Heat pump system integrated in Geniox or Geniox Core air handling unit

User Manual

GB

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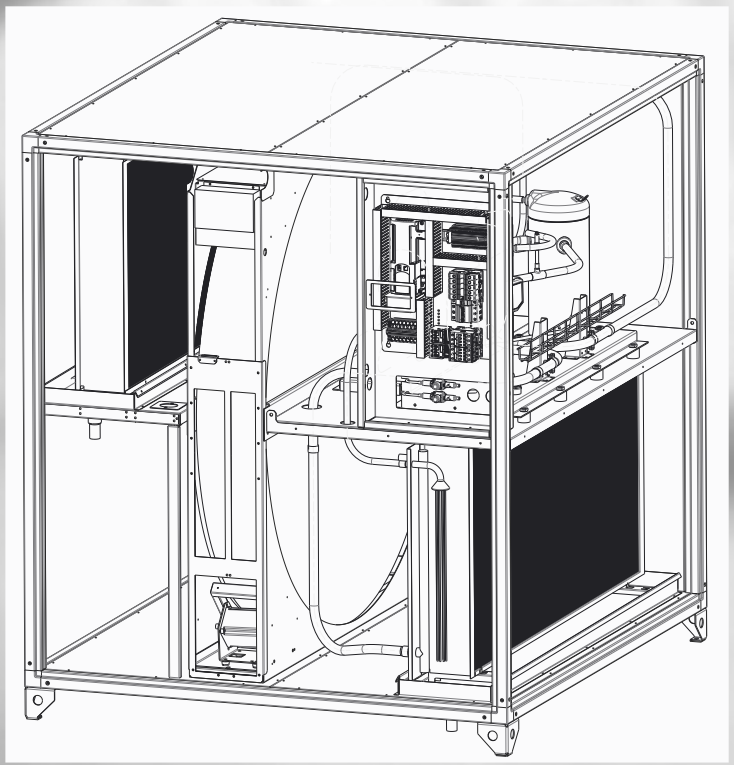
Order number Heat_Pump



systemair

Only the English version is valid in case of a dispute. Translated versions are not valid in case of disputes.

Contents

1 Reversible heat pump for cooling and heating

The air handling unit section with heat pump is a separate section in the air handling unit, containing a fully integrated, complete stand-alone reversible heat pump system (heating and cooling). The system has been tested and optimized before delivery. All refrigerant system components are fully integrated into the unit. The refrigerant is evaporated and condensed directly in the integrated coils, and the capacity is controlled automatically and steeples between 5 and 100 %.

The system is delivered with refrigerant R-410a in the circuit. The integrated control system handles all safety functions as well as capacity control of the digital scroll compressor and additional on/off compressor in units Geniox 10 – Geniox 24. The system generates exactly the capacity requested by the main air handling unit controller via a 0-10V DC control signal.

When a demand for heating or cooling occurs, the main air handling unit controller sends a start signal for heating or cooling and a start signal. Capacity is controlled by the 0-10V DC signal (X5:10-11) connected to the internal controller in the heat pump section. When the signal exceeds 1.6 V DC, the digital compressor starts. After start-up, the capacity is regulated between 5 and 50 % by the digital scroll compressor - C1 and Q1 - in the illustration below. When more than 50 % of the capacity is demanded (control signal exceeds 5.0 V DC), the second compressor C2 starts. Then the capacity of the digital compressor is reduced to a minimum and, with increasing demand, gradually increased to 100% capacity. The reverse sequences are activated by declining demand until 5%. Below 5% the system will run at minimum capacity until the start signal is off.

A full envelope control function is integrated into the internal control system. This prevents operation that exceeds safe conditions for any of the components. Signals from the high and low pressure transmitters, P6 and P7, contribute with information to ensure maximum performance without exceeding the set value. Thereby preventing safety switches for HP and LP, HP1 and P5 from discontinued cooling or heating. This system ensures maximum performance under the given air flows and temperatures of outdoor and extract air.

The system includes 2 electronic expansion valves. One for heating mode - Q3, and one for cooling mode -Q2. Super Heat is controlled by the built-in controller. The SH control is based on evaporating pressure measured by LP transmitter, P7 and temperature sensor, R110 placed on the suction line. This ensures highly accurate and efficient system performance under all operating conditions.

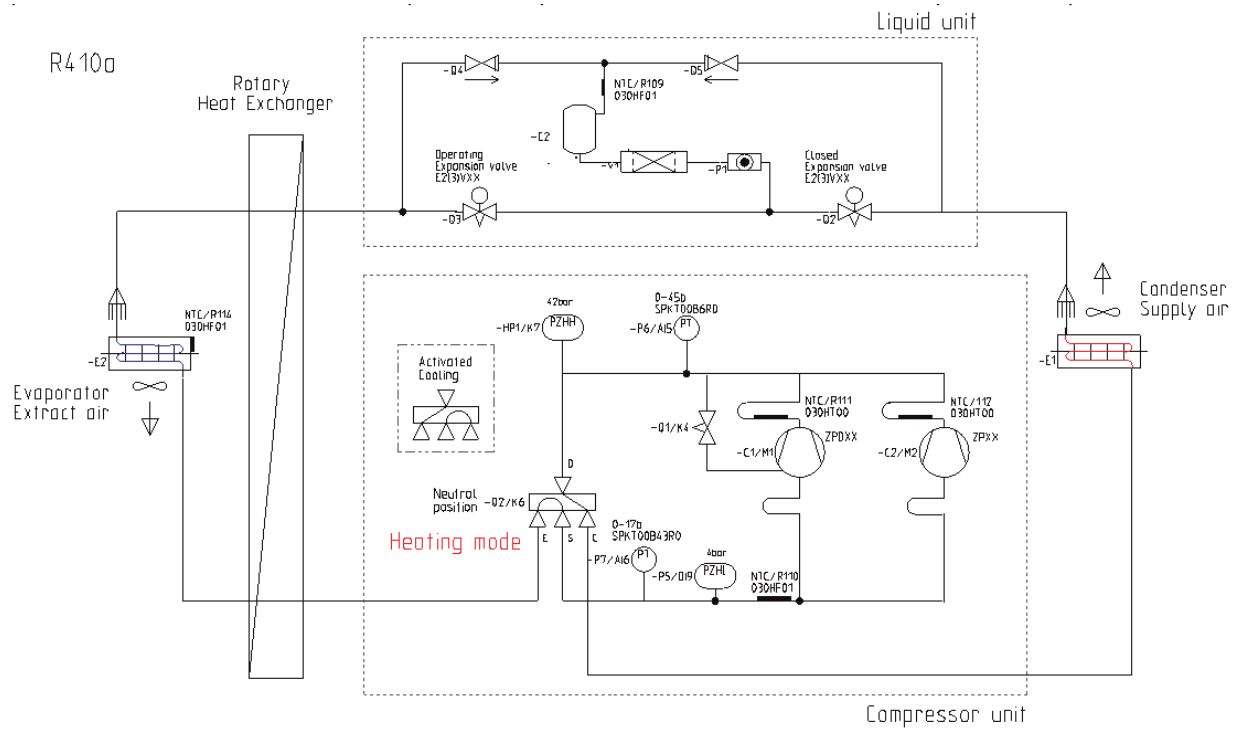
A 4-way valve Q1 changes the function of the system between heating and cooling mode.

The evaporator (condenser in cooling mode) on the Heat Pump unit is placed in the extract air flow downstream of the rotary heat exchanger. This makes it possible to utilize the heat exchanger in both heating and cooling mode for recovering energy. This will minimize the compressor system's power consumption.

A heat trace element has been placed below the evaporator in the drip tray to prevent ice buildup during heating operation.

During heating operation, the evaporator in the exhaust air must be defrosted when operating at low outdoor temperatures. In the integrated control system, there is an advanced software function to detect ice buildup on the coil. Based on evaporating temperature and time. The less energy we have in the extract air downstream of the exchanger, the faster ice will build up. Time between defrost is dynamic based on how long it takes to go through the defrost sequence. When ice buildup is at a certain level, a de-icing sequence is initiated. During this cycle, the refrigeration system will reverse to bring energy to the coil in the exhaust air, to melt the ice. Once the control system detects that ice is gone, the system returns to normal heating operation. Detection is based on condensing temperature/time and temperature/time of the sensor installed at the coil in the exhaust air flow, R114. A very quick and efficient sequence. Default settings for these functions will normally give an optimal relation between time between de-frost and the defrost cycle time. A number of settings are available to adapt these functions to local conditions if needed. See menu descriptions. This manual is for qualified and experienced refrigeration personnel only.

1.1 Heat pump circuit



2 Units with integrated reversible heat pump without Systemair Access control system

1. Start/stop hysteresis is integrated in the heat pump control system. This means that the best way of controlling the capacity is to give start signal when there is more than 0% capacity demand. This means that no hysteresis on start/stop or 0–10V capacity signals (still note point 2).

a. The heat pump will start at a capacity demand of 5%. After start sequence, output capacity will go to 8.5% for the remaining startup time (available signal, see point 3).

b. The unit will not stop until the start signal has been off for 5 seconds. This is to ensure that a very short flick on start signal will not stop the unit.

c. The unit will continue to run at minimum capacity as long as the start signal is present. Even without any capacity demand. To minimize stops caused by very short variations in control signal at minimum capacity demand.

