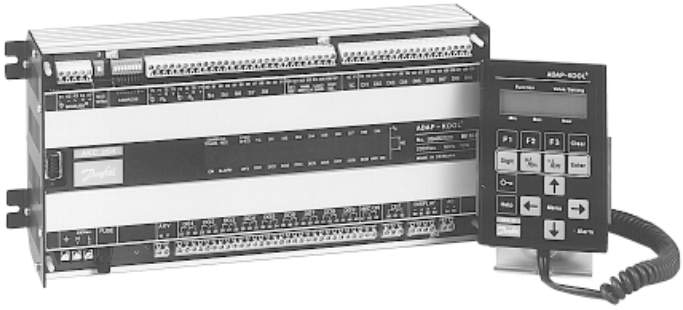
Menu operation via AKA 21

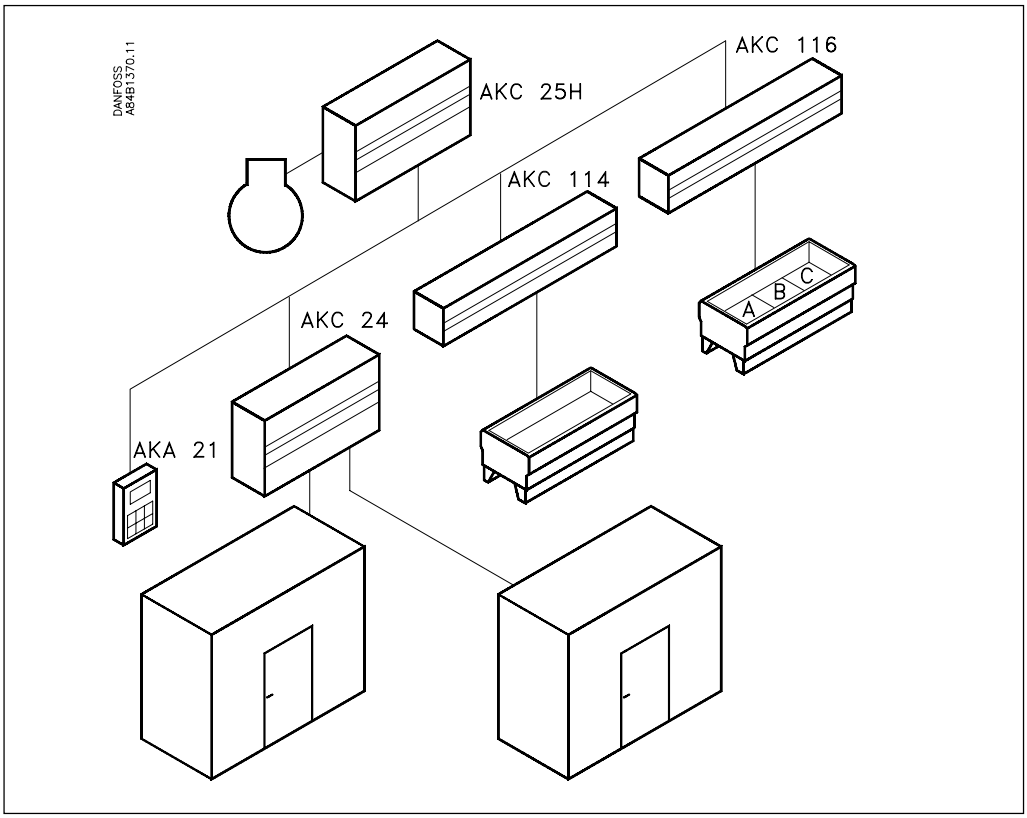
ADAP-KOOL®



Compressor Pack Controller
AKC 25H7

Software version 1.1x

System survey



A refrigerating plant fitted with ADAP-KOOL® refrigeration controls will mostly consist of several controllers where each controller will regulate its own refrigeration appliance/ cold room.

The system has been designed in such a way that contact can be made to each and every controller via a data communication system. One specific controller is selected, and it will now be possible to make settings and readouts for this unit.

Operation

The individual controllers can be operated in two ways:

1. With control panel type AKA 21.
   Use this document when operation takes place in this way.
2. With PC and system software type AKM. Use another document with literature number RC.1N.N-.02

Validity

This menu operation (dated June 2001), applies to AKC 25H7 with the following code numbers:
084B2022 and 084B2023 that are fitted with software version 1.1x.

Select a controller

All controllers that are connected to the same network can be operated with the control panel. There may be as many as 125 controllers, and they are shown in groups of 16 on the display.

```
1   <    1     > 16
AEAAAAAAAAEEgg A
```

A system is shown here which consists of more than 16 controllers. The meaning of the letters is, as follows:

A: AKC controller
E: Controller with active ERROR (on addresses 2, 11 and 12 in this example)
g: Gateway (to addresses 13 and 14 in this example)
G: Gateway with connected printer
: A blank field indicates that there is no unit with this address.

```
1   <    4     > 16
AEAAAAAAAAEEgg A
```

Select the unit that is to be operated by using the “+/On” or “-/Off” key, and push “Enter”. In this example you select the controller with address 4.

```
17  <    17    > 32
AAA
```

If the system comprises more than 16 units or units with an address code higher than 16, you may change to the next group by pushing "→".

Settings of a controller

When a controller has been selected, you can make settings in it. This setting is performed, as follows:

```
                  5
  -50 to +50      5
```

```
                 ON
  OFF / ON       ON
```

Shown in the upper right corner of the display is the setting with which the controller is operating. Below that value a new setting may be made. Use the three keys “+/ON”, “-/OFF” and “Digit” for setting the new value. This new value will not govern the regulation until you push the key “Enter”.

Access to a controller

The functions in the controller can be protected by means of an access code. Depending on the settings to be made, you may gain access in one of the following ways:

User input:		**Gives access to:**
1.	Push F1	Display of alarms
2.	Push F2	Read selected pressures and capacities, stop and start the regulation
3.	Code 1 and then F1	Acknowledgement of alarms
	Code 1 and then F3	Setting of selected parameters
4.	Code 2	Operation of all settings of the entire menu system (with system software type AKM there is access to additional functions).

Pages 6 and 7 contain a description of how you gain access to the system via a code.

Supporting text

A supporting text is attached to the individual functions. When such a function is shown in the control panel's display, the supporting text can be obtained by pushing the key "Help". The supporting text is intended as a help to users who no longer use these operating instructions.
In the menus shown below functions with supporting texts are identified with the word "Help" next to the function.

How to localise an error

When an error appears in a system, it can be seen on the control panel's display which will show an "E". If the control panel shows a text from a selected controller, the LED at the word "Alarm" will furthermore flash.

1 < 2 > 16
A**E**AAAAAAAAAgg A

AKC 25H7 Adr: 2
E Mon-11:27

High Air Temp

When an error has occurred, first select the controller on which the error is registered. When the controller has been found, push "F1", and the error message will appear. At the end of the document there is a list of all the error messages and a description of how to acknowledge an alarm.

Functions of a controller

When one controller has been selected from the total system, the following display will appear (the display is the first one shown when you have selected an address from the total system):

e.g.

AKC 25H7 Adr: 2
E Mon-11:27

From this position you can freely choose between several forms of operating levels:
1. Display of alarms - push "F1"
2. Display and setting of a few selected functions - push "F2"
3. Display and setting of several selected functions - push "F3"
   The function may be protected with a code (code 1)
4. Display and setting of all allowed functions in the controller. The function may be protected with a code (code 2).

Operation of the individual levels is shown below:

1. F1 When you push "F1" the alarm messages from the controller in question appear. Only active alarms are shown. With a push on "↓" you can see whether there are more alarm messages, and if so, their texts.
When an alarm has been localised and corrected, the alarm is acknowledged (removed from the system, so that it no longer appears). In large systems where a gateway is also connected this acknowledgement will take place automatically. In other systems it has to be done manually, cf. end of the document.
Prior to the acknowledgement of the alarm, the keying of a code is required, see page 6.

Leave the F1 function by pushing "←".

2. F2 When you push “F2” a number of functions will appear where it is possible to read or set values.
You can move to and from the individual functions by pushing "↑" or "↓". On page 3 you can see how a setting is changed.

Cold Ref°C 3:02:01	Reference temperature of cold brine forward flow Cold Ref °C = Cold SP°C + Dt.Night K + K1(U Cold - UrefCold V) + K2(S3 - TrefCold)
S4 °C 3:02:02	Temperature of cold brine forward flow
Comp.Cap.% 3:02:08	Cut-in compressor capacity in % (of total capacity)
Warm Ref°C 4:02:01	Reference temperature for condenser (either S7 or PcA) Warm Ref °C = Warm SP°C + K3(U Warm - UrefWarm V)
S7 °C 4:02:03	Temperature at S7 sensor (warm brine return flow)
Pc A °C 4:02:04	Condensing pressure in °C (if PcA is not used, “xxx.x” will be shown)
Heat Recov 4:02:07	Status of heat recovery function ON: Heat recovery function active OFF: Normal situation
Saux °C 4:02:06	Temperature at Saux sensor (warm brine forward flow) (when there is heat recovery, regulation is based on this temperature)
Cond. Cap. % 4:02:08	Cut-in condenser capacity in %
Man. Def. OFF/ON 9:03:01	Manual defrost is activated when ON (automatically changes to OFF, when defrost period has ended)
Defrosting 9:02:02	Status of defrost function
Sdef. °C 9:02:01	Defrost sensor temperature
Def.Time m 9:02:03	Actual defrost cut-in time or duration of the latest finished defrosting period.

Leave the F2 function by pushing "←".

3. F3 When you push “F3”, a number of functions will appear which are used when the system is serviced.

- If access code is used (code 1), key it as follows:
  - Push the “key”
  - Enter the code by using the three keys “+”, “-” and “Digit” (the code is mentioned later as code 1, and the factory setting is 40. If code 2 has been set at 0, access code 1 cannot be used).
  - Push “Enter”
  - Push “F3”

Move to and from the individual functions by pushing "↑" or "↓".
On page 3 you can see how a setting is changed.

