error state.

| CODE | Meaning | Control action | Reason | Before you call service |
|-------|---|-------------------------------------|---|--|
| AL 01 | Low pressure | Switches off the compressor and fan | Extremely low temperature of the outdoor air (below -20°C), freezing of the evaporator, operating failure of the fan | Wait for the error status to come to an end, in the case of the freezing of the evaporator, wait for the starting of the unit and perform a manual defrost; if the error occurs repeatedly, contact the installation company |
| AL 02 | High pressure PT | Switches off the compressor and fan | Too high a temperature of the heating water | Reduce the required heating water temperature, check the bleeding and filling of the system, and check and clean the heating water filter; report the error to the installation company if it occurs repeatedly |
| AL 03 | High Discharge Temperature | Switches off the compressor and fan | This error may be caused by insufficient coolant filling or its minor leaks; it may also be caused by a high temperature of the heating water or an extremely low outdoor air temperature. This error also occurs in the case of a sensor failure (AL 10) | Reduce the required heating water temperature, check the bleeding and filling of the system, and check and clean the heating water filter; report the error to the installation company if it occurs repeatedly |
| AL 04 | High Condensing Temperature in heating/cooling mode | Switches off the compressor and fan | In the thawing mode, too high a temperature has been set for the end of thawing; in the cooling mode, a failure of the fan | Check the outdoor unit, and perform a manual reset; the installation company must be contacted |
| AL 05 | Low Evaporating Temperature heating/cooling mode | Switches off the compressor and fan | Extremely low temperature of the outdoor air (below -20°C), freezing of the evaporator, operation failure of the fan | Wait for the error status to come to an end; in the case of the freezing of the evaporator, wait for the starting of the unit and perform a manual thawing; if the error occurs repeatedly, contact the installation company |

| CODE | Meaning | Control action | Reason | Before you call service |
|-------------|-------------------------------------|-------------------------------------|--|---|
| AL 06 | Antifreeze water protection | Switches off the compressor and fan | Low temperature of the heating water | Check the circuit-breaker of the built-in electric boiler; check whether the cooling mode has not been activated by mistake |
| AL 07 | Fan Thermal Protection | Switches off the compressor and fan | Fan overloading, faulty fan | Check the outdoor unit, and perform a manual reset; the installation company must be contacted |
| AL 08 | Compressor Thermal Protection | Switches off the compressor | Too high a temperature of the heating water, incorrect setting of the heat protection of the compressor, faulty compressor | Reset the circuit-breaker of the compressor; contact the installation company |
| AL 09 | Low cooling/heating water flow | Switches off the compressor and fan | Circulation pump error, clogged heating water filter | Check and clean the heating water filter. If the error occurs repeatedly, contact the installation company |
| AL 10 | Temperature probe problem | Switches off the compressor and fan | Faulty sensor | Contact the installation company. |
| AL11 | High Pressure Switch | See AL01, AL02 | See AL01, AL02 | See AL01, AL02, always call service |
| AL12 | Low Pressure HP Side | See AL01, AL02 | See AL01, AL02 | See AL01, AL02, always call service |
| AL13 | DC Drive Alarm, Inverter units only | Switches off compressor and fan | Pressure transducer malfunction | Call service |
| AL14 | EVD Evo Alarm | Switches off compressor and fan | Malfunction of EVD400 module | Call service |

7.3 Reseting Circuit Breakers

Please check the chapter “6 Switchboard” to find correct device and use device switch to reset it.

WARNING:

BEFORE OPENING THE FRONT COVER, DISCONNECT THE POWER SUPPLY TO THE UNIT IN THE HOUSE MAIN ELECTRIC DISTRIBUTOR !

7.4 Reseting the Auxiliary Heater Safety Thermostat

Activation of this safety device is signalized by appearing the “E!” symbol on the Main Screen. Please check the chapter “6 Switchboard” to find device location inside Your unit. If this protection is activated, it is necessary to unscrew the thermoregulator plastic cover (anti-clockwise) and press the button located under the cover. If this activation occurred, inform please the installation company about this event.

WARNING:

BEFORE OPENING THE FRONT COVER, DISCONNECT THE POWER SUPPLY TO THE UNIT IN THE HOUSE MAIN ELECTRIC DISTRIBUTOR !

7.5 Defrost Cycle (Air/Water only)

Due to the principle of operation of Air/Water Heat Pumps, there is air humidity condensation or ice creation on the outdoor unit heat exchanger. From this reason, control system is continuously checking unit efficiency and when snow/ice layer is too big, the defrost cycle is initiated.

Firstly the compressor and fan are stopped, next the reverse valve is activated and then the compressor is restarted. The defrosting cycle is completed by starting the fan and switching the reversing valve into the heating mode. During this mode the steam/fog could appear in the area of the outdoor unit.

7.5.1 Activating of the Manual Defrost

Defrosting cycle is performed automatically by the control system. From reason of extreme weather conditions with combination of power supply malfunction, the standard automatic procedure might not be sufficient to fully remove the snow/ice from heat exchanger. From this reason it is possible to activate the defrost cycle manually from pDG display, pressing the UP and DOWN key simultaneously.

Manual defrost could be also activated from the “Defrost Info” mask, please see chapter 3.2.8.1. Reversible units could be also defrosted by setting the unit to the Cooling Function, please see chapter 3.2.1 “Setting Unit Operation”.

8 Declaration of Conformity



MasterTherm

Master Therm CZ s.r.o.
Václavské Náměstí 819/43, 110 00 Praha 1, Czech Republic

ID: 25419714



EC DECLARATION OF CONFORMITY

acc. to §22 act no. 22/1997 Sb. as ammended by the act no.71/2000 Sb

Product: Heat Pump air/water AirMaster, EasyMaster, BoxAir, BoxAir Inverter

Models: AM3015Z, AM3021Z, AM3030Z, AM3038Z, AM3045Z
AM3060.2Z, AM3076.2Z, AM3090.2Z
AM3130Z, AM3138Z, AM3145Z, AM3160.2Z, AM3176.2Z, AM3190.2Z
EM17Z, EM22Z, EM26Z, EM30Z, EM37Z, EM45Z
BA17Z, BA22Z, BA22I, BA26Z, BA30Z, BA30I, BA37Z, BA45Z
BA17Z1, BA22Z1, BA26Z1, BA30Z1, BA37Z1

Manufacturer: Master Therm CZ s.r.o., Praha, ČR

Product Description:
Appliance for energy trasfer from Renewable Energy Sources to Heating,
Cooling and Sanitary Hot Water.

Declares that the components of the above mentioned units are conform to the following directives and standards:

NV č.163/2002 Sb.
ČSN EN 60335-2-40, ČSN EN 60335-1, ČSN ISO 11200
ČSN EN 378-1 až 4, ČSN EN 13136, ČSN EN 12263
ČSN EN 60704-2-2, ČSN EN 14511-2, -3, -4, ČSN EN 255-3
NV č.616/2006, ČSN EN 55011

Conformity: according to §7 art. 2 government directive no.163/2002 Sb.

No. of sheets: 1



Praha

1.7.2009

Ing. Karel Guzek
company executive



EC DECLARATION OF CONFORMITY

acc. to §22 act no. 22/1997 Sb. as amended by the act no.71/2000 Sb

Product: Heat Pump water/water AquaMaster, AquaMaster Inverter

Models: AQ17Z, AQ22Z, AQ22I, AQ26Z, AQ30Z, AQ30I, AQ37Z, AQ45Z, AQ45I
AQ60Z, AQ60I, AQ75Z, AQ90Z, AQ120.2Z, AQ150.2Z, AQ180.2Z
AQ17Z1, AQ22Z1, AQ26Z1, AQ30Z1, AQ37Z1, AQ50Z1, AQ60Z1

Manufacturer: Master Therm CZ s.r.o., Praha, ČR

Product Description:

Appliance for energy transfer from Renewable Energy Sources to Heating, Cooling and Sanitary Hot Water.

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NV č.163/2002 Sb.
ČSN EN 60335-2-40, ČSN EN 60335-1, ČSN ISO 11200
ČSN EN 378-1 až 4, ČSN EN 13136, ČSN EN 12263
ČSN EN 60704-2-2, ČSN EN 14511-2, -3, -4, ČSN EN 255-3
NV č.616/2006, ČSN EN 55011

Conformity: according to §7 art. 2 government directive no.163/2002 Sb.

No. of sheets: 1



Praha 1.7.2009

Ing. Karel Guzek
company executive

9 Safety and Environment Protection

9.1 Greenhouse Gas

Heat Pumps contains greenhouse gas – refrigerant charge listed in Kjoto Protocol. Venting refrigerant into atmosphere is not allowed.

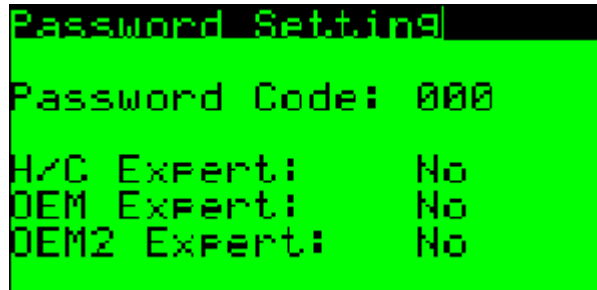
9.2 Hermetical Sealing

All units are hermetically sealed system after installation.

10 Service Menu

Service menu allows detailed parameters setting. Menu is divided into separate parts according to different heat pump functions.

To enter the service menu, press PRG on the main (icon) screen. Password dialog appears. Enter the correct password to reach service level.

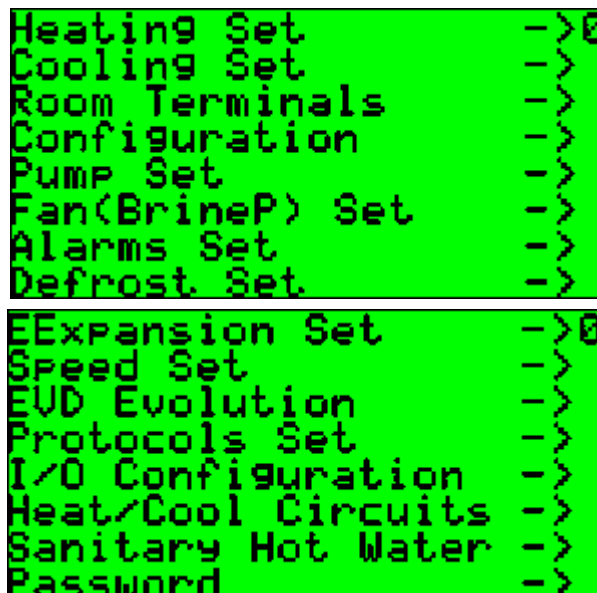


| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|----|-----------|------|---------------------------|
| Password Code | - | 0-999 | - | Password Code, 999 H/C, * |
| H/C Expert | - | Yes/No | - | H/C Expert access level |
| OEM Expert | - | Yes/No | - | OEM Expert access level |
| OEM2 Expert | - | Yes/No | - | OEM2 Expert access level |

* Please ask Master Therm for other codes

Warning: Entering OEM/OEM2 access levels allows editing parameters, which incorrect setting could damage or destroy heat pump system.

Pressing PRG opens the Service Menu.



Move cursor to required function setting and press ENTER.

10.1 Heating Set

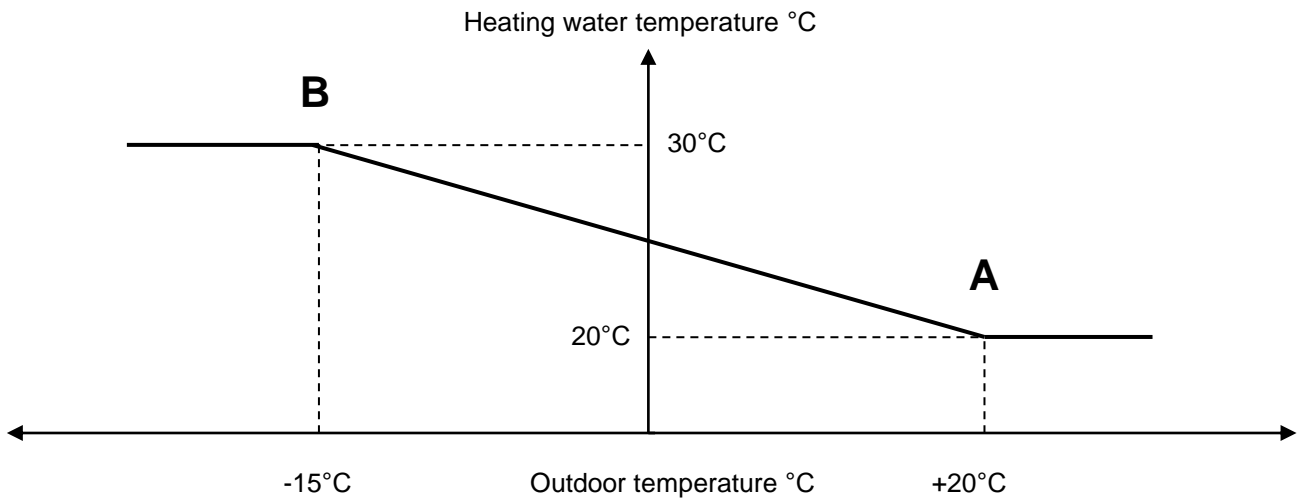
General setting of the main (heat pump) heating circuit.

10.1.1 Weather compensation Heating

```

Heating Setting
Heating Curve Point A
Outdoor Temp.: 20.0 °C
Water Temp.: 20.0 °C
Heating Curve Point B
Outdoor Temp.: -15.0 °C
Water Temp.: 30.0 °C
    
```

Weather compensation parameters could be shown on following picture:



| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------------------|-----|---------------------------|------|---|
| Point A Outdoor Temperature | A35 | -20.0 30.0 F: 20.0 | °C | Point A, outdoor temperature definition. |
| Point A Water Temperature | A37 | *20.0 47.5 F: 20.0 | °C | Point A, water temperature definition. Requested heating water temperature for defined Point A outdoor temperature. 20.0°C is typical setting for Under Floor Heating (UFH) and Radiators. |
| Point B Outdoor Temperature | A36 | -20.0 30.0 F: -15.0 | °C | Point B, outdoor temperature definition. |
| Point B Water Temperature | A38 | *20.0 47.5 F: 30.0 | °C | Point B, water temperature definition. Requested heating water temperature for defined Point B outdoor temperature. 30.0°C is typical setting for UFH. 40.0°C is typical setting for Radiators. |

* The real temperature range is limited according to the setting during commissioning.

10.1.1.1 Room Compensation

Pressing PRG on 10.1.1 opens Room compensation screens.

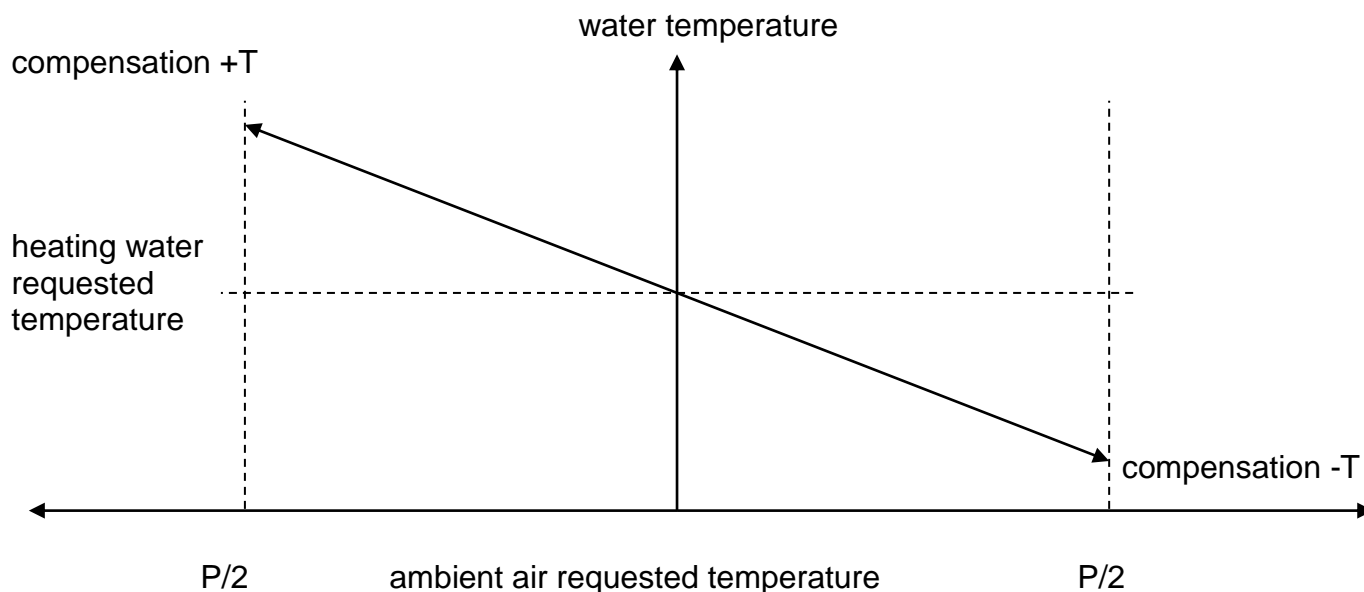
```

Compensation Setting
pAD Active:No
Room Temp.: 00.0 °C
Room Set Temp.00.0 °C
Actual Compensation
Heating: 00.0 °C
Cooling: 00.0 °C
  
```

```

Compensation Setting
Room Temp. Probe
Not Used
Water Compensation
Heating: 05.0 °C
Cooling: 05.0 °C
Prop. Band: 02.0 °C
Integr. Time: 0000 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------------|------|--|------|---|
| pAD Active | D242 | Yes/No | - | pAD01 Active status |
| Room Temp. | A211 | -99.9/99.9 | °C | Actual room temperature |
| Room Set Temp. | - | -99.9/99.9 | °C | Room setpoint temperature |
| Actual Compensation Heating | A198 | -99.9/99.9 | °C | Result of room compensation on requested water temperature Heating |
| Actual Compensation Cooling | A199 | -99.9/99.9 | °C | Result of room compensation on requested water temperature Cooling. |
| Room Temp. Probe | - | B1- B5/pCO ₅ , B1- B4/pCO _e | - | Room temperature probe selection. If pAD01 is connected, keep Not Used |
| Water Compensation Heating | A196 | -99.9/99.9 F: 5.0 | °C | Maximum/Minimum water temperature compensation in heating mode |
| Water Compensation Cooling | A197 | -99.9/99.9 F: 5.0 | °C | Maximum/Minimum water temperature compensation in cooling mode |
| Prop. Band | A200 | -99.9/99.9 F: 2.0 | °C | Room temperature proportional band for water compensation calculation |
| Integr. Time | I180 | 0-9999 F: 0 | S | Integration time of the water compensation calculation. Keep 0 for Proportional function only |



Picture above, shows principle of room compensation. Calculated water compensation value is add to weather compensation value of the requested water temperature.

When room probe is not installed, nor the pAD01, the system automatically supposes room temperature 20.0°C. When requested room temperature is adjusted by the user, water compensation is also recalculated with virtual room temperature 20.0°C.

10.1.2 Water/Air Limits Heating

```

Heating Settings
Setpoint Water Limit
Minimum Temp.: 20.0 °C
Maximum Temp.: 50.0 °C
Setpoint Air Limit
Minimum Temp.: -30.0 °C
Maximum Temp.: 30.0 °C
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------------|------|------------------------|------|--|
| Water Minimum Temp. | A299 | -99.9/99.9 F: 20.0 | °C | Minimum water temperature limit for the unit setpoint |
| Water Maximum Temp. | A207 | -99.9/99.9 F: 50.0 | °C | Maximum water temperature limit for the unit setpoint |
| Air Minimum Temp. | A300 | -99.9/99.9 F: -30.0 | °C | Minimum Air temperature limit for the unit setpoint. This is not the limit for unit operation. |
| Air Maximum Temp. | A301 | -99.9/99.9 F: 30.0 | °C | Maximum Air temperature limit for the unit setpoint. This is not the limit for unit operation. |

10.1.3 Compressor Hysterezis / Offset Heating

```

Heating Settings
Compressor
Hysterezis:      02.5 °C
Compressor 2
Offset:          02.5 °C
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------|------|----------------------|------|---|
| Compressor Hysterezis | A43 | -99.9/99.9 F: 2.5 | °C | Compressor control hysterezis. |
| Compressor 2 Offset | A302 | -99.9/99.9 F: 2.5 | °C | Negative offset of the Compressor 2 setpoint for double compressor units. |

10.1.4 Compressor limit

```

Heating Settings
Outdoor Temperature
Compressor Limit
Water 30°C:      -18.0 °C
Water 50°C:      -12.0 °C
Actual Limit:    -12.0 °C
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------|-----|--------------------|------|---|
| Water 30°C | A44 | -99.9/99.9 F: * | °C | Compressor operation limit for water temperature 30°C. |
| Water 50°C | A45 | -99.9/99.9 F: * | °C | Compressor operation limit for water temperature 50°C. |
| Actual Limit | A46 | -99.9/99.9 | °C | Actual calculated limit according to outdoor temperature. |

* Different for different units

| Unit: | Water 30°C | Water 50°C |
|-------|------------|------------|
| AQ | -99.9 | -99.9 |
| AM | -15.0 | -15.0 |
| EM | -15.0 | -12.0 |
| BA | -15.0 | -12.0 |
| BAI | -15 | -7.0 |

Control works with hysterezis 3.0°C.

Example: Calculated limit: -15.0°C
 Temperature OFF: -18.0°C
 Temperature ON: -15.0°C

10.1.5 Auxiliary Heater Limit

```

Heating Setting
Auxiliary Heater
Outdoor Temperature
Limit: 00.0 °C
Actual Integration
Value: 0000.0 °C*min
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------------------|-----|--------------------|--------|--|
| Outdoor Temperature Limit | A39 | -99.9/99.9 F: 0 | °C | Outdoor temperature limit for enabling auxiliary heater. |
| Actual Integration Value | A10 | -9999.9/ 9999.9 | °C.min | Actual value of calculated missing heat integration. |

10.1.6 Auxiliary Heater Control

```

Heating Setting
Auxiliary Heater
Hysteresis: 02.5 °C
Offset: 02.5 °C
Integral °C*min
Activation: 050.0
Deactivation: 010.0
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------|-----|----------------------|--------|--|
| Hysteresis | A27 | -99.9/99.9 F: 2.5 | °C | Heater control hysteresis. |
| Offset | A28 | -99.9/99.9 F: 2.5 | °C | Heater setpoint offset from compressor setpoint. |
| Integral Activation | A40 | 0/999.9 F: 50.0 | °C.min | When missing heat integration reaches this value, heater is activated |
| Integral Deactivation | A41 | 0/999.9 F: 10.0 | °C.min | When missing heat integration reaches this value(negative) , heater is deactivated |

10.1.7 Heater Antifreeze function

```

Heating Setting
Auxiliary Heater
Antifreeze Function
Heating Mode: 23.0 °C
Cooling Mode: 09.0 °C
Actual: Heating
    
```

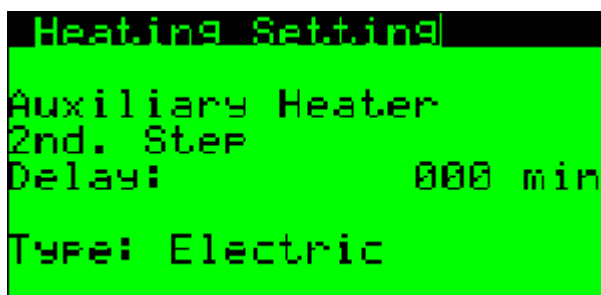

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------------|------|---------------------|------|--|
| Antifreeze Heating Mode | A42 | -99.9/99.9 F: * | °C | Antifreeze water setpoint for activation of auxiliary heater in heating mode, below outdoor defrost limit. |
| Antifreeze Cooling Mode | A151 | -99.9/99.9 F: * | °C | Antifreeze water setpoint for activation of auxiliary heater in cooling mode, above outdoor defrost limit. |
| Actual | - | Heating/ Cooling | - | Shows actual mode for antifreeze heater function. |

* Different for different units

| Unit: | Heating Mode | Cooling Mode |
|-------|--------------|--------------|
| AQ | 15.0 | 15.0 |
| AM | 23.0 | 13.0 |
| EM | 23.0 | 13.0 |
| BA | 15.0 | 10.0 |
| BAI | 15.0 | 10.0 |

Control works with negative hysteresis.