2. The unit has a minimum output capacity when running. To avoid unnecessary start/stop of the system, it is important to ensure a minimum capacity demand (temperature*air volume) before the heat pump is started. This can be done in several ways.

a. The minimum capacity is about 10% of maximum system capacity (not nominal design point).

b. The best way is to calculate the system supply air energy demand. The delta temperature between supply air temperature setpoint and actual temperature multiplied by current air volume. Ts-Ta*m3/s*1.21=demand kW. As long as energy demand is not higher than system minimum capacity, the heat pump sequence regulator must be blocked at 0%. When the demand is high enough, the sequence regulator can be given free, and the system will not regulate down to 0%, and the system will keep on running until the demand is below 0%.

c. A simpler version is a neutral zone based on the temperature delta only. However, that does not take into account variations in air volume. For systems with fairly constant air volume, this can be OK. A delta of 1–2° will usually match typical unit designs. Typical winter operation with lower air volumes will probably be around 2°.

d. This is not a hysteresis function, but a block/freeze of AHU temperature regulator to ensure a minimum demand before regulation continues.

3. A potential free digital output (NO9) signal is available to indicate output power out of normal range. It is selectable if either of the conditions below will activate the digital output. It is important to handle these situations to give a stable temperature regulation. The heat pump will hold capacity demand from before “condition” happens and go back to it as the given sequence is finished. In this situation, it is advisable to block/freeze heat pump sequence regulator signal, as in reality, the output demand is not changing during this period.

a. When the unit is starting up. It goes to 50% capacity for 90 seconds, or until Δt of 30°C between condenser temperature and evaporator temperature is achieved. In the remaining time, the capacity will go to 8.5%.

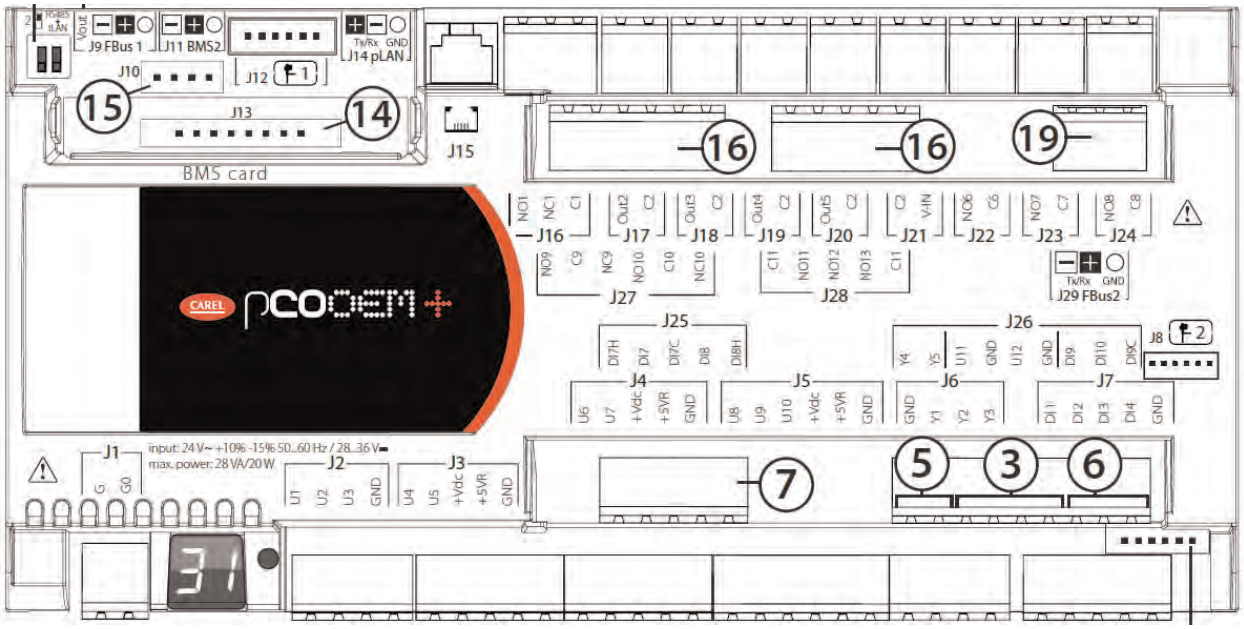
b. If the unit has been running with low capacity <10% for one hour. Output capacity will make oil boost for a short period.

c. During defrost sequence. Operation goes to reverse operation and other needed phases to defrost.

3 Electrical documentation

Wiring diagram for the integrated control system is available in a separate document.

At power, the 2-segment LED display on the controller will light up with moving dots until controller and display are ready for operation.



4 Control signals

Signal:	Terminals:	Electrical:
Start (Heat mode)	X5; 18-19	External potential free contact
Cooling demand	X5; 16-17	External potential free contact
Capacity	X5; 10-11	10: gnd. 11: 0-10V_{DC}
Alarm output	X5; 25-26	Internal potential free contact
Defrost & start active	J27; C9-NO9	Internal potential free contact

5 Internal controller for compressor system

Control panel pGD1 placed inside integrated control cabinet

The control panel has 6 buttons with the following functions

- Alarm	Display the list of active alarms Manually reset alarms
- Prg	Access the service menu
- Esc	Return to the previous screen
- Up - Down	Navigate between the display screens or increase/decrease values
- Enter	Switch from parameter display to edit Confirm value and return to the parameter list

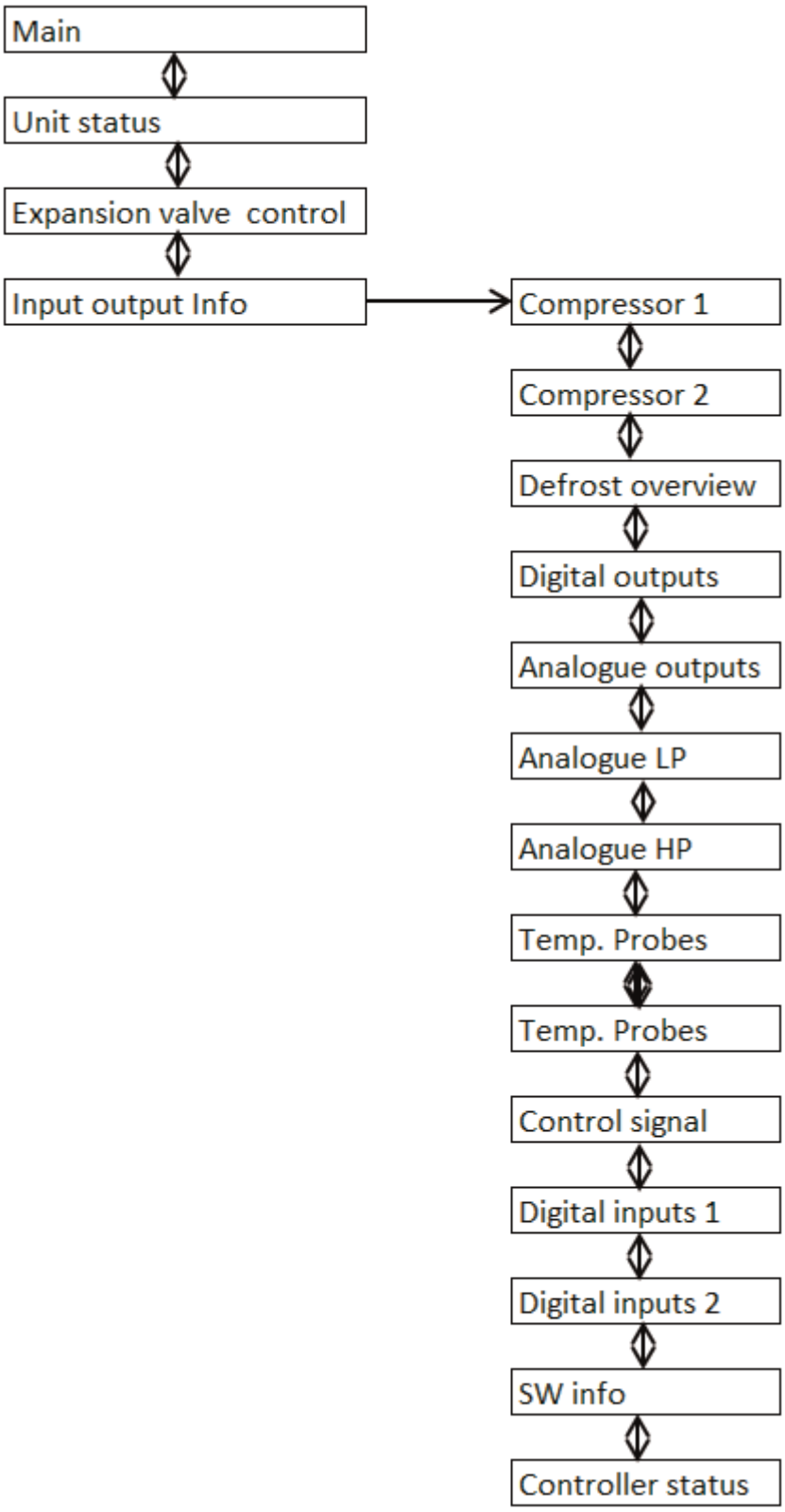
When the red alarm light flashes (bell), there is an active alarm and display is not in alarm view.