Main Switch -1 / 0 / 1 2:02:01	Function switch: 1: Regulation 0: Controller stopped -1: Service function
Cold SP °C -70.0 50.0 3:03:01	Temperature reference for cold brine forward flow
NightCond. 3:02:06	Status of night setback function ON: Setback of cold brine temperature allowed OFF: Normal situation
Dt.Night K -25.0 25.0 3:03:04	Temperature displacement when at active night setback signal
PoA °C 3:02:04	Evaporating pressure in °C (measured with pressure transmitter P0A)
PoB °C 3:02:05	Evaporating pressure in °C (measured with pressure transmitter P0B) (if POB is not used, “xxx.x” will be shown)
S3 °C 3:02:03	Temperature of cold brine return flow
Act.C Pump 6:02:01	Display of pump status 0: Pumps stopped 1: Cold pump 1 operating (DO1) 2: Cold pump 2 operating (DO3) 3: Both pumps operating
Warm SP °C -25.0 75.0 4:03:01	Reference temperature for condenser (S7 or PcA)
Dt Heat K 0.0 50.0 4:03:05	Displacement valve for condensing pressure in connection with an active heat recovery signal (set in Kelvin)
Act.W Pump 6:03:01	Display of pump status 0: Pumps stopped 1: Warm pump 1 operating (DO2) 2: Warm pump 2 operating (DO4) 3: Both pumps operating
Sout °C 4:02:05	Outdoor temperature at Sout sensor (may be used for displacement of condenser’s reference temperature
MaxDefTime 5 240 9:04:02	Max. permissible defrost time in minutes (Security time on Temperature stop)
Def.Stop°C 0 60 9:04:03	Temperature value of defrost stop (defrost is stopped when the temperature of the selected defrost sensor reaches the set value)

Leave the function by pushing "←".

4. Access to all functions

The access to the functions may be protected with a code (code 2).

- If access code is used, key it as follows:
  - Push the “key”
  - Enter the code by using the three keys “+”, “-” and “Digit”
  - Push “Enter”
  - Push "←"

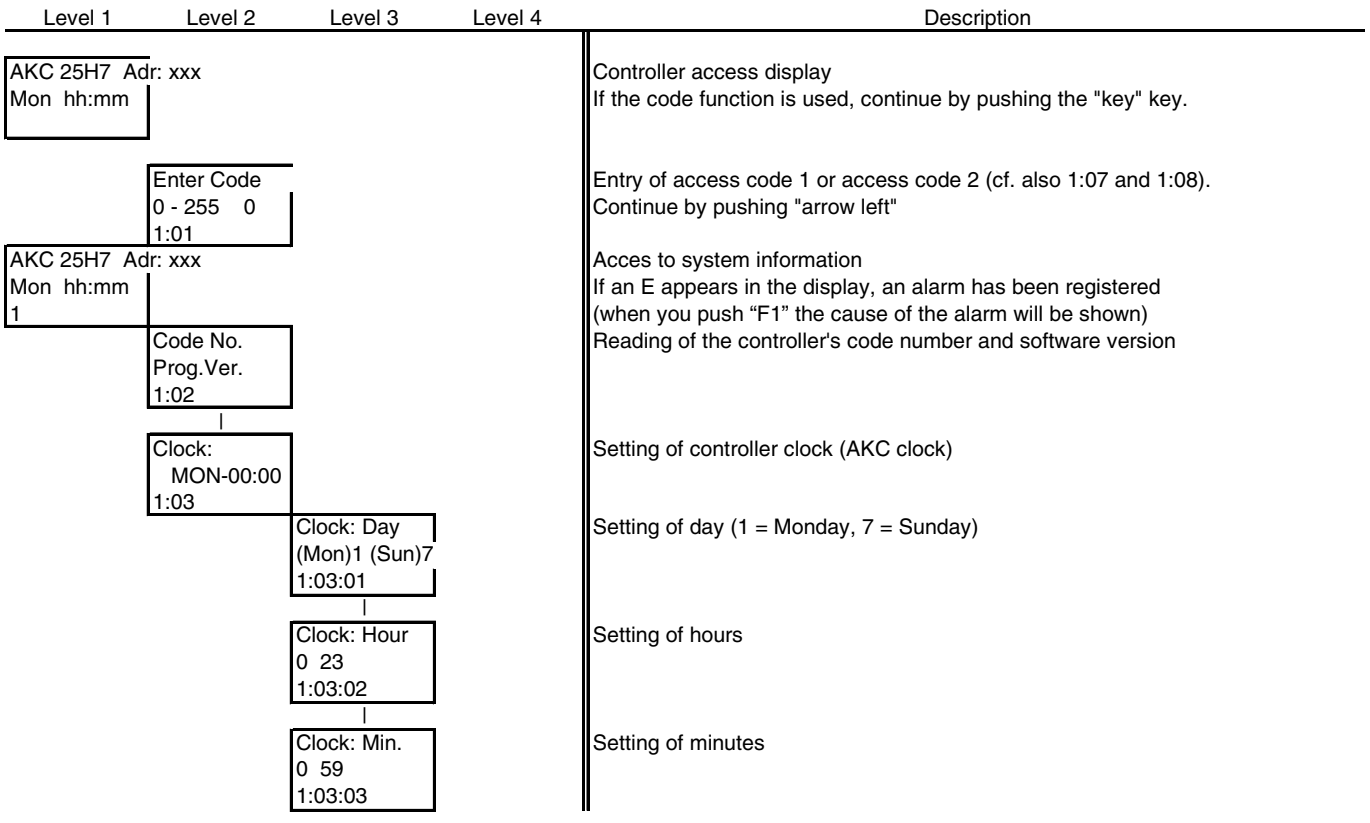
Move to and from the individual functions by pushing the four arrow keys.
On page 3 you can see how a setting is changed.

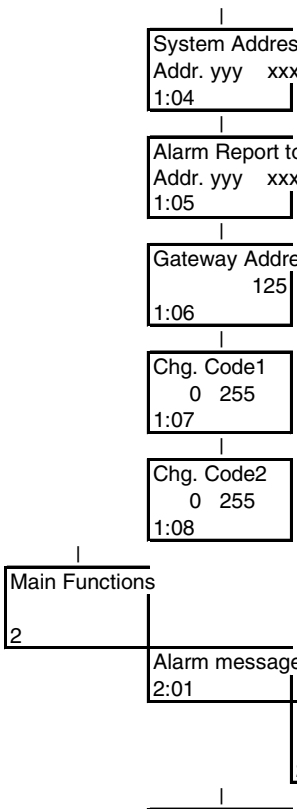
When you wish to leave the “Access to all functions” function, push “Clear” and then "←".

List of functions on level 1:

1. Controller’s access picture and access to system information
2. Controller switch and language selection
3. Compressor capacity regulation
4. Condenser capacity regulation
5. Safety limits
6. Pump control
7. Thermostat alarms
8. Day / night table
9. Defrost function
10. Configuration of inputs
11. Configuration of outputs
12. Forced-control functions for service and initial setting
13. Setting of alarm priorities

Below and on the following pages the individual functions are shown together with a brief description:





System Address
Addr. yyy xxx
1:04

Reading of the controller's system address
yyy = network No. and xxx = address
The system address can only be set via PC

Alarm Report to
Addr. yyy xxx
1:05

Reading of the alarm address (end receiver) the alarms are to be sent to
The alarm address can only be set via PC

Gateway Address
125
1:06

Reading of address of nearest gateway which has to effect alarms
The address can only be set via PC

Chg. Code1
0 255
1:07

Change of code 1. The code gives access to acknowledgement of active alarm by means of the F1 key.
Also access to the selected settings/readouts via the F3 key.
(Factory setting = 40) (See also code 2)

Chg. Code2
0 255
1:08

Change of code 2. The code gives access to the whole menu system.
(Factory setting = 0. Setting = 0 offers free access where neither code 1 not code 2 is required)

Main Functions
2

Main functions

Alarm message
2:01

When there is an alarm, an E appears in the display
(Error register becomes visible)

2:01:01

For survey of alarm messages, see page 28

Main Function
Settings
2:02

Access to function switch

Main Switch
Help -1 / 0 / 1
2:02:01

Function switch: 1: Regulation
0: Controller stopped
-1: Service function

Rfg. Type R
2:02:02

Reading of set refrigerant type

Language
Help 0 6
2:02:03

Selection of language. Three languages have been entered in the controller

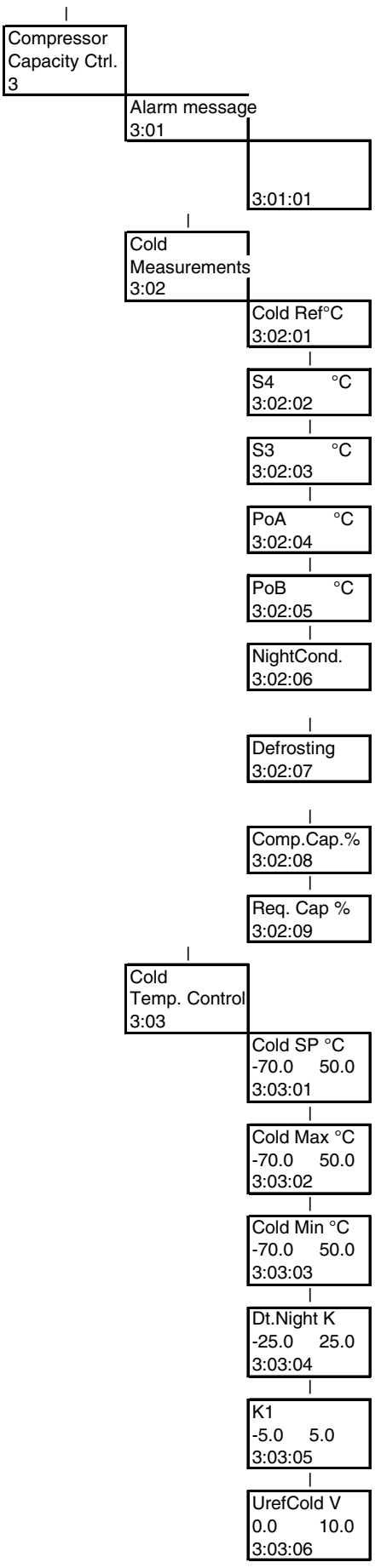
Either:	Or:
0: English	0: English
1: German	3: Danish
2: French	6: Swedish

NB! This function must be set prior to any uploading to system software type AKM.
When the language code has been changed, push "ENTER" and then "Clear".