10.1.8 Auxiliary Heater HW config



| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------|----|-----------------------------|------|---|
| 2nd. Step Delay | 15 | 0/999 F: 0 | min | Delay of the 2nd. heater stage. When set to 0, 2nd. stage is not activated with running compressor. |
| Type | - | Electric/Gas F: Electric | - | Specifies heater type. If Gas is selected, heater works beside compressor when unit remotely OFF (tariff control) |

10.1.9 Heating Control Logic

```

Heating Setting
Control Logic
Requested +/- Hysteresis
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|-----|------------------------|------|--|
| Control Logic | D30 | 0: +/- 1: - F: 0 | - | Main heating circuit control logic. When 0, water is controlled in logic setpoint +/- hysteresis. When 1, water is controlled in logic setpoint - hysteresis |

10.1.10 Geometric temperature

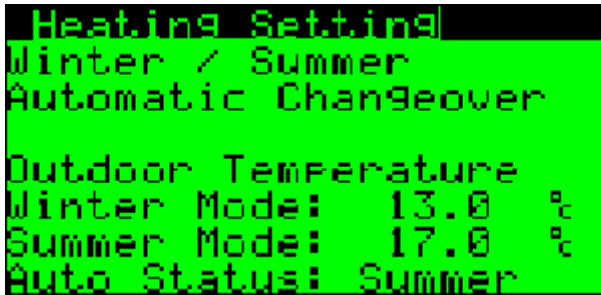
```

Heating Setting
Geometric Temperature
Setting
Delta T:          0.5 °C
Geometric Time:  1800 s

Outdoor:         010.0 °C
Geometric:       000.0 °C
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------|------|------------------|------|--|
| Delta T | A303 | 0/9.9 F: 0.5 | °C | Change of the geometric temperature each period of geometric time (integration step). |
| Geometric Time | I43 | 0/9999 F:1800 | s | Time period for geometric temperature calculation (integration period). |
| Outdoor | A3 | -99.9/99.9 | °C | Actual outdoor temperature. |
| Geometric | A34 | -99.9/99.9 | °C | Actual geometric temperature. Note: geometric temperature is reset to outdoor temperature on powering unit ON |

10.1.11 Automatic Changeover



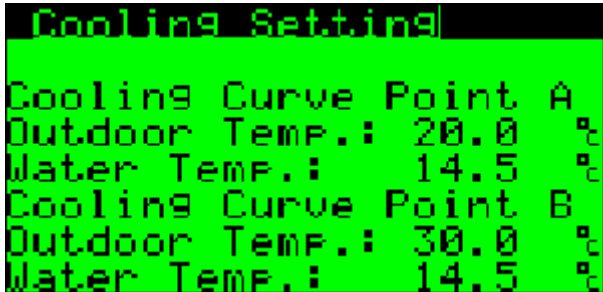
| Parameter: | SP | Range/F.: | Unit | Description |
|-------------|-----|--------------------------|------|--|
| Winter Mode | A82 | -20.0 40.0 F:+13.0 | °C | Outdoor temperature for activation of Winter Mode. Below this temperature, Winter Mode is activated. |
| Summer Mode | A83 | -20.0 40.0 F:+17.0 | °C | Outdoor temperature for activation of Summer Mode. Above this temperature, Summer Mode is activated. |
| Auto Status | - | Winter Summer | - | Result of the Automatic Changeover according to the setting above. |

Note: The mode is not changed according to actual outdoor temperature, but geometric outdoor temperature, created inside the controller.

10.2 Cooling Set

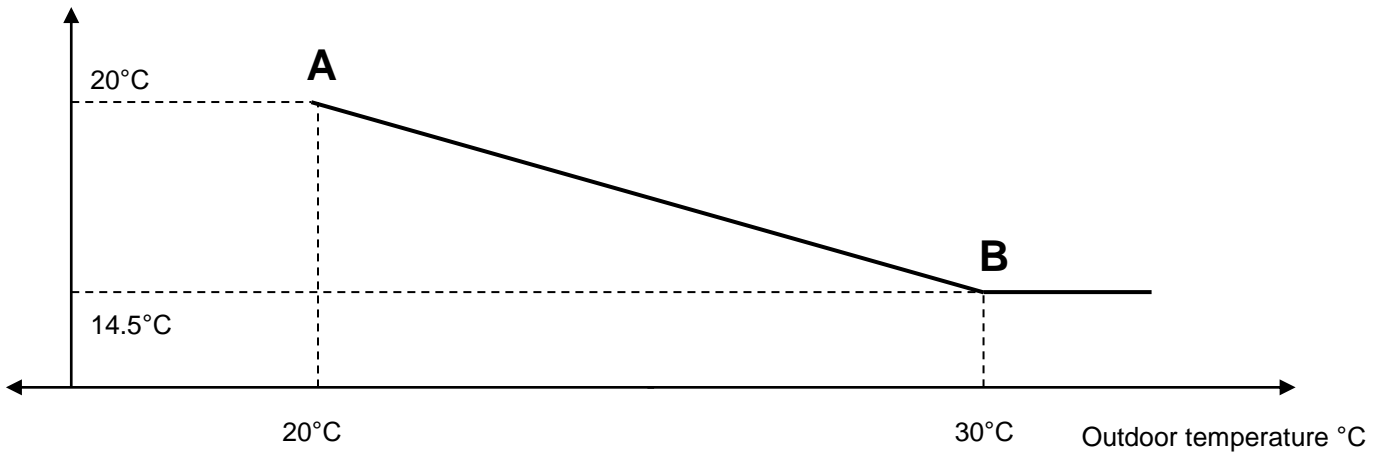
10.2.1 Weather compensation Cooling

This display is available only for units with Cooling, or Passive Cooling (Optional Equipment). Display enables setting of the Main Cooling Weather Compensation.



Weather compensation parameters could be shown on following picture:

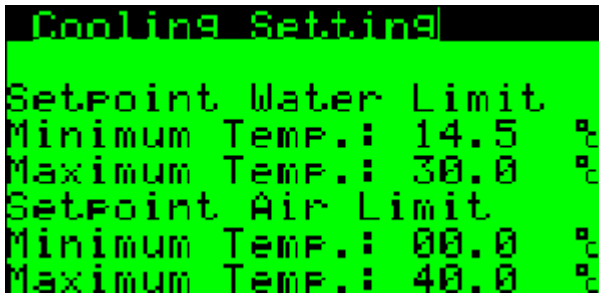
Cooling water temperature °C



| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------------|-----|--------------------------|------|--|
| Point A Outdoor Temperature | A47 | 10.0 40.0 F: 20.0 | °C | Point A, outdoor temperature definition. |
| Point A Water Temperature | A49 | *14.5 30.0 F: 14.5 | °C | Point A, water temperature definition. Requested cooling water temperature for defined Point A outdoor temperature. 20.0°C is typical setting for Under Floor Heating (UFH) and FanCoils. |
| Point B Outdoor Temperature | A48 | 10.0 40.0 F: 30.0 | °C | Point B, outdoor temperature definition. |
| Point B Water Temperature | A50 | *14.5 30.0 F: 14.5 | °C | Point B, water temperature definition. Requested cooling water temperature for defined Point B outdoor temperature. 18.0°C is typical setting for UFH. 14.5°C is typical setting for FanCoils. |

* The real temperature range is limited according to the setting during commissioning. Additional limitation is possible due to the Dew Point protection if it is activated.

10.2.2 Water/Air Limits Cooling



| Parameter: | SP | Range/F.: | Unit | Description |
|---------------------|------|-----------------------|------|--|
| Water Minimum Temp. | A305 | -99.9/99.9 F: 14.5 | °C | Minimum water temperature limit for the unit setpoint |
| Water Maximum Temp. | A306 | -99.9/99.9 F: 30.0 | °C | Maximum water temperature limit for the unit setpoint |
| Air Minimum Temp. | A307 | -99.9/99.9 F: 0.0 | °C | Minimum Air temperature limit for the unit setpoint. This is not the limit for unit operation. |
| Air Maximum Temp. | A308 | -99.9/99.9 F: 40.0 | °C | Maximum Air temperature limit for the unit setpoint. This is not the limit for unit operation. |

10.2.3 Compressor Hysteresis/Offset Cooling

```

Cooling Setting
Compressor
Hysteresis:    02.5  °C
Compressor 2
Offset:       02.5  °C
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------|------|----------------------|------|---|
| Compressor Hysteresis | A51 | -99.9/99.9 F: 2.5 | °C | Compressor control hysteresis. |
| Compressor 2 Offset | A309 | -99.9/99.9 F: 2.5 | °C | Positive offset of the Compressor 2 setpoint for double compressor units. |

10.2.4 Dew Point Control

Dew point control is function for limitation of the cooling water setpoint to avoid condensation on the cooling surface. This requires pAD room terminal with humidity probe.

```

Cooling Setting
Rel. Humidity:  000  %
Dew Point:     00.0  °C
Temp. Limit:   00.0  °C
DewP Offset:   00.0  °C
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------|----------------------|------|---|
| Rel. Humidity | I185 | 0/100 | % | Actual relative humidity measured by pAD01. |
| Dew Point | A13 | -99.9/99.9 | °C | Calculated dew point from relative humidity and temperature |
| Temp. Limit | A310 | -99.9/99.9 | °C | Calculated water temperature limit from dew point and dew point offset. |
| DewP Offset | A14 | -99.9/99.9 F: 0.0 | °C | Dew point offset for safety margin to avoid condensation. |

10.2.5 Dew Point Control Enable/Disable (OEM)

```

Cooling Settings
DewPoint Protection:
Disabled / Not Active
DewP Offset:      00.0 °C
Rel. Humidity:    000 %
Dew Point:       00.0 °C
Temp. Limit:     00.0 °C
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------------|------|-----------------------------------|------|--|
| DewPoint Protection | B196 | 0: Disabled 1: Enabled F: 0 | - | Enabling/Disabling function. |
| | B197 | 0: Not Active 1: Active | - | Function is Active/Not Active. When probe alarm, function is not active, although it is Enabled. |
| DewP Offset | A14 | -99.9/99.9 F: 0.0 | °C | Dew point offset for safety margin to avoid condensation. |
| Rel. Humidity | I185 | 0/100 | % | Actual relative humidity measured by pAD01. |
| Dew Point | A13 | -99.9/99.9 | °C | Calculated dew point from relative humidity and temperature |
| Temp. Limit | A310 | -99.9/99.9 | °C | Calculated water temperature limit from dew point and dew point offset. |

10.2.6 Passive Cooling

Passive cooling function for ground source heat pumps is using ground loop energy for cooling of the house and recovering ground loop.

```

Cooling Settings
Passive Cooling:
Disabled
On Time:      0120 s
Off Time:     0360 s
Control Probe: B1/PC05
Relay: Relay 2 /PC05
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------|------|---|------|---|
| Passive Cooling | B276 | 0: Disabled 1: Enabled F: 0 | - | Enabling/Disabling function. |
| On Time | I105 | 0/9999 F: 120 | s | Brine pump circulation time to obtain water temperature value, higher than the setpoint. |
| OFF Time | I106 | 0/9999 F: 360 | s | Brine pump OFF cycle, when temperature is too low. The brine pump although on minimum speed delivered very high cooling capacity resulting the cooling water is too cold. |
| Control Probe | - | B1- B5/pCO ₅ , B1- B4/pCO _e F: B2/pCO ₅ | - | Control probe selection. Normally it is the main control probe, cause it is located between passive cooling heat exchanger and condenser. |
| Relay | - | R1- R8/pCO ₅ R1- R4/pCO _e F: R2/pCO ₅ | - | Passive cooling 3 way valve selection. |

10.2.7 Passive Cooling Info

```

Passive Cooling
Temperature
Actual:      00.0 °C
Requested:   00.0 °C
Rel. Humidity: 000 %
Dew Point:   00.0 °C
PUMP:       Off
Output:     000.0 %
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------|-----------------|------|---|
| Actual | A311 | -99.9/99.9 | °C | Actual water temperature measured by probe. |
| Requested | A312 | -99.9/99.9 | °C | Requested water temperature. |
| Rel. Humidity | I185 | 0/100 | % | Actual relative humidity measured by pAD01. |
| Dew Point | A13 | -99.9/99.9 | °C | Calculated dew point from relative humidity and temperature |
| Pump | B277 | 0: OFF 1: ON | - | Brine pump operation. |
| Output | A313 | 0/100.0 | % | Brine pump speed. |

10.2.8 Brine Temperature Control

```

Brine Temp. Control
Enabled: No
Ctrl.Probe: Not Used
Setpoint: 05.0 °C
Hysterezis: 05.0 °C
BrineT:00.0 °C Out:No
BrineP Run: Compressor
BrineP Speed: 050.0 %
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------------------|------|----------------------|------|--|
| Brine Control Enabled | B415 | 0/1 F: 0 | - | Brine temperature control activation. When brine temperature reaches setpoint, compressor stops. Auxiliary heater starts beside compressor. When brine temperature reaches setpoint+hysterezis, compressor starts. |
| Ctrl.Probe | - | 0-9 F: 0 | - | Control probe selection: 0=Not Used, B1-B5/pCO ₅ , B1-B4/pCO _e |
| Brine Control Setpoint | A434 | -99.9-99.9 F: 5.0 | °C | Brine temperature control setpoint. |
| Brine Control Hysterezis | A435 | -99.9-99.9 F: 5.0 | °C | Brine temperature control hysterezis. |
| BrineT | A433 | -99.9-99.9 | °C | Real brine temperature. |
| Brine Control Out | B417 | 0/1 | - | 0(No)=Brine control output not active, compressor Off. 1(Yes)=Brine control output active, compressor On. |
| BrineP Run | B416 | 0/1 F: 0 | - | Specifies, if brine pump is running with compressor only (0=Compressor), or brine pump is running permanently (1=Permanent) |
| BrineP Speed | A436 | 0-100.0 F: 50.0 | % | Brine pump speed, when compressor is Off by brine control and permanent run is selected. |

10.3 Room Terminals

Set up of the room terminals.

```

pAD 00 Status
Active: No
On/Off: PERMANENT OFF
Mode: None
Setpoint: 00.0°C
Temperature: 00.0°C
000
Buzzer: Disabled
  
```

| Parameter: | Range/F.: | Unit | Description |
|---------------|-------------------------------------|------|--|
| pAD | 01, 11-16 | - | pAD Identification Number. This Parameter is not adjustable. It is given by pAD Hardware Address. 01: Main Zone Room Terminal 11: Heating Circuit 1 Room Terminal 12: Heating Circuit 2 Room Terminal 13: Heating Circuit 3 Room Terminal 14: Heating Circuit 4 Room Terminal 15: Heating Circuit 5 Room Terminal 16: Heating Circuit 6 Room Terminal |
| Active | 0: No, 1: Yes | - | Informs about pADxx staus. pADxx must be ONLINE and ENABLED to be Active. |
| On/Off | 0: Pernament OFF 1: OFF 2: ON | - | Pernament OFF: Terminal is permanently OFF and heating/cooling of the zone is disabled. OFF: Terminal is OFF by the scheduler and heating/cooling of the zone is temporarily disabled. ON: Terminal is ON and heating/cooling of the zone is enabled. |
| Mode | 1: Winter 2: Summer | - | For pAD 01 it has the same meaning like the main Mode of the Heat Pump. When unit is equipped with cooling or passive cooling, with Mode change also Function is changed. For pAD11 to 16, the Mode setting has no effect and Mode is forced according to the Heat Pump Mode. Heat Pump has priority to pAD11 to 16. |
| Setpoint | 6.0 to 32.0 | °C | Requested Room Temperature set by user. |
| Temperature | -99.9 to 99.9 | °C | Real Room Temperature |
| Rel. Humidity | 0-100 | % | Real Room Relative Humidity |
| Buzzer | Disabled Enabled F: Disabled | - | Enables/Disables Buzzer |

10.3.1 pAD Status

```
pAD 00 Status
Sleep Time: 0 Hour(s)
Setpoint Sleep: 00.0 °C
Temperature: 00.0°C
Rel.Humidity: 000 %
```

| Parameter: | Range/F.: | Unit | Description |
|----------------|---------------|------|--|
| pAD | 01, 11-16 | - | pAD Identification Number. This Parameter is not adjustable. It is given by pAD Hardware Address. 01: Main Zone Room Terminal 11: Heating Circuit 1 Room Terminal 12: Heating Circuit 2 Room Terminal 13: Heating Circuit 3 Room Terminal 14: Heating Circuit 4 Room Terminal 15: Heating Circuit 5 Room Terminal 16: Heating Circuit 6 Room Terminal |
| Sleep Time | 0-9 | h | Remaining time of the pAD Sleep Function. |
| Setpoint Sleep | 6.0 – 32.0 | °C | Room Temperature Setpoint for pAD Sleep Function. Temporary Room Setpoint for the Sleep Time set. When Sleep Time elapses, Setpoint is returned to standart value set on the pAD. |
| Temperature | -99.9 to 99.9 | °C | Real Room Temperature |
| Rel. Humidity | 0-100 | % | Real Room Relative Humidity |

10.3.2 pAD Scheduler

Scheduler setting consists of 2 displays.

```
pAD 00 Scheduler
pAD Clock: Mon 00:00
Enable scheduler: 0
```

```
pAD 00 Scheduler
Scheduler
time set
Mon-Fri 1 00:00 00.0°C
          2 00:00 00.0°C
Sat-Sun 1 00:00 00.0°C
          2 00:00 00.0°C
```

| Parameter: | Range/F.: | Unit | Description |
|------------------------|------------------------------------|--------------|--|
| pAD | 01, 11-16 | - | pAD Identification Number. This Parameter is not adjustable. It is given by pAD Hardware Address. 01: Main Zone Room Terminal 11: Heating Circuit 1 Room Terminal 12: Heating Circuit 2 Room Terminal 13: Heating Circuit 3 Room Terminal 14: Heating Circuit 4 Room Terminal 15: Heating Circuit 5 Room Terminal 16: Heating Circuit 6 Room Terminal |
| pAD Clock | Mo-Su 00:00-23:59 | d h:m | pAD actual time. Time is automatically synchronized with the main controller. |
| Enable Scheduler | 0 1 | - | 0: Scheduler is not enabled. 1: Scheduler is enabled. |
| Mon-Fri time 1 2 | 00:00-23:59 00:00-23:59 | h:m h:m | Start time of the first time zone for Monday to Friday. Start time of the second time zone for Mo to Fr. |
| Mon-Fri set 1 2 | Off/6.0-32.0/On Off/6.0-32.0/On | °C/- °C/- | Room Setpoint, or simple On/Off request for TZ 1. Room Setpoint, or simple On/Off request for TZ 2. |
| Sat-Sun time 1 2 | 00:00-23:59 00:00-23:59 | h:m h:m | Start time of the first time zone for Sat - Sun. Start time of the second time zone for Sat - Sun. |
| Sat-Sun set 1 2 | Off/6.0-32.0/On Off/6.0-32.0/On | °C/- °C/- | Room Setpoint, or simple On/Off request for TZ 1. Room Setpoint, or simple On/Off request for TZ 2. |

10.3.3 pAD Display Config

```

pAD 00 Configuration
Show Main Display:
Current Time
Show Second Display:
Current Time
  
```

| Parameter: | Range/F.: | Unit | Description |
|---------------------|---|------|--|
| pAD | 01, 11-16 | - | pAD Identification Number. This Parameter is not adjustable. It is given by pAD Hardware Address. 01: Main Zone Room Terminal 11: Heating Circuit 1 Room Terminal 12: Heating Circuit 2 Room Terminal 13: Heating Circuit 3 Room Terminal 14: Heating Circuit 4 Room Terminal 15: Heating Circuit 5 Room Terminal 16: Heating Circuit 6 Room Terminal |
| Show Main Display | CurrentTime Temperature Setpoint Local Temperature Humidity Setpoint Local Humidity" | - | What is shown on the main display. |
| Show Second Display | CurrentTime Temperature Setpoint Local Temperature Humidity Setpoint Local Humidity" | - | What is shown on the second display. |

10.3.4 pAD Key Config



| Parameter: | Range/F.: | Unit | Description |
|--|--|------|--|
| pAD | 01, 11-16 | - | pAD Identification Number. This Parameter is not adjustable. It is given by pAD Hardware Address. 01: Main Zone Room Terminal 11: Heating Circuit 1 Room Terminal 12: Heating Circuit 2 Room Terminal 13: Heating Circuit 3 Room Terminal 14: Heating Circuit 4 Room Terminal 15: Heating Circuit 5 Room Terminal 16: Heating Circuit 6 Room Terminal |
| Key1F Key2F Key3F Key4F Key5F Key6F | Disabled On/Off Mode Humidity Night/Sleep Clock Temperature PRG Fan Alarm Reset | - | Key function configuration. |

10.3.5 pAD Configuration

```

pAD 00 Configuration
Enabled: Yes
Hyster. Heat: 02.0 °C
Hyster. Cool: 02.0 °C
MinTemp: 06.0 °C
MaxTemp: 32.0 °C
    
```

| Parameter: | Range/F.: | Unit | Description |
|--------------|----------------------|------|--|
| pAD | 01, 11-16 | - | pAD Identification Number. This Parameter is not adjustable. It is given by pAD Hardware Address. 01: Main Zone Room Terminal 11: Heating Circuit 1 Room Terminal 12: Heating Circuit 2 Room Terminal 13: Heating Circuit 3 Room Terminal 14: Heating Circuit 4 Room Terminal 15: Heating Circuit 5 Room Terminal 16: Heating Circuit 6 Room Terminal |
| Enabled | Yes/No F: No | - | Enabling pADxx terminal. |
| Hyster. Heat | -99.9/99.9 F: 2.0 | °C | Thermostat Hysteresis in heating mode. |
| Hyster. Cool | -99.9/99.9 F: 2.0 | °C | Thermostat Hysteresis in cooling mode. |
| MinTemp | -99.9/99.9 F: 6.0 | °C | Minimum room temperature setpoint. |
| MaxTemp | -99.9/99.9 F: 6.0 | °C | Maximum room temperature setpoint. |

10.3.6 pAD HW Setup/Info

```

pAD 00 Configuration
Address:          000
Firmware version: 0.0
HW options:      None
Clock from:      FCO
  
```

| Parameter: | Range/F.: | Unit | Description |
|------------|---------------------------------------|------|--|
| pAD | 01, 11-16 | - | pAD Identification Number. This Parameter is not adjustable. It is given by pAD Hardware Address. 01: Main Zone Room Terminal 11: Heating Circuit 1 Room Terminal 12: Heating Circuit 2 Room Terminal 13: Heating Circuit 3 Room Terminal 14: Heating Circuit 4 Room Terminal 15: Heating Circuit 5 Room Terminal 16: Heating Circuit 6 Room Terminal |
| Address | 0/255 | - | pAD address in network, must be the same like pAD number. |
| Firmware | 0.0/9.9 | - | Firmware version of connected pADxx. |
| HW options | None Clock Humid Humid+Clock | - | Shows connected pADxx equipment. |
| Clock from | pAD pCO F: pCO | - | Clock source for pADxx terminal. |

10.3.7 pAD Debug

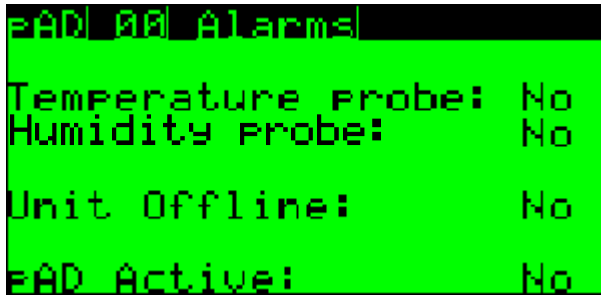
```

pAD 00 Debug
Mod_pAD   Version: 1.4
          Address:001
MB result
01-05: 0  0  0  0  0
06-10: 0  0  0  0  0
11-15: 0
  
```

| Parameter: | Range/F.: | Unit | Description |
|---|-----------|------|--|
| pAD | 01, 11-16 | - | pAD Identification Number. This Parameter is not adjustable. It is given by pAD Hardware Address. 01: Main Zone Room Terminal 11: Heating Circuit 1 Room Terminal 12: Heating Circuit 2 Room Terminal 13: Heating Circuit 3 Room Terminal 14: Heating Circuit 4 Room Terminal 15: Heating Circuit 5 Room Terminal 16: Heating Circuit 6 Room Terminal |
| Address | 0/255 | - | pAD address in network |
| Version | 0.0/9.9 | - | Firmware version of connected pADxx. |
| MB result For Modbus communication, Sublists 01-15 | -2 | - | Generic error on one or more Modbus commands. Summarizes one or more data errors from Modbus sublists. |
| | -1 | - | Incorrect Uart settings data |
| | 0 | - | No Message |
| | 1 | - | Uart settings successfully completed |
| | 2 | - | Command successfully completed. All commands requested by sublists were successfully completed |

10.3.8 pADxx Alarms

If pAD is in Alarm Status it is possible to see it on this display.



| Parameter: | Range/F.: | Unit | Description |
|-------------------|-----------|------|--|
| pAD | 01, 11-16 | - | pAD Identification Number. This Parameter is not adjustable. It is given by pAD Hardware Address. 01: Main Zone Room Terminal 11: Heating Circuit 1 Room Terminal 12: Heating Circuit 2 Room Terminal 13: Heating Circuit 3 Room Terminal 14: Heating Circuit 4 Room Terminal 15: Heating Circuit 5 Room Terminal 16: Heating Circuit 6 Room Terminal |
| Temperature Probe | No Yes | - | No: Temperature probe is not in alarm. Yes: Temperature probe has active alarm. Contact Your installation company, pAD must be replaced. |
| Humidity Probe | No Yes | - | No: Humidity probe is not in alarm. Yes: Humidity probe has active alarm. Contact Your installation company, pAD must be replaced. |
| Unit Offline | No Yes | - | No: Unit is Online, no alarm. Yes: Unit is Offline = alarm Please check proper pAD location in the plastic frame on the wall. If the position is correct, please contact installation company. |
| pAD Active | No Yes | - | pAD xx Status (Yes=active). |

10.3.9 pAD related supervisor parameters

Supervisor Parameters Table

| Parameter: | pAD01 | pAD11 | pAD12 | pAD13 | pAD14 | pAD15 | pAD16 |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|
| Active | B242 | B245 | B248 | B251 | B254 | B257 | B259 |
| On/Off | I16 | I15 | I6 | I227 | I230 | I239 | I210 |
| Mode | I181 | I218 | I217 | I228 | I237 | I240 | I248 |
| Setpoint | A191 | A219 | A225 | A231 | A238 | A247 | A256 |
| Temperature | A190 | A220 | A226 | A232 | A239 | A248 | A257 |
| Humidity | I185 | I219 | I220 | I229 | I238 | I247 | I249 |
| Setpoint Sleep | A263 | A264 | A267 | A270 | A273 | A276 | A277 |
| pAD Enabled | B182 | B244 | B247 | B250 | B253 | B256 | B258 |
| Hyster. Heat | A194 | A265 | A268 | A271 | A274 | A431 | A278 |
| Hyster. Cool | A195 | A266 | A269 | A272 | A275 | A432 | A279 |
| Alarm Temperature Probe | B198 | - | - | - | - | - | - |
| Alarm Humidity Probe | B199 | - | - | - | - | - | - |

10.4 Configuration

Basic and HW configuration of heat pump system.