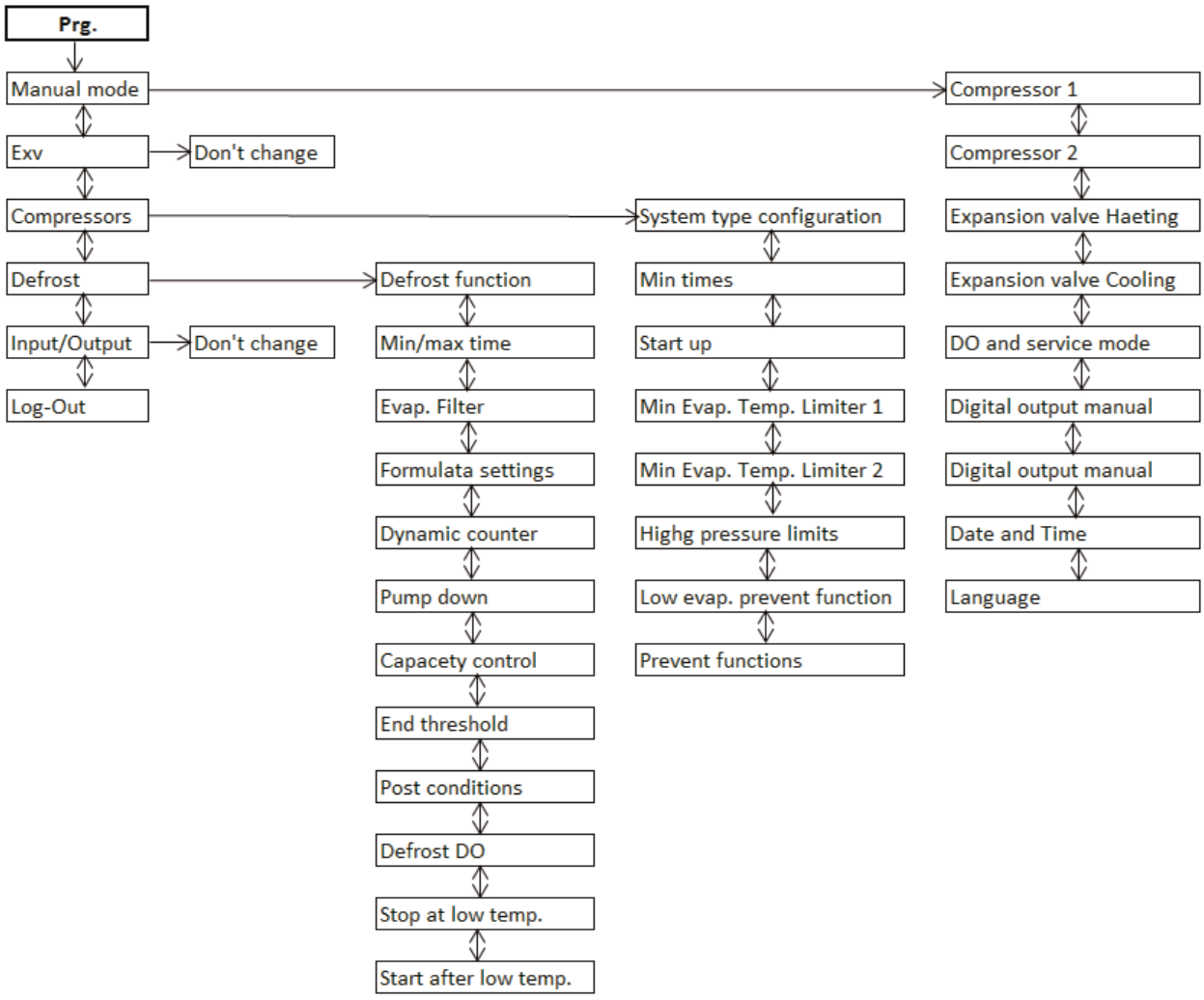
When red alarm light is steady, there is an active alarm and display is in alarm view.

5.1 Background illumination of the display

Background illumination of the display switches on automatically when the first push button is activated. Illumination switches off some time after the last activation. The red alarm button will flash in case of alarm until it is acknowledged.

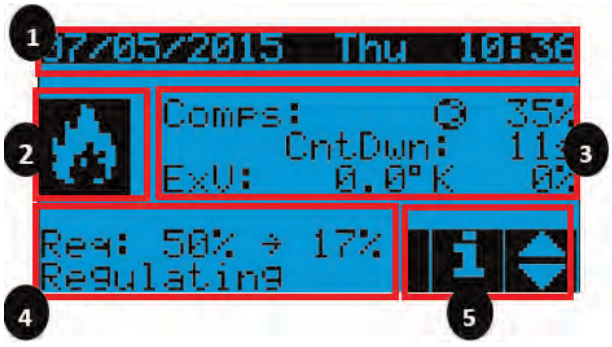
6 Menu – drawing of the menu structure to guide the user





7 The start display, main menu

The following screen displays an example of the main screen with an active unit, highlighting the fields and icons used:



1. Date and time
2. Current unit status:

	Unit OFF
	Summer mode (cooling)

	Winter mode (heating)
	Defrosting in progress

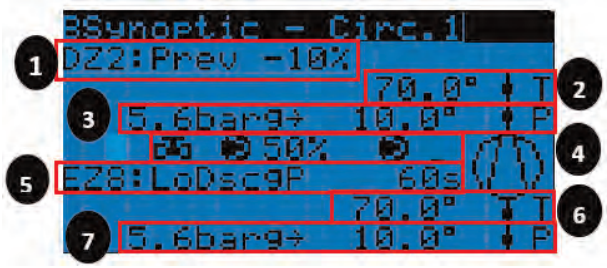
3. Device status
   a. Compressors in operation and digital capacity. Digital 35% output, fixed off)
   b. Timer in action, Min. on/off time, Min. time between starts
   c. Super Heat and Expansion valve opening
4. System capacity request and actual power output
   a. System status
      i. System OFF
      ii. OFF by input, but no capacity signal
      iii. Regulating
      iv. Pump-Down, and count down
      v. Defr. Ph, and count up/down
      vi. Manual mode
      vii. OFF alarm
      viii. OFF low temp
5. Indicates access to the info menu using the DOWN button

8 Status menus

From the main screen, the DOWN (UP) button can be used to scroll through the status of devices. No password is needed to access these menus; no settings can be changed here.

The physical status of inputs, outputs, transmitters and defrost sequence are all available in the menus. The individual screens are shown below.

Compressor status:



1. Discharge temperature zone and prevent action (never in action)
2. Discharge temperature
3. Condensing pressure and temperature
4. Compressor status and digital percentage
5. Envelope zone and count down time:
   - **EZ1:Ok**: zone within operating limits
   - **EZ2:HiDP**: High compression ratio
   - **EZ3:HiDscgP**: High condensation pressure
   - **EZ4:HiCurr**: High motor current
   - **EZ5:HiSuctP**: High suction pressure
   - **EZ6:LoDP**: Low differential pressure
   - **EZ7:LoPRat**: Low compression ratio
   - **EZ8:LoDscgP**: Low condensation pressure

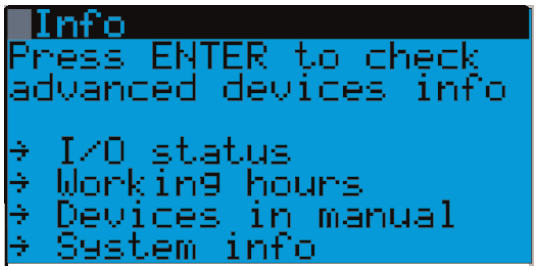
- **EZ9:LoSuctP**: Low evaporation pressure

6. Suction gas temperature
7. Evaporating pressure and temperature

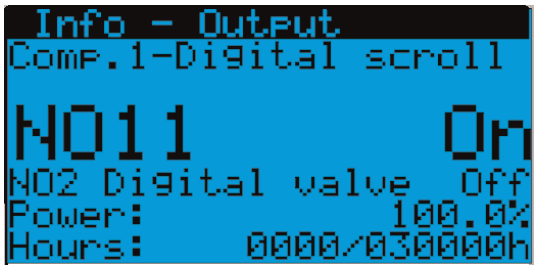
Expansion Valve Overview:

1. Actual Super Heat
2. Suction gas temperature
3. Valve opening mode, percentage and steps;
4. Valve status:
   - **Close**: valve closed
   - Std-by: system stop position
   - Pos: fixed position during sequence
   - Wait: after positioning and in case of change in capacity greater than 10%, the valve must carry out a large action that can take some seconds. Wait will be displayed during this phase.
   - **On**: valve in regulation
   - Init: driver initialization
5. Evaporating pressure and temperature
6. Super Heat set-point

Status Information:

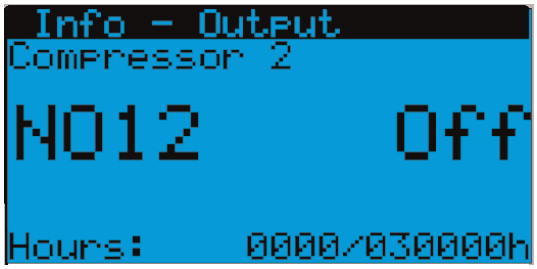


Push Enter to get the following information:



Showing status of digital compressor 1 and actual output capacity

Running hours

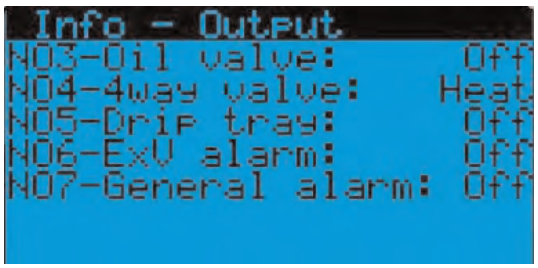


Showing status of on/off compressor 2

Running hours

A very compressed overview of defrost status

1. Actual phase running, Actual system power output
2. Short phase name / description, Phase time, Disable = not active
3. Expansion valve position, Heating / Cooling
4. Actual evaporating temperature
5. Filtered evaporating temperatur used for time to defrost calculation
6. Actual condensing temperature (pressure)
7. Count down to next defrost, Actual super heat



Status of digital outputs:

Oil valve and Drip tray not in use

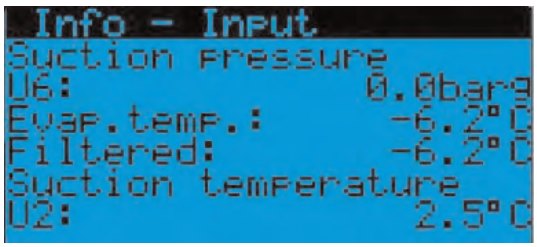
Status digital outputs:

El-coil and ElHeat Excoil not in use

Analogue outputs:

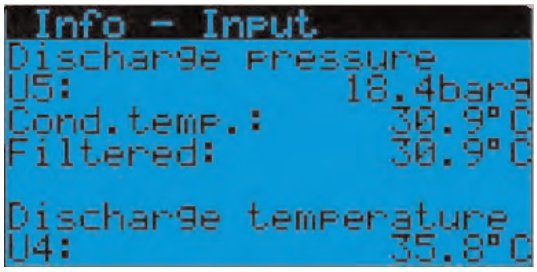
Y1 and 2 not in use

Y3, actual position of active expansion valve



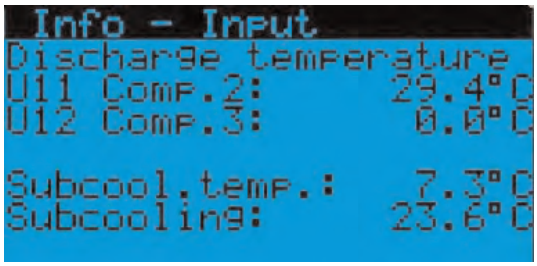
Evaporating pressure and temperature

Suction gas temperature



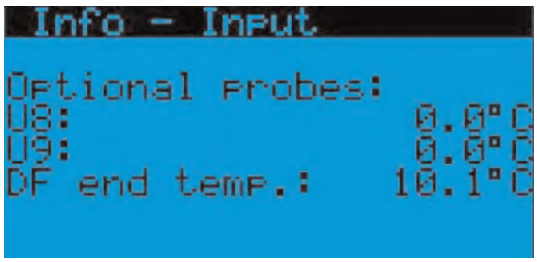
Condensing pressure and temperature

Discharge temperature compressor 1



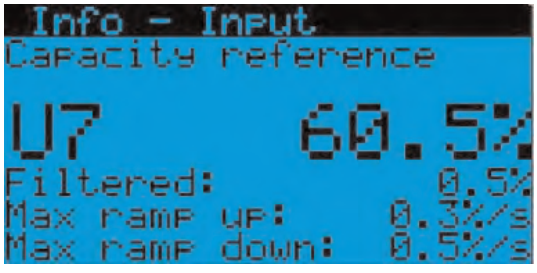
Discharge temperature compressor 2 and 3 (not in use)

Liquid temperature and sub-cooling



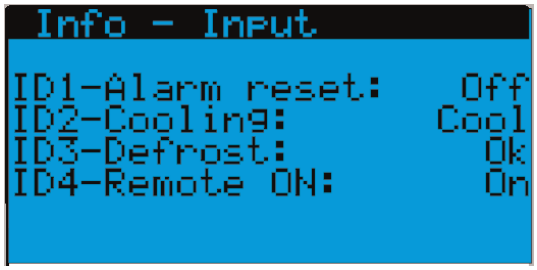
Probes not in use U8 and 9

Defrost end temperature sensor

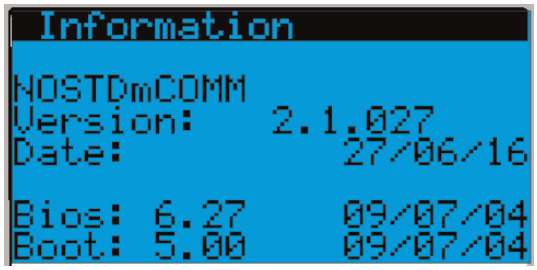


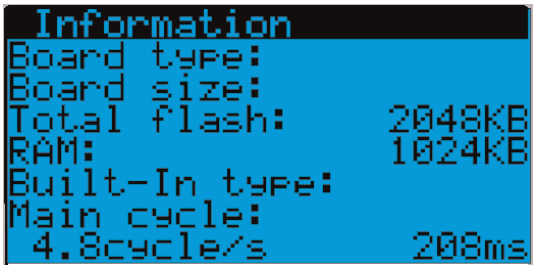
Capacity demand input

Actual ramp limits



Status of digital inputs





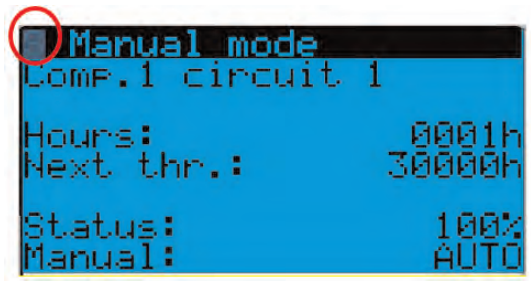
Software version and memory status

9 Service

Regardless of the displayed screen, pressing the programming key accesses the password entry screen that allows access to the menu shown below for service level. Enter the password (1111) and push enter. Use enter key to move the cursor. Once the password is entered, it will be maintained for 5 minutes from the last time a key was activated. Then the password will have to be re-entered in order to access the service level again. If you exit the service level menu you will have to re-enter the password to get in.

Service level gives read access to all parameters, with the ability to edit some of them. For more information on the parameters that can be changed, see the parameter table. Password: 1111.

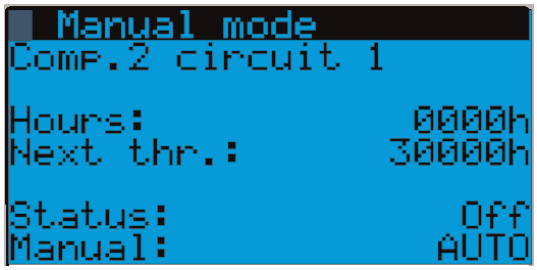
As soon as the password is entered in the login screen and function has been selected, the access level needed to edit the values will be shown. As seen in the following screens, S flashing for Service and M for Manufacture:



10 Manual operation

From the menu – Manual mode – it is possible to operate components manually. The technician can control the operation of components manually. This procedure is relevant for the test during annual maintenance with the control of all safety and control functions, or after exchanging components. Menus as follows:

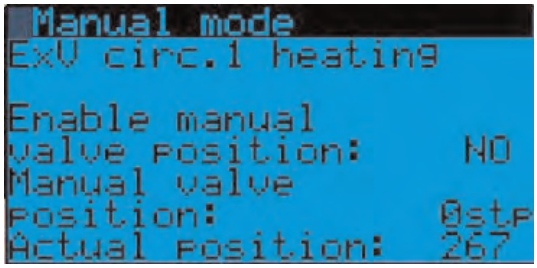
In the first screen above: Compressor 1 status. Actual operating hours. Next threshold of operating hours for service can be set. Current capacity and selection of manual mode.

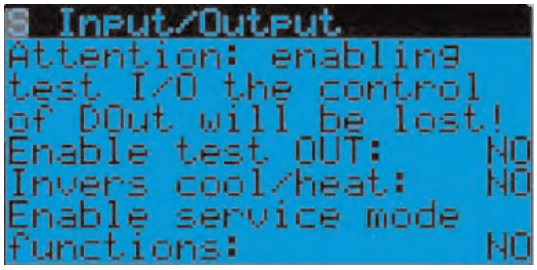


Compressor 2 status. Actual operating hours. Next threshold of operating hours for service can be set. Current status and manual selection.

When operating compressors manually, Super Heat control will still be active as long as expansion valves are in auto.