Rfg. Type
Help 0 23
2:02:04

Refrigerant selection:

0: No refrigerant selection.	12: R142b
1: R12	13: User defined
2: R22	14: R32
3: R134a	15: R227
4: R502	16: R401A
5: R717 (ammonia)	17: R507
6: R13	18: R402A
7: R13b1	19: R404A
8: R23	20: R407C
9: R500	21: R407A
10: R503	22: R407B
11: R114	23: R410A
10: R503	22: R407B
11: R114	23: R410A



Compressor capacity regulation

When there is an alarm, an E appears in the display
(Error register becomes visible)

For survey of alarm messages, see page 28

Display of measured values with relation to capacity control and regulation of the cold brine

Reference temperature of cold brine forward flow
Cold Ref °C = Cold SP°C + Dt.Night K + K1(U Cold - UrefCold V) + K2(S3 - TrefCold)

Temperature of cold brine forward flow

Temperature of cold brine return flow

Evaporating pressure in °C (measured with pressure transmitter P0A)

Evaporating pressure in °C (measured with pressure transmitter P0B)
(if POB is not used, “xxx.x” will be shown)

Status of night setback function
ON: Setback of cold brine temperature allowed
OFF: Normal situation

Status of defrost function
ON: Defrost going on
OFF: Normal situation

Cut-in compressor capacity in % (of total capacity)

Reference compressor capacity
(deviations from “3:02:08” may be due to time delays)

Settings for cold brine temperature reference

Temperature reference for cold brine forward flow

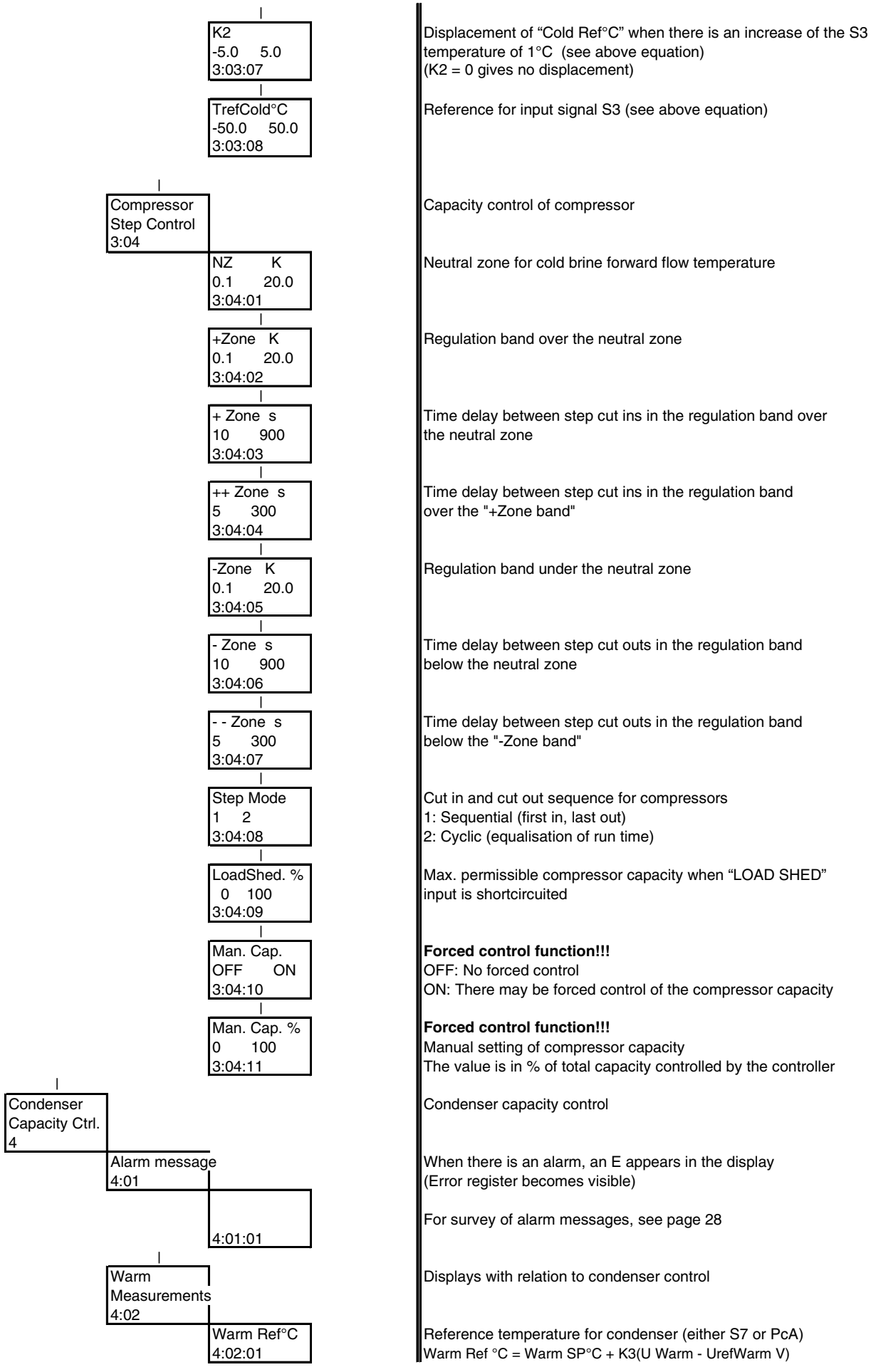
Max. limit for temperature reference for cold brine forward flow

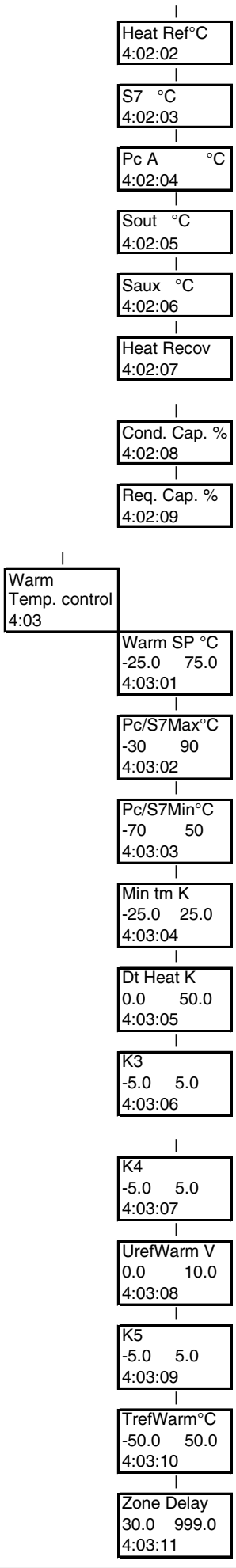
Min. limit for temperature reference for cold brine forward flow

Temperature displacement when at active night setback signal

Displacement of “Cold Ref°C” when there is an increase of the “U Cold” signal of 1 V (K1 = 0 gives no displacement)
Cold Ref °C = Cold SP°C + Dt.Night K + K1(U Cold - UrefCold V) + K2(S3 - TrefCold)

Reference for input signal “U Cold” (see above equation)


K2
-5.0 5.0
3:03:07
Displacement of “Cold Ref°C” when there is an increase of the S3 temperature of 1°C (see above equation)
(K2 = 0 gives no displacement)
TrefCold°C
-50.0 50.0
3:03:08
Reference for input signal S3 (see above equation)
Compressor Step Control
3:04
Capacity control of compressor
NZ K
0.1 20.0
3:04:01
Neutral zone for cold brine forward flow temperature
+Zone K
0.1 20.0
3:04:02
Regulation band over the neutral zone
+ Zone s
10 900
3:04:03
Time delay between step cut ins in the regulation band over the neutral zone
++ Zone s
5 300
3:04:04
Time delay between step cut ins in the regulation band over the "+Zone band"
-Zone K
0.1 20.0
3:04:05
Regulation band under the neutral zone
- Zone s
10 900
3:04:06
Time delay between step cut outs in the regulation band below the neutral zone
- - Zone s
5 300
3:04:07
Time delay between step cut outs in the regulation band below the "-Zone band"
Step Mode
1 2
3:04:08
Cut in and cut out sequence for compressors
1: Sequential (first in, last out)
2: Cyclic (equalisation of run time)
LoadShed. %
0 100
3:04:09
Max. permissible compressor capacity when “LOAD SHED” input is shortcircuited
Man. Cap.
OFF ON
3:04:10
Forced control function!!!
OFF: No forced control
ON: There may be forced control of the compressor capacity
Man. Cap. %
0 100
3:04:11
Forced control function!!!
Manual setting of compressor capacity
The value is in % of total capacity controlled by the controller
Condenser Capacity Ctrl.
4
Condenser capacity control
Alarm message
4:01
When there is an alarm, an E appears in the display (Error register becomes visible)
4:01:01
For survey of alarm messages, see page 28
Warm Measurements
4:02
Displays with relation to condenser control
Warm Ref°C
4:02:01
Reference temperature for condenser (either S7 or PcA)
Warm Ref °C = Warm SP°C + K3(U Warm - UrefWarm V)