10.4.1

```

Configuration
Heat Pump Type
Air/Water
1 Compressor
1 Refrigerant Circuit
Mini
MasterLan: No
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------|------|---|------|--|
| HP type | I14 | 0: A/W 1: B/W 2: W/W 3: DX/W 4: A/W R 5: B/W R 6: W/W R | - | Type of the heat pump system. |
| Compressors | B40 | 0: 1 Comp 1: 2 Comp | - | Single or Double compressor unit. |
| Ref. Circuit | B39 | 0: 1 RC 1: 2 RC | - | 1 or 2 refrigerant circuits present. |
| Mini/Aku | I208 | 0: Mini 1: Mini SHW 2: Aku | - | Hydraulic type of the unit. Mini = standard unit, Mini SHW = unit with external storage tank with fresh SHW heat exchanger, Aku = internal storage tank . |
| MasterLan | - | 0: No 1: Yes | - | MasterLan Master/Slave system. |

10.4.2 Timing

```

Configuration
Pump Circulation Time
0060 s
Compressor Off Time
0360 s
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------|----|------------------|------|--|
| Pump Circulation Time | I8 | 0-9999 F: 60 | s | Pump circulation time after compressor Off cycle, the water temperature is measured and compared to setpoint. |
| Compressor Off Time | I7 | 0-9999 F: 360 | s | Minimum compressor Off time, between On cycles or alarm recovery time. Never set lower than 120s for service purposes. |

10.4.3 Double compressor unit setup

```

Configuration
Compressors Rotation
Disabled
2nd Compressor Delay
0000 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------|------|-----------------------------------|------|---|
| Rotation | B206 | 0: Disabled 1: Enabled F: 1 | - | Enables or Disables 2 compressors rotation. |
| 2nd Compressor Delay | I209 | 0-9999 F: 15 | s | Delay of the 2nd compressor start after starting the 1st one. |

10.4.4 Pump Timing

```

Configuration
PUMP Before Compressor
0030 s
PUMP After Compressor
0030 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------------------|-----|-----------------|------|--|
| Pump Before Compressor | I9 | 0-9999 F: 30 | s | Pump start time before compressor start. |
| Pump After Compressor | I10 | 0-9999 F: 30 | s | Pump stop time after compressor stop. |

10.4.5 Remote On/Off (Tariff) configuration

```

Configuration
Remote On/Off (Tariff)
Compressor:
Enabled
Aux.Heater:
Enabled
Sanitary Hot Water:
Disabled
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------------|-----|---------------------------|------|--|
| Compressor | B75 | 0: Disabled 1: Enabled | - | When Enabled, compressor starts and stops according to remote on/off input. |
| Aux. Heater | B74 | 0: Disabled 1: Enabled | - | When Enabled, auxiliary heater starts and stops according to remote on/off input. |
| Sanitary Hot Water | B76 | 0: Disabled 1: Enabled | - | When Disabled, compressor starts and stops to heat sanitary hot water, ignoring remote on/off input. |

10.4.6 SHW/H&C timing

```

Configuration
Max Time SHW Mode:
060 min
Min Time H/C Mode:
060 min
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------|-----|----------------|------|---|
| Max Time SHW Mode | I53 | 0-999 F: 60 | min | Maximum time the unit stays in SHW mode. |
| Min Time H/C Mode | I54 | 0-999 F: 60 | min | Minimum time the unit stays in H/C mode before returns to SHW or Pool mode. |

10.4.7 Compressor 1 Statistics

```

Configuration
Hours Compressor 1
Total: 000000 Hrs
Starts: 00000 x10
Service: 000000 Hrs
Total Reset: 0
Service Reset: 0
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------------------|-----|-------------|------|--|
| Hours Compressor 1 Total | - | 0-999999 | hrs | Total compressor operating time. |
| Compressor 1 Starts | I12 | 0-32000 x10 | - | Total compressor starts |
| Service | I11 | 0-32000 | Hrs | Service compressor operating hours. Operating hours from last service reset. |
| Total Reset | - | 0/1 | - | Change to 1 for reset of the total operating hours. |
| Service Reset | - | 0/1 | - | Change to 1 for reset of the service operating hours. |

10.4.8 Compressor 2 Statistics

```

Configuration
Hours Compressor 2
Total: 000000 Hrs
Starts: 00000 x10

Service: 000000 Hrs
Total Reset: 0
Service Reset: 0
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------------------|----|-------------|------|--|
| Hours Compressor 2 Total | - | 0-999999 | hrs | Total compressor 2 operating time. |
| Compressor 2 Starts | - | 0-32000 x10 | - | Total compressor 2 starts |
| Service | - | 0-32000 | Hrs | Service compressor 2 operating hours. Operating hours from last service reset. |
| Total Reset | - | 0/1 | - | Change to 1 for reset of the total operating hours. |
| Service Reset | - | 0/1 | - | Change to 1 for reset of the service operating hours. |

10.4.9 Service Time / Fan Time

```

Configuration
Comp. Service Time
003000 Hrs

Hours Fan
Total: 000000 Hrs

Total Reset: 0
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------|----|-----------|------|---|
| Service Time | - | 0-999999 | hrs | Compressor service period. |
| Hours Fan | - | 0-999999 | hrs | Fan operating hours. |
| Total Reset | - | 0/1 | - | Change to 1 for reset of the fan operating hours. |

10.4.10 Pump Time

```

Configuration
Hours Pump
Total: 000000 Hrs

Total Reset: 0
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------|-----|-----------|------|---|
| Hours Pump | I13 | 0-999999 | hrs | Pump operating hours. |
| Total Reset | - | 0/1 | - | Change to 1 for pump operating hours reset. |

10.4.11 Heater Statistics

```

Configuration
Hours Heater 1
Total: 000000 Hrs
Hours Heater 2
Total: 000000 Hrs

Total Reset: 0
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------|------|-----------|------|--|
| Hours Heater 1 Total | I100 | 0-999999 | hrs | Total heater 1 operating time. |
| Hours Heater 2 Total | I101 | 0-999999 | hrs | Total heater 2 operating time. |
| Total Reset | - | 0/1 | - | Change to 1 for heaters operating hours reset. |

10.4.12 Heat Pump ID / SW Release

```

Configuration
Heat Pump ID:
00001

SW Release:
PCO5_001
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|------|-----------------|------|------------------|
| ID | 172 | 0-32000 F: 1 | - | Heat Pump ID |
| SW Release | 1104 | 0-999 | - | pCO5 SW Release. |

10.4.13 Probes Selection

```

Configuration I/O
Control Probe:
B2/PCO5
Antifreeze Probe:
B2/PCO5
Outdoor Probe:
B3/PCO5
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------------|----|--|------|-------------------------------------|
| Control Probe | - | B1-B5/pCO5 B1-B4/pCOe F: B2/pCO5 | - | Water control probe selection. |
| Antifreeze Probe | - | B1-B5/pCO5 B1-B4/pCOe F: B2/pCO5 | - | Antifreeze control probe selection. |
| Outdoor Probe | - | B1-B5/pCO5 B1-B4/pCOe F: B2/pCO5 | - | Outdoor control probe selection. |

10.4.14 ID Configuration 1

```

Configuration I/O
Safety Thermostat:
ID1_pCO5
High Pressure Switch:
ID2_pCO5
Compressor 1 Thermal:
ID3_pCO5
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------|----|-----------------------------|------|--|
| Safety Thermostat | - | ID1-ID8_pCO5 F: ID1_pCO5 | - | Heater safety thermostat input. |
| High Pressure Switch | - | ID1-ID8_pCO5 F: ID2_pCO5 | - | High pressure switch input. |
| Compressor 1 Thermal | - | ID1-ID8_pCO5 F: ID3_pCO5 | - | Compressor 1 thermal protection input. |

10.4.15 ID Configuration 2

```

Configuration I/O
Remote On/Off(Tariff):
ID4_pCO5
Fan Thermal:
ID5_pCO5
Flow Switch:
ID6_pCO5
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|----|-----------------------------|------|-------------------------------|
| Remote On/Off | - | ID1-ID8_pCO5 F: ID4_pCO5 | - | Remote On/Off input. |
| Fan Thermal | - | ID1-ID8_pCO5 F: ID5_pCO5 | - | Fan thermal protection input. |
| Flow Switch | - | ID1-ID8_pCO5 F: ID6_pCO5 | - | Flow switch protection input. |

10.4.16 ID Configuration 3

```

Configuration I/O
Compressor 2 Thermal:
Not Used
HP Switch Circuit 2:
Not Used
Remote Heat/Cool:
Not Used
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------|----|-----------------------------|------|--|
| Compressor 2 Thermal | - | ID1-ID8_pCO5 F: Not Used | - | Compressor 2 thermal protection input. |
| HP Switch Circuit 2 | - | ID1-ID8_pCO5 F: Not Used | - | High pressure switch of the 2nd refrigeration circuit. |
| Remote Heat/Cool | - | ID1-ID8_pCO5 F: Not Used | - | Input for function remote control Heating/Cooling. |

10.4.17 Relay Configuration 1

```

Configuration I/O
Compressor Relay:
Relay 1 /pCO5

Compressor 2 Relay:
Not Used
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------------|----|---------------------------|------|----------------------------|
| Compressor Relay | - | R1-R8/pCO5 F: R1/pCO5 | - | Compressor output relay. |
| Compressor 2 Relay | - | R1-R8/pCO5 F: Not Used | - | Compressor 2 output relay. |

10.4.18 Relay Configuration 2

```

Configuration I/O
Reversing Valve:
Relay 2 /pCO5
Alarm Relay:
Not Used
Alarm Relay Polarity:
Open
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------|----|---------------------------|------|---|
| Reversing Valve | - | R1-R8/pCO5 F: R2/pCO5 | - | Reversing valve output relay. |
| Alarm Relay | - | R1-R8/pCO5 F: Not Used | - | Alarm relay output. |
| Alarm Relay Polarity | - | Open Closed | - | Alarm relay output polarity when alarm is active. |

10.4.19 Relay Configuration 3

```

Configuration 1/0
Auxiliary Heater 1:
Relay 4 /pCO5

Auxiliary Heater 2:
Relay 5 /pCO5
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------------|----|--------------------------|------|------------------------|
| Auxiliary Heater 1 | - | R1-R8/pCO5 F: R4/pCO5 | - | Heater 1 relay output. |
| Auxiliary Heater 2 | - | R1-R8/pCO5 F: R5/pCO5 | - | Heater 2 relay output. |

10.4.20 Relay Configuration 4

```

Configuration 1/0
Heating/Cooling Relay:
Not Used

H/C Relay Polarity:
Cooling = On
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------|----|-------------------------------|------|--|
| Heating/Cooling Relay | - | R1-R8/pCO5 F: Not Used | - | Heating / Cooling function relay output. |
| H/C Relay Polarity | - | Cooling = On Cooling = OFF | - | H/C relay output polarity. |

10.4.21 Analog Output Configuration

```

Configuration I/O
Analog Outputs
Y1/pCO5: HC 1
Y2/pCO5: HC 2
Y3/pCO5: Fan
Y4/pCO5: Pump
Y1/pCOe: HC 3
Key PRG for AO Setup
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|--|------|--|
| Y1/pCO5 | - | HC1-HC6 Fan Pump Solar F: HC1 | - | Configuration of analog output Y1(0-10V). |
| Y2/pCO5 | - | HC1-HC6 Fan Pump Solar F: HC2 | - | Configuration of analog output Y2(0-10V). |
| Y3/pCO5 | - | HC1-HC6 Fan Pump Solar F: Fan | - | Configuration of analog output Y3(PWM). |
| Y4/pCO5 | - | HC1-HC6 Fan Pump Solar F: Pump | - | Configuration of analog output Y4(PWM). |
| Y1/pCOe | - | HC1-HC6 Fan Pump Solar F: HC3 | - | Configuration of analog output Y1/pCOe(0-10V). |

10.5 Pump Set

Hot side pump setting.

10.5.1 Pump Timing

```

Load Side Pump
PUMP Before Compressor
0030 s
PUMP After Compressor
0030 s
PUMP Run Type
COMPRESSOR
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------------------|-----|---|------|--|
| Pump Before Compressor | I9 | 0-9999 F: 30 | s | Pump start time before compressor start. |
| Pump After Compressor | I10 | 0-9999 F: 30 | s | Pump stop time after compressor stop. |
| Pump Run Type | B1 | 0: Compressor 1: Permanent F: Compressor | - | Type of the pump run. When Compressor, it runs only with compressor, with periodical circulation "Pump Circulation Time" after each "Compressor Off Time". When "Pump Circulation Time" set to 0, pump runs with compressor only (see 10.4.2). When set to Permanent, pump runs except the "Summer Mode". |

10.5.2 Pump Speed Heating

```

Load Side Pump
Heating Mode
Minimum Speed:050.0 %
Maximum Speed:100.0 %
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------|-------------------|------|--|
| Minimum Speed | A157 | 0-100 F: 50.0 | % | Minimum pump speed for minimum inverter speed. |
| Maximum Speed | A158 | 0-100 F: 100.0 | % | Maximum pump speed for maximum inverter speed. |

10.5.3 Pump dT Mode (Reserved for future use)

10.5.4 Pump Speed Cooling

```

Load Side Pump
Cooling Mode
Minimum Speed: 050.0 %
Maximum Speed: 100.0 %
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------|-------------------|------|--|
| Minimum Speed | A496 | 0-100 F: 50.0 | % | Minimum pump speed for minimum inverter speed. |
| Maximum Speed | A497 | 0-100 F: 100.0 | % | Maximum pump speed for maximum inverter speed. |

10.5.5 Pump Antifreeze Function

```

Load Side Pump
Antifreeze Function
Water Temp: 20.0 °C
Air Temp: -20.0 °C
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|------|------------------------|------|---|
| Water Temp | A498 | -99.9/99.9 F: 20.0 | °C | Water temperature to start pump like antifreeze function. |
| Air Temp | A201 | -99.9/99.9 F: -20.0 | °C | Outdoor air temperature to start pump like antifreeze function. |

10.5.6 Pump Flow Alarm

```

Load Side Pump
Pump Alarm: Disabled
Alarm On Time: 0010 s
Pump Alarm Active: No
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------|------|---------------------------|------|---|
| Pump Alarm | B31 | 0: Disabled 1: Enabled | - | Function Stops pump when no flow after "Alarm On Time" from pump start. Pump symbol flashes on the main screen. It tries to restart the pump after "Compressor Off Time". |
| Alarm On Time | I55 | 0-9999 F: 10 | s | Pump alarm time delay. |
| Pump Alarm Active | B385 | 0: No 1: Yes | - | When Yes, pump alarm is actually active. Pump symbol flashes on the main screen. |

10.5.7 Pump HW config

```

Load Side Pump [X]
PUMP Relay:
Relay 3 /pCO5
PUMP Analog Out:
Use "Configuration"
PUMP Manual: 000.0 %
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------|------|--------------------------|------|---|
| Pump Relay | - | R1-R8/pCO5 F: R3/pCO5 | - | Pump relay output configuration. |
| Pump Manual | A499 | 0-100.0 F: 000.0 | % | Manual Pump activation (Permanent memory). When set higher than 1.0%, the relay and analog outputs are activated. Must be set to 0 for automatic operation. |

10.6 Fan (Brine Pump) Set

Fan or brine pump configuration.

10.6.1 Fan Timing

```

Fan / Brine Pump
Fan before Compressor
015 s
Fan After Compressor
015 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------|-----|----------------|------|---|
| Fan before Compressor | I30 | 0-999 F: 15 | s | Fan/Brine Pump start before compressor start. |
| Fan after Compressor | I31 | 0-999 F: 15 | s | Fan/Brine Pump stop after compressor stop. |

10.6.2 Fan Speed Heating Mode

```

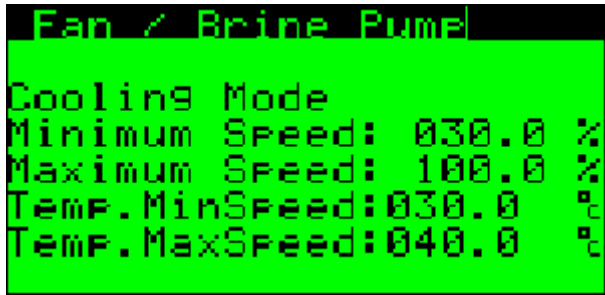
Fan / Brine Pump
Heating Mode
Minimum Speed: 030.0 %
Maximum Speed: 100.0 %
TempMin Speed: 015.0 %
TempMax Speed: 005.0 %
Control Type: EvapT
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------|------------------------------|------|---|
| Minimum Speed | A56 | 0-100 F: * | % | Minimum fan/brine pump speed for minimum inverter speed. |
| Maximum Speed | A58 | 0-100 F: * | % | Maximum fan/brine pump speed for maximum inverter speed. |
| TempMin Speed | A446 | -99.9-99.9 F: 15.0 | °C | Evaporating temperature for fan/brine pump minimum speed in EvapT control mode |
| TempMax Speed | A447 | -99.9-99.9 F: 5.0 | °C | Evaporating temperature for fan/brine pump maximum speed in EvapT control mode |
| Control Type | D439 | Speed(0) EvapT(1) F: 0 | - | 0=fan/brine pump speed related to compressor speed 1=fan/brine pump speed related to evaporating temperature |

*Factory setting:

| Unit type | Minimum Speed % | Maximum Speed % |
|--------------------------|-----------------|-----------------|
| AM, EM, AQ | 100 | 100 |
| AM, EM with DC Fan | 50 | 50 |
| EM60Z, EM75Z with DC Fan | 75 | 75 |
| BA | 70 | 70 |
| AQxxl | 50 | 100 |
| BA22I, BA30I | 30 | 70 |
| BA45I | 50 | 90-100 |

10.6.3 Fan Speed Cooling Mode

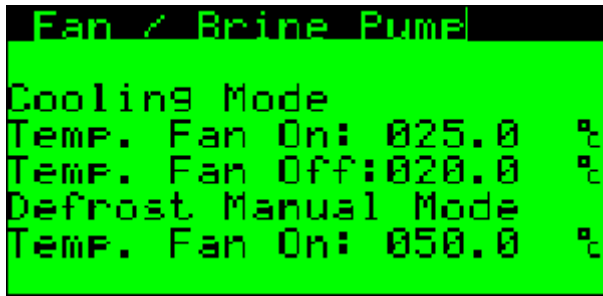


| Parameter: | SP | Range/F.: | Unit | Description |
|------------------------|-----|-------------------------|------|--|
| Minimum Speed | A60 | 0-100 F: * | % | Minimum fan/brine pump speed for minimum speed condensing temperature. |
| Maximum Speed | A62 | 0-100 F: * | % | Maximum fan/brine pump speed for maximum speed condensing temperature. |
| Temperature Min. Speed | A61 | -99.9 - 99.9 F: 30.0 | °C | Temperature for minimum speed. |
| Temperature Max. Speed | A63 | -99.9 - 99.9 F: 40.0 | °C | Temperature for Maximum speed. |

*Factory setting:

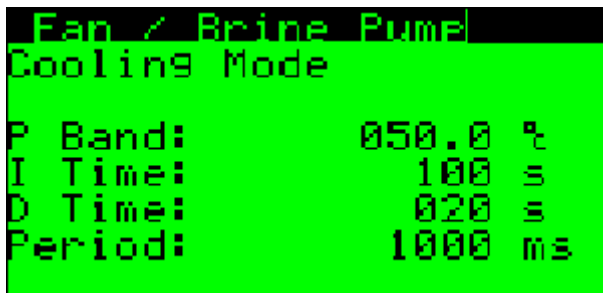
| Unit type | Minimum Speed % | Maximum Speed % |
|--------------------------|-----------------|-----------------|
| AM, EM, AQ | 100 | 100 |
| AM, EM with DC Fan | 20 | 60 |
| EM60Z, EM75Z with DC Fan | 20 | 100 |
| BA | 30 | 70 |
| AQxxl | 30 | 100 |
| BA22I, BA30I | 30 | 70 |
| BA45I | 30 | 100 |

10.6.4 Fan On/Off Cooling Mode



| Parameter: | SP | Range/F.: | Unit | Description |
|---------------------------------|------|-------------------------|------|--|
| Temperature Fan On | A65 | -99.9 - 99.9 F: 25.0 | °C | Fan/Brine pump start temperature in cooling mode. |
| Temperature Fan Off | A64 | -99.9 - 99.9 F: 20.0 | °C | Fan/Brine pump stop temperature in cooling mode. |
| Defrost Manual Mode Temp.Fan On | A493 | -99.9 - 99.9 F: 50.0 | °C | Fan/Brine pump start temperature in manual defrost mode. |

10.6.5 Fan PID setting Cooling Mode



| Parameter: | SP | Range/F.: | Unit | Description |
|------------|------|----------------------|------|---|
| P Band | A494 | 0 - 999.9 F: 50.0 | °C | Fan/Brine pump speed control Proportional Band in Cooling/Passive cooling mode. |
| I Time | I78 | 0 - 999 F: 100 | s | Integration Time for speed control in Cooling/Passive cooling mode. |
| D Time | I76 | 0 - 999 F: 20 | s | Derivative Time for speed control on Cooling/Passive cooling mode. |
| Period | - | 0-9999 F: 1000 | ms | PID control period. Do not set below 1000ms. |

10.6.6 Fan - Winter Periodic Run

```

Fan / Brine Pump
Winter Periodic Run
Enabled:          No
Start Temp:      02 %
On Period:       0000 s
Off Period:      0360 s
Output:          No
Fan/Speed:      No /000.0%
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------|----|---------------------------|------|---|
| Enabled | - | 0 – No 1- Yes F: No | - | Periodic Run Enabled. |
| Start Temp: | - | -99/99 F: 2 | °C | Requested temperature for switching in winter period. |
| On Period | - | 0 - 9999 F: 0 | s | Runtime in winter period. |
| Off Period | - | 0-9999 F: 360 | s | Off time between running time. |
| Output | - | Yes/No | - | Output status. |
| Fan/Speed | - | Yes/No 0-100.0 | -% | Fan status. Yes= ON Speed displayed. |

10.6.7 Fan I/O Configuration

```

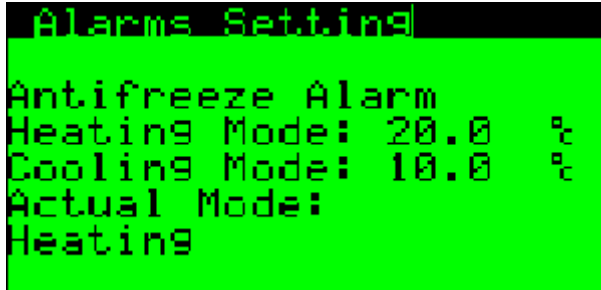
Fan / Brine Pump I/O
Fan Relay:
Not Used
Fan Analog Out:
Use "Configuration"
Fan Manual: 000.0 %
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------|-----|---------------------------------------|------|--|
| Fan Relay | - | R1-R8/pCO ₅ F: Not Used | - | Fan relay output configuration. Normally Analog Output only is used. |
| Fan Analog Out | - | - | - | Please see menu "Configuration" for Analog Output assignment. |
| Fan Manual | A11 | 0-100.0 F: 000.0 | % | Manual Fan activation (Permanent memory). When set higher than 1.0%, the relay and analog outputs are activated. Must be set to 0 for automatic operation. |

10.7 Alarms Set

Setting of general alarms parameters.

10.7.1 Antifreeze Alarm



| Parameter: | SP | Range/F.: | Unit | Description |
|--------------|------|--------------------|------|---|
| Heating Mode | A52 | -999 - 999 F: * | °C | Heating water antifreeze setpoint in "Heating" antifreeze mode. |
| Cooling Mode | A150 | -999 - 999 F: * | °C | Heating water antifreeze setpoint in "Cooling" antifreeze mode. |
| Actual Mode | - | Heating/Cooling | - | Actual antifreeze mode: "Heating" = Outdoor temperature below defrost limit. "Cooling" = Outdoor temperature above defrost limit. |

*Factory setting:

| Unit type | Heating Mode °C | Cooling Mode °C |
|---------------------|-----------------|-----------------|
| AM, EM | 20 | 10 |
| AM, EM glycol 15% | 15 | 10 |
| AQ | 10 | 10 |
| BA, glycol min. 30% | 5 | 5 |

10.7.2 Low Pressure Alarm

```

Alarms Setting
Low Pressure Alarm
Setpoint: 00.7 bar
Hysterezis: 00.5 bar
Alarm Delay: 005 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------------|------|------------------------|------|--|
| Low Pressure Alarm Setpoint | A76 | -99.9 - 99.9 F: * | bar | Low Pressure alarm setpoint. (Electronic pressure switch). |
| Hysterezis | A125 | -99.9 - 99.9 F: 0.5 | bar | Low pressure alarm hysterezis. Alarm disappears when real pressure > setpoint + hysterezis |
| Low Pressure Alarm Delay | I18 | 0-999 F:* | s | Low pressure alarm delay activation. |

*Factory setting:

| Unit type | LP Setpoint, bar | LP Delay, s |
|------------------------|------------------|-------------|
| 407c units, AM, EM, BA | 0.6 | 120 |
| 407c units, AQ | 1.7 | 5 |
| 410a units, BA | 1.5 | 120 |
| 410a units, AQ | 4.0 | 5 |

10.7.3 High Pressure Alarm

```

Alarms Setting
High Pressure Alarm
Setpoint: 28.0 bar
Hysterezis: 05.0 bar
Low Pressure HP Side
Setpoint: 02.0 bar
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---|------|------------------------|------|---|
| High Pressure Alarm Setpoint | A74 | -99.9 - 99.9 F: * | bar | High Pressure alarm setpoint. (Electronic pressure switch). |
| Hysterezis | A492 | -99.9 - 99.9 F: 5.0 | bar | High pressure alarm hysterezis. Alarm disappears when real pressure < setpoint - hysterezis |
| Low Pressure Alarm on high pressure side Setpoint | A75 | -99.9 - 99.9 F: * | bar | Low Pressure alarm setpoint on high pressure side. (Electronic pressure switch). Alarm avoids compressor running when low amount of refrigerant in the circuit. |

| Unit type | HP Setpoint, bar | LP HP side, bar |
|------------|------------------|-----------------|
| 407c units | 28.0 | 1.0 |
| 410a units | 41.0 | 2.0 |

10.7.4 Low Evaporating Temperature

```

Alarms Settings
Low Evaporating Temp.
Heating Mode: -30.0 %
Cooling Mode: 00.0 %
Alarm Delay: 000 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------------------------|------|----------------------|------|--|
| Low Evaporating Heating Mode | A54 | -99.9 - 99.9 F: * | °C | Low evaporating temperature protection for heating mode. When evaporating temperature, calculated from suction pressure drops below threshold, alarm is activated after alarm delay. |
| Low Evaporating Cooling Mode | A128 | -99.9 - 99.9 F: * | °C | The same protection as above in cooling mode. |
| Low Evaporating Alarm Delay | I319 | 0-999 F: 5 | s | Low evaporating temperature alarm delay. |

*Factory setting:

| Unit type | LE Heating Mode °C | LE Cooling Mode °C |
|---------------------|--------------------|--------------------|
| AM, EM | -35.0 | 0.0 |
| AM, EM glycol 15% | -35.0 | -5.0 |
| AQ, ground loop BW | -15.0 | 1.0 |
| AQ, open loop WW | 1.0 | 1.0 |
| BA, glycol min. 15% | -35.0 | -5.0 |
| BA, glycol min. 30% | -35.0 | -15.0 |

10.7.5 High Condensing Temperature

```

Alarms Settings
High Condensing Temp.
Heating Mode: 65.0 %
Cooling Mode: 65.0 %
Alarm Delay: 000 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------------------------|------|-------------------------|------|---|
| High Condensing Heating Mode | A53 | -99.9 - 99.9 F: 68.0 | °C | High condensing temperature protection for heating mode. Value is calculated from discharge pressure. Alarm is activated after alarm delay. |
| High Condensing Cooling Mode | A127 | -99.9 - 99.9 F: 65.0 | °C | The same protection as above in cooling mode. |
| High Condensing Alarm Delay | I320 | 0-999 F: 5 | s | Alarm Delay before High Condensing Temperature. |

10.7.6 High Compressor Discharge Temperature

```

Alarms Setting
High Discharge Temp.
Setpoint: 120.0 °C
Flow Switch Delay:
005 s
Alarm Relay Type:
Some Error
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---|-----|------------------|------|---|
| High Discharge Gas Temperature Setpoint | A55 | -999 - 999 F: | °C | Compressor protection avoiding too high discharge temperature of refrigerant. |

*Factory setting:

| Unit type | High DGT °C |
|----------------------------|-------------|
| AM, EM, BA, AQ | 130.0 |
| AQ22I, AQ30I, BA22I, BA30I | 115.0 |
| AQ45I, BA45I | 110.0 |

10.7.7 Flow Switch Delay

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------|-----|-----------------|------|---|
| Flow Switch Delay | I17 | 0 - 999 F: 5 | s | Bypassing flow switch time after pump/submersible pump start. |

10.7.8 Alarm Relay Type

| Parameter: | SP | Range/F.: | Unit | Description |
|------------------|------|-------------|------|---|
| Alarm Relay Type | B384 | 0/1 F: 0 | - | Specifies type of alarm relay activation. 0=Some Error - relay activated when alarm is active. 1=Manual Reset Required - relay activated when unit requires manual reset of alarm (3 alarms condition). |

10.8 Defrost Set

Setting of defrost parameters.