Expansion valves can be manually operated individually. The valve does have 0-480 steps

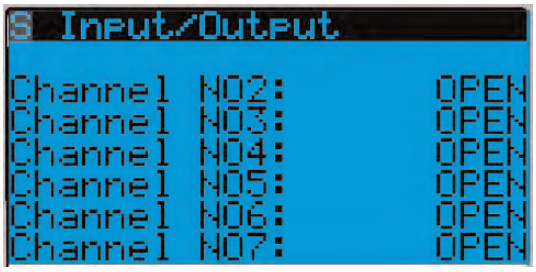




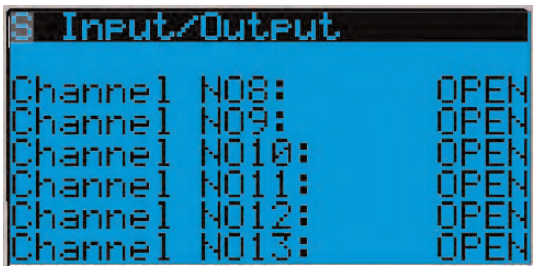
Service features. Enabling manual control of digital outputs will disable safety functions.

Operating mode can be reversed to test both cooling and heating operation

Activation of service mode will hold for 2 hours if not set back manually. Max ramp up of output capacity is changed to 0,5%/s. Defrost mask is shown in main menu. Max condensing temperature limit in heating mode is disabled.

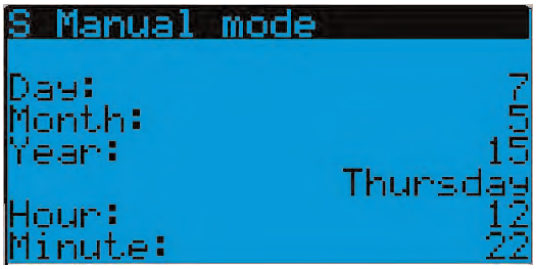


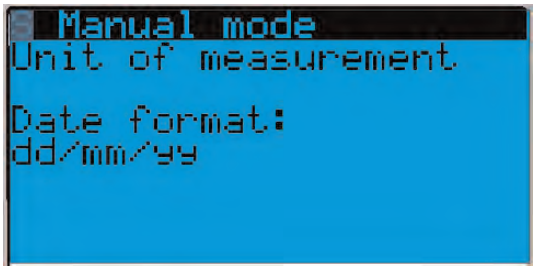
Channel NO2: Digital valve
Channel NO3: 4-way valve
Channel NO7: General alarm



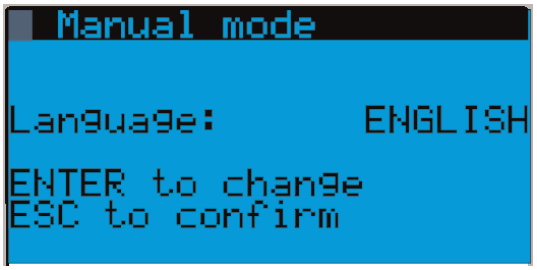
Channel NO9: Defrost/start active
Channel NO11: Compressor 1
Channel NO12: Compressor 2

11 Date, time and format setting





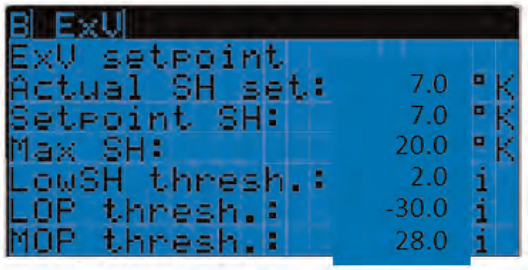
Only English is available



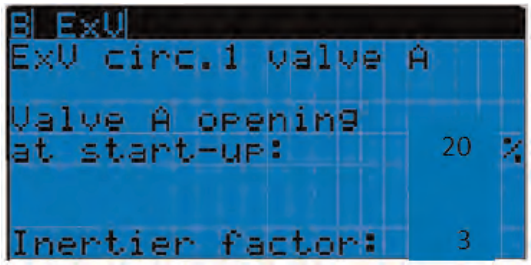
12 Expansion valve handling

Only few values can be changed and it is not recommended to change any of them

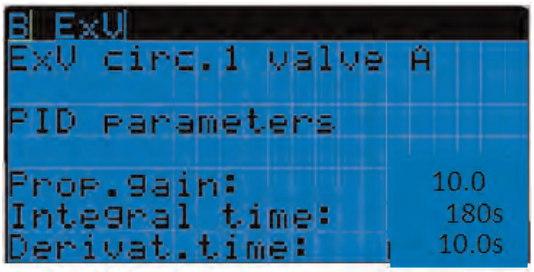
Super Heat set-point under normal operation. Set-point is modulated at low system output capacity. Max. SH is at min. capacity. Alarm limits which should not be changed.



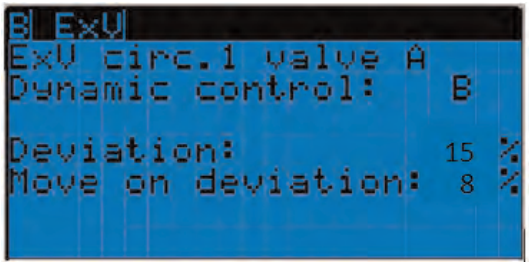
Opening position at startup of system. It is not recommended to change this value



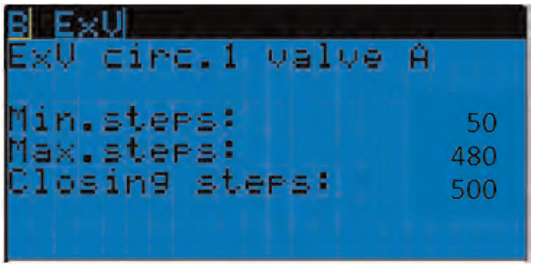
PID parameters for SH regulation can't be changed

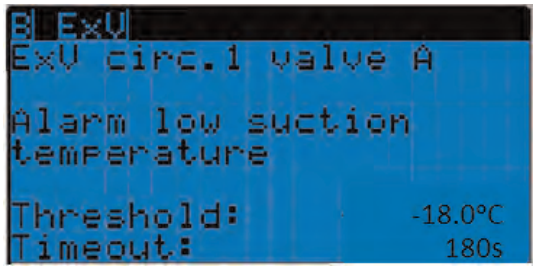


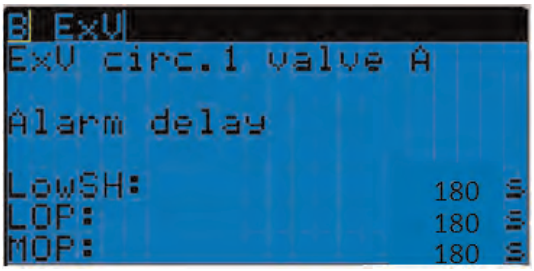
If there are large deviations in SH regulation, the valve will be moved in bigger increments, can't be changed

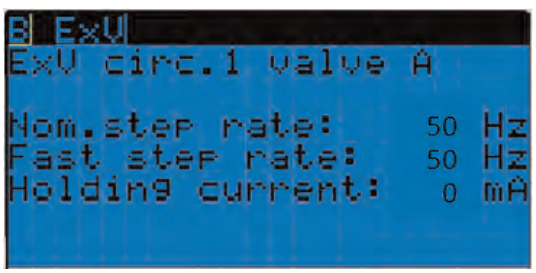


Protective limits and valve configuration can't be changed









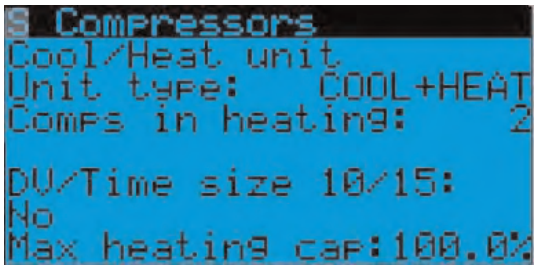
13 Compressor handling

Apart from the first menu it is not recommended to change any settings as it might damage the system.

Selection of unit type: Cool+Heat, Heat only or Cool only

If heating is possible, it can be selected to run only one compressor in heating mode. Running more than one compressor in heating mode will often indicate that there is insufficient energy to recover in extract air downstream of the exchanger.

The two smallest unit sizes only have one compressor. As above 100% capacity will often be too much. With only one compressor, capacity has to be limited on digital function.

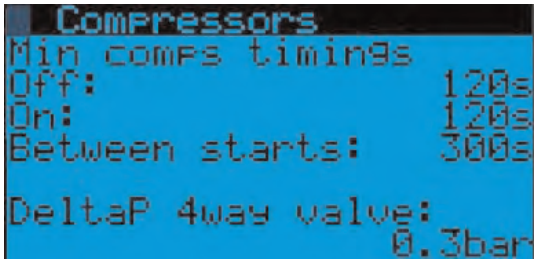


Minimum time a compressor must be off, default 120s

Minimum time a compressor must be on when started, default 120s

Minimum time between start of the system, default 300s

Minimum differential pressure to allow the 4-way valve to be activated

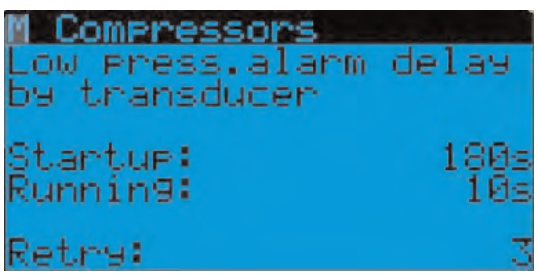


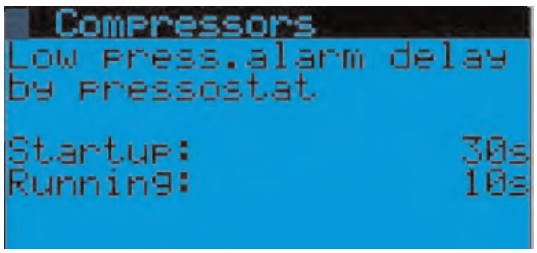
Startup time with digital compressor at 100% or until differential temperature is 30°.