Reference temperature for condenser during heat recovery (Saux)
Heat Ref °C = Warm SP°C + Dt Heat K + K4(U Warm - UrefWarm V) + K5(Sout - TrefWarm)

Temperature at S7 sensor (warm brine return flow)

Condensing pressure in °C
(if PcA is not used, “xxx.x” will be shown)

Outdoor temperature at Sout sensor
(may be used for displacement of condenser’s reference temperature

Temperature at Saux sensor (warm brine forward flow)
(when there is heat recovery, regulation is based on this temperature)

Status of heat recovery function
ON: Heat recovery function active
OFF: Normal situation

Cut-in condenser capacity in %

Reference for condenser capacity
(deviations from “4:02:08” may be due to time delays)

Temperature references for condenser

Reference temperature for condenser (S7 or PcA)

Max. limit for Pc or S7 temperature

Min. limit for Pc or S7 temperature
(If temperature becomes lower than the set limit, the heat recovery function will be cut out temporarily)

Minimum temperature differential between air- and condensing temperature
(temperature differential tc - Sout)

Displacement valve for condensing pressure in connection with an active heat recovery signal (set in Kelvin)

Displacement of "Warm Ref °C" when there is an increase of the “U Warm” signal of 1 V (K3 = 0 gives no displacement)
Warm Ref °C = Warm SP°C + K3(U Warm - UrefWarm V)

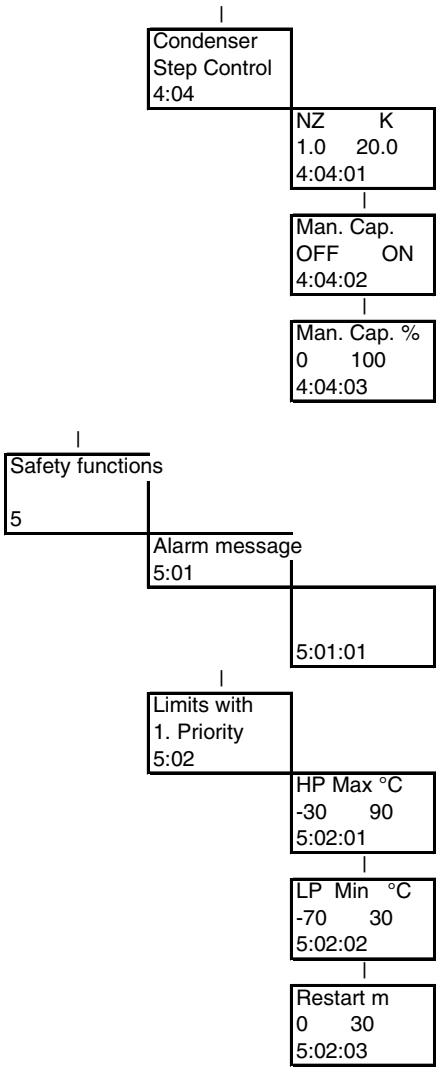
Displacement of "Warm Ref °C"/“Heat Ref°C” when there is an increase of the “U Warm” signal of 1 V (K4 = 0 gives no displacement)
Heat Ref °C = Warm SP°C + Dt Heat K + K4(U Warm - UrefWarm V)+ K5(Sout - TrefWarm)

Reference for input signal “U Warm” (see above equation)

Displacement of “Heat Ref°C” at an increase of the Sout temperature of 1°C (see above equation)
(K5 = 0 gives no displacement)

Reference for input signal Sout (see above equation)

The time delay at the start of the "+ zone band" and "-zone band" is set



Capacity control of condenser

Neutral zone for condensing temperature

Forced control function!!!
OFF: No forced control
ON: There may be forced control of the condenser capacity

Forced control function!!!
Manual setting of condenser capacity
The value is in % of total capacity controlled by the controller

Safety limits

When there is an alarm, an E appears in the display
(Error register becomes visible)

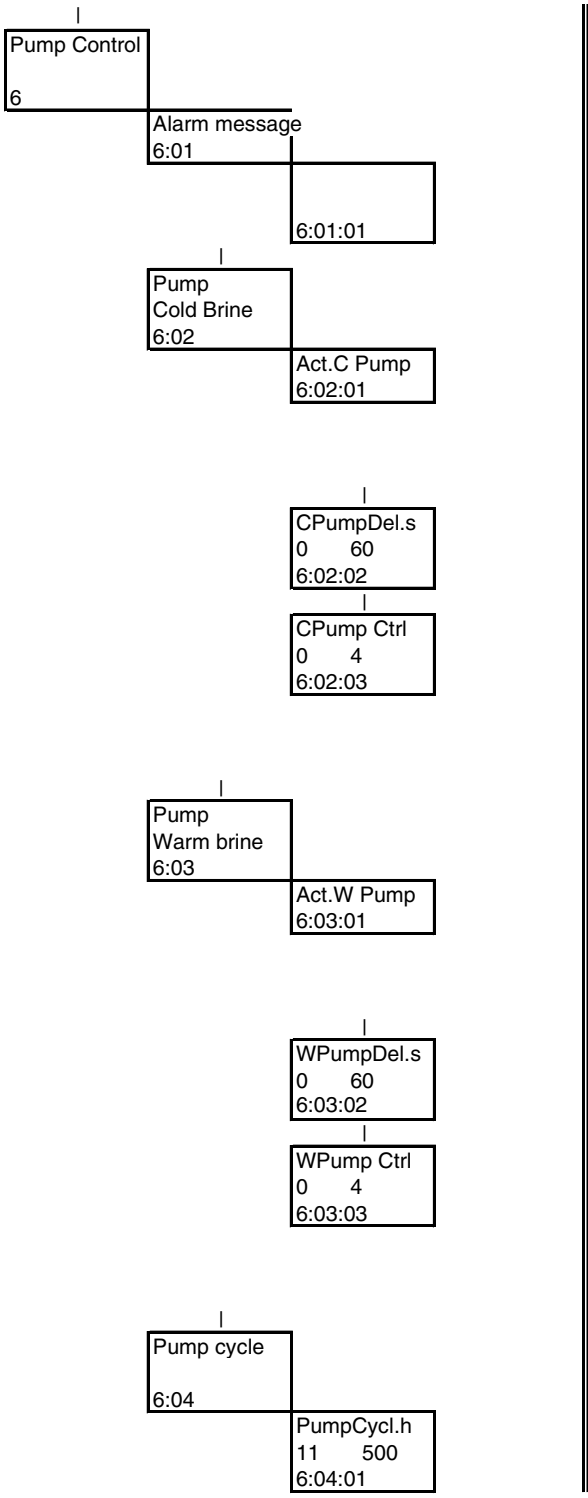
For survey of alarm messages, see page 28

Setting of limit values that will stop the regulation

Max. value for Pc/S7 in °C (Pc is used, if both Pc and S7 have been installed)
(If the value is exceeded, the entire compressor capacity will be cut out)
(at 3 K under “HP Max °C.” the entire condenser capacity is cut in

Min. value for evaporating pressure in °C
(If the evaporating pressure becomes lower, the entire compressor capacity will be cut out)

Time delay before restart
(Applies to the two earlier functions: “HP Max” and “LP Min”)



Pump control

When there is an alarm, an E appears in the display
(Error register becomes visible)

For survey of alarm messages, see page 28

Pump control cold brine

Display of pump status
0: Pumps stopped
1: Cold pump 1 operating (DO1)
2: Cold pump 2 operating (DO3)
3: Both pumps operating

Overlapping time where both pumps are operating
(only of interest, if the subsequent menu is set at 4)

Definition of pump operation
0: Both pumps stopped
1: Cold pump 1 constantly operating
2: Cold pump 2 constantly operating
3: Both pumps constantly operating
4: Equalisation of operating time between the two pumps (cf. also 6:04:01)

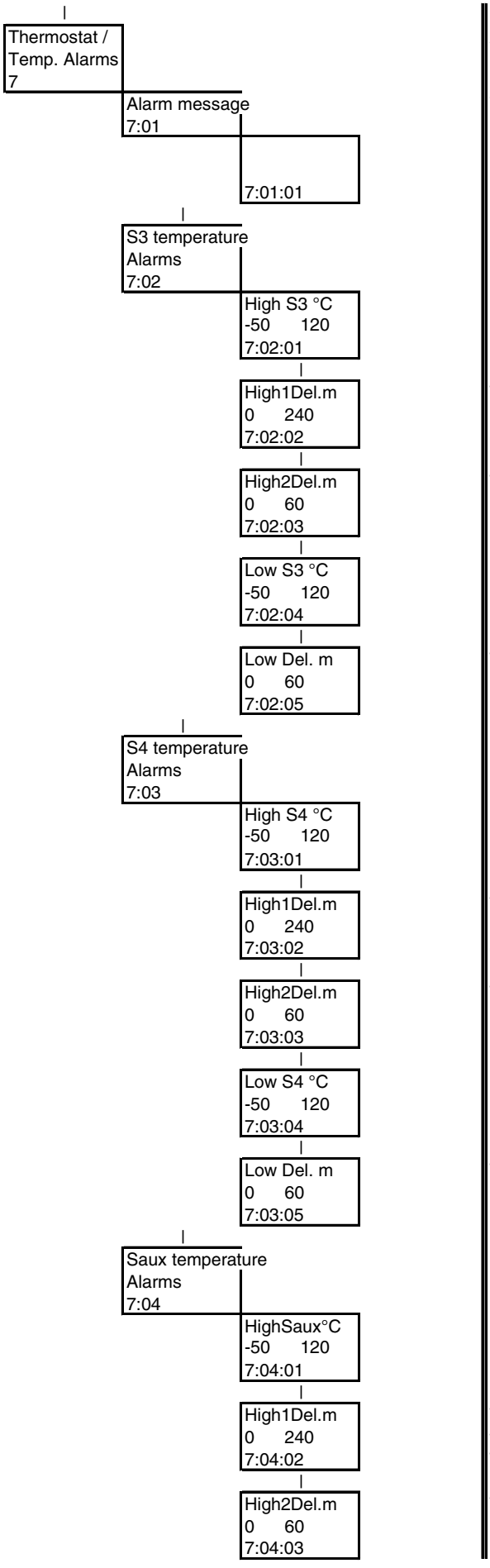
Pump control warm brine

Display of pump status
0: Pumps stopped
1: Warm pump 1 operating (DO2)
2: Warm pump 2 operating (DO4)
3: Both pumps operating