10.8.1 Defrost Point A

```
Defrost Setting
Defrost Point A
Outdoor: 10.0 °C
Difference 0%: 12.0 °C
Difference 100%: 12.0 °C
Actual Diff.: 08.0 °C
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------------------|-----|----------------------|------|--|
| Defrost Point A Outdoor Temp. | A66 | -99.9 - 99.9 F: * | °C | Outdoor reference temperature for difference definition of the point A. |
| Defrost A Difference 0% | A68 | -99.9 - 99.9 F: * | °C | Difference (Outdoor - Evaporating Temperature) to start defrost for minimum compressor capacity. |
| Defrost A Difference 100% | A57 | -99.9 - 99.9 F: * | °C | Difference (Outdoor - Evaporating Temperature) to start defrost for maximum compressor capacity. |
| Actual Difference A | - | -99.9 - 99.9 | °C | Real actual calculated difference, point A. |

10.8.2 Defrost Point B

```
Defrost Setting
Defrost Point B
Outdoor: -10.0%
Difference 0%: 08.0 %
Difference 100%: 08.0 %
Activation Delay: 060s
Actual Diff.: 08.0 %
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------------------|-----|----------------------|------|---|
| Defrost Point B Outdoor Temp. | A67 | -99.9 - 99.9 F: * | °C | Outdoor reference temperature for difference definition of the point B. |
| Defrost B Difference 0% | A69 | -99.9 - 99.9 F: * | °C | Difference (Outdoor - Evaporating Temperature) to start defrost for minimum compressor capacity. |
| Defrost B Difference 100% | A59 | -99.9 - 99.9 F: * | °C | Difference (Outdoor - Evaporating Temperature) to start defrost for maximum compressor capacity. |
| Actual Difference B | - | -99.9 - 99.9 | °C | Real actual calculated difference, point B. |
| Activation Delay | I45 | 0-999 F: 60 | s | Defrost activation delay. When temperature difference is reached for at least Activation Delay, defrost starts. |

10.8.3 Forced Defrost Set

Forced defrost bypasses minimum time between defrost cycles. When temperature difference between outdoor and evaporating temperature is too high, defrost starts after forced defrost delay.

```
Defrost Setting
Forced Def. Difference
Outdoor +10% : 15.0 %
Outdoor -20% : 10.0 %
Forced Delay: 0360 s
Actual Diff.: 10.0 %
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------------------------|-----|-------------------------|------|--|
| Forced Difference Outdoor +10°C | A72 | -99.9 - 99.9 F: 15.0 | °C | Difference (Outdoor - Evaporating Temperature) to start forced defrost for outdoor temperature +10°C. |
| Forced Difference Outdoor -20°C | A22 | -99.9 - 99.9 F: 10.0 | °C | Difference (Outdoor - Evaporating Temperature) to start forced defrost for outdoor temperature -20°C. |
| Forced Delay | I38 | 0-9999 F: 360 | s | Forced Defrost activation delay. When temperature difference is reached for at least Activation Delay, defrost starts. |
| Actual Difference | A23 | -99.9 - 99.9 | °C | Real actual calculated difference, to start forced defrost. |

10.8.4 Defrost Limit, End, Heater activation Temperature

```

Defrost Setting
Enabled below
Outdoor Temp.: 12.0 °C
Defrost End
Temperature: 35.0 °C
Heater
Activation: 30.0 °C
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------------------|-----|-------------------------|------|--|
| Enabled below Outdoor Temperature | A70 | -99.9 - 99.9 F: * | °C | Outdoor temperature threshold, below defrost operation is enabled. |
| Defrost End Temperature | A71 | -99.9 - 99.9 F: * | °C | Defrost end temperature. When condensing temperature reaches defrost end temperature, defrost stops. |
| Heater Activation | A73 | -99.9 - 99.9 F: 30.0 | °C | When in defrost mode water temperature drops below Heater Activation - Heater Hysterezis, heater is activated to keep water temperature sufficient to perform defrost. |

10.8.5 Defrost Timing 1

```

Defrost Setting
Min. Time between
2 Cycles: 060min
RU & Compressor
Delay Start: 030 s
Delay End: 060 s
PT Swap Delay: 040 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------------------|------|----------------|------|---|
| Minimum Time between 2 Cycles | I32 | 0-999 F: * | min | Minimum time between 2 defrost cycles. This time from last defrost cycle must be elapsed before starting next defrost cycle, with exception of Forced Defrost. |
| RV&Compressor Delay Start | I34 | 0-999 F: * | s | Reversing valve and compressor delay when starting defrost cycle. When defrost cycle is activated, compressor stops. After this delay reversing valve changes position following additional the same delay, before compressor is started in defrost mode. |
| Delay End | I323 | 0-999 F: * | s | Compressor OFF period after finishing the defrost cycle. When set to 0, compressor will not stop. |
| PT Swap Delay | I324 | 0-999 F: 60 | s | Delay to swap pressure transducers between suction line (detects defrost start) and discharge line (detects defrost end) after compressor stops before defrost cycle. |

10.8.6 Defrost Timing 2

```

Defrost. Setting
Defrost
Max. Time:      008min
Fan Run Time
Defrost End:    010 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------------------|------|---------------|------|---|
| Defrost Maximum Time | I33 | 0-999 F: * | min | Maximum duration of defrost cycle. If defrost end temperature is not reached in this time, defrost stops. |
| Fan Run Time Defrost End | I102 | 0-999 F: * | s | When defrost end temperature is reached, fan starts for this time to reduce discharge pressure and 4 way valve changes position for heating mode. |

10.8.7 Hot Water at Defrost

```
Defrost Setting
Sanitary Hot Water
Deactivation: Yes
Manual Defrost
Time: 015 min
Fan On Temp: 50.0 °C
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------------------------|-----|------------------|------|--|
| Sanitary Hot Water Deactivation | B44 | Yes/No F: Yes | - | When set to "Yes", Hot water is deactivated during defrost mode. We recommend to keep this setting for Hot Water Tank with heat exchanger and 3 way valve combination. For "Tank in Tank" we recommend setting "No". |
| Manual Defrost Time | | | min | Reserved for future use. |
| Fan On Temperature | | | °C | Reserved for future use. |

10.8.8 Defrost Info

```
Defrost Setting
Time from Last: 000min
Temperature
Condition: No
Start Manual: No
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------|------|-----------|------|---|
| Time from Last | I35 | 0-200 | min | Time elapsed from last defrost cycle. |
| Temperature Condition | - | Yes/No | - | Informs if temperature difference for starting the defrost cycle is met. |
| Start Manual | B386 | Yes/No | - | When set to "Yes" and temperature condition is met, defrost starts immediately. After 5 seconds, the parameter returns to "No". |

10.8.9 Defrost Factory Setting

| Parameter | unit | SP | AM EM ≤-30 | AM EM >30 | AM IS EM IS | BA | BA I |
|-----------------------------------|------|------|------------------|-----------------|----------------|-------|-------|
| Defrost Point A Outdoor Temp. | °C | A66 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Defrost A Difference 0% | °C | A68 | 12.0 | 12.0 | 14.0 | 12.0 | 12.0 |
| Defrost A Difference 100% | °C | A57 | 12.0 | 12.0 | 14.0 | 12.0 | 12.0 |
| Defrost Point B Outdoor Temp. | °C | A67 | -10.0 | -10.0 | -10.0 | -10.0 | -10.0 |
| Defrost B Difference 0% | °C | A69 | 0.0 | 8.0 | 8.0 | 0.0 | 3.0 |
| Defrost B Difference 100% | °C | A59 | 0.0 | 8.0 | 8.0 | 0.0 | 8.0 |
| Activation Delay | s | I45 | 60 | 60 | 60 | 60 | 60 |
| Forced Difference Outdoor +10°C | °C | A72 | 15.0 | 15.0 | 18.0 | 15.0 | 15.0 |
| Forced Difference Outdoor -20°C | °C | A22 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Forced Delay | s | I38 | 360 | 360 | 360 | 360 | 360 |
| Enabled below Outdoor Temperature | °C | A70 | 12.0 | 12.0 | 15.0 | 12.0 | 12.0 |
| Defrost End Temperature | °C | A71 | 35.0 | 35.0 | 50.0 | 45.0 | 45.0 |
| Heater Activation | °C | A73 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 |
| Minimum Time between 2 Cycles | min | I32 | 60 | 60 | 45 | 45 | 45 |
| RV&Compressor Delay Start | s | I34 | 30 | 30 | 30 | 30 | 30 |
| Delay End | s | I323 | 0 | 0 | 0 | 0 | 60 |
| PT Swap Delay | s | I324 | 60 | 60 | 60 | 60 | 60 |
| Defrost Maximum Time | min | I33 | 15 | 15 | 8 | 8 | 8 |
| Fan Run Time Defrost End | s | I102 | 10 | 10 | 10 | 10 | 10 |
| Sanitary Hot Water Deactivation | - | B44 | 1 | 1 | 1 | 1 | 1 |

10.9 Expansion Set

Setting of Electronic Expansion Valve parameters.

10.9.1 Expansion info

```

Expansion Info
StSht/DSht:06.0 /00.5
PV:0000      Power:005%
LP/HP:00.0   /00.0   bar
ET/CT:00.0   / 00.0   °C
S/DGT:00.0   /000.0   °C
S/Dht:00.0   /000.0   °C
Mode: DSht   Auto
    
```

| Parameter: | Range/F.: | Unit | Description |
|------------|----------------|------|--|
| StSht | -99.9 99.9 | °C | Suction Superheat Setpoint. |
| StDSht | -99.9 99.9 | °C | Discharge Superheat Setpoint. |
| PV | 0 9999 | - | Actual valve position. |
| Power | 0 100 | % | Requested valve capacity. |
| LP/HP | -1.0 45.0 | bar | Actual Compressor Suction / Discharge Pressure. |
| ET/CT | -50.0 99.9 | °C | Actual Evaporating/Condensing Temperature. |
| S/DGT | -50.0 150.0 | °C | Actual Suction / Discharge Gas Temperature. |
| S/Dht | -50.0 99.9 | °C | Actual Suction / Discharge Superheat. |
| Mod | SSht DSht | °C | Actual Control type. SSht: Suction Superheat Control DSht: Discharge Superheat Control |

10.9.2 Config

```

Expansion Setting
Compressor: GKT141DBA
E2V Heating: E2V14
E2V Cooling: E2V14
Refrigerant: R407c
Cap.Offset: 020.0 %
Comp. Delay: 001 s
Glider Time: 060 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------------|------|--------------------|------|---|
| Compressor | I300 | 0-19 | - | Compressor model used in the unit. 0=GKT141, 1=GJT240, 2=GPT425DBA, 3=GPT425DAA, 4=AQ036, 5=C-SBN26x, 6=C-SBN30x, 7=C-SBN37x, 8=C-SBN453, 9=C-SBS235, 10=C-SCN603, 11=C-SCN753, 12=C-SCN903, 13=ZH15, 14=ZH21, 15=ZH30, 16=ZH38, 17=ZH45, 18=JBA068, 19=GJT325 |
| E2V Heating | I301 | 0-7 | - | Size of valve Carel E2V used in heating mode. 0=14, 1=18, 2=24, 3=30, 4=35, 5=45, 6=55, 7=65 |
| E2V Cooling | I302 | 0-7 | - | Size of valve Carel E2V used in cooling mode. 0=14, 1=18, 2=24, 3=30, 4=35, 5=45, 6=55, 7=65 |
| Refrigerant | I303 | 0-1 | - | Type of used refrigerant. 0=407c, 1=410a |
| Capacity Offset | A208 | 0-100.0 F: 30.0 | % | Offset from compressor capacity for EEV control range. |
| Compressor Delay | I4 | 0-999 F: 0, 3 | s | Delay of compressor after EEV opening. 0s for Inverter units, 3s for On/Off units. |
| Glider Time | I304 | 0-999 F: 60 | s | Time after compressor start, to glide evaporating/condensing reference temperatures from solid values to real ones, measured by pressure transducers, when Glider Mode is selected. |

10.9.3 Evaporating Reference

```

Expansion Setting
Evaporating Reference
Heating Mode
Temperature: -10.0 %
Type: Glider
Cooling Mode
Temperature: 05.0 %
Type: Glider
  
```


| Parameter: | SP | Range/F.: | Unit | Description |
|---|------|----------------------|------|---|
| Evaporating Reference Heating Mode | A478 | -99.9-99.9 F:* | °C | Evaporating reference for compressor capacity calculation in heating mode. For BW and WW units, the reference is the set temperature. For AW units it is relative value to actual outdoor temperature. Example: Outdoor = -2.0°C, Reference Set = -10°C. Resulting reference = -2.0+(-10.0)=-12°C |
| Heating Mode Evaporating Reference Type | I305 | 0-2 F: 0 | - | Type of reference calculation in heating mode. 0=Reference T, 1=Suction T, 2=Glider. |
| Evaporating Reference Cooling Mode | A479 | -99.9-99.9 F: 5.0 | °C | Evaporating reference for compressor capacity calculation in cooling mode. It is relative value to actual water control temperature. |
| Cooling Mode Evaporating Reference Type | I306 | 0-2 F: 0 | - | Type of reference calculation in cooling mode. 0=Reference T, 1=Suction T, 2=Glider. |

10.9.4 Condensing Reference

```

Expansion Setting
Condensing Reference
Heating Mode
Temperature: 10.0 °C
Type: Condensing T
Cooling Mode
Temperature: 10.0 °C
Type: Condensing T
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--|------|----------------------|------|---|
| Condensing Reference Heating Mode | A480 | -99.9-99.9 F:10.0 | °C | Condensing reference for compressor capacity calculation in heating mode. It is relative value to actual water control temperature. |
| Heating Mode Condensing Reference Type | I307 | 0-2 F: 1 | - | Type of reference calculation in heating mode. 0=Reference T, 1=Discharge T, 2=Glider. |
| Cooling Mode Condensing Reference | A481 | -99.9-99.9 F:10.0 | °C | Condensing reference for compressor capacity calculation in cooling mode. For AW units it is relative value to outdoor temperature. For BW, WW units it is the set temperature. |
| Cooling Mode Condensing Reference Type | I308 | 0-2 F: 1 | - | Type of reference calculation in heating mode. 0=Reference T, 1=Discharge T, 2=Glider. |

10.9.5 EEV Steps

```

Expansion Settings
Manual Steps: 0000
Mode: Auto
StandBy Steps: 0030
StandBy Delay: 030 s
Defrost Steps: 0000
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------|----------------------------|------|--|
| Manual Steps | I168 | 0-9999 0-480E2V F: 0 | - | Manual requested valve position. |
| Mode | B49 | 0 = Auto 1 = Manual | - | Activation of the manual valve position. |
| StandBy Steps | I153 | 0-9999 F: * | - | Valve position when compressor is Off. |
| StandBy Delay | I309 | 0-999 F: 30 | s | Valve goes to StandBy position after delay from compressor stop. |
| Defrost Steps | I103 | 0-9999 F:* | - | Fixed valve position during defrost mode. When set to 0, EEV is automatically controlled. This setting is valid, when SGT or S/DGT control mode is chosen. |

*Factory setting:

| Unit type | StandBy Steps |
|----------------|---------------|
| AM, EM, BA, AQ | 30 |
| AQ22I | 30 |
| AQ30I | 30 |
| AQ45I | 150 |

| Unit type | Defrost Steps |
|------------|---------------|
| AM, EM, BA | 470 |
| BA22I | 470 |
| BA30I | 350 |
| BA45I | 470 |

10.9.6 EEV Capacity

```

Expansion Setting
EEV Capacity Setting
Auto = 000 %
Heating: 000 %
Cooling: 100 %
Defrost: 100 %
Automatic: 000 %
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------|------|-----------------|------|---|
| EEV Capacity Heating | I165 | 0-100 F: 0 | % | Valve capacity for heating mode. When set to 0%, automatic calculation is used, according to compressor type and circuit actual conditions. |
| EEV Capacity Cooling | I164 | 0-100 F: 0 | % | Valve capacity for cooling mode. When set to 0%, automatic calculation is used, according to compressor type and circuit actual conditions. |
| EEV Capacity Defrost | I166 | 0-100 F: 100 | % | Valve capacity for defrost mode. When set to 0%, automatic calculation is used, according to compressor type and circuit actual conditions. |
| Automatic | I310 | 0-100 | % | Result of automatic calculation. |

10.9.7 EEV Control Type

```

Expansion Setting
Control Type:
DGT
DGT Mode:
EUD Evolution
S4_Time: 050.0
Actual:
Discharge Superheat
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------|------|----------------------|------|--|
| Control Type | I191 | 0-3 F: * | - | EEV control mode setting. 0=DGT: Discharge Gas Superheat. 1=SGT: Conventional Suction Gas Superheat. 2=DGT/SGT: DGT for heating mode and SGT for cooling mode. 3=SDGT/SGT: Combination of SGT and DGT for heating mode and SGT for cooling mode. |
| DGT Mode | B53 | 0/1 F: 1 | - | Type of DGT control. 0: EVD Evo automatic control 1: pCO ₅ custom (manual) control. In this case special control routine from main controller is used. |
| S4_Time | A482 | 0.1-800.0 F: 20.0 | - | DGT probe antifer constant. System is able to assume target DGT, considering inertia of the heat transmission of hot gas -> probe. |
| Actual | B47 | 0/1 | - | Actual control mode. 0=Suction Superheat 1=Discharge Superheat |

*Factory setting:

| Unit type | Control Type |
|----------------------|--------------|
| AM, EM | 0, DGT |
| AM/EM Reversible, BA | 2, DGT/SGT |
| BAI | 3, SDGT/SGT |
| AQ | 1, SGT |

10.9.8 DGT Temperature Setting

```

Expansion Setting
DGT Setting DSuperheat
T.Reference A: 20.0 °C
DSuperheat A20:30.0 °C
DSuperheat A50:37.0 °C
T.Reference B: -20.0 °C
DSuperheat B20:35.0 °C
DSuperheat A50:42.0 °C
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------------|------|--------------------|------|---|
| DGT Temperature Reference A | A483 | -99.9-99.9 F: * | °C | Outdoor temperature reference, point A. |
| Discharge Superheat A20 | A29 | -99.9-99.9 F: * | °C | Requested discharge superheat for condensing temperature 20°C, reference point A. |
| Discharge Superheat A50 | A30 | -99.9-99.9 F: * | °C | Requested discharge superheat for condensing temperature 50°C, reference point A. |
| DGT Temperature Reference B | A484 | -99.9-99.9 F: * | °C | Outdoor temperature reference, point B. |
| Discharge Superheat B20 | A31 | -99.9-99.9 F: * | °C | Requested discharge superheat for condensing temperature 20°C, reference point B. |
| Discharge Superheat B50 | A32 | -99.9-99.9 F: * | °C | Requested discharge superheat for condensing temperature 50°C, reference point B. |

*Factory Setting:

| Parameter | unit | SP | AM | EM BA | BA22Z BAI | AQ | AQI |
|-----------------------------|------|------|-------|----------|--------------|-------|-------|
| DGT Temperature Reference A | °C | A483 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| Discharge Superheat A20 | °C | A29 | 30.0 | 35.0 | 30.0 | 30.0 | 30.0 |
| Discharge Superheat A50 | °C | A30 | 37.0 | 42.0 | 37.0 | 37.0 | 37.0 |
| DGT Temperature Reference B | °C | A484 | -20.0 | -20.0 | -20.0 | -20.0 | -20.0 |
| Discharge Superheat B20 | °C | A31 | 35.0 | 40.0 | 35.0 | 30.0 | 30.0 |
| Discharge Superheat B50 | °C | A32 | 42.0 | 47.0 | 42.0 | 37.0 | 37.0 |

10.9.9 DGT Configuration

```

Expansion Setting
DGT Setting

CT Source: Discharge T
Inverter Cor.: -10.0 °C
Actual Cor.: 00.0 °C
DSHeat Set: 0000.5 °C
DGT Set: 0000.5 °C
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------|------------------------|------|---|
| CT Source | B54 | 0/1 F: 1 | - | Condensing temperature source. 0=Discharge T: condensing temperature 1=Water: heating water temperature |
| Inverter Cor. | A485 | -99.9-99.9 F: -10.0 | °C | Inverter correction for requested DGT. This correction is corresponding to 0rps for inverter models. |
| Actual Cor. | - | -99.9-99.9 | °C | Actual calculated inverter requested DGT correction. |
| DSHeat Set | A8 | -999-999 | °C | Actual requested discharge superheat. |
| DGT Set | A486 | -999-999 | °C | Actual requested DGT |

10.9.10 DGT PID Setting

```

Expansion Setting
DGT Setting PID

P Band: 100.0 %
I Time: 100 s
D Time: 020 s
Period: 2000 ms
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|------|---------------------|------|---|
| P Band | A26 | 0-999.9 F: 100.0 | °C | EEV control proportional band for DGT mode. Lower value speeds up control. |
| I Time | I3 | 0-999 F: 100 | s | EEV control integration time. Lower value speeds up reaching the setpoint, but with risk of instability. |
| D Time | I2 | 0-999 F: 20 | s | EEV control deriavation time. Higher value speeds up reaching the setpoint, but with risk of instability. |
| Period | I311 | 0-9999 F: 2000 | ms | PID control period. Do not set lower than 1000. |

10.9.11 DGT Timing



| Parameter: | SP | Range/F.: | Unit | Description |
|----------------|-----|---------------------|------|--|
| DGT Begin Time | I1 | 0-999 F: 120 | s | DGT mode starts with solid EEV setting to reach stable circuit situation. PID control begins after DGT Begin Time. |
| Defrost Set | A25 | 0-100.0 F: 90.0 | % | Opening of the valve in defrost mode. Valid only for DGT mode. |
| EEV Manual | A9 | 0-100.0 F: 000.0 | % | Manual valve positioning during DGT control. When set to 0%, automatic operation. |

10.9.12 S/DGT Setting

```

Expansion Setting
S/DGT Setting
DGT DSht >      01.0 °C
SGT DSht <      15.0 °C
SDGT Active:    No
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------|-----|-----------------------|------|--|
| DGT DSht > | A17 | -99.9-99.9 F: 1.0 | °C | Offset to start DGT control beside SGT control. When discharge superheat (DSht) is higher then setpoint + offset, control switches from SGT to DGT mode. |
| SGT DSht < | A18 | -99.9-99.9 F: 15.0 | °C | Offset to start SGT control beside DGT control. When DSht is lower than setpoint - offset, control switches from DGT to SGT. |
| SDGT Active | B45 | 0/1 | - | 0=SGT mode, 1=DGT mode. |

10.9.13 SGT Superheat, MOP