Request power (default 8.5%) which will start the system. Once started, the unit will run until the start signal is removed. With 0% demand it will still run at minimum capacity as long as the start signal is on.

Alarm level for max. discharge temperature.

Low pressure alarm limits are not recommended to change. If a LP alarm occurs, it is likely that a fault in the installation is causing this. Most likely not in the cooling system itself.



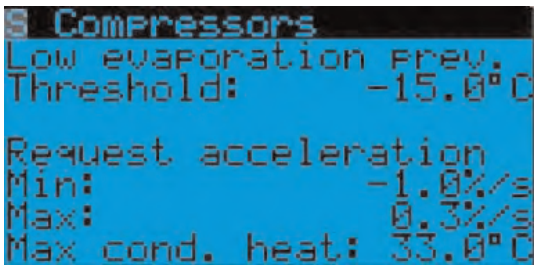


A maximum of 3 automatic re-starts is allowed within 1 hour. Then the unit will stop in permanent alarm. Due to preventing functions in the control system, only extreme changes in operating conditions will be able to activate an HP alarm

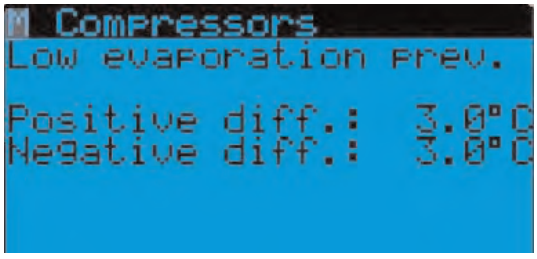
It is possible to set a minimum evaporating temperature limit. If this temperature is reached, output capacity will be reduced. Default is -15°C, reaching -15° indicates that there is too little energy in the extract air to recover.

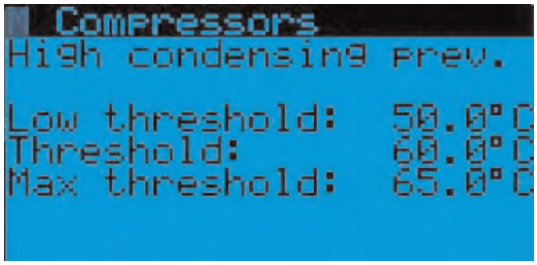
The output capacity increase or decrease is limited to allow the refrigeration system to react and change real output to the supply air temperature.

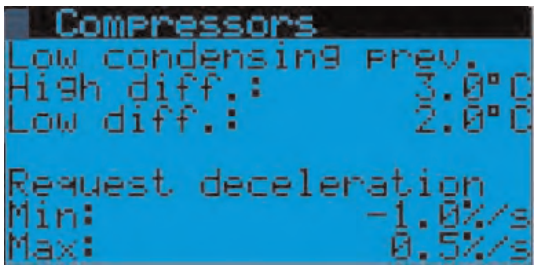
A maximum limit to the condensing temperature is used to ensure that the system is not “running away” when conditions are outside what the system is designed for.



Control values for different limiting functions, can’t be changed







14 Defrost handling

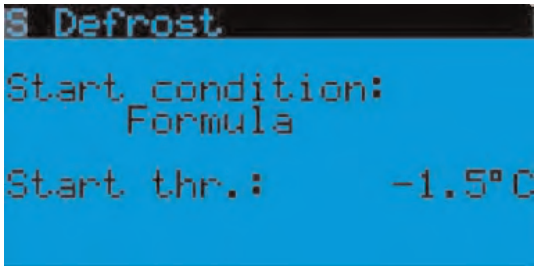
If the unit is set to be Cooling only, this menu is disabled.

It is not recommended to change values unless you understand the full functionality.

A number of different concepts can be selected:

1. Filter, which is an integrated count-down function based on time and evaporating temperature
2. Formula (default), based on evaporating temperature over time
3. Passive + El-Coil, Special function not covered
4. Stop + El-Coil, Special function not covered

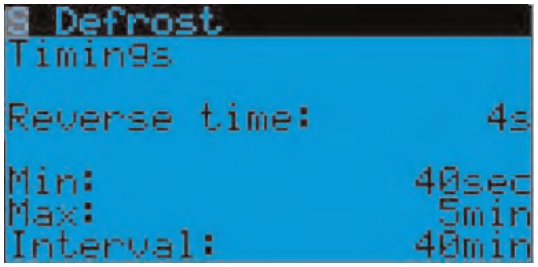
Starting threshold that initiates the defrost function (X)



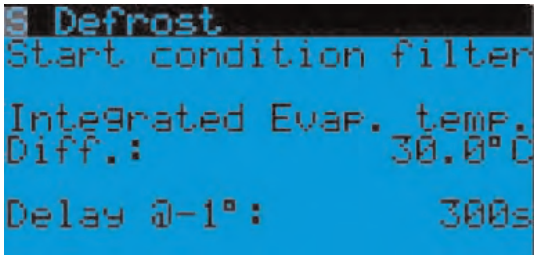
The reverse time should not be changed.

The minimum and maximum time in the reverse phase is allowed to be

The minimum time between start of defrost sequence



The integrated evaporating temperature is also used for the Formula function



The power output will give a factor between 1.0 and 1.5 (Request Multipl.).

The request related factor plus 2.0 (Z) is multiplied by the current evaporating temperature (integrated) minus the threshold. Y=1, function not in action. This result is added to the last result and so forth.

Meaning that the main influence on how fast is counted to next defrost is the Z factor.

Threshold (Q) is the limit to activate defrosts. Min. value is only used if dynamic function is active.

The power output (P), 10-100% will give a factor between 1.0 and 1.5 (RM), linear function.

The request related factor plus 2.0 (Z) is multiplied by the current evaporating temperature (E) minus the threshold (T).

Power output	(P_{out})
Request Multiplier	(RM)
Threshold °C	(T_{hrs})
Integrated evaporating temperature °C	(E_{vap})

20% of E_{vap} minus T is lifted to 1 (Y) is also added to the result. (1= not in action)

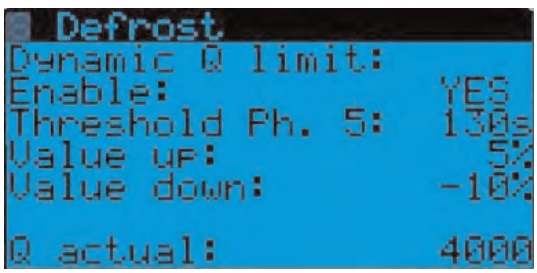
$((P_{out}\text{-}10\%)*111\%*RM+Z)*(E_{vap}- T_{hrs}) = K$

Full version: $((P_{out}\text{-}10\%)*111\%*RM+Z)*(E_{vap}- T_{hrs})+(E_{vap} - T_{hrs})Y = K$

14.1 Defrost phase description

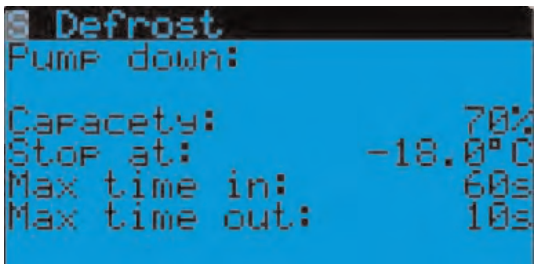
1. Waiting for count down
2. Defrost sequence start, digital output “Defrost” activated until end of defrost sequence, capacity change for pump down
3. Pump down
4. Change of 4-way valve to cooling mode, Capacity change to defrost, Expansion valves to defrost position
5. Wait for end conditions
6. Pump down capacity
7. Pump down
8. Change 4-way valve to heating mode, post capacity
9. Waiting for post conditions
10. Old power output

The maximum count to activate a defrost sequence (Q) can be set to be dynamic (changing). Depending on the time of the reverse phase in the defrost sequence. If the defrost time is short, the limit for next defrost will be longer and vice versa. This is to adapt to different conditions and changes throughout the year

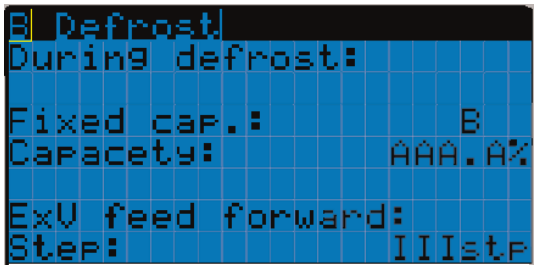


During the defrost sequence, a pump down will happen as a first step and at the end before going back to normal operation (4-way valve in heat mode). The output capacity is set to a percentage of the current output power, default 70%. Default threshold to end the pump down is -18°C.