Overlapping time where both pumps are operating
(only of interest, if the subsequent menu is set at 4)

Definition of pump operation
0: Both pumps stopped
1: Warm pump 1 constantly operating
2: Warm pump 2 constantly operating
3: Both pumps constantly operating
4: Equalisation of operating time between the two pumps (cf. also 6:04:01)

Pump operating time before change of pump is made
(pump operating time before you change over to the other pump)



Alarm settings

When there is an alarm, an E appears in the display
(Error register becomes visible)

For survey of alarm messages, see page 28

Limits and time delays for the S3 sensor

Upper alarm limit for S3 temperature

Time delay for alarm during cooling (value applies until the S3 temperature has fallen below the value of the upper alarm limit. Then there will be a change-over to the next time delay.)

Time delay for alarm during normal regulation

Lower alarm limit for S3 temperature

Time delay for lower alarm limit

Limits and time delays for the S4 sensor

Upper alarm limit for S4 temperature

Time delay for alarm during cooling (value applies until the S4 temperature has fallen below the value of the upper alarm limit. Then there will be a change-over to the next time delay.)

Time delay for alarm during normal regulation

Lower alarm limit for S4 temperature

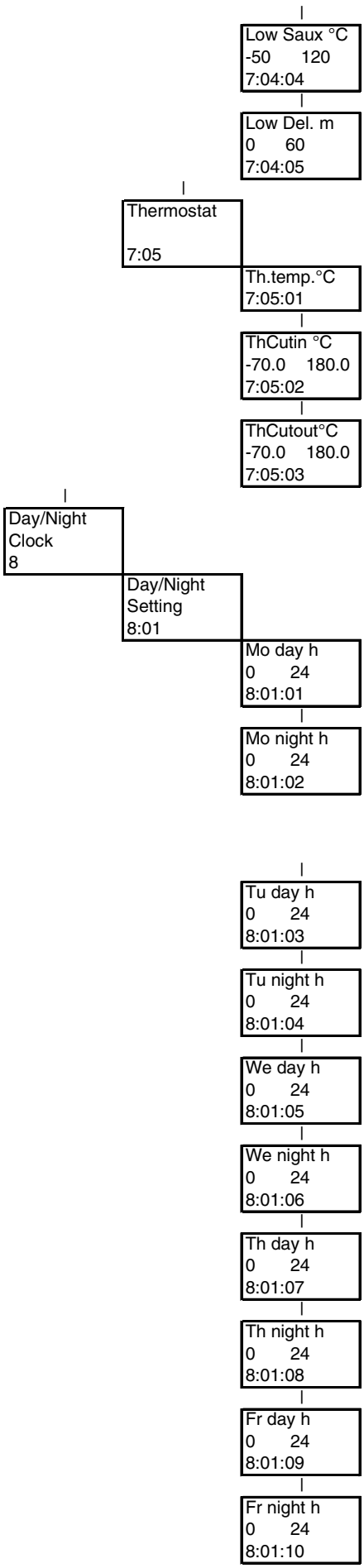
Time delay for lower alarm limit

Limits and time delays for the Saux sensor

Upper alarm limit for the Saux temperature

Time delay for alarm during cooling (value applies until the Saux temperature has fallen below the value of the upper alarm limit. Then there will be a change-over to the next time delay.)

Time delay for alarm during normal regulation



Lower alarm limit for Saux temperature

Time delay for lower alarm limit

Thermostat function

Display of thermostat temperature
(selected sensor at 10:02:01)

Setting of thermostat's cutin value

Setting of thermostat's cutout value

Time table for night setback function

Settings

Time table for displacement of evaporating pressure on Mondays
End of night setback (normal suction pressure)
At setting = 0 there is no displacement this day

Time table continued:
Start (of night setback) when the suction pressure is changed with setting "3:03:04'
At setting = 0 there is no displacement this day
If day and night settings are identical, or if night comes before day, there will be a different function. See functional description