```

Expansion Setting
SGT Setting
Superheat:      008.0 °C
MOP HT:         20.0 °C
MOP CO:         20.0 °C
MOP DF:         20.0 °C
MOP Alr Delay: 00360 s
MOP_Ti:         020.0 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------|-----------------------|------|--|
| Superheat | A174 | -999-999 F: 6.0 | °C | Suction superheat setpoint in case if SGT control. |
| MOP HT | A169 | -99.9-99.9 F: 20.0 | °C | Maximum Opening Pressure (MOP) setpoint for heating mode. When evaporating temperature is higher than setpoint, EEV starts closing to limit evaporating temperature. |
| MOP CO | A168 | -99.9-99.9 F: 20.0 | °C | Maximum Opening Pressure (MOP) setpoint for cooling mode. |
| MOP DF | A170 | -99.9-99.9 F: 20.0 | °C | Maximum Opening Pressure (MOP) setpoint for defrost mode. |
| MOP Alr Delay | I155 | 0-18000 F: 360 | s | When MOP is not reached in this time, MOP Alarm is activated. |
| MOP_Ti | A487 | 0.0-800.0 F: 20.0 | s | MOP control integration time. |

10.9.14 SGT LOP

```

Expansion Setting
SGT Setting

LOP:                -0030.0 °C

LOP Air Delay:     00360 s
LOP_Ti:            015.0 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------------|------|---|------|---|
| LOP Heating/Cooling | A166 | -99.9-99.9 F: AW=-30.0 BW=-12.0 WW=+2.0 | °C | Lowest Opening Pressure (LOP) setpoint. When evaporating temperature is lower than setpoint, EEV starts opening to limit evaporating temperature. |
| LOP Air Delay | I154 | 0-18000 F: 360 | s | When LOP is not reached in this time, LOP Alarm is activated. |
| LOP_Ti | A488 | 0.0-800.0 F: 15.0 | s | LOP control integration time. |

10.9.15 SGT Superheat Low

```

Expansion Setting
SGT Setting

SHL:                002.0 °C

SHL Air Delay:     00360 s
SHL_Ti:            015.0 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------|----------------------|------|---|
| SHL | A177 | -99.9-99.9 F: 2.0 | °C | Superheat Low setpoint. When superheat is lower than setpoint, EEV starts faster closing to reach at least minimum superheat. |
| SHL Air Delay | I156 | 0-18000 F: 360 | s | When at least SHL is not reached in this time, SHL Alarm is activated. |
| SHL_Ti | A489 | 0.0-800.0 F: 15.0 | s | SHL control integration time. |

10.9.16 SGT EVD Setting

EVD – PID settings of the EEV valve control in SGT mode.



| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|-----------------------------|------|---|
| EVD Pk | - | -99.9-99.9 Hodnota: 15.0 | °C | Proportional band for PID control of EEV. |
| EVD Ik | - | 0-9999 Hodnota: 150 | s | Integration time for PID control of EEV. |
| EVD Dk | - | 0.0-800.0 Hodnota: 5.0 | s | Derivation time for PID control of EEV. |

10.9.17 Expansion Info DGT

DGT control information screen.

```

Expansion Info DGT
StSht/DSht:08.0 /00.5
PV:0000      Power:005%
RegSubtype: 9 A:000.0
DGTControl: 0 R:000.5
EEVDGTON:   0 O:0000
EEVDGTMan:  0      010.0%
PIDON:0
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|------|------------|------|--|
| StSht | A181 | -99.9-99.9 | °C | Suction Superheat Setpoint. |
| StDSht | A8 | -99.9-99.9 | °C | Discharge Superheat Setpoint. |
| PV | I169 | 0-9999 | - | Actual valve position. |
| Power | I167 | 0-100 | % | Requested valve capacity. |
| RegSubtype | I312 | 0-2 | - | Evd Evolution control type, when it is used for control. 1=SGT, 2=DSheat, 3=DGT. |
| DGTControl | B340 | 0/1 | - | When DGT control enabled = 1. |
| EEVDGTON | B341 | 0/1 | - | Request from pCO to EVD Evolution to start DGT control. |
| EEVDGTMan | B342 | 0/1 | - | Request to start pCO special control of DGT. |
| A | A7 | 0-999.9 | °C | Actual discharge superheat. |
| R | A8 | 0-999.9 | °C | Requested discharge superheat |
| O | - | -1000-1000 | - | Actual PID output of DGT control in relative values. |
| O | A490 | 0-100.0 | % | Actual PID output of DGT control in % opening of valve. |
| PIDON | B343 | 0/1 | - | PID control of DGT active=1. |

10.9.18 Expansion Info SDGT

```

EEExpansion Info SDGT
StSht/DSht:08.0 /00.5
PV:0000      Power:005%
RegSubtype: 9 A:000.0
DGTControl: 0 R:000.5
EEVSDGTON:  0 O:0000
EEVDGTMan:  0      000.0%
PIDON:0
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|------|------------|------|--|
| StSht | A181 | -99.9-99.9 | °C | Suction Superheat Setpoint. |
| StDSht | A8 | -99.9-99.9 | °C | Discharge Superheat Setpoint. |
| PV | I169 | 0-9999 | - | Actual valve position. |
| Power | I167 | 0-100 | % | Requested valve capacity. |
| RegSubtype | I312 | 0-2 | - | Evd Evolution control type, when it is used for control. 1=SGT, 2=DSheat, 3=DGT. |
| DGTControl | B340 | 0/1 | - | When DGT control enabled = 1. |
| EEVSDGTON | B344 | 0/1 | - | Request from pCO to EVD Evolution to start SDGT control. |
| EEVDGTMan | B342 | 0/1 | - | Request to start pCO special control of DGT. |
| A | A7 | 0-999.9 | °C | Actual discharge superheat. |
| R | A8 | 0-999.9 | °C | Requested discharge superheat |
| O | - | -1000-1000 | - | Actual PID output of SDGT control in relative values. |
| O | A491 | 0-100.0 | % | Actual PID output of SDGT control in % opening of valve. |
| PIDON | B346 | 0/1 | - | PID control of SDGT active=1. |

10.9.19 EExpansion Set EVI - 1.part

```

EEExpansion Set EVI
RPS > 030.0 H: 1.0 rps
ET < 12.0 H: 1.0 %
CT < 58.0 H: 1.0 %
ETA:-18.0 CTA:10.0 %
ETB:12.0 CTB:47.0 %
CTAB:047.0 H: 1.0 %
Enabled: No
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|-----------|------|--|
| RPS > | - | 0-99.9 | - | Compressor speed have to higher then EVI activation set limit. |
| H | - | 0-9.9 | rps | Compressor Speed Hysteresis (+/-). |
| ET< | - | 99.9-99.9 | °C | Evaporation temperature have to lower then EVI activation set limit. |
| H | - | 0-9.9 | °C | Hysteresis limit for Evaporation temperature (+/-). |
| CT< | - | 99.9-99.9 | °C | Condensation temperature have to lower then set limit. |
| H | - | 0-9.9 | °C | Hysteresis limit for Condensation temperature. (+/-) |
| ETA | - | 99.9-99.9 | °C | Temperature line, Evaporation point A |
| CTA | - | 99.9-99.9 | °C | Temperature line, Condensation point A |
| ETB | - | 99.9-99.9 | °C | Temperature line, Evaporation point B |
| CTB | - | 99.9-99.9 | °C | Temperature line, Condensation point B |
| CTAB | - | 99.9-99.9 | °C | Condensation temperature calculated from AB line. Actual value have to higher then calculated value for EVI activated. |
| H | - | 0-9.9 | °C | Hysteresis of Condensation temperature AB (+/-). |
| Enabled | - | 0/1 | - | 1=Yes, 0=No |

10.9.20 EExpansion Set EVI - 2.part

```

EExpansion Set. EVI
Par. Real Set =
RPS: 000.0 > 030.0 0
ET: 000.0 < 12.0 0
CT: 000.0 < 58.0 0
CT: 000.0 > 047.0 0
Compressor On: 0
EVI ON: 0
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|----------------|------|--|
| RPS | - | Real>Set /= | rps | Real rotate per second (rps)>set point/0-not comply the condition, 1- comply the condition. |
| ET | - | Real<Set /= | °C | Real evaporation temperature<set point/0-not comply the condition, 1- comply the condition. |
| CT | - | Real<Set /= | °C | Real condensation temperature<set point/0-not comply the condition, 1- comply the condition. |
| CT | - | Real>Set /= | °C | Real condensation temperature>set point/0-not comply the condition, 1- comply the condition. |
| CompOn | - | 0/1 | - | 1=compressor On, 0 = compressor Off |
| EVI ON | - | 0/1 | - | 1=EVD EVI module switch On, 0 = Off |

10.9.21 EEV Default Setting

Used to return basic setting of EEV and pair/preset EVD Evolution with pCO.

```

EExpansion Setting
Default Setting
R407c: No
R410a: No
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------------------|----|-----------|------|---|
| Default Setting R407c | - | 0/1 | - | When set to 1(Yes), procedure of default setting is started. It is returned to 0(No) automatically. It takes at least 2 minutes until procedure is finished. Use this for units with 407c refrigerant and 410a refrigerant as well. |
| Default Setting R410a | - | 0/1 | - | Additional procedure for units with 410a refrigerant. Default setting for 407c must be performed before 410a procedure ! |

10.10 Speed Set

Parameters to set Inverter control.

10.10.1 Speed Info

```
Speed Info
Temperature
Requested: 00.0 %
Real: 36.0 %
Speed
Requested: 000.0
Real: 010.0 rps
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------|------|------------|------|--|
| Temperature Requested | - | -99.9-99.9 | °C | Requested water temperature for speed control. |
| Temperature Real | A1 | -99.9-99.9 | °C | Real heating control water temperature. |
| Speed Requested | A148 | 0-100.0 | rps | Manual requested speed of compressor. |
| Speed Real | A450 | 0-100.0 | rps | Requested compressor speed. |
| Speed Real | A159 | 0-100.0 | rps | Real Requested compressor speed, considering speed limitations and speed timing. |

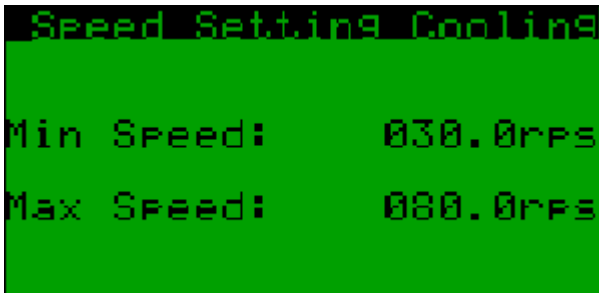
10.10.2 Speed Setting Heating

Operating map for heating mode.

```
Speed Setting Heating
Temperature A: 20.0 %
Min Speed: 030.0rps
Max Speed: 060.0rps
Temperature B: -20.0%
Min Speed: 060.0rps
Max Speed: 090.0rps
SHW Max Speed: 060.0rps
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------|------------------------|------|---|
| Temperature A | A130 | -99.9-99.9 F: 20.0 | °C | Outdoor temperature reference point A. |
| Min Speed A | A132 | 0-100.0 F: 30.0 | rps | Minimum speed for reference point A. |
| Max Speed A | A133 | 0-100.0 F: 60.0 | rps | Maximum speed for reference point A. |
| Temperature B | A131 | -99.9-99.9 F: -20.0 | °C | Outdoor temperature reference point B. |
| Min Speed B | A134 | 0-100.0 F: 60.0 | rps | Minimum speed for reference point B. |
| Max Speed B | A135 | 0-100.0 F: 90.0 | rps | Maximum speed for reference point B. |
| SHW Max Speed | A16 | 0-100.0 F: 80.0 | rps | Maximum speed in generating hot water (SHW) |

10.10.3 Speed Setting Cooling



```

Speed Setting Cooling
Min Speed: 030.0rps
Max Speed: 080.0rps
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------|------|--------------------|------|---------------------------------|
| Cooling Min Speed | A451 | 0-100.0 F: 30.0 | rps | Minimum speed for cooling mode. |
| Cooling Max Speed | A452 | 0-100.0 F: 80.1 | rps | Maximum speed for cooling mode. |

10.10.4 Speed Setting Offset

```

Speed Setting Offset
Heating:      00.0 %
Cooling:      00.0 %
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------|------|---------------------|------|--|
| Offset Heating | A429 | -99.-99.9 F: 2.5 | °C | Offset from water setpoint for speed control in heating mode. Speed water setpoint = heating water setpoint - Offset Heating. |
| Offset Cooling | A430 | -99.-99.9 F: 2.5 | °C | Offset from water setpoint for speed control in cooling mode. Speed water setpoint = cooling water setpoint + Offset Cooling. |

10.10.5 Speed Setting PID

```

Speed Setting PID
P Band:      015.0 %
I Time:      100 s
D Time:      020 s
Period:      1000 ms
Direction:   0
Filter:      001.0 rps
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|------|--------------------|------|---|
| P Band | A136 | 0-999.9 F: 15.0 | °C | Speed control proportional band. Lower value speeds up control. |
| I Time | I114 | 0-999 F: 100 | s | Speed control integration time. Lower value speeds up reaching the setpoint, but with risk of instability. |
| D Time | I113 | 0-999 F: 20 | s | Speed control deriavation time. Higher value speeds up reaching the setpoint, but with risk of instability. |
| Period | I115 | 0-9999 F: 1000 | ms | PID control period. Do not set lower than 1000. |
| Direction | B80 | 0/1 F: 0 | - | Directional of speed PID control. Direct or Reverse. Always it must be 0. |
| Filter | - | 0-100.0 F: 1.0 | rps | Output filter from PID control to avoid shock output change. RPS per program cycle. |

10.10.6 Speed Setting Defrost

```

Speed Setting Defrost
Min Speed: 050.0 rps
Max Speed: 080.0 rps
Manual Speed:060.0 rps
Mode: Automatic
Evap Request:02.0 °C
Evap Real: 000.0 °C
Output: 010.0 rps
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------|------|----------------------|------|--|
| Defrost Min Speed | A138 | 0-100.0 F: 50.0 | rps | Minimum speed for defrost mode. |
| Defrost Max Speed | A139 | 0-100.0 F: 80.0 | rps | Maximum speed for defrost mode. |
| Defrost Manual Speed | A137 | 0-100.0 F: 60.0 | rps | When Manual Mode selected, defrost compressor speed. |
| Defrost Mode | B81 | 0/1 F: 1 | - | Defrost speed control mode. 0=Manual 1=Automatic |
| Evap Request | A153 | -99.9-99.9 F: 2.0 | °C | Requested evaporating temperature for speed control in defrost mode. |
| Evap Real | A80 | -99.9-99.9 | °C | Real evaporating temperature. |
| Output | A159 | 0-100.0 | rps | Output of the defrost speed control |

10.10.7 Speed Defrost PID

```

Speed Setting Defrost
PID Setting
P Band: 010.0 %
I Time: 050 s
D Time: 010 s
Period: 1000 ms
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|------|--------------------|------|--|
| P Band | A152 | 0-999.9 F: 10.0 | °C | Defrost speed control proportional band. Lower value speeds up control. |
| I Time | I118 | 0-999 F: 50 | s | Defrost speed control integration time. Lower value speeds up reaching the setpoint, but with risk of instability. |
| D Time | I117 | 0-999 F: 10 | s | Defrost speed control derivation time. Higher value speeds up reaching the setpoint, but with risk of instability. |
| Period | I119 | 0-9999 F: 1000 | ms | PID control period. Do not set lower than 1000. |

10.10.8 Speed Setting Config

```

Speed Setting Config
Start Speed: 050.0 rps
Start Time: 060 s

Step Speed: 005.0 rps
Step Time: 030 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------|------|--------------------|------|--|
| Start Speed | A453 | 0-100.0 F: 50.0 | rps | Compressor start speed. Compressor starts with the fixed speed for Start Time. |
| Start Time | I120 | 0-999 F: 90 | s | Time after compressor start to keep fixed speed. |
| Step Speed | A454 | 0-100.0 F: 5.0 | rps | Step of compressor speed change. This is to avoid frequent change of speed, damaging lubrication and bearings. |
| Step Time | I124 | 0-999 F: 30 | s | Minimum time compressor must keep the actual speed. |

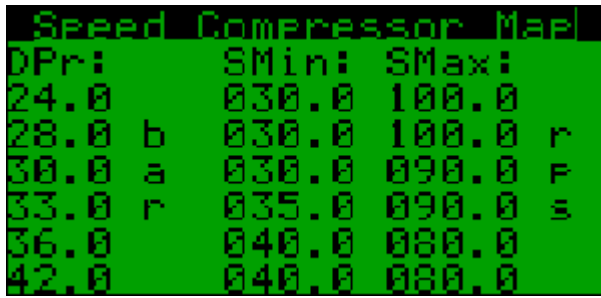
10.10.9 Speed Setting Limits

```

Speed Setting Config
Setting Limits
Min Speed: 030.0 rps
Max Speed: 100.0 rps
AlrMinSpeed: 025.0 rps
AlrMinSpeedDelay: 060 s
AlrMinPD: 03.0 bar
AlrMinPDDelay: 090 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------------|------|---------------------|------|--|
| Min Speed | A455 | 0-100.0 F: 30.0 | rps | Minimum compressor speed limit. |
| Max Speed | A456 | 0-100.0 F: 100.0 | rps | Maximum compressor speed limit. |
| AlrMinSpeed | - | 0-200 F: 25.0 | rps | Minimal speed limit. When compressor speed drops below this limit during operation → alarm is activated. |
| AlrMinSpeedDelay | - | 0-999 F: 60 | s | Setting Alarm delay for minimal speed (after compressor start). |
| AlrMinPD | - | 0-99,9 F: 1.0 | bar | Setting pressure difference limit – When limit drops below minimal value during compressor operation → alarm is activated. |
| AlrMinPDDelay | - | 0-999 F: 180 | s | Setting Alarm delay for minimal pressure difference limit (after compressor start). |

10.10.10 Speed Compressor Map

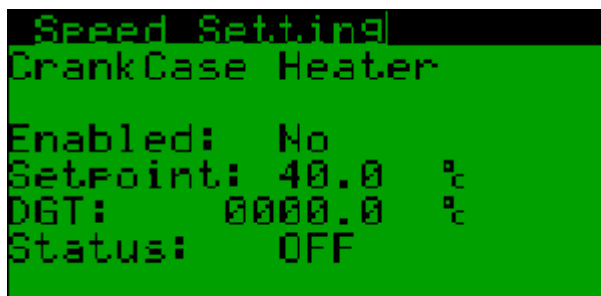


| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|-----------------|------|---|
| DPr | * | 0-99.9 F: * | bar | Pressure reference value for operating range of minimum and maximum speeds. |
| SMin | * | 0-100.0 F: * | rps | Minimum speed to corresponding pressure reference. |
| SMax | * | 0-100.0 F: * | rps | Maximum speed to corresponding pressure reference. |

* Factory setting

| Inverter Model | DPr(bar) | SP | SMin(rps) | SP | SMax(rps) | SP |
|-------------------|----------|------|-----------|------|-----------|------|
| 22l 30l 45l | 24.0 | A457 | 30.0 | A463 | 90.0 | A469 |
| | 28.0 | A458 | 30.0 | A464 | 90.0 | A470 |
| | 30.0 | A459 | 30.0 | A465 | 90.0 | A471 |
| | 33.0 | A460 | 35.0 | A466 | 90.0 | A472 |
| | 36.0 | A461 | 40.0 | A467 | 80.0 | A473 |
| | 42.0 | A462 | 40.0 | A468 | 80.0 | A474 |
| 45l1 | 24.0 | A457 | 30.0 | A463 | 90.0 | A469 |
| | 28.0 | A458 | 30.0 | A464 | 90.0 | A470 |
| | 30.0 | A459 | 30.0 | A465 | 80.0 | A471 |
| | 33.0 | A460 | 35.0 | A466 | 70.0 | A472 |
| | 36.0 | A461 | 40.0 | A467 | 50.0 | A473 |
| | 42.0 | A462 | 40.0 | A468 | 50.0 | A474 |

10.10.11 Speed Setting – CrankCase Heater



| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|----------------------|------|---|
| Enabled | - | 0/1 Yes/No F: No | - | Setting heating. Yes-On heating, No-Off heating. |
| Setpoint | - | -99.9/+99.9 F: 40 | °C | Setting discharge temperature for compressor heating. |
| DGT | - | -9999/9999 | °C | Actual Discharge Gas Temperature. |
| Status | - | 0/1 | - | Off/On – Status heating. |

10.10.12 Speed Drive Status (Info)

```

Speed Drive Status
Run Req/Real: 0 / 0
Speed Req: 010.0 rps
Speed Real: 000.0 rps
0000 V/000.0 A/000.0kW
DC0000V/000 %
Status: Stop
No Alarm
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|------|-----------|------|---|
| Run Req | B410 | 0/1 | - | Request to start refrigeration circuit. |
| Run Real | B411 | 0/1 | - | Request to run the compressor. |
| Speed Req | A159 | 0-100.0 | rps | Requested compressor speed. |
| Speed Real | A475 | 0-100.0 | rps | Real compressor speed. |
| Volts | I295 | 0-9999 | V | Compressor voltage. |
| Amps | A476 | 0-999.9 | A | Compressor current. |
| kW | A477 | 0-999.9 | kW | Compressor power. |
| DC | I296 | 0-9999 | V | DC drive voltage. |
| °C | I297 | 0-999 | °C | Drive temperature. |
| Status | I298 | 0-2 | - | Drive status: 0:Stop, 1:Run, 2:Alarm |
| Alarm | I299 | 0-99 | - | Drive Alarm Code. |

10.10.13 DC drive – Alarms table:

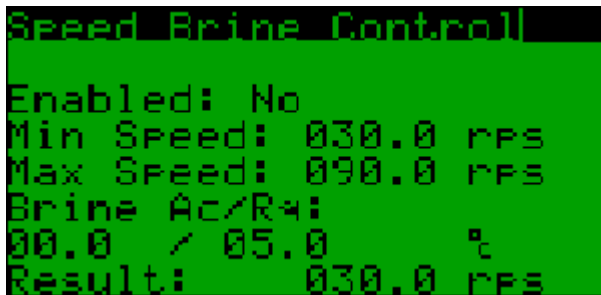
| | |
|------|---|
| I299 | Typ Alarmu |
| 0 | No fault |
| 1 | Overcurrent |
| 2 | Motor overload |
| 3 | Overvoltage |
| 4 | Undervoltage |
| 5 | Drive overT |
| 6 | Drive underT |
| 7 | Overcurrent HW |
| 8 | Motor overtemp |
| 9 | Drive failure |
| 10 | Cpu error |
| 11 | Param. default |
| 12 | DC bus ripple |
| 13 | Data comms fault |
| 14 | Drive thermistor |
| 15 | Autotune fault |
| 16 | Drive disabled = High Pressure Switch alarm |
| 17 | Motor phase fault |
| 18 | Fan fault |
| 19 | Speed fault |
| 20 | PFC failure |
| 21 | error code 21, reserved |
| 22 | PFC undervoltage |
| 23 | STO survey fail |
| 24 | STO survey fail |
| 25 | Ground fault |
| 26 | Internal error 1 |
| 27 | Internal error 2 |
| 28 | Drive overload |
| 29 | Drive overtemp |
| 30 | error code 30, reserved |
| 98 | Unexpected Inverter Restart |
| 99 | Unexpected Inverter Stop |

10.10.14 Speed Drive Setting (entrance to DC drive menu)



Pressing ENTER moves to DC Drive Menu.

10.10.15 Speed Brine Control



| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------------|------|----------------------|------|---|
| Brine Control Enabled | B419 | 0/1 F: 0 | - | Enable speed limitation according to the brine temperature. When brine temperature is decreasing, system is limiting the maximum speed. |
| Brine Control Min Speed | A437 | 0-100.0 F: 30.0 | rps | Minimum speed limit for brine control. |
| Brine Control Max Speed | A438 | 0-100.0 F: 90.0 | rps | Maximum speed limit for brine control. |
| Brine Ac | A433 | -99.9-99.9 | °C | Actual brine temperature. |
| Brine Rq | A434 | -99.9-99.9 F: 5.0 | °C | Brine temperature control setpoint. |
| Result | A439 | 0-100.0 | rps | Result of brine temperature control speed limitation. |

10.11Evd Evolution

Reserved for Manufacturer.

10.12 Protocols Set

Setting of pCO₅ communication.

10.12.1 Ports Information

```

Ports Information
  Pr BR   S P Adr SO
B1:01/19200/2/0/001 0
B2:01/19200/2/0/001 0
F1:01/19200/2/0/001 0
F2:07/19200/2/0/001
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|---|------|---|
| Pr | - | 1-99 | - | Protocol type used on ports 1: Carel; 3: Modbus Slave, 18: Carel Master V2, 21: Modbus Master 2.0, 28: Modbus Master 2.0, 30: Modbus Slave Extended, 33: Modbus Slave Extended, 54: Carel Master V1, 60: Modbus Master 3.0 |
| BR | - | 1200, 2400, 4800, 9600, 19200, 38400 | bps | Baud Rate. |
| S | - | 0/1 | - | Stop Bits. 0=2, 1=1 |
| P | - | 0-2 | - | Parity. 0=none, 1=even, 2=odd. |
| Adr | - | 1-207 | - | Address of the port for slave protocols. |
| SO | - | 0/1 | - | Connected to Supervisor. 1=Yes. |

10.12.2 BMS Configuration

```

Ports Configuration
BMS Port
Protocol:
Modbus Master n.2
Baudrate: 19200
Stopbit: 2
Parity: None
BMS Address: 001
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------|----|---------------|------|--|
| BMS Protocol | - | 1-14 F: 11 | - | Protocol type used on port BMS. 0:Reserved; 1:Carel Slave Local, 2:Carel Slave Remote, 3:Modbus Slave, 4:Winload, 5:Benshaw, 6:GSM Modem, 7:Wireless Kiocera, 8:Printer, 9: Carel Master v.2, 10:Modbus Master, 11:Modbus Master n.2 , 12:Modbus Slave Ext.30, 13:Modbus Slave Ext.33, 14:Carel Master v.1 |
| BMS Baudrate | - | 0-5 F: 4 | - | Baudrate used on port BMS. 0:1200, 1:2400; 2:4800, 3:9600, 4:19200, 5:38400 |
| BMS Stopbit | - | 0/1 F: 0 | - | BMS stopbit configuration. 0: 2 stopbits, 1: 1 stopbit |
| BMS Parity | - | 0-2 F: 0 | - | BMS parity. 0:None, 1:Even, 2:Odd |
| BMS Address | - | 1-207 F: 1 | - | BMS address used for slave protocols. |

10.12.3 BMS2 Configuration

```

Ports Configuration
BMS2 Port
Protocol:
Modbus Slave Ext.33
Baudrate: 19200
Stopbit: 2
Parity: None
BMS Address: 001

```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|----|---------------|------|---|
| BMS2 Protocol | - | 1-5 F: 5 | - | Protocol type used on port BMS2. 0:Reserved; 1:Carel Slave Local; 2:Carel Master v.2; 3:Modbus Master; 4:Modbus Master n.2; 5:Modbus Slave Ext.33 |
| BMS2 Baudrate | - | 0-5 F: 4 | - | Baudrate used on port BMS2. 0:1200, 1:2400; 2:4800, 3:9600, 4:19200, 5:38400 |
| BMS2 Stopbit | - | 0/1 F: 0 | - | BMS2 stopbit configuration. 0: 2 stopbits, 1: 1 stopbit |
| BMS2 Parity | - | 0-2 F: 0 | - | BMS2 parity. 0:None, 1:Even, 2:Odd |
| BMS2 Address | - | 1-207 F: 1 | - | BMS address used for slave protocols. |

10.12.4 FieldBus Configuration

```
Ports Configuration
FieldBus port
Protocol:
Modbus Master n.2
Baudrate: 19200
Stopbit: 2
Parity: None
FBus Address: 001
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------|----|---------------|------|---|
| FieldBus Protocol | - | 1-16 F: 14 | - | Protocol type used on port FieldBus. 1:Belimo; 2:PST; 3:Carel Slave Local; 4:Modbus Slave; 5:GSM Modem; 6:Wireless Kyocera; 7: Carel Slave Remote; 8:Printer; 9:Winload; 10:Carel Master v.2; 11:Th-Tune; 12:tLAN Master; 13:Modbus Master; 14:Modbus Master n.2 ; 15:Modbus Slave Extended; 16:Carel Master v.1 |
| FB Baudrate | - | 0-5 F: 4 | - | Baudrate used on port FieldBus. 0:1200, 1:2400; 2:4800, 3:9600, 4:19200, 5:38400 |
| FB Stopbit | - | 0/1 F: 0 | - | FieldBus stopbit configuration. 0: 2 stopbits, 1: 1 stopbit |
| FB Parity | - | 0-2 F: 0 | - | FieldBus parity. 0:None, 1:Even, 2:Odd |
| FB Address | - | 1-207 F: 1 | - | FieldBus address used for slave protocols. |

10.12.5 FieldBus 2 Configuration

```
Ports Configuration
FieldBus2 port
Protocol:
Carel Master v.2
Baudrate: 19200
Stopbit: 2
Parity: None
FBus2 Address: 001
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------|----|---------------|------|--|
| FB2 Protocol | - | 1-16 F: 2 | - | Protocol type used on port FieldBus2. 1:tLAN Master; 2:Carel Master v.2 ; 3:Modbus Master; 4:Modbus Master n.2 |
| FB2 Baudrate | - | 0-5 F: 4 | - | Baudrate used on port FieldBus2. 0:1200, 1:2400; 2:4800, 3:9600, 4:19200, 5:38400 |
| FB2 Stopbit | - | 0/1 F: 0 | - | FieldBus2 stopbit configuration. 0: 2 stopbits, 1: 1 stopbit |
| FB2 Parity | - | 0-2 F: 0 | - | FieldBus2 parity. 0:None, 1:Even, 2:Odd |
| FB2 Address | - | 1-207 F: 1 | - | FieldBus2 address used for slave protocols. |

10.12.6 pLAN Configuration

pLAN port is used pGD displays and for MasterLAN applications.