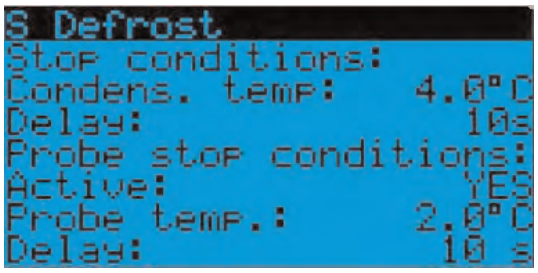
A max. time for pump down is set individually when going in to the defrost sequence and when going out of the sequence.



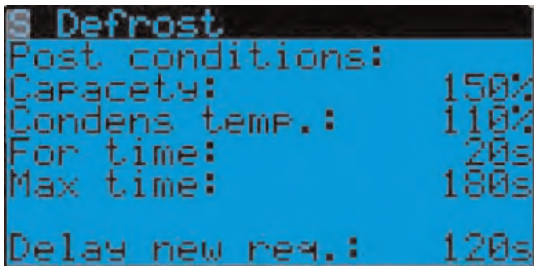
Power and expansion valve control during the reverse phase in the defrost sequence.



Conditions to stop the reverse part of the sequence. Condensing pressure (temperature) must be above a limit for a time. The same goes for the temperature probe placed on the coil in exhaust air flow. You can also choose to disable the last function.



When back in heating mode, the capacity is set to a percentage of the capacity before defrost sequence was initiated, default 150%. Condensing temperature (pressure) must reach 110% (default) of the condition from before defrost was initiated. Default time 20s. There is a max. time (default 180s) for this condition to be reached. When either of these conditions is reached, power output is set back to the same laves as before defrost was initiated. The output power is frozen at this level for 120s (default) to stabilize the system. Now normal capacity control will continue.



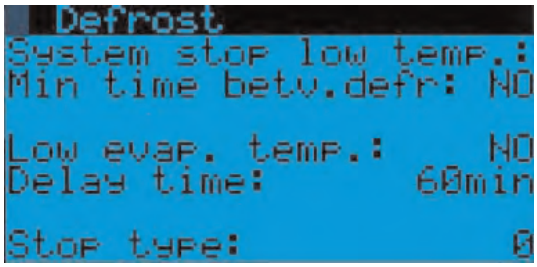
You can select which operating condition will activate the digital output “Defrost active”

The system can be set to automatic shut-down if operating conditions are not suitable for continued efficient operation. Meaning low level of energy in exhaust air to recover, giving a rather low COP factor.

First option is to detect whether count-down for defrost is faster than the set min. time between defrost.

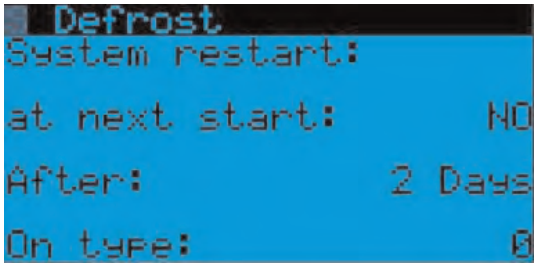
Second option is to detect on evaporating temperature. If it is running at minimum level, “Low evaporating temp.”, default -15°C set under compressor, for 60 min.

If any of these conditions is met, the system will shut down. It will ramp down to allow AHU controller to ramp up capacity of an after heater.



To restart the system, it can be set to do this when the next start signal is given to the controller. Meaning start signal must have been off in between. Typically next morning.

System restart can be further delayed by a number days



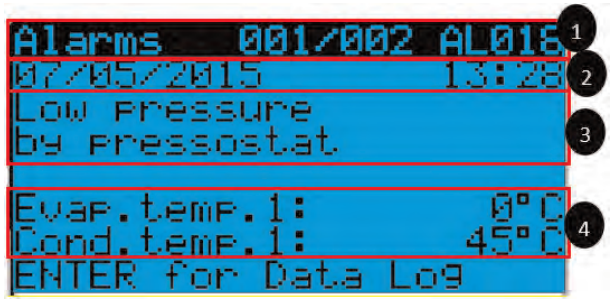
15 Input Output handling

It is not recommended to change any values here.

16 Alarm

16.1 Alarm

By pushing the Alarm button, you can see any active alarm.



1. Alarm 1 of 2 active alarms which has not been reset. Alarm number from list below
2. Time and date of alarm
3. Alarm type
4. Operating conditions at the point of alarm

16.2 Alarm Log

By using the enter key, you can enter the alarm log. Up to 100 alarms are saved.

16.3 Alarm reset

Alarms can be reset manually, automatically or with retries.

- Manual reset: When the alarm condition is no longer present, you must enter alarm menu and acknowledge the alarm by pushing the alarm button. Now the unit can restart.
- Automatic reset: When the alarm condition is gone, the system will automatically restart. Still holding min. off time.
- Automatic reset with retries: Retry conditions are checked; if OK, it will be automatic reset mode. If not, it will be manual reset mode.

16.4 Alarm list

Code	Description	Reset	Action	Delay
AL001	Liquid temp. U1 broken/disconnected	A	None	10s
AL002	Suction temp. U2 broken/disconnected	A	Circuit OFF	No
AL003	Discharge Compr. 1 U4 broken/disconnected	A	Circuit OFF	10s
AL004	Condensing pressure U5 broken/disconnected	A	Circuit OFF	No
AL005	Evaporating pressure U6 broken/disconnected	A	Circuit OFF	10s
AL006	Capacity signal U7 outside range	A	None	No
AL007	Coil defrost temp. U8 broken/disconnected	A	None	10s
AL008	Probe U9 broken or disconnected	A	None	10s
AL009	Probe U10 broken or disconnected	A	None	10s
AL010	Discharge Compr. 2 U11 broken/disconnected	A	Compressor 2 OFF	10s
AL011	Probe U12 broken or disconnected	A	Compressor 3 OFF	10s
AL012	Low SH alarm	A	Circuit OFF	180s
AL013	LOP alarm	A	Circuit OFF	180s
AL014	MOP alarm	A	Circuit OFF	180s
AL015	Low suction temp. -20°C, from EVD	A	Circuit OFF	180s
AL016	High discharge pressure from envelope	A	Circuit OFF	600s
AL017	Low suction pressure from envelope	A/M	Circuit OFF	3 retries
AL018	Low pressure by LP switch	A	Circuit OFF	10s
AL019	Envelope alarm	A	Circuit OFF	300s
AL020	Motor phase alarm	A	Circuit OFF	0s
AL021	Compressor overload	A	Circuit OFF	0s
AL022	High pressure by HP switch	A/M	Circuit OFF	3 retries
AL023	High discharge temp. compressor 1	A	Circuit OFF	60s
AL024	High discharge temp. compressor 2	A	Compressor 2 OFF	0s
AL027	Maintenance request compressor 1	A	None	Parameter
AL028	Maintenance request compressor 2	A	None	Parameter
AL031	Clock alarm	A	None	No
AL032	Memory expansion damaged	A	None	No
AL033	BMS Offline	A	50%	60s

17 Maintenance

General maintenance must be carried out according to national and local regulations by a skilled technician from a certified company.

List of spare parts as well as datasheets from the manufacturers are available on the DVD delivered with the unit.

18 Data

Dimensions, heating and cooling capacity, refrigerant content

Heat pump DVU-HP in DV and TIME units	10	15	20	25	30	40	50	60	80
Width in mm	970	1120	1270	1420	1570	1720	2020	2170	2170
Height in mm	970	1120	1270	1420	1570	1720	2020	2240	2540
Length in mm	1420	1420	1420	1420	1570	1570	2320	2460	2460
Weight in kg excluding exchanger	190	240	500	600	650	750	1175	1575	1690
Power supply – 3 phase + N + PE 3x400V + N + PE									
Pre fuse Amp.	10A	16A	20A	25A	32A	40A	50A	63A	63A
Refrigerant R410a									
Refrigerant content in kg	3,4	4,7	5,3	8,3	9,7	11,8	20,5	22,0	25
Design pressure 42 bar. Test pressure after repair with evacuation of the refrigerant for the sizes 10, 15, 20, 25, 30, 40 and 50: 30.8 bar. Test pressure after repair with evacuation of the refrigerant for the sizes 60 and 80: 32.5 bar. Exceeding this test pressure is not allowed, because this will damage the low-pressure part of the compressor/compressors.									
Nominal air volume, m3/s	1.0	1.4	1.9	2.4	2.9	3.6	5.0	5.9	6.7
Cooling capacity, kW	14	18	27	32	37	47	64	78	80