As above, Tuesdays

As above, Tuesdays

As above, Wednesdays

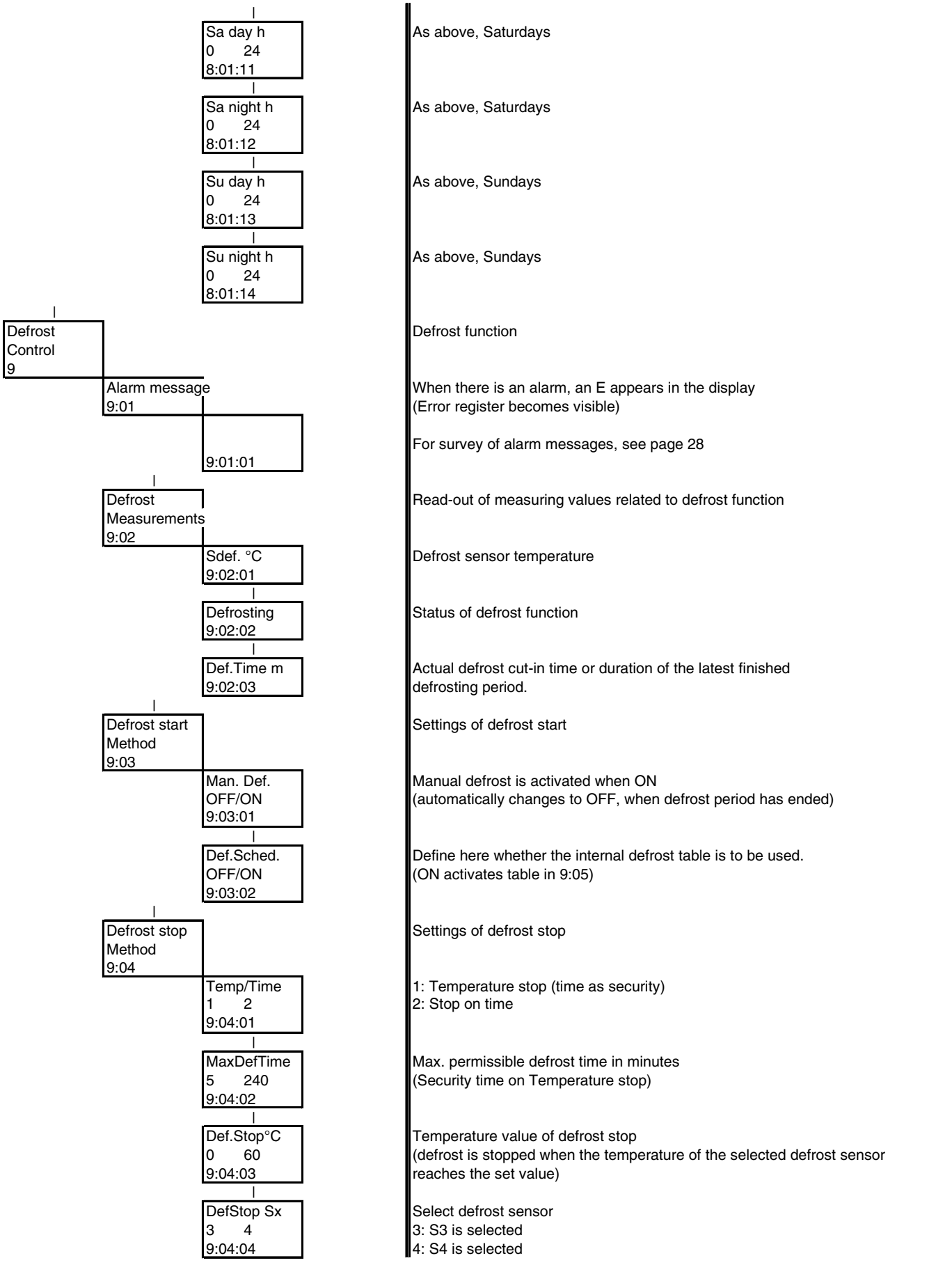
As above, Wednesdays

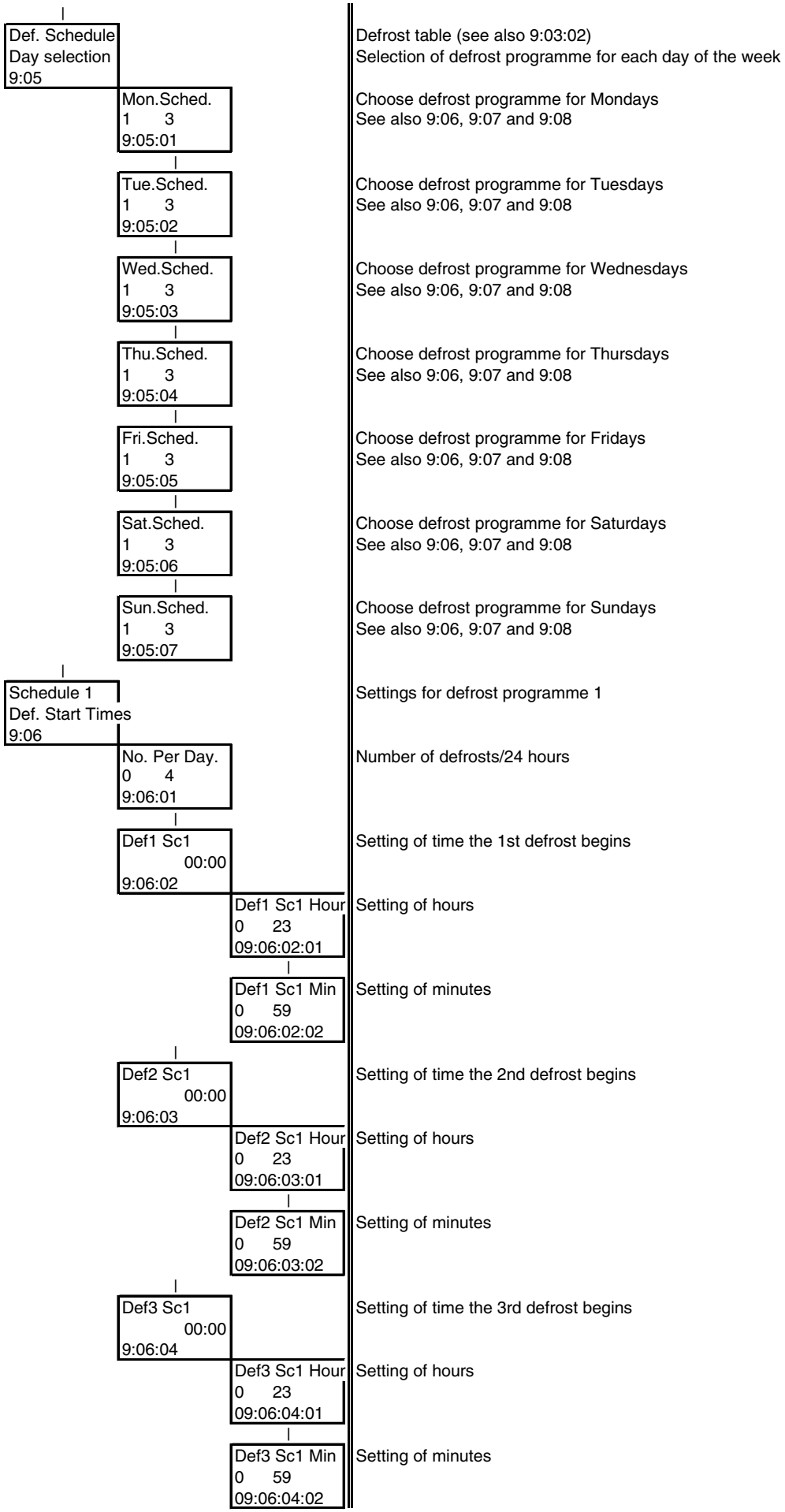
As above, Thursdays

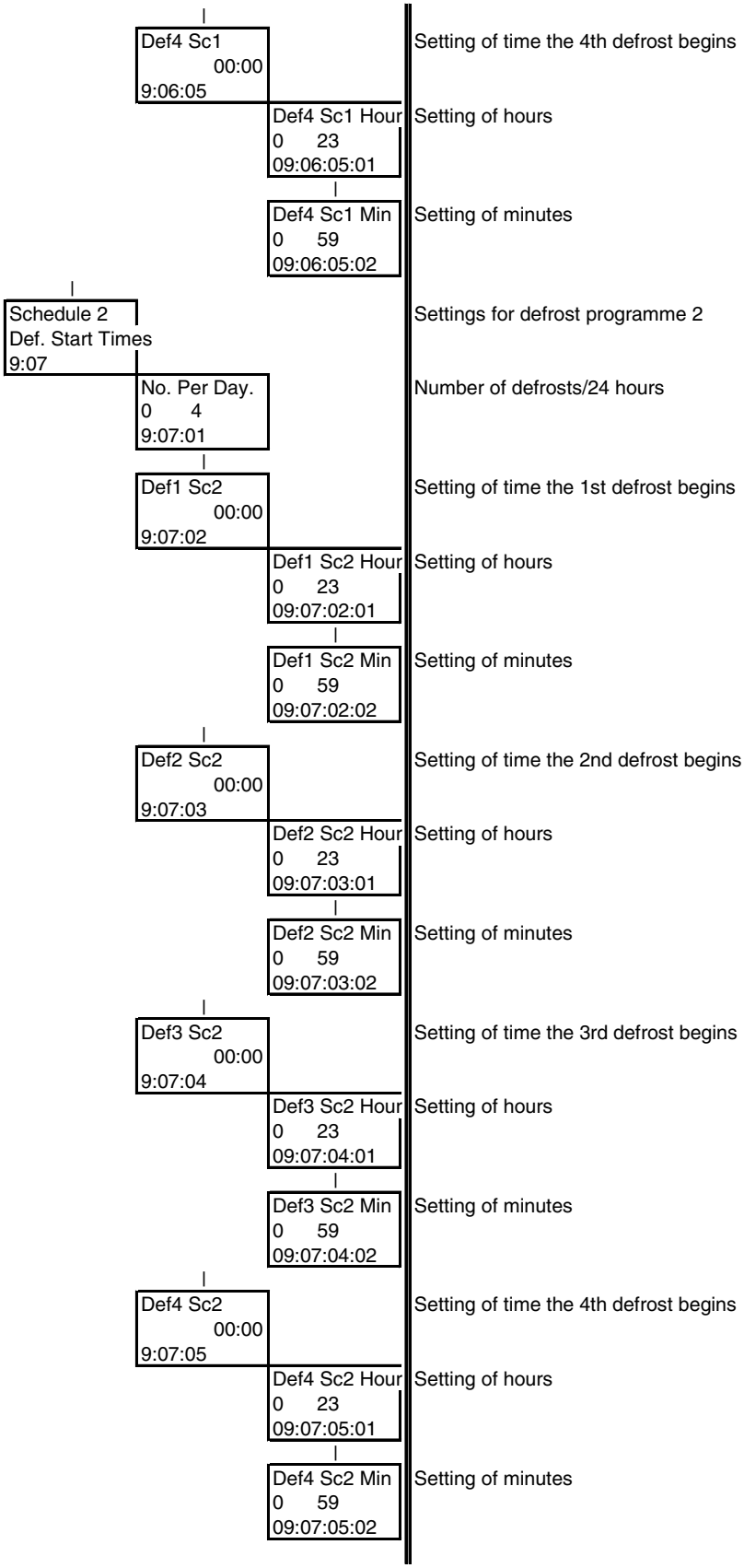
As above, Thursdays

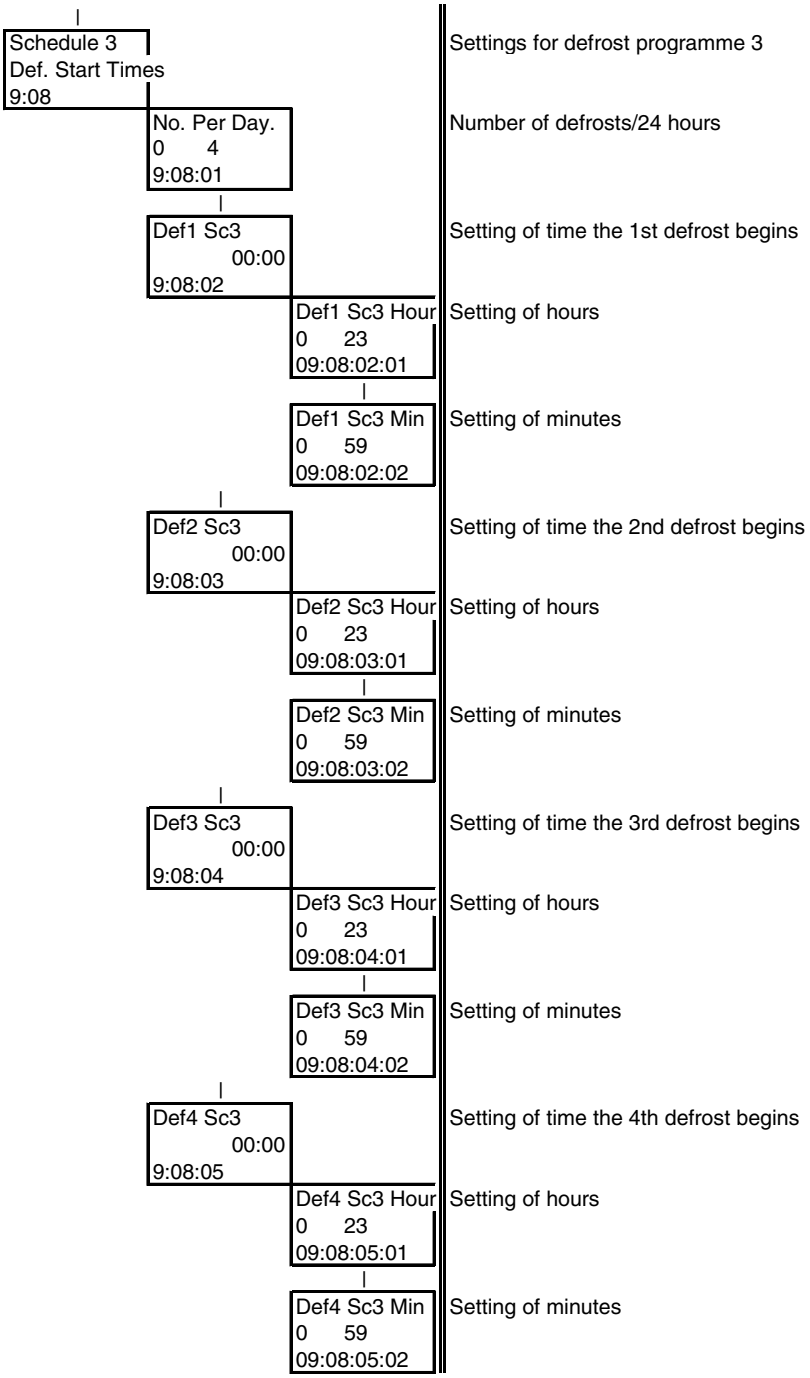
As above, Fridays

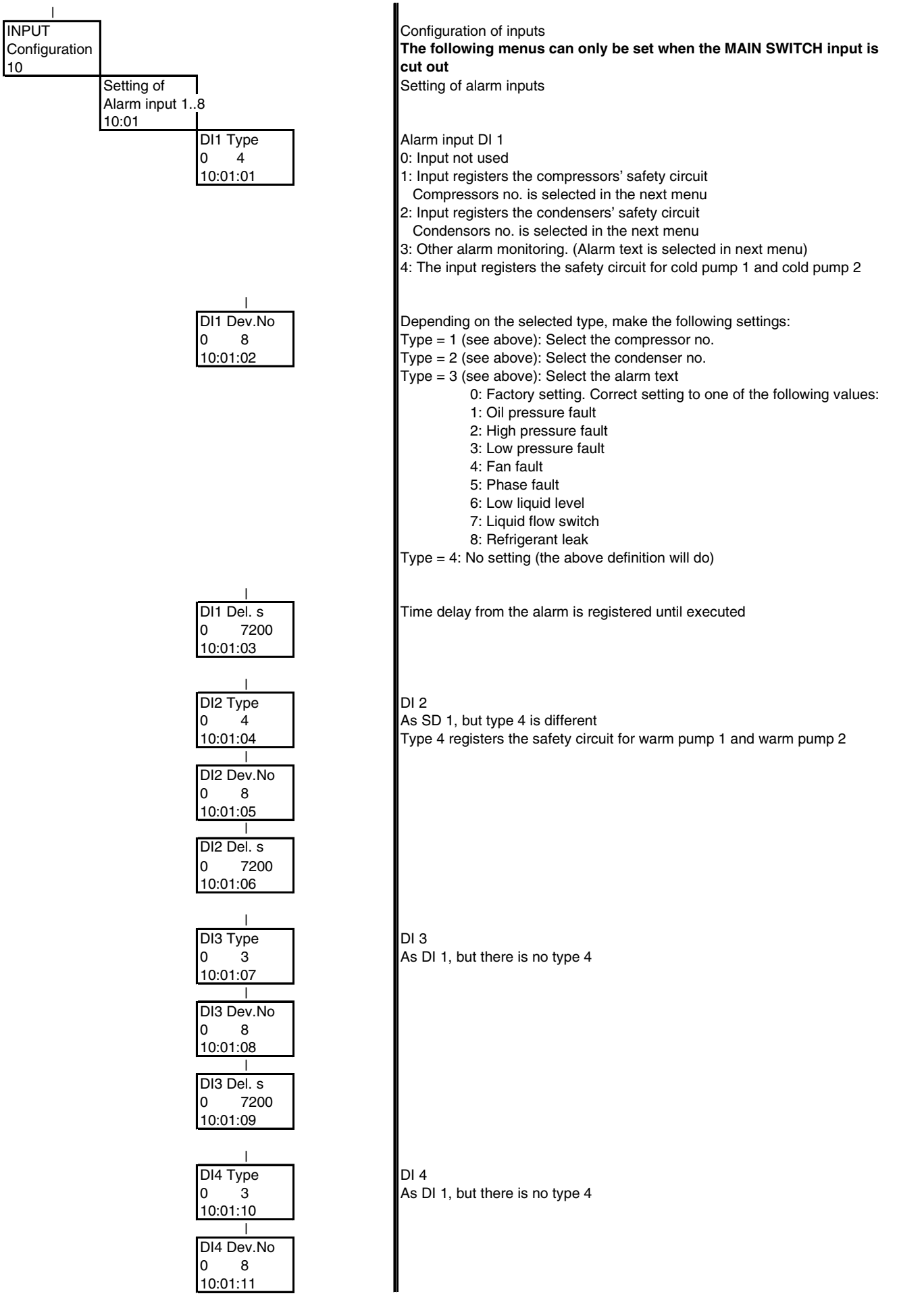
As above, Fridays

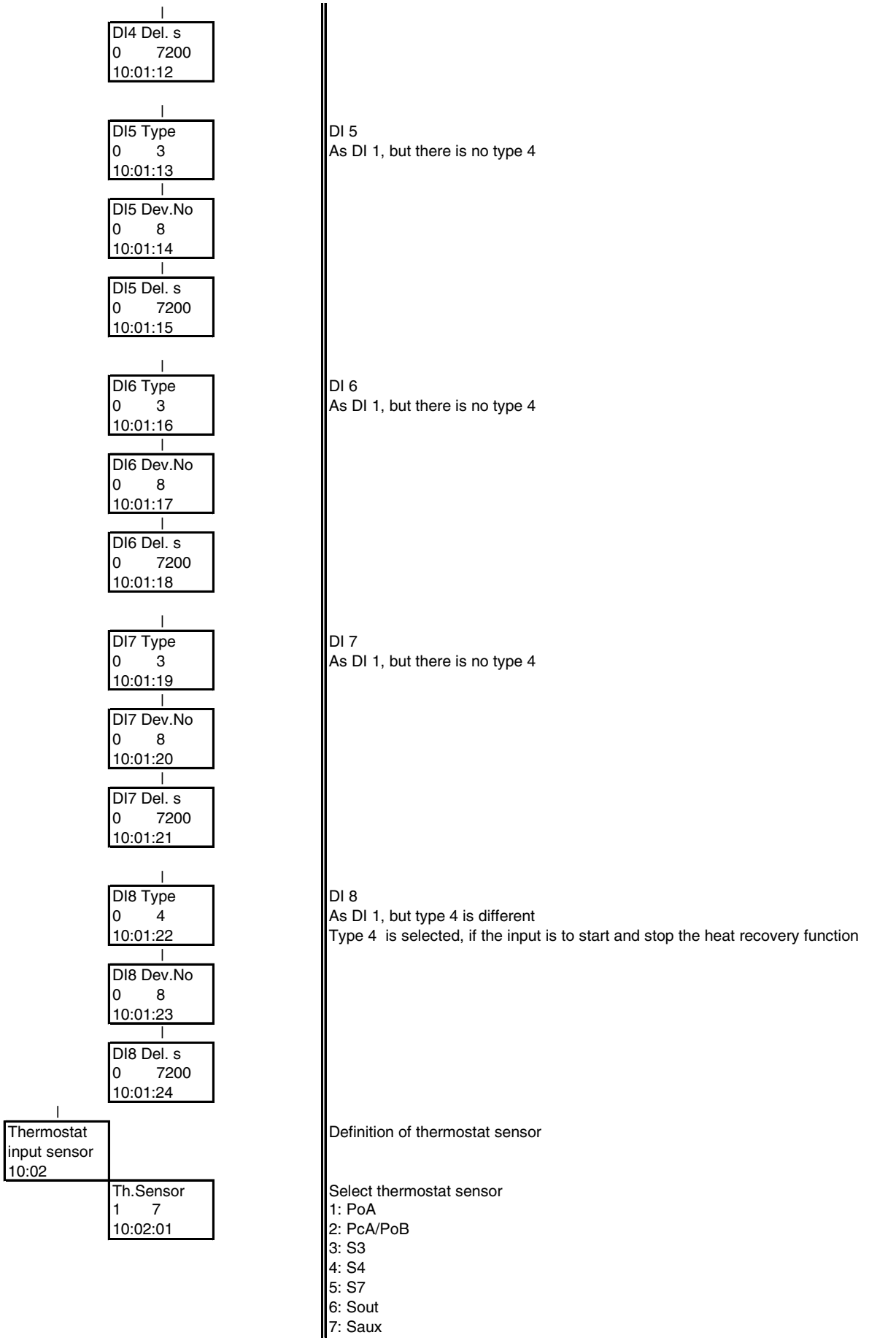

Sa day h
0 24
8:01:11
As above, Saturdays
Sa night h
0 24
8:01:12
As above, Saturdays
Su day h
0 24
8:01:13
As above, Sundays
Su night h
0 24
8:01:14
As above, Sundays
Defrost Control 9
Defrost function
Alarm message 9:01
When there is an alarm, an E appears in the display
(Error register becomes visible)
9:01:01
For survey of alarm messages, see page 28
Defrost Measurements 9:02
Read-out of measuring values related to defrost function
Sdef. °C 9:02:01
Defrost sensor temperature
Defrosting 9:02:02
Status of defrost function
Def.Time m 9:02:03
Actual defrost cut-in time or duration of the latest finished defrosting period.
Defrost start Method 9:03
Settings of defrost start
Man. Def. OFF/ON 9:03:01
Manual defrost is activated when ON
(automatically changes to OFF, when defrost period has ended)
Def.Sched. OFF/ON 9:03:02
Define here whether the internal defrost table is to be used.
(ON activates table in 9:05)
Defrost stop Method 9:04
Settings of defrost stop
Temp/Time 1 2 9:04:01
1: Temperature stop (time as security)
2: Stop on time
MaxDefTime 5 240 9:04:02
Max. permissible defrost time in minutes
(Security time on Temperature stop)
Def.Stop°C 0 60 9:04:03
Temperature value of defrost stop
(defrost is stopped when the temperature of the selected defrost sensor reaches the set value)
DefStop Sx 3 4 9:04:04
Select defrost sensor
3: S3 is selected
4: S4 is selected