```

Ports Configuration
pLAN
T1: Private Address:32
T2: Private Address:31
T3: Private Address:30
Set Terminals: No
pCO Address: 01
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------|----|--|------|--|
| T1 Address: | - | 0/1 F: 0 Address: 01-32 F: 32 | - | Type of terminal T1 0=Private, 1=Shared Type of address. |
| T2 Address: | - | 0/1 F: 0 Address: 01-32 F: 31 | - | Type of terminal T2 0=Private, 1=Shared Type of address. |
| T3 Address: | - | 0/1 F: 0 Address: 01-32 F: 30 | - | Type of terminal T3 0=Private, 1=Shared Type of address. |
| Set Terminals | - | No/Yes | - | Set Yes to store terminals configuration. |
| pCO Address | - | 0-31 F: 1 | - | pLAN address of pCO5. |

10.12.7 Modbus Master Configuration

2 Modbus Master protocols are used on pCO controller.

```

ModBus Master Config
MBMaster 1 Port: FB1
Enabled: 1
R:UART set OK

MBMaster 2 Port: BMS1
Enabled: 1
R:UART set OK
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------------|----|-------------|------|---|
| MBMaster 1 Port | - | 0-4 F: 2 | - | Port used for Modbus Master 1. 0:pLAN; 1:BMS1; 2:FB1; 3:BMS2; 4:FB2 |
| MBMaster 1 Enabled | - | 0/1 F: 1 | - | Enabling Modbus Master 1 protocol. |
| MBMaster 1 R | - | 0-3 | - | Result of Modbus Protocol 1 operation. 0:UART set OK; 1:Commands OK; 2:UART incorrect; 4:Generic Error |
| MBMaster 2 Port | - | 0-4 F: 1 | - | Port used for Modbus Master 2. 0:pLAN; 1:BMS1; 2:FB1; 3:BMS2; 4:FB2 |
| MBMaster 2 Enabled | - | 0/1 F: 1 | - | Enabling Modbus Master 2 protocol. |
| MBMaster 2 R | - | 0-3 | - | Result of Modbus Protocol 2 operation. 0:UART set OK; 1:Commands OK; 2:UART incorrect; 4:Generic Error |

10.12.8 Modbus Master 1st Configuration

1st Modbus Master is used for communication with pAD room terminals and pCOe expansion.

```

Configuration
Modbus settings
1st Master
Baudrate:          19200
Stop bit:          2
Parity mode:       NONE
Timeout:           0300ms
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------------------|----|------------------|------|---|
| 1st Master Baudrate | - | 0-5 F: 4 | - | Baudrate used for 1st Master. 0:1200, 1:2400; 2:4800, 3:9600, 4:19200, 5:38400 |
| 1st Master Stopbit | - | 0/1 F: 0 | - | 1st Master stopbit configuration. 0: 2 stopbits, 1: 1 stopbit |
| 1st Master Parity mode | - | 0-2 F: 0 | - | 1st Master parity. 0:None, 1:Even, 2:Odd |
| 1st Master Timeout | - | 0-9999 F: 300 | ms | 1st Master timeout. |

10.12.9 Modbus Master 2nd Configuration

2nd Modbus Master is used for communication with DC Drive.

```

Configuration
Modbus settings
2nd Master
Baudrate:          19200
Stop bit:          2
Parity mode:       NONE
Timeout:           0300ms
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------------------|----|------------------|------|---|
| 2nd Master Baudrate | - | 0-5 F: 4 | - | Baudrate used for 2nd Master. 0:1200, 1:2400; 2:4800, 3:9600, 4:19200, 5:38400 |
| 2nd Master Stopbit | - | 0/1 F: 0 | - | 2nd Master stopbit configuration. 0: 2 stopbits, 1: 1 stopbit |
| 2nd Master Parity mode | - | 0-2 F: 0 | - | 2nd Master parity. 0:None, 1:Even, 2:Odd |
| 2nd Master Timeout | - | 0-9999 F: 300 | ms | 2nd Master timeout. |

10.12.10 Carel Master Configuration

Carel Master protocol is used for communication with EEV driver EVD Evolution.

```

Carel Master Config
Baudrate: 19200
Retry:    03
ORT:     015 s
Enable:   1
CurrUnit: 000
LstError: 000
PrntError: 000
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------|----|----------------|------|---|
| Carel Master Baudrate | - | 0-5 F: 4 | - | Baudrate used for 2nd Master. 0:1200, 1:2400; 2:4800, 3:9600, 4:19200, 5:38400 |
| Retry | - | 0-20 F: 3 | - | Retries before Offline error. |
| ORT | - | 0-999 F: 15 | - | Time between attempts when Offline error. |
| Enable | - | 0/1 F: 1 | - | Enables Carel Master protocol. 1=Enabled |
| CurrUnit | - | 1-207 | - | Unit address currently communicating. |
| LstError | - | 1-207 | - | Address of the first peripheral that did not correctly allocate list size. |
| PrtError | - | 0-999 | - | Protocol Error Code. |

10.13 I/O Configuration

Configuration of Inputs and Outputs.

10.13.1 B1 to B3 Probes

```

I/O Config
Analog input B00
Probe type:          NTC
Offset:              0000.0
                    0000.0
                    1000.0
Alarm delay:        00060s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|----|---------------------------------|------|---|
| B1 Probe type | - | 0-12 F: 0 | - | B1 probe type definition. 0:NTC; 1:PT1000; 2:0-1V; 3:0-10V; 4:0-20mA; 5:4-20mA; 6:ON/OFF; 7:0-5V; 8:0.5-4.5V; 9:NTC HT; 10:-50T90; 11:10T170; 12:PT100 |
| B1 Offset | - | -9999-9999 F: 0 | - | B1 probe offset. |
| B1 Min | - | -3276.8- 3276.8 F: 0 | - | B1 minimum reference for active probes. |
| B1 Max | - | -3276.8- 3276.8 F: 1000.0 | - | B2 maximum reference for active probes. |
| Alarm Delay | - | 0-32000 F: 60 | s | B1 probe alarm Delay. |

10.13.2 B4 to B5 Probes

```

I/O Config
Analog input B00
Probe type:      NTC
Offset:          0000.0
                 0000.0
                 1000.0

Alarm delay:    00060s
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|----|-----------------------------|------|--|
| B4 Probe type | - | 0-12 F: 0 | - | B4, B5 probe type definition. 0:NTC; 1:PT1000; 5:ON/OFF |
| B1 Offset | - | -9999-9999 F: 0 | - | B4, B5 probe offset. |
| B1 Min | - | -3276.8-3276.8 F: 0 | - | Not Used |
| B1 Max | - | -3276.8-3276.8 F: 1000.0 | - | Not Used |
| Alarm Delay | - | 0-32000 F: 60 | s | B4, B5 probe alarm Delay. |

10.13.3 ID1 to ID8 Digital Inputs

```

I/O Config
Digital Inputs 1-4
  R  A/M  M  Value
DI1: 0 Auto 0 0
DI2: 0 Auto 0 0
DI3: 0 Auto 0 0
DI4: 0 Auto 0 0
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|-----------------|------|-------------------------------------|
| R | - | 0/1 | - | IDx read value (Real value). |
| A/M | - | Auto/ Manual | - | IDx mode. Automatic or Manual mode. |
| M | - | 0/1 | - | IDx manual value for manual mode. |
| Value | - | 0/1 | - | IDx result used for control. |

10.13.4 Analog Outputs AO1 to AO4

```
I/O Config
Analog Output 1 OK
Mode: 0-10V
ModDutyCycleIR:000.0 %
PeriodDR:0000 x0.01s
TriacGateMin: 007.0 %
TriacGateMax: 093.0 %
TriacGateWD: 02.0 ms
```

```
I/O Config
Analog Output 2 OK
Mode: 0-10V
ModDutyCycleIR:000.0 %
PeriodDR:0000 x0.01s
TriacGateMin: 007.0 %
TriacGateMax: 093.0 %
TriacGateWD: 02.0 ms
```

```
I/O Config AO 3
Enabled: 1 OK
Mode: 0-10V
ModDutyCycleIR:000.0 %
PeriodDR:0000 x0.01s
TriacGateMin: 007.0 %
TriacGateMax: 093.0 %
TriacGateWD: 20.0 ms
```

```
I/O Config AO 4
Enabled: 1 OK
Mode: 0-10V
ModDutyCycleIR:000.0 %
PeriodDR:0000 x0.01s
TriacGateMin: 007.0 %
TriacGateMax: 093.0 %
TriacGateWD: 02.0 ms
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------|----|--------------------|-------|--|
| Enabled | - | 0/1 F: 1 | - | Only for Menu AO3-4. Analog output: Enabled=1 |
| OK/Error | - | OK/Error | - | Configuration OK or Error. If Error, configuration is wrong. |
| Mode | - | 0-4* | - | AOx output mode. 0:0-10V;1:PWM Sync ; 2:Phase Cutt Sync; 3:CONV010NONOFFFCS3; 4:PWM Slew Rate. |
| ModDutyCycleIR | - | 0-100.0 F: 0 | % | Modulation Duty Cycle for PWM modes. |
| PeriodDR | - | 0-9999 F: 0 | 0.01s | Modulation Period for PWM modes. |
| TriacGateMin | - | 0-100.0 F: 7.0 | % | Minimum opening for phase cutting. |
| TriacGateMax | - | 0-100.0 F: 93.0 | % | Maximum opening for phase cutting. |
| TriacGateWD | - | 0-99.9 F: 2.0 | ms | Phase cutting pulse duration. |

*Factory setting:

| Analog Output | Mode |
|---------------|-------------------|
| AO1 | 0: 0-10V |
| AO2 | 0: 0-10V |
| AO3 | 1: PWM Sync |
| AO4 | 2: Phase Cut Sync |

Note:

Analog outputs are used and must be configured in pairs AO1/AO2 and AO3/AO4.
If 0-10V is used on AO1(AO3) it must be used on AO2(AO4) as well.

10.13.5 DO1 to DO8 Digital Outputs

```

I/O Config
Digital Outputs 1-4
      A/M      M      Auto
DO1: Auto    0      0
DO2: Auto    0      0
DO3: Auto    0      0
DO4: Auto    0      0
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|-----------------|------|---|
| A/M | - | Auto/ Manual | - | DOx mode. Automatic or Manual mode. |
| M | - | 0/1 | - | DOx manual value for manual mode. Please use manual mode carefully. Please note DOx Relay is connected to some power element like compressor. |
| Auto | - | 0/1 | - | DOx output from pCO control. 1=switch On |

10.13.6 pCOe Configuration

Configuration of expansion board.

```

I/O Config.
pCOe number:      001
Enabled: 0
      Online
Offline alr delay:030s
Analog input type
Ch 1&2 :   Carel NTC !
Ch 3&4 :   Carel NTC !
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------------|----|-------------------|------|--|
| pCOe Enabled | - | 0/1 F: 0 | - | Enabling pCOe. Do not activate until pCOe is HW connected. |
| pCOe Online | - | Online Offline | - | pCOe connection status. |
| Offline alr delay | - | 0-999 F: 30 | s | Delay before Offline status of pCOe. |
| Analog input type Ch1&2 | - | 0-6 F: 0 | - | Type of analog input B1/2 pCOe. 0:Carel NTC; 1:0..1V; 2:0..20mA; 3:4.. 20mA; 4:0..5V; 5:0.5.. 4.5 V; 6: NTC-HT |
| Analog input type Ch3&4 | - | 0-6 F: 0 | - | Type of analog input B3/4 pCOe. 0:Carel NTC; 1:0..1V; 2:0..20mA; 3:4.. 20mA; 4:0..5V; 5:0.5.. 4.5 V; 6: NTC-HT |

10.13.7 pCO_e Limits B1 to B4 (analog input)

```
I20 Config.
pCOe number:      001

Analog input limits
Ch 1 Min:         000.0
Ch 1 Max:         010.0
Ch 2 Min:         000.0
Ch 2 Max:         010.0
```

```
I20 Config.
pCOe number:      001

Analog input limits
Ch 3 Min:         000.0
Ch 3 Max:         010.0
Ch 4 Min:         000.0
Ch 4 Max:         010.0
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|----------------------|------|--|
| Ch x Min | - | -999.9-999.9 F: 0 | - | (B) Ch 1-4/pCO _e minimum reference for active probes. |
| Ch x Max | - | -999.9-999.9 F: 0 | - | (B) Ch 1-4/pCO _e maximum reference for active probes. |

10.13.8 pCO_e Offset

```
I20 Config.
pCOe number:      001

Offset Ch 1:      000.0
Offset Ch 2:      000.0
Offset Ch 3:      000.0
Offset Ch 4:      000.0
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------------|----|----------------------|------|--|
| pCO _e Offset Ch1 | - | -999.9-999.9 F: 0 | - | Bx/pCO _e offset/calibration |

10.13.9 pCO_e Offline Setting

Configuration of outputs when pCO_e goes Offline.

```
I20 Config pCOe
pCOe number:      001
Values When Offline
DO1: 0           Enabled: 0
DO2: 0
DO3: 0
DO4: 0
AO1: 5U         Enabled: 0
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------|----|-------------|------|---|
| DO x | - | 0/1 F: 0 | - | pCOe DO 1-4 Offline configuration. |
| DO Enabled | - | 0/1 F: 0 | - | 1=Enable all pCOe DO Offline operation. |
| AO1 | - | 0-2 F: 1 | - | pCOe AO1 Offline configuration. 0=0V, 1=5V, 2=10V. |
| AO1 Enabled | - | 0/1 | - | 1=Enable pCOe AO1 Offline operation. |

10.13.10 pCOe ID1 to ID4 Digital Inputs

```

I/O Config pCOe
pCOe number:      001
R A/M      M      Value
Ch1: 0 Auto 0 0
Ch2: 0 Auto 0 0
Ch3: 0 Auto 0 0
Ch4: 0 Auto 0 0
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|-----------------|------|--|
| R | - | 0/1 | - | IDx/pCOe read value. |
| A/M | - | Auto/ Manual | - | IDx/pCOe mode. Automatic or Manual mode. |
| RV | - | 0/1 | - | ID polarity. |
| M | - | 0/1 | - | IDx/pCOe manual value for manual mode. |
| Value | - | 0/1 | - | IDx/pCOe result used for control. |

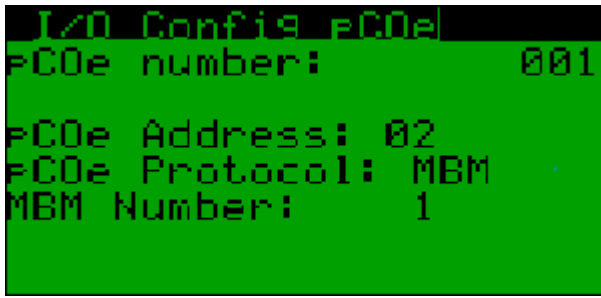
10.13.11 pCOe DO1 to DO4 Digital Outputs

```

I/O Config pCOe
pCOe number:      001
Digital Outputs 1-4
A/M      M      Auto
DO1: Auto 0 0
DO2: Auto 0 0
DO3: Auto 0 0
DO4: Auto 0 0
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|-----------------|------|--|
| A/M | - | Auto/ Manual | - | DOx/pCOe mode. Automatic or Manual mode. |
| M | - | 0/1 | - | DOx/pCOe manual value for manual mode. Please use manual mode carefully. Please note DOx Relay is connected to some power element. |
| Auto | - | 0/1 | - | DOx/pCOe output from pCO control. |

10.13.12 I/O Config pCOe - Parametres



| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|----|---------------------|------|---|
| pCOe Adress | - | 0-15 F: 2 | - | Type of pCOe address. |
| pCOe Protocol | - | Carel/MBM F: MBM | - | Type of pCOe communication protocol. |
| MBM Number | - | 1/2 F: 1 | - | Type of Modbus Master 1/2 communication protocol. |

10.14 Heat/Cool Circuits

10.14.1 Heat/Cool Circuits – Main Menu

Menu individual circuits HC1 to HC6 (heating circuit-hereafter HC).

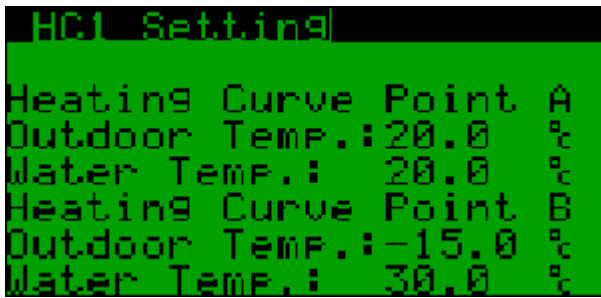
```

[01] -----
Status: Off / Auto
Room Temperature
Rq/Ac: 20000 /00.0 °C
Water Temperature
Rq/Ac: 00.0 /00.0 °C
Pump: Off Servo:000.0%
Mode: Auto 00.0
  
```

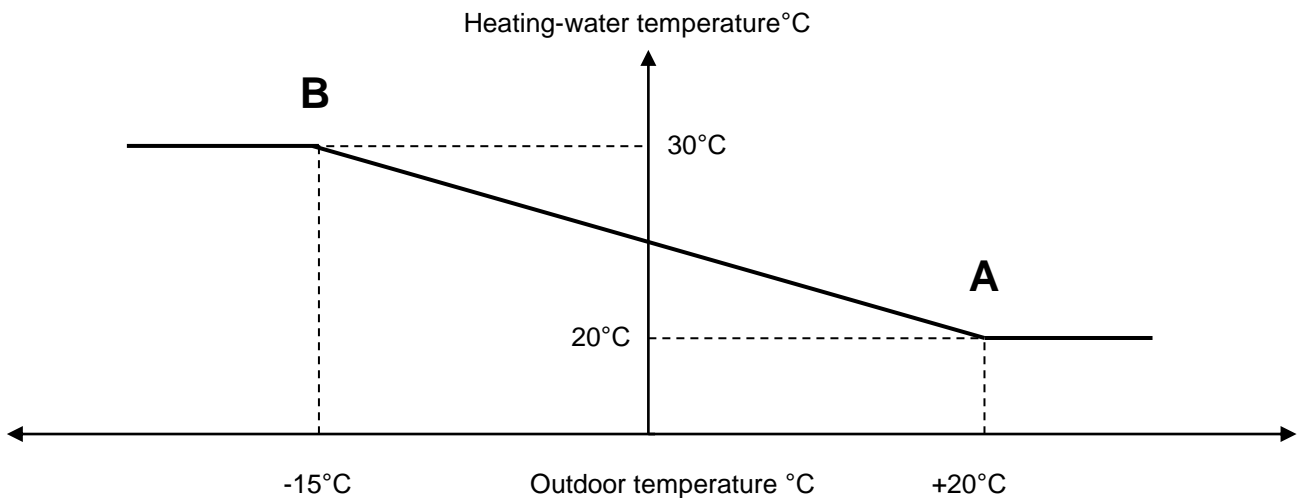
| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------------------|-----------|--|------|---|
| Status | B212/ | Off/On | - | Run H.circuit. On / Off |
| | I269 | Auto/pAD/Heat ing/Cooling F:Auto | | H.circuit mode: HCx mode selection, 0=heating, 1=cooling, 2=auto, 3=pAD Auto – HP automatic control pAD – control pAD = HP (pAD01) Heating – only (reverse) Cooling – only (direct) |
| Rq/Ac (Room Temperature) | A215/ | 6.0/32.0 | °C | HCx room setpoint. / |
| | A216 | F: 20.0 -99.9/99.9 | | HCx actual room temperature. |
| Rq/Ac (Water Temperature) | A96/ | -99.9/99.9 | °C | HCx control setpoint. |
| | A90 | -99.9/99.9 | | HCx actual temperature. |
| Pump | B68 | Off/On | - | HCx output relayactive. |
| Servo | A20 | 0-100 | % | HCx analog output signal. |
| Mode (Cooling/Heati ng) | B214/B215 | Auto/Manual / | - | Automatic/Manual mode. |
| | A217/A218 | xx°C F: Auto | | Manual heating/cooling setpoint temperature. |

HCx menu - Press Prg → and enter to HCx Settings menu.

10.14.2 Heat/Cool Circuits – HC1 (HCx) Heating Setting



Ekviterm curve illustrates in the following figure:

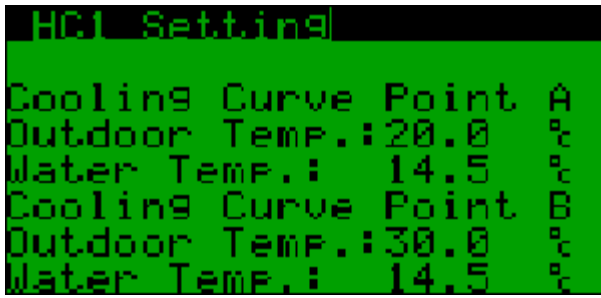


| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------------------|------|---------------------------|------|---|
| Outdoor Temperature (point A) | A101 | -20.0 30.0 F: 20.0 | °C | Heating air temperature point A. |
| Water Temp. (point A) | A106 | *20.0 47.5 F: 20.0 | °C | Heating water temperature point A (UFH + Radiators). |
| Outdoor Temperature (point B) | A102 | -20.0 30.0 F: -15.0 | °C | Heating air temperature point B. |
| Water Temp. (point B) | A107 | *20.0 47.5 F: 30.0 | °C | Heating water temperature point B A (UFH - typical 30,0 ° C, Radiators - typical 40,0 ° C). |

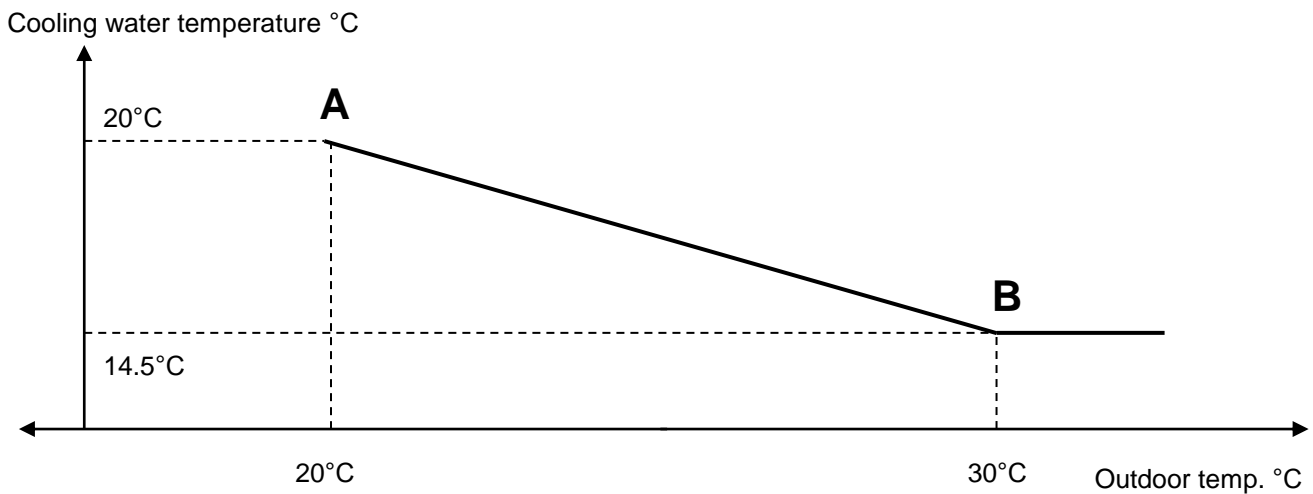
* Real temperature dimension in accordance with setpoint limits.

10.14.3 Heat/Cool Circuits – HC1 (HCx) Cooling Setting

This setting is enabled only for optional cooling equipment.



Compensation parameters in accordance with Weather in the following figure:



| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------------------|------|------------------------|------|--|
| Outdoor Temperature (point A) | A314 | 0.00 - 40.0 F: 20.0 | °C | Cooling air temperature point A |
| Water Temp. (point A) | A315 | *14.5/30.0 F: 14.5 | °C | Cooling water temperature point A (typical 20,0 ° C - UFH + FanCoils). |
| Outdoor Temperature (point B) | A316 | 0.00/40.0 F: 30.0 | °C | Cooling air temperature point B. |
| Water Temp. (point B) | A317 | *14.5/30.0 F: 14.5 | °C | Cooling water temperature point B (UFH - typical 18,0 ° C, FanCoils - typical 14.5 ° C). |

* The current temperature range is limited by the settings during commissioning. Another restriction is enabled by Dew point protection (if is activated).

10.14.4 Heat/Cool Circuits – HC1 (HCx) Compensation Setting

HCx Setting (Heating or Cooling) - Press Prg → and enter to HCx Compensation Set.