Values based on 50°C condensing temperature and 10° evaporating temperature

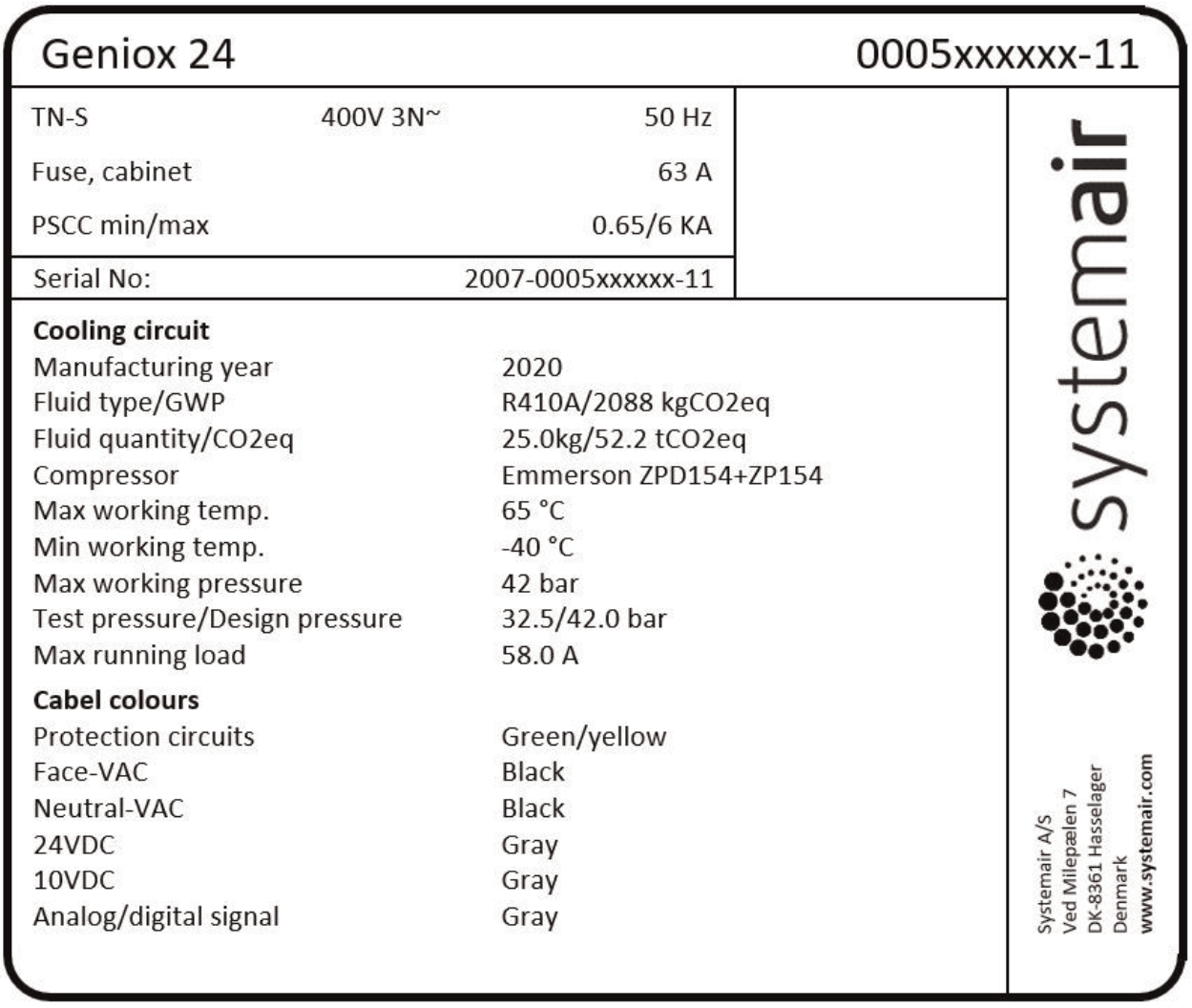
Detailed performance data can be found by using design program SystemairCAD

Heat pump in Geniox air handling units units	10	11	12	14	16	18	20	22	24
Refrigerant R410a	3.4	4.7	5.3	8.3	9.7	11.8	20.5	22.0	25.0
Design pressure 42 bar. Test pressure after repair with evacuation of the refrigerant for the sizes 10, 11, 12, 14, 16, 18 and 20: 30.8 bar. Test pressure after repair with evacuation of the refrigerant for the sizes 22 and 24: 32.5 bar. Exceeding this test pressure is not allowed, because this will damage the low-pressure part of the compressor/compressors.									

19 Data plates

An example of the data plates are shown below.

On the outside on the unit



Geniox 24		0005xxxxxx-11
TN-S	400V 3N~	50 Hz
Fuse, cabinet		63 A
PSCC min/max		0.65/6 KA
Serial No:		2007-0005xxxxxx-11

Cooling circuit

Manufacturing year	2020
Fluid type/GWP	R410A/2088 kgCO2eq
Fluid quantity/CO2eq	25.0kg/52.2 tCO2eq
Compressor	Emmerson ZPD154+ZP154
Max working temp.	65 °C
Min working temp.	-40 °C
Max working pressure	42 bar
Test pressure/Design pressure	32.5/42.0 bar
Max running load	58.0 A

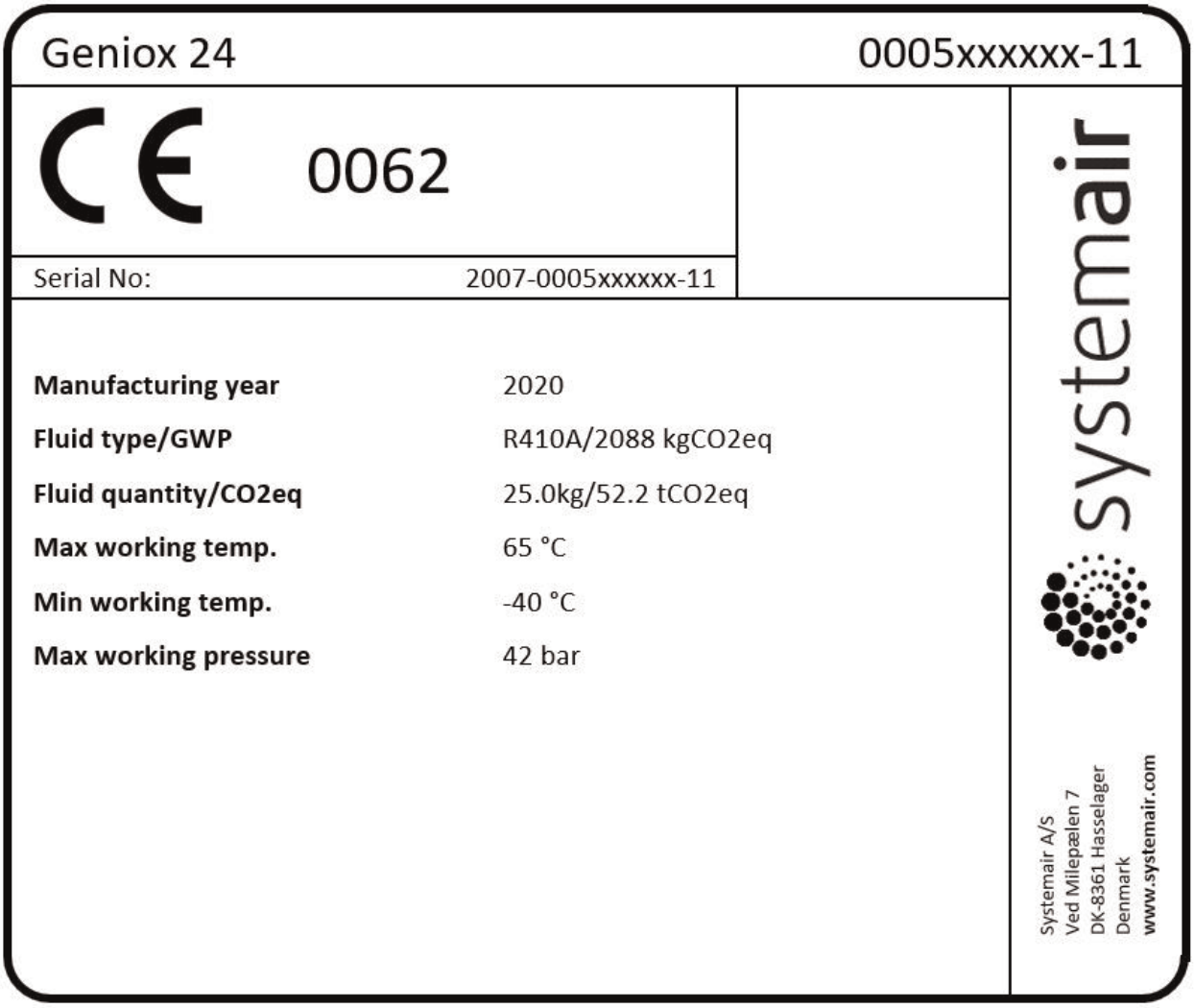
Cabel colours

Protection circuits	Green/yellow
Face-VAC	Black
Neutral-VAC	Black
24VDC	Gray
10VDC	Gray
Analog/digital signal	Gray

systemair

Systemair A/S
Ved Milepælen 7
DK-8361 Hasselager
Denmark
www.systemair.com

Inside the unit


Geniox 24
0005xxxxxx-11
CE 0062
Serial No: 2007-0005xxxxxx-11
Manufacturing year 2020
Fluid type/GWP R410A/2088 kgCO2eq
Fluid quantity/CO2eq 25.0kg/52.2 tCO2eq
Max working temp. 65 °C
Min working temp. -40 °C
Max working pressure 42 bar
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Heat pump system integrated in Geniox or Geniox Core air handling unit · User Manual · 90925374 · en_GB · 2022-10-11 · 1.01.17 · Heat_Pump