```

HC1 Compensation Set.
pAD Active:No
Room Temp.: 00.0 °C
Room Set Temp.00.0 °C
Actual Compensation
Heating: 00.0 °C
Cooling: 00.0 °C
  
```

```

HC1 Compensation Set.
Room Temp. Probe
Not Used
Water Compensation
Heating: 05.0 °C
Cooling: 05.0 °C
Prop. Band: 02.0 °C
Integr. Time: 0000 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------------------|------|--|------------|--|
| pAD Active | B285 | Yes/No | - | pAD0x Activity – status. |
| Room Temp. | A216 | -99.9/99.9 | °C | Actual room temperature. |
| Room Set Temp. | A215 | -99.9/99.9 | °C | Setpoint room temperature. |
| Heating (Actual Compensation) | A325 | -99.9/99.9 | °C | Water temperature heating compensation. |
| Cooling (Actual Compensation) | A326 | -99.9/99.9 | °C | Water temperature cooling compensation. |
| Room Temp. Probe | - | B1-B5/pCO ₅ , B1-B4/pCO _e Not Used | - | Temperature probe - selection. If is pADx connected, It used inside temperature probe. |
| Heating (Water Compensation) | A327 | -99.9/99.9 F: 5.0 | °C | Max/Min - Heating compensation. |
| Cooling (Water Compensation) | A328 | -99.9/99.9 F: 5.0 | °C | Max/Min - Cooling compensation. |
| Prop. Band | A329 | -99.9/99.9 F: 2.0 | °C | PI control band to calculate water compensation. |
| Integr. Time | I276 | 0-9999 F: 0 | S (sec) | PI integration time to calculate water compensation. Set "0" only for "Proporcional band" function. |

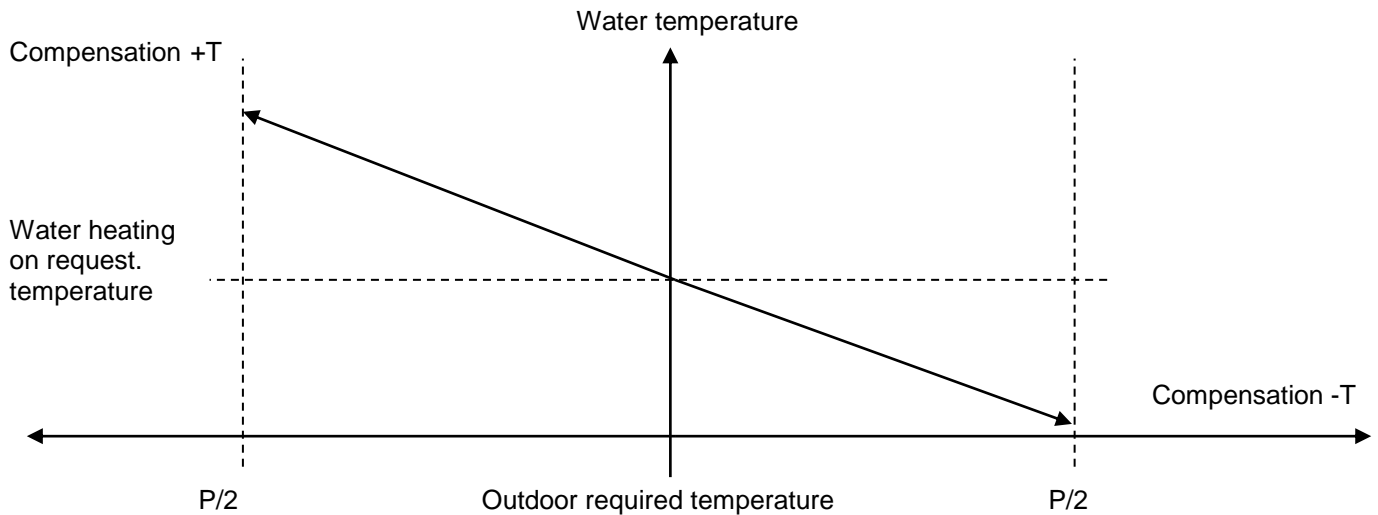
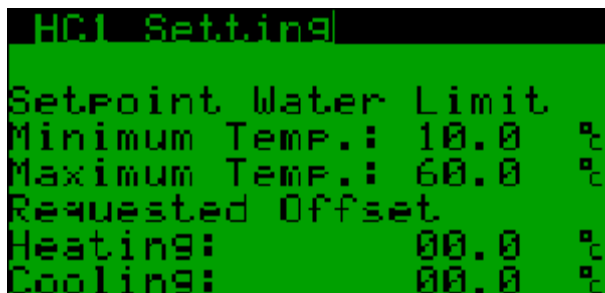


Figure above: compensation principle in accordance with room temperature. Calculated water compensation value is supplemented by the weather compensation value in accordance with required water temperature.

If room temperature probe or pAD01 controller is not installed, the system automatically assumes a room temperature of 20.0 ° C. When required room temperature is set by the user, water compensation is converted with virtual room temperature of 20.0 ° C.

10.14.5 Heat/Cool Circuits – HC1 (HCx) Setting operating range



| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------------------|------|-----------------------|------|--|
| Minimum Temp. | - | -99.9/99.9 F: 10.0 | °C | HCx Setpoint value - Minimum temperature water limit. |
| Maximum Temp. | - | -99.9/99.9 F: 60.0 | °C | HCx Setpoint value - Maximum temperature water limit. |
| Heating (Requested Offset) | A318 | -99.9/99.9 F: 0.0 | °C | HCx heating water value - Offset. HCx requested value = 35.0°C Offset = 5.0 Final requested temperature of heating water = 35.0+5.0 = 40.0 (increase) |
| Cooling (Requested Offset) | A319 | -99.9/99.9 F: 0.0 | °C | HCx cooling water value – Offset (decrease). |

10.14.6 Heat/Cool Circuits – HC1 (HCx) Function Setting

```

HC1 Setting
Enabled: No
Type: Mixing UFH/Rad
Hysterezis
Heating:      05.0  %
Cooling:      05.0  %
SHW Priority: Yes
Pool Priority: No
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------------|------|----------------------|------|---|
| Enabled | B278 | Yes/No F: No | - | Function enabled. |
| Type (Function) | I62 | 0-3 F:1 | - | HCx Function Type Setting. 0: None 1: Mixing UFH/Rad 2: Thermostatic 3: Hot water (SHW) |
| Heating (Hysterezis) | A103 | -99.9/99.9 F: 5.0 | °C | HCx Hysterezis in Heating mode. |
| Cooling (Hysterezis) | A320 | -99.9/99.9 F: 5.0 | °C | HCx Hysterezis in Cooling mode. |
| SHW Priority | B61 | Yes/No F: Yes | - | Yes = SHW priority, HCx turn off. No = SHW and HCx running in same time. |
| Pool Priority | B279 | Yes/No F: No | - | Yes = Pool priority, HCx turn off No = Pool and HCx running in same time. |

10.14.7 Heat/Cool Circuits – HC1 (HCx) PID setting

```

HC1 Setting
PID Setting
P Band:      050.0  %
I Time:      100  s
D Time:      020  s
Reverse Servo: No
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------|-------------------------|------|---|
| P Band | A104 | -999.9/999.9 F: 50.0 | °C | Proportional band of HCx temperature control. Lower value is for faster control. |
| I Time | I61 | 0-999 F: 100 | s | Integration time for HCx mixing. Lower value is for faster setpoint with risk of instability. |
| D Time | I60 | 0-999 F: 20 | s | Derivation time for HCx mixing. Higher value is for faster setpoint with risk of instability. |
| Reverse Servo | B280 | Yes/No F: No | - | Reverse switch for HCx servo running. |

10.14.8 Heat/Cool Circuits – HC1 (HCx) Analog output

```

HC1 Settings
Analog Output
Min:          000.0 %
Max:          100.0 %
Off Position: 050.0 %
Manual:       000.0 %
Digital Output
Manual:       0
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------------|------|-----------------|------|---|
| Min | - | 0-100 F: 0 | % | Servo/valve minimal running limit. |
| Max | - | 0-100 F: 100 | % | Servo/valve maximal running limit. |
| Off Position | - | 0-100 F: 50 | % | Analog.output limit for valve, when HCx is off. |
| Manual | A321 | 0-100 F: 0 | % | Manual valve position (permanent memory). |
| Manual (Digital Output) | B281 | 0/1 F: 0 | - | DO output - Manual switch On. 0=Off, 1=On |

10.14.9 Heat/Cool Circuits – HC1 (HCx) Run Setting

```

HC1 Setting
Heating Run: Yes
Cooling Run: No
AND Function: None
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------|------|-------------------------------------|------|--|
| Heating Run | B282 | Yes/No F: Yes | - | Enables running in Heating mode. Yes = Enabled (both modes can be enabled at same time). |
| Cooling Run | B283 | Yes/No F: No | - | Enables running in Cooling mode. Yes = Enabled |
| AND Function | I391 | UT1/UT2/UT3/DT4/ None F: None | - | AND - Logic function setting. 0/None = Forbidden HCx can be activated with this function depending on UT1 / UT2 / UT3 / DT4. |

10.14.10 Heat/Cool Circuits – HC1 (HCx) Group management

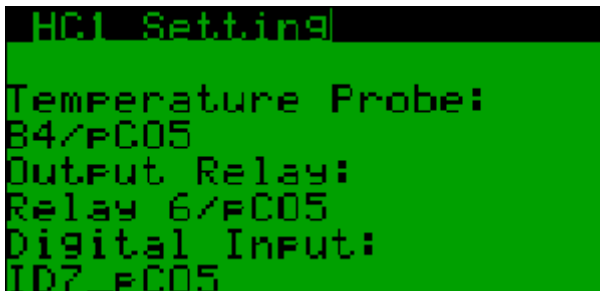
Group mode deactivates the main heating circuit if at least 1 group (heating circuit) is not active. Each HC (1-6) can be assigned to Group 1 or 2.
Group is activated if at least 1 group heating circuit is active.

```

HC1 Setting
Group Mana9: Disabled
Group No.: 1
HC1 Out: No
Group 1: No
Group 2: No
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------|------|--|------|---|
| Group Manag. | B284 | 0/1 Disabled/Enabled F: Disabled | - | Group Enabled/Disabled. |
| Group No. | I275 | 1/2 F: 1 | - | Group selection 1 or 2. |
| HCx Out | B285 | Yes/No | - | HCx - Required status for running. Yes=HCx active (Cooling/Heating) |
| Group 1 | B286 | Yes/No | - | G1 - Required status for activity. Yes=active. |
| Group 2 | B287 | Yes/No | - | G2 - Required status for activity. Yes=active. |

10.14.11 Heat/Cool Circuits – HC1 (HCx) HW setting (I/O)

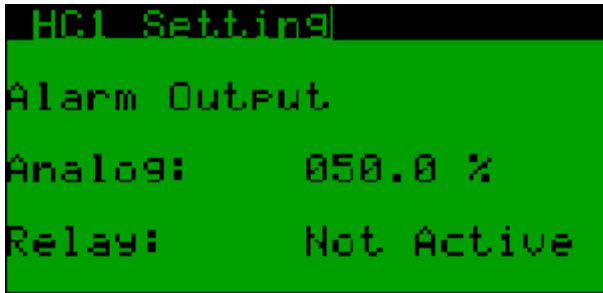


```

HC1 Settings
Temperature Probe:
B4/pCO5
Output Relay:
Relay 6/pCO5
Digital Input:
ID7_pCO5
  
```

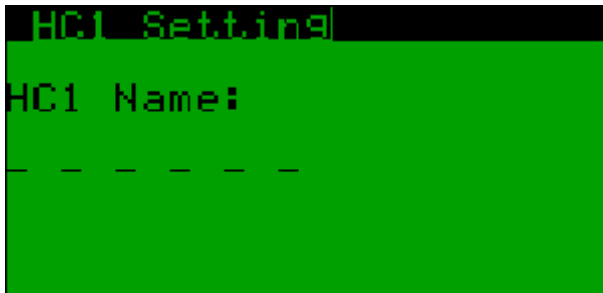
| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------|----|--|------|---|
| Temperature Probe | - | B1-B5/pCO5 B1-B4/pCOe Not Used F: B4/pCO5 | - | HCx Probe - Water Selection. |
| Output Relay | - | 0-16 F: 6 | - | HCx Relay - SHW Selection. 0:Not Used 1:Relay 1 /pCO5, 2:Rele 2 /pCO5, 3:Relay 3 /pCO5, 4:Rele 4 /pCO5, 5:Relay 5 /pCO5, 6:Rele 6 /pCO5, 7:Relay 7 /pCO5, 8:Rele 8 /pCO5, 9:Relay 1 /pCOe, 10:Rele 2 /pCOe, 11:Relay 3 /pCOe, 12:Rele 4 /pCOe, Optional 1-4 |
| Digital Input | - | ID1-ID8_pCO5 Not Used F: ID7_pCO5 | - | HCx DI - Selection. |

10.14.12 Heat/Cool Circuits – HC1 (HCx) Alarm Output



| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|------------------------------------|------|-----------------------------|
| Analog | - | 0-100 F: 50 | % | HCx Valve – Alarm position. |
| Relay | - | Not Active/Active F: Not Active | - | HCx Probe - Alarm Status. |

10.14.13 Heat/Cool Circuits – HC1 (HCx) Name



| Parameter: | SP | Range/F.: | Unit | Description |
|------------|----|-----------|------|---|
| HCx Name | - | | - | Hcx Name - max. 6 letters. A-Z / 0-9 Name is transmitted to the NET connection. |

10.14.14 Heat/Cool Circuits – HC1 (HCx) – Probe Alarm

```

HC1 Settings
Probe Alarm:    No
Alarm Memory:  No
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------|----|-----------|------|--|
| Probe Alarm | - | Yes/No | - | HCx Alarm Temperature Probe – actual status. |
| Alarm Memory | - | Yes/No | - | Alam Status in memory. Yes=Alarm was activated. Reset-manually change: No. |

10.14.15 Heat/Cool Circuits – HC1 (HCx) – DewPoint Protection

```

HC1 Cooling Settings
DewPoint Protection:
Disabled / Not Active
DewP Offset:    00.0 °C
Rel. Humidity:  000 %
Dew Point:     00.0 °C
Temp. Limit:   00.0 °C
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------------|------|----------------------------------|------|--|
| DewPoint Protection | B288 | Disabled/ Enabled F: Disabled | - | DewPoint Protection – On/Off function. |
| | B289 | 0/1 | | DewPoint Protection status. 0=Not Active, 1=Active |
| DewP Offset | A322 | -99.9/99.9 F: 0.0 | °C | Requested DewP Offset to avoid condensation. |
| Rel.Humidity | I219 | 0/100 | % | Actual Relative Humidity (pAD11...16 Terminals probe) |
| Dew Point | A323 | -99.9/99.9 | °C | DewP calculated from relative humidity and temperature. |
| Temp.Limit | A324 | -99.9/99.9 | °C | Temperature Water Limit calculated from DewP and Offset. |

10.15 Heat/Cool Circuits – Summary table

Table of Supervisor parameters:

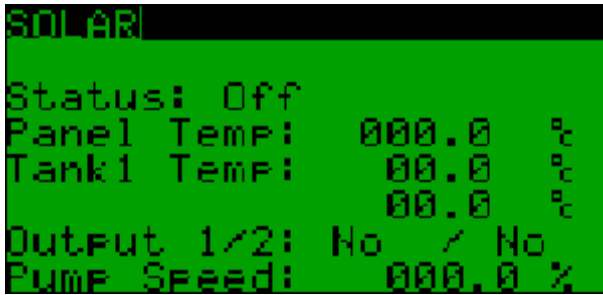
| Name parameter: | Acronym (pAD) | HC1 | HC1 | HC2 | HC3 | HC4 | HC5 | HC6 |
|--|------------------|------|------|------|------|------|------|-----|
| Servo (<i>Output</i>) | hc1analogout_v | A20 | A89 | A209 | A235 | A244 | A253 | |
| Outdoor Temperature (<i>point A</i>) | hc1h_air_a_v | A101 | A108 | A113 | A122 | A387 | A401 | |
| Water Temp. (<i>point A</i>) | hc1h_wtr_a_v | A106 | A84 | A86 | A120 | A388 | A402 | |
| Outdoor Temperature (<i>point B</i>) | hc1h_air_b_v | A102 | A109 | A114 | A88 | A389 | A403 | |
| Water Temp. (<i>point B</i>) | hc1h_wtr_b_v | A107 | A85 | A87 | A121 | A390 | A404 | |
| Outdoor Temperature (<i>point A</i>) | hc1c_air_a_v | A314 | A330 | A346 | A362 | A379 | A405 | |
| Water Temp. (<i>point A</i>) | hc1c_wtr_a_v | A315 | A331 | A347 | A363 | A380 | A406 | |
| Outdoor Temperature (<i>point B</i>) | hc1c_air_b_v | A316 | A332 | A348 | A364 | A381 | A407 | |
| Water Temp. (<i>point B</i>) | hc1c_wtr_b_v | A317 | A333 | A349 | A365 | A382 | A408 | |
| Ac (<i>Water Temperature</i>) | hc1temperature_v | A90 | A91 | A92 | A93 | A243 | A252 | |
| Rq (<i>Water Temperature</i>) | hc1setpoint_v | A96 | A97 | A98 | A99 | A242 | A251 | |
| Heating (<i>Actual Compensation</i>) | hc1cmpsh_v | A325 | A341 | A357 | A374 | A396 | A418 | |
| Cooling (<i>Actual Compensation</i>) | hc1cmpsc_v | A326 | A342 | A358 | A375 | A397 | A419 | |
| Heating (<i>Water Compensation</i>) | hc1h_cmps_v | A327 | A343 | A359 | A376 | A398 | A420 | |
| Cooling (<i>Water Compensation</i>) | hc1c_cmps_v | A328 | A344 | A360 | A377 | A399 | A421 | |
| Prop. Band | hc1room_pk_v | A329 | A345 | A361 | A378 | A400 | A422 | |
| Integr. Time | hc1room_ik_v | I276 | I278 | I280 | I284 | I289 | I294 | |
| Heating (<i>Requested Offset</i>) | hc1offset_v | A318 | A334 | A350 | A366 | A383 | A409 | |
| Cooling (<i>Requested Offset</i>) | hc1offsetc_v | A319 | A335 | A351 | A367 | A384 | A410 | |
| Group No. | hc1group_v | I275 | I277 | I279 | I283 | I288 | I293 | |
| Enabled | hc1enabled_v | B278 | B436 | B298 | B307 | B316 | B326 | |
| Type (<i>Function</i>) | hc1looptype_v | I62 | I65 | I68 | I69 | I285 | I290 | |
| Heating (<i>Hysteresis</i>) | hc1hyst_v | A103 | A111 | A115 | A118 | A385 | A411 | |
| Cooling (<i>Hysteresis</i>) | hc1hystc_v | A320 | A336 | A352 | A368 | A386 | A412 | |
| SHW Priority | hc1tuv_v | B61 | B63 | B65 | B67 | B317 | B327 | |
| Mode (<i>Cooling</i>) | hc1manualc_v | B214 | B219 | B222 | B225 | B229 | B233 | |
| Mode (<i>Heating</i>) | hc1manual_v | B215 | B218 | B223 | B226 | B230 | B234 | |
| Pool Priority | hc1pool_v | B279 | B290 | B299 | B308 | B318 | B328 | |
| P Band | hc1_pk_v | A104 | A110 | A116 | A369 | A391 | A413 | |



| | | | | | | | |
|-------------------------------------|------------------------|------|------|------|------|------|------|
| Room Set Temp. | hc1roomsetpoint_v | A215 | A221 | A227 | A233 | A240 | A249 |
| Room Temp. | hc1_roomtemp_v | A216 | A222 | A228 | A234 | A241 | A250 |
| Mode (Cooling setpoint temperature) | hc1quickc_v | A217 | A223 | A229 | A236 | A245 | A254 |
| Mode (Heating setpoint temperature) | hc1quick_v | A218 | A224 | A230 | A237 | A246 | A255 |
| I Time | hc1_ik_v | I61 | I64 | I67 | I281 | I286 | I291 |
| D Time | hc1_dk_v | I60 | I63 | I66 | I282 | I287 | I292 |
| Reverse Servo | hc1servod_v | B280 | B291 | B300 | B309 | B319 | B329 |
| Manual | hc1amanual_v | A321 | A337 | A353 | A370 | A392 | A414 |
| Manual (Digital output) | hc1doutmanual_v | B281 | B292 | B301 | B310 | B320 | B330 |
| Heating Run | hc1heatingrun_v | B282 | B293 | B302 | B311 | B321 | B331 |
| Cooling Run | hc1coolingrun_v | B283 | B294 | B303 | B312 | B322 | B332 |
| AND Function | hc1andfunc_v | I391 | I392 | I393 | I394 | I395 | I396 |
| HCx Out (pAD11-16) | pad11out_v | B285 | B295 | B304 | B313 | B323 | B333 |
| DewPoint Protection | hc1dewpcontrol_v | B288 | B296 | B305 | B314 | B324 | B334 |
| DewP Offset | hc1dewpoffset_v | A322 | A338 | A354 | A371 | A393 | A415 |
| DewPoint Protection status (RB) | hc1dewpcontrolactive_v | B289 | B297 | B306 | B315 | B325 | B335 |
| Dew Point (pAD11-16) | pad11dewp_v | A323 | A339 | A355 | A372 | A394 | A416 |
| pAD Active (pAD11-16) | pad11active_v | D245 | D248 | D251 | D254 | D257 | D259 |
| Rel.Humidity (pAD11-16) | pad11humvalue_v | I219 | I220 | I229 | I238 | I247 | I249 |
| Status (Run H.circuit) | hc1on_v | B212 | B216 | B220 | B50 | B51 | B52 |
| Pump (Output active) | hc1_v | B68 | B69 | B70 | B71 | B228 | B232 |
| Temp.Limit | hc1dewplimit_v | A324 | A340 | A356 | A373 | A395 | A417 |

10.16 Heat/Cool Circuits – SOLAR

When SOLAR function is activated, follow next menu:



| Parameter: | SP | Range/F.: | Unit | Description |
|------------|--------------|------------------|------|---|
| Status | B235 | Off/On F: Off | - | 0/Off: Solar control is deactivated. 1/On: Solar control is activated. |
| Panel Temp | A258 | -50.0/150.0 | °C | Solar panel – S1 real temperature. |
| Tank1 Temp | A259 | -50.0/99.9 | °C | Solar tank1 - S2 real temperature. |
| Tank2 Temp | A260 | -50.0/99.9 | °C | Solar tank2 – S3 real temperature (If it is activated). |
| Output 1/2 | B236 B237 | Ne/Ano Ne/Ano | - | Relay status 1/2. No=Off, Yes=On. |
| Pump speed | A261 | 0-100.0 | % | Heating (solar) pump speed, when Module for speed control (rotates per second) is used. |

Menu: Heat/Cool Circuits / Solar → Press Prg → Entrance to Heat/Cool Circuits / Solar / Main Setup menu:

10.16.1 Heat/Cool Circuits – Solar Main Setup

```

Solar Main Setup
Solar Type: simple
Diff ON : 006.0 °C
Diff OFF: 002.0 °C
S2 max : 095.0 °C
S3 max : 095.0 °C
1st time: 005min
2nd time: 020min
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|------|--|------|--|
| Solar Type | I390 | simple 2crc-swi (3cv) 2crc-pump F: simple | - | Solar panels (collectors) configuration. |
| Diff ON | A142 | -999.9/999.9 F: 6 | °C | Difference between Solar panel and tank, when start Solar charging. Heating (solar) pump run in minimal speed (for this value). |
| Diff OFF | A143 | -100/200 F: 2 | °C | Difference between Solar panel and tank to complete Solar charging (switched off). Heating (solar) pump run in maximal speed (for this value). |
| S2 max | A144 | -100/200 F: 95 | °C | S2 maximal temperature for Solar charging. When S2 value is reached, the charging switches to the 2nd Tank or the charging is switched off. |
| S3 max | A423 | -100/200 F: 95 | °C | S3 maximal temperature for Solar charging. When S3 value is reached, the charging is switched off. |
| 1st time | I338 | 0-530 F: 5 | min | Operation Time for run of heating (solar) pump, when Tank 1 heating. Také se přepne na nádž 2? |
| 2nd time | I339 | 0-530 F: 20 | min | Operation Time for run of heating (solar) pump, when Tank 2 heating. After end of time, switches to Tank 1. |

10.16.2 Heat/Cool Circuits – Solar Main Setup - Pump

Pump configuration with speed control (rotate per second).

```
Solar Main Setup
Analog Min:      020.0 %
Analog Max:      100.0 %
Analog Out:      000.0 %

S1Max Temp.:    110.0 °C
Delay Off:       060s
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------|------|------------------------|------|---|
| Analog Min | A424 | 0-100.0 F: 20 | % | Minimal speed value. |
| Analog Max | A425 | 0-100.0 F: 100 | % | Maximal speed value. |
| Analog Out | - | 0-100.0 | % | Actual status speed. |
| S1 max Temp | A528 | -999.9/999.9 F: 110 | °C | Maximal panel temperature for heating (solar) pump start. |
| Delay Off | I74 | 0-999 F: 60 | s | Required shutdown delay time (heating/solar pump). |

10.16.3 Heat/Cool Circuits – Solar Main Setup - Probes

Temperature probes - HW configuration.

```
Solar Main Setup
Probe S1 Selection:
Not Used
Probe S2 Selection:
Not Used
Probe S3 Selection:
Not Used
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------------|----|---|------|--|
| Probe S1 Selection | - | B1-B5/pCO ₅ , B1-B4/pCO _e Not Used F: Not Used | - | S1 temperature probe configuration for solar panel when it is installed. S1 = panels probe NTC-HT, all inputs Pt1000, only B4/pCO ₅ , B5/pCO ₅ Necessary configuration in section: „I/O Configuration” |
| Probe S2 Selection | - | B1-B5/pCO ₅ , B1-B4/pCO _e Not Used F: Not Used | - | S2 temperature probe configuration for Tank1 when it is installed. |
| Probe S3 Selection | - | B1-B5/pCO ₅ , B1-B4/pCO _e Not Used F: Not Used | - | S3 temperature probe configuration for Tank2 when it is installed. |

10.16.4 Heat/Cool Circuits – Solar Main Setup - Relay

HW Relay configuration.

```
Solar Main Setup
Enabled: No
Relay R1 Selection:
Not Used
Relay R2 Selection:
Not Used
R1 Pulse on R2 Change:
060 s
```

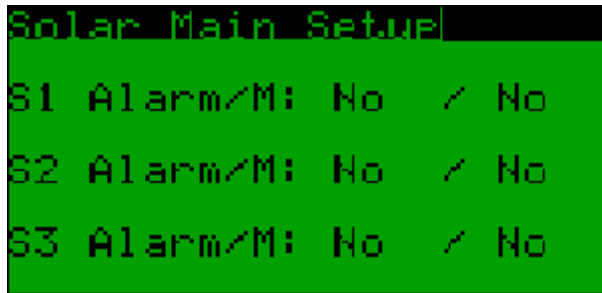
| Parameter: | SP | Range/F.: | Unit | Description |
|--------------------------|------|---|------|---|
| Enabled | B433 | Yes/No F: No | - | Solar control enabled. |
| Relay R1 | - | R1-R8/pCO ₅ R1-R4/pCO _e Optional 1-4 Not Used F: Not Used | - | R1 relay selection. |
| Relay R2 | - | R1-R8/pCO ₅ R1-R4/pCO _e Optional 1-4 Not Used F: Not Used | - | R2 relay selection. |
| R1 Pulse on R2 Change | I404 | 0-999 F: 60 | s | Pump stop time when switching the 3-way valve to prevent mixing of water between 1/2 tanks. |

```

Solar Main Setup
R1 Manual: No
R2 Manual: No
Analog Manual:000.0 %
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------------|------|-----------------|------|--|
| R1 Manual | B434 | Yes/No F: No | - | Manual relay switching R1. Yes=switched |
| R2 Manual | B435 | Yes/No F: No | - | Manual relay switching R2. Yes=switched |
| Analog Manual | A426 | 0-100 F: 0 | % | Manual setting of required solar pump speed. |

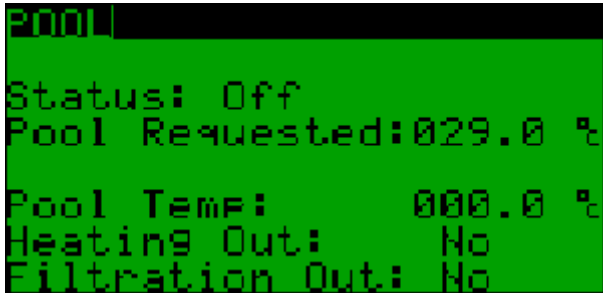
10.16.5 Heat/Cool Circuits – Solar Main Setup - info Alarm



| Parameter: | SP | Range/F.: | Unit | Description |
|------------|------|---------------------------|------|--|
| S1 Alarm/M | B364 | Yes-No/Yes-No F: No/No | - | Alarm/Memory Alarm: Displays “Yes”, alarm S1 Solar is active. Memory: Yes= Alarm in memory. Reset - you need to enter manually “No”. If Alarm is active, Solar function is deactivated. |
| S2 Alarm/M | B365 | Yes-No/Yes-No F: No/No | - | Alarm/ Memory Alarm: Displays “Yes”, alarm S2 Solar is active. Memory: Yes= Alarm in memory. Reset - you need to enter manually “No”. If Alarm is active, Solar function is deactivated. |
| S3 Alarm/M | B366 | Yes-No/Yes-No F: No/No | - | Alarm/ Memory Alarm: Displays “Yes”, alarm S3 Solar is active. Memory: Yes= Alarm in memory. Reset - you need to enter manually “No”. If Alarm is active, Solar function is deactivated. |

10.17 Heat/Cool Circuits – Pool

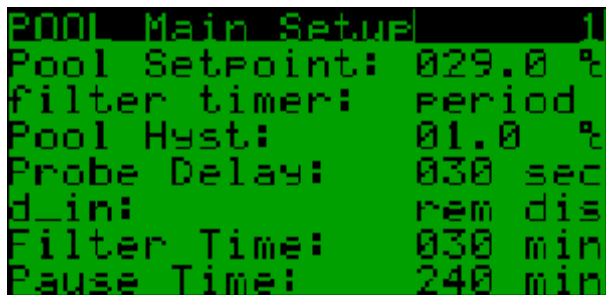
If Pool heating function is activated, follow next menu:



| Parameter: | SP | Range/F.: | Unit | Description |
|----------------|------|-------------------|------|---|
| Status | B238 | Off/On F: Off | - | Off: Pool function deactivated. On: Pool function activated. |
| Pool Requested | A15 | -100/200 F: 29 | °C | Requested water pool temperature by user. |
| Pool Temp | A262 | -99.9/99.9 | °C | Real temperature pool water. |
| Heating Out | B239 | Yes/No | - | R1 output. Yes=Pool heating is active. |
| Filtration Out | B240 | Yes/No | - | R2 output. Yes=Filtration is active. |

Press PRG → entrance to Pool Main Setup menu:

10.17.1 Heat/Cool Circuits – Pool Main Setup



| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------|---|------|--|
| Pool Setpoint | A15 | -100/ 200.0 F: 29.0 | °C | Requested Pool Water Temperature. |
| Filter timer | I343 | period fro-to F: period | - | Filtration pump setting. period – periodic timer fro-to - timer programming from-to 0 = period 1 = 4x from-to |
| Pool Hyst | A428 | 0/10 F: 1 | °C | Negative value of hysteresis to heating control. |
| Probe Delay | I344 | 0-999 F: 30 | s | Measuring delay of temperature after filtration start. |
| d_in | I345 | 2/rem dis 1/filt on 0/heat on F: rem dis | - | Pool - Switching functions. 0=heating + filtration, 1=filtration, 2=nonactive filtration |
| Filter time | I346 | 0-533 F: 30 | min | Periodic Filtration Time for section Filter Timer: "Period" . |
| Pause Time | I347 | 0-533 F: 240 | min | Pause (filtration pump) between cycle in section: Filter Timer: "Period" . |

10.17.2 Heat/Cool Circuits – Pool Main Setup / Offset, Time

```

POOL Main Setup
Heat Demnd Offs: 020.0%
Pool Heating Time:
060 min
Heat/Cool Time:
060 min
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------|------|--------------------|------|--|
| Heat Demnd Offs | A427 | 0/100.0 F: 20.0 | °C | Required temperature offset of Main heating circuit water. |
| Pool Heating Time | I348 | 0-999 F: 60 | min | Maximal heating limit for 1 charging pool cycle. |
| Heat/Cool Time | I349 | 0-999 F: 60 | min | Minimal heating/cooling time after 1 charging pool cycle. |

10.17.3 Heat/Cool Circuits – Pool Filtration Timer

```

Pool Filtration Timer
Type: On/Off Period
Filter Time: 030 min
Pause Time: 240 min
1st ON 00:00 OFF 00:15
2nd ON 06:00 OFF 06:15
3rd ON 12:00 OFF 12:15
4th ON 18:00 OFF 18:15
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------|------|---|------|--|
| Type | I343 | On/Off Period Scheduler F: On/Off Period | - | 0=On/Off Period: Filtration pump run in continuous on/off period. 1=Scheduler (Timer): Filtration pump run in accordance with time program. |
| Filter Time | I346 | 0-533 F: 30 | min | On-Period Time setting. Filtration pump running in 1 cycle of Period in accordance with section Type: On/Off Period. |
| Pause Time | I347 | 0-533 F: 240 | min | Off-Period Time setting. Pause between 1 cycle of Period where filtration pump running. |
| 1, 2, 3, 4 On/Off | - | 00:00 23:59 | h:m | Scheduler – 4x programs. Time programming with factory setting (15 minutes for every programs). |

10.17.4 Heat/Cool Circuits – Pool Main Setup / Inputs, priority

```

POOL Main Setup
Temp Probe Selection:
Not Used
Digital Input:
Not Used

SHW Priority: Yes
Pool H/C Priority: Yes
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------------|------|---|------|---|
| Temp Probe Selection | - | B1-B5/pCO ₅ , B1-B4/pCO _e Not Used F: Not Used | - | Probe configuration for pool temperature measuring. |
| Digital Input | - | ID1-ID8_pCO ₅ ID1-ID4/pCO _e Not Used F: Not Used | - | DI - input configuration for Pool function. |
| SHW priority | - | Yes/No F: Yes | - | SHW setting mode. Yes = SHW have priority before Pool. |
| Pool H/C Priority | B209 | Yes/No F: Yes | - | 0=No, Pool heating together with Heat circuit (does not affect the H/C mode). 1=Yes, Pool have priority before Heat circuit (Example: Deactivates cooling mode). |

10.17.5 Heat/Cool Circuits – Pool Main Setup / Relays

```

POOL Main Setup
Enabled: No
Relay R1 Selection:
Not Used
Relay R2 Selection:
Not Used
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------------|------|---|------|---------------------------------------|
| Enabled | B348 | Yes/No F: No | - | Enabled Pool control function. |
| Relay R1 Selection | - | R1-R8/pCO ₅ R1-R4/pCO _e Optional 1-4 Not Used F: Not Used | - | R1 relay selection for Pool function. |
| Relay R2 Selection | - | R1-R8/pCO ₅ R1-R4/pCO _e Optional 1-4 Not Used F: Not Used | - | R2 relay selection for Pool function. |

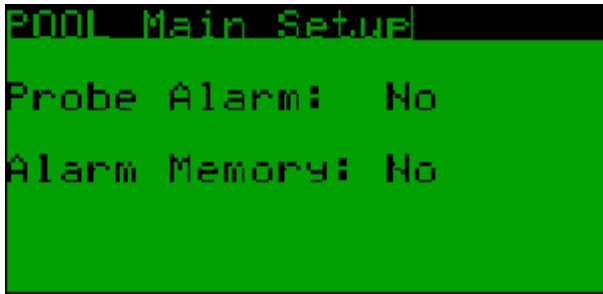
10.17.6 Heat/Cool Circuits – Pool Main Setup / Relays manual

```

POOL Main Setup
R1 Manual: No
R2 Manual: No
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------|------|-----------------|------|--|
| R1 manual | B407 | Yes/No F: No | - | R1 relay manual activation. Yes=switched On |
| R2 manual | B408 | Yes/No F: No | - | R2 relay manual activation. Yes=switched On |

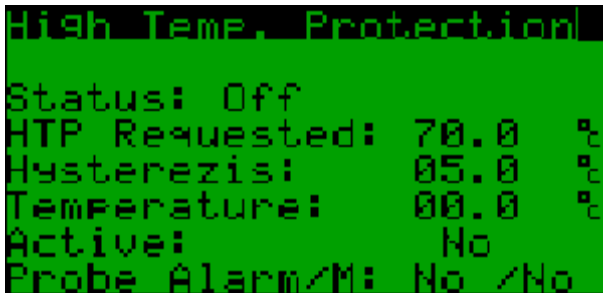
10.17.7 Heat/Cool Circuits – Pool Main Setup / Alarm



| Parameter: | SP | Range/F.: | Unit | Description |
|--------------|------|-----------|------|---|
| Probe Alarm | B367 | Yes/No | - | Actual alarm status – S1 temperature pool probe. |
| Alarm Memory | - | Yes/No | - | Memory alarm status – S1 temperature pool probe. Yes=alarm was active. Reset - you need to enter manually "No". |

Press ESC → list to "High Temp.Protection":

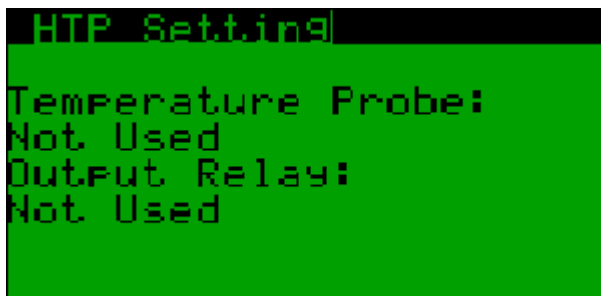
10.18 Heat/Cool Circuits – High Temp.Protection (HTP)



| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------------|-----------------------|------|---|
| Status | B260 | Off/On | - | Enabled/Disabled protection. On= active |
| HTP Requested | A280 | -99.9/ 99.9 F:70.0 | °C | Requested temperature for protection activity. |
| Hysterezis | A281 | -99.9/ 99.9 F:5.0 | °C | Negative hysteresis value for temperature protection control. |
| Temperature | A282 | -99.9/ 99.9 | °C | Actual sensor temperature selected for protection. |
| Active | B261 | Yes/No | - | View protection activity. Yes = active protection, No = protection not activated. |
| Probe Alarm/M | B262/ - | Yes-No/ Yes-No | - | Alarm / Memory Alarm: Yes = Alarm is active. Memory: Yes = Memory alarm Reset - you need to enter manually "No". |

Press PRG → entrance to HTP Setting menu:

10.18.1 Heat/Cool Circuits – HTP Setting



| Parameter: | SP | Range/F.: | Unit | Description |
|--------------|----|---|------|-------------------------------------|
| Ridici Cidlo | - | B1-B5/pCO ₅ , B1-B4/pCO _e Neni F:Neni | - | Výběr čidla pro měření teploty OVT. |
| Vystup. Rele | - | R1-R8/pCO ₅ R1-R4/pCO _e Optional 1-4 Neni F: Neni | - | Volba relé příslušné funkce OVT. |

Press ESC back → and list to Universal Thermostat menu:

10.19 Heat/Cool Circuits – Universal Thermostat 1 to 3

```

Universal Thermostat. 1
Status: Off
Setpoint:      20.0 °C
Hysterezis:   05.0 °C
Temperature:   00.0 °C
Active:        No
Probe Alarm/M: No /No
    
```

```

Universal Thermostat. 3
Status: Off
Setpoint:      20.0 °C
Hysterezis:   05.0 °C
Temperature:   00.0 °C
Active:        No
Probe Alarm/M: No /No
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------|---------------------------------|------------------------|------|---|
| Status | B263 (B266, B269) | Off/On F: Off | - | On/Off thermostat. On = active. |
| Setpoint | A283 (A286, A289) | -99.9/ 99.9 F: 20.0 | °C | Requested temperature for thermostat switching. |
| Hysterezis | A284 (A287, A290) | -99.9/ 99.9 F: 5.0 | °C | Negative hysteresis value for temperature protection control. |
| Temperature | A285 (A288, A291) | -99.9/ 99.9 | °C | Actual temperature probe selected for the thermostat. |
| Active | B264 (B267, B270) | Yes/No | - | Thermostat activity display. Yes = Active, No = not activated |
| Probe Alarm /M | B265 (B268, B60) / B60 | Yes-No / Yes-No | - | Alarm/Memory Alarm: Yes = Alarm is active. Memory: Yes = Memory alarm Reset - you need to enter manually "No". |

Press PRG → entrance to UT1 Setting (same setting for UT2 a UT3):

10.19.1 Heat/Cool Circuits – UT1 (UT2, 3) Setting

```

UT1 Setting
Temperature Probe:
Not Used
Output Relay:
Not Used
Control Direction:
Heating (Reverse)
    
```

```

UT3 Setting
Temperature Probe:
Not Used
Output Relay:
Not Used
Control Direction:
Heating (Reverse)
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------|---------------------|---|------|---|
| Temperature Probe | - | B1-B5/pCO ₅ , B1-B4/pCO _e Not Used F: Not Used | - | UTx-Probe configuration for temperature measuring. |
| Output Relay | - | R1-R8/pCO ₅ R1-R4/pCO _e Optional 1-4 Not Used F: Not Used | - | UTx – Relay output configuration. |
| Control Direction | B336 (B337,B338) | Heating (Reverse) Cooling (Direct) F:Cooling (Direct) | - | Requested setting of regulation: Heating = reverse function (requested - hysterezis) Cooling = direct function (requested + hysterezis) |

Press ESC back → and list to Differential Thermostat menu:

10.19.2 Heat/Cool Circuits – Differential Tstat 4

```

Differential Tstat. 4
Status: Off
Diff. On:      85.0 °C
Diff. Off:     82.0 °C
Temp 1/2: 88.0 / 88.0 °C
Active:       No
Prb 1 Alr./M: No /No
Prb 2 Alr./M: No /No
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|--------------------|---------------|----------------------------|------|--|
| Status | B271 | Off/On F: Off | - | On/Off thermostat. On = active. |
| Diff. On | A292 | -99.9/ 99.9 F: 5.0 | °C | Requested temperature difference value for switching on the thermostat. |
| Diff. Off | A293 | -99.9/ 99.9 F: 2.0 | °C | Temperature difference for thermostat switch off. |
| Temp 1/2 | A294/ A295 | -99.9/99.9 / -99.9/99.9 | °C | Actual temperature 1 probe / 2 probe for thermostat. |
| Active | B272 | Yes/No | - | Thermostat activity. Yes= Active, No= not actived |
| Probe 1 Alr. /M | B273/ - | Yes-No / Yes-No | - | Alarm / Memory Alarm: Yes = Alarm is active. Memory: Yes = Memory alarm Reset - you need to enter manually "No". |
| Probe 2 Alr. /M | B274/ - | Yes-No / Yes-No | - | Alarm / Memory Alarm: Yes = Alarm is active. Memory: Yes = Memory alarm Reset - you need to enter manually "No". |

Press PRG → entrance to UT4 setting menu:

10.19.3 Heat/Cool Circuits – UT4 Setting

```

UT4 Setting
Temperature Probe 1/2:
Not Used
Not Used
Output Relay:
Not Used
Control Direction:
Heating (Reverse)
    
```

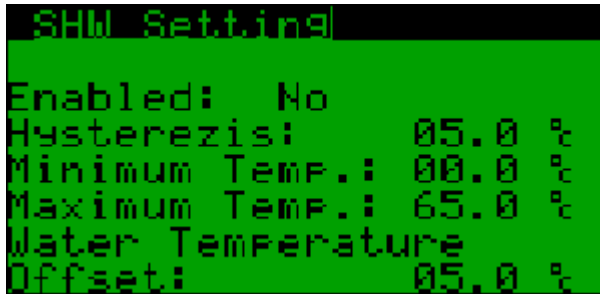
| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------|------|--|------|---|
| Temperature Probe 1/2 | - | Choice for both probes: B1-B5/pCO ₅ , B1-B4/pCO _e Not Used F: Not Used / Not Used | - | Configuration of temperature probes for temperature measurement using a differential thermostat (UT4). |
| Output Relay | - | R1-R8/pCO ₅ R1-R4/pCO _e Optional 1-4 Not Used F: Not Used | - | UT4 – Relay output configuration. |
| Control Direction | B339 | Topení (reverse) Chlazení (direct) F: Chlazení (direct) | - | Requested setting of regulation: Heating = reverse function (requested - hysteresis) Cooling = direct function (requested + hysteresis) |

Press ESC back → and list to SHW menu:

10.20 Sanitary Hot Water

Hot water – main setting.

10.20.1 SHW Configuration



| Parameter: | SP | Range/F.: | Unit | Description |
|-------------------|------|-------------------|------|---|
| SHW Enabled | B275 | 0/1 F: 1 | - | Enables generation of Hot Water. 0=No, 1=Yes |
| SHW Hysterezis | A12 | 0-99.9 F: 5.0 | °C | Hysterezis of hot water preparation. On=SHW Temperature < Setpoint - Hysterezis Off=SHW Temperature >= Setpoint |
| SHW Minimum Temp. | A296 | 0-99.9 F: 0.0 | °C | Minimum hot water setpoint limit. |
| SHW Maximum Temp. | A297 | 0-99.9 F: 45.0 | °C | Maximum hot water setpoint limit. |
| SHW Offset | A298 | 0-99.9 F: 5.0 | °C | Offset for heating water temperature setpoint. SHW setpoint = 45.0°C Offset = 5.0 Heating water setpoint = 45.0+5.0 = 50.0 |

10.20.2 Hot Water Timing

```

SHW Settings
Max Time SHW Mode:
060 min
Min Time H/C Mode:
060 min
Delay High Temperature
060 s
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|------------------------|-----|----------------|------|---|
| Max Time SHW Mode | I53 | 0-999 F: 60 | min | Maximum time unit is generating hot water. When hot water setpoint is not reached in this time, hot water mode is finished and heating/cooling mode is activated. When set to 0, this function is disabled. |
| Min Time H/C Mode | I54 | 0-999 F: 60 | min | Minimum time unit stays in heating or cooling mode, before returning to hot water mode. |
| Delay High Temperature | I71 | 0-999 F: 60 | s | Delay of heating water temperature setpoint in hot water mode after hot water mode stop. |

10.20.3 SHW HW Configuration

```

SHW Settings
Temperature Probe:
81/pCO5
Output Relay:
Relay 8 /pCO5
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|-----------------------|----|--------------|------|---|
| SHW Temperature Probe | - | 0-9 F: 1 | - | Temperature probe sensing hot water. 0=Not Used, 1=B1, 2=B2, 3=B3, 4=B4, 5=B5, 6=B1/pCOe, 7=B2/pCOe, 8=B3/pCOe, 9=B4/pCOe |
| SHW Output Relay | - | 0-16 F: 8 | - | Relay selection for hot water output. 0:Not Used 1:Relay 1 /pCO5, 2:Relay 2 /pCO5 3:Relay 3 /pCO5, 4:Relay 4 /pCO5 5:Relay 5 /pCO5, 6:Relay 6 /pCO5 7:Relay 7 /pCO5, 8:Relay 8 /pCO5 9:Relay 1 /pCOe, 10:Relay 2 /pCOe 11:Relay 3 /pCOe, 12:Relay 4 /pCOe Optional 1-4 (Do not used) |

10.20.4 Antilegionella Function

```

SHM Setting
Anti Legionella Func
Active: No
Enabled: No
Setpoint: 60.0 °
WeekDay: Friday
Start Hour: 00 h
Stop Hour: 01 h
    
```

| Parameter: | SP | Range/F.: | Unit | Description |
|---------------|------|-----------------|------|--|
| AL Active | B426 | 0/1 | - | Function actually active. 0=No, 1=Yes |
| AL Enabled | B425 | 0/1 | - | Function Enabled. 0=No, 1=Yes |
| AL Setpoint | A443 | 0-99.9 F: 60 | °C | Setpoint of hot water for antilegionella function. |
| AL WeekDay | I397 | 1-7 F: 5 | - | Day of the week for antilegionella function. |
| AL Start Hour | I398 | 0-23 F: 0 | h | Start hour of antilegionella function. |
| AL Stop Hour | I399 | 0-23 F: 1 | h | Stop hour of antilegionella function. |

10.20.5 Solar Period

Hot water mode is deactivated during time of this function.

```

SHM Setting
Solar Period
Active: No
Enabled: No
Start Month: May
Stop Month: October
Start Hour: 06
Stop Hour: 16
  
```

| Parameter: | SP | Range/F.: | Unit | Description |
|----------------|------|---------------|------|---|
| SP Active | B438 | 0/1 | - | Solar period function actually active. 0=No, 1=Yes |
| SP Enabled | B437 | 0/1 F: 0 | - | Solar period function enabled. 0=No, 1=Yes |
| SP Start Month | I400 | 1-12 F: 5 | m | Start month for solar period. |
| SP Stop Month | I401 | 1-12 F: 10 | m | Stop month of solar period. |
| SP Start Hour | I402 | 0-23 F: 6 | h | Start hour for solar period. |
| SP Stop Hour | I403 | 0-23 F: 16 | h | Stop hour of solar period. |