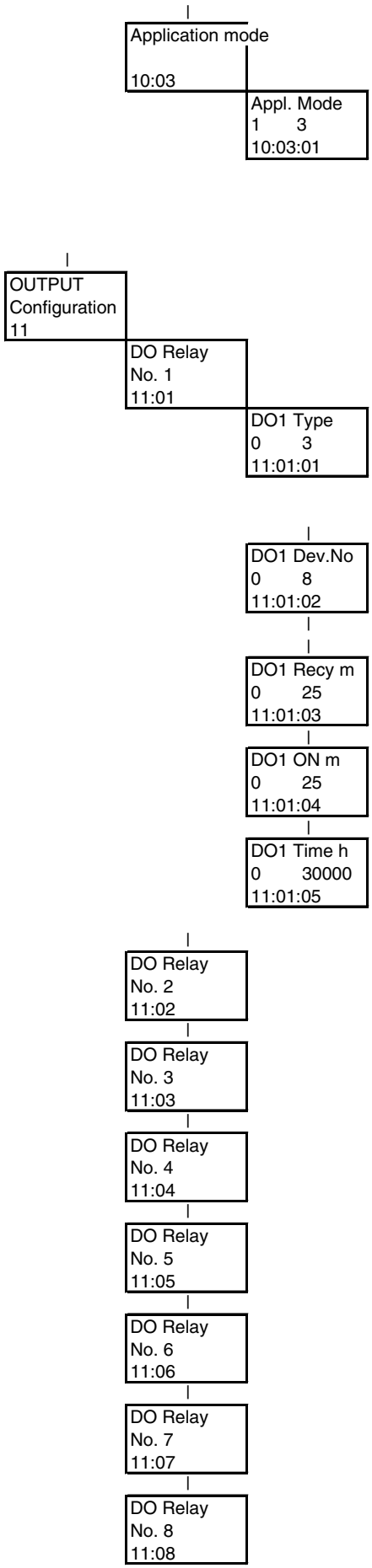

Def. Schedule
Day selection
9:05
Defrost table (see also 9:03:02)
Selection of defrost programme for each day of the week
Mon.Sched.
1 3
9:05:01
Choose defrost programme for Mondays
See also 9:06, 9:07 and 9:08
Tue.Sched.
1 3
9:05:02
Choose defrost programme for Tuesdays
See also 9:06, 9:07 and 9:08
Wed.Sched.
1 3
9:05:03
Choose defrost programme for Wednesdays
See also 9:06, 9:07 and 9:08
Thu.Sched.
1 3
9:05:04
Choose defrost programme for Thursdays
See also 9:06, 9:07 and 9:08
Fri.Sched.
1 3
9:05:05
Choose defrost programme for Fridays
See also 9:06, 9:07 and 9:08
Sat.Sched.
1 3
9:05:06
Choose defrost programme for Saturdays
See also 9:06, 9:07 and 9:08
Sun.Sched.
1 3
9:05:07
Choose defrost programme for Sundays
See also 9:06, 9:07 and 9:08
Schedule 1
Def. Start Times
9:06
Settings for defrost programme 1
No. Per Day.
0 4
9:06:01
Number of defrosts/24 hours
Def1 Sc1
00:00
9:06:02
Setting of time the 1st defrost begins
Def1 Sc1 Hour
0 23
09:06:02:01
Setting of hours
Def1 Sc1 Min
0 59
09:06:02:02
Setting of minutes
Def2 Sc1
00:00
9:06:03
Setting of time the 2nd defrost begins
Def2 Sc1 Hour
0 23
09:06:03:01
Setting of hours
Def2 Sc1 Min
0 59
09:06:03:02
Setting of minutes
Def3 Sc1
00:00
9:06:04
Setting of time the 3rd defrost begins
Def3 Sc1 Hour
0 23
09:06:04:01
Setting of hours
Def3 Sc1 Min
0 59
09:06:04:02
Setting of minutes


Def4 Sc1
00:00
9:06:05
Setting of time the 4th defrost begins
Def4 Sc1 Hour
0 23
09:06:05:01
Setting of hours
Def4 Sc1 Min
0 59
09:06:05:02
Setting of minutes
Schedule 2
Def. Start Times
9:07
Settings for defrost programme 2
No. Per Day.
0 4
9:07:01
Number of defrosts/24 hours
Def1 Sc2
00:00
9:07:02
Setting of time the 1st defrost begins
Def1 Sc2 Hour
0 23
09:07:02:01
Setting of hours
Def1 Sc2 Min
0 59
09:07:02:02
Setting of minutes
Def2 Sc2
00:00
9:07:03
Setting of time the 2nd defrost begins
Def2 Sc2 Hour
0 23
09:07:03:01
Setting of hours
Def2 Sc2 Min
0 59
09:07:03:02
Setting of minutes
Def3 Sc2
00:00
9:07:04
Setting of time the 3rd defrost begins
Def3 Sc2 Hour
0 23
09:07:04:01
Setting of hours
Def3 Sc2 Min
0 59
09:07:04:02
Setting of minutes
Def4 Sc2
00:00
9:07:05
Setting of time the 4th defrost begins
Def4 Sc2 Hour
0 23
09:07:05:01
Setting of hours
Def4 Sc2 Min
0 59
09:07:05:02
Setting of minutes


Schedule 3
Def. Start Times
9:08
Settings for defrost programme 3
No. Per Day.
0 4
9:08:01
Number of defrosts/24 hours
Def1 Sc3
00:00
9:08:02
Setting of time the 1st defrost begins
Def1 Sc3 Hour
0 23
09:08:02:01
Setting of hours
Def1 Sc3 Min
0 59
09:08:02:02
Setting of minutes
Def2 Sc3
00:00
9:08:03
Setting of time the 2nd defrost begins
Def2 Sc3 Hour
0 23
09:08:03:01
Setting of hours
Def2 Sc3 Min
0 59
09:08:03:02
Setting of minutes
Def3 Sc3
00:00
9:08:04
Setting of time the 3rd defrost begins
Def3 Sc3 Hour
0 23
09:08:04:01
Setting of hours
Def3 Sc3 Min
0 59
09:08:04:02
Setting of minutes
Def4 Sc3
00:00
9:08:05
Setting of time the 4th defrost begins
Def4 Sc3 Hour
0 23
09:08:05:01
Setting of hours
Def4 Sc3 Min
0 59
09:08:05:02
Setting of minutes


INPUT
Configuration
10
Setting of
Alarm input 1..8
10:01
DI1 Type
0 4
10:01:01
DI1 Dev.No
0 8
10:01:02
DI1 Del. s
0 7200
10:01:03
DI2 Type
0 4
10:01:04
DI2 Dev.No
0 8
10:01:05
DI2 Del. s
0 7200
10:01:06
DI3 Type
0 3
10:01:07
DI3 Dev.No
0 8
10:01:08
DI3 Del. s
0 7200
10:01:09
DI4 Type
0 3
10:01:10
DI4 Dev.No
0 8
10:01:11
Configuration of inputs
The following menus can only be set when the MAIN SWITCH input is cut out
Setting of alarm inputs
Alarm input DI 1
0: Input not used
1: Input registers the compressors' safety circuit
Compressors no. is selected in the next menu
2: Input registers the condensers' safety circuit
Condensors no. is selected in the next menu
3: Other alarm monitoring. (Alarm text is selected in next menu)
4: The input registers the safety circuit for cold pump 1 and cold pump 2
Depending on the selected type, make the following settings:
Type = 1 (see above): Select the compressor no.
Type = 2 (see above): Select the condenser no.
Type = 3 (see above): Select the alarm text
0: Factory setting. Correct setting to one of the following values:
1: Oil pressure fault
2: High pressure fault
3: Low pressure fault
4: Fan fault
5: Phase fault
6: Low liquid level
7: Liquid flow switch
8: Refrigerant leak
Type = 4: No setting (the above definition will do)
Time delay from the alarm is registered until executed
DI 2
As SD 1, but type 4 is different
Type 4 registers the safety circuit for warm pump 1 and warm pump 2
DI 3
As DI 1, but there is no type 4
DI 4
As DI 1, but there is no type 4


DI4 Del. s
0 7200
10:01:12
DI5 Type
0 3
10:01:13
DI 5
As DI 1, but there is no type 4
DI5 Dev.No
0 8
10:01:14
DI5 Del. s
0 7200
10:01:15
DI6 Type
0 3
10:01:16
DI 6
As DI 1, but there is no type 4
DI6 Dev.No
0 8
10:01:17
DI6 Del. s
0 7200
10:01:18
DI7 Type
0 3
10:01:19
DI 7
As DI 1, but there is no type 4
DI7 Dev.No
0 8
10:01:20
DI7 Del. s
0 7200
10:01:21
DI8 Type
0 4
10:01:22
DI 8
As DI 1, but type 4 is different
Type 4 is selected, if the input is to start and stop the heat recovery function
DI8 Dev.No
0 8
10:01:23
DI8 Del. s
0 7200
10:01:24
Thermostat input sensor
10:02
Definition of thermostat sensor
Th.Sensor
1 7
10:02:01
Select thermostat sensor
1: PoA
2: PcA/PoB
3: S3
4: S4
5: S7
6: Sout
7: Saux



System structure

Select application
1: One compressor group where PcA is used for controlling the condenser
2: One compressor group where S7 is used for controlling the condenser
3: Two compressor groups where S7 is used for controlling the condenser
Compr. A1 - Compr. B1 - Compr. A2 - Compr. B2 - etc.

(see functional description for further details)

Configuration of relay outputs
The following menus can only be set when the MAIN SWITCH input is cut out
Relay output No. 1

Select function (type) for relay output DO 1:
0: Not used
1: Compressor / compressor steps
2: Condenser / condenser steps
3: Cold pump 1

Depending on the selected type, make the following settings:
Type = 1 (see above): Select the compressor no.
Type = 2 (see above): Select the condenser no.
Type = 3: (see above): No setting (the above definition will do)

Minimum period of time between two successive starts

Minimum duration of ON period

Reading and adjustment, if applicable, of hourmeter

DO2
As DO 1, but type 3 is different
Select type 3, if output is to be used for warm pump 1

DO3
As DO 1, but type 3 is different
Select type 3, if output is to be used for cold pump 2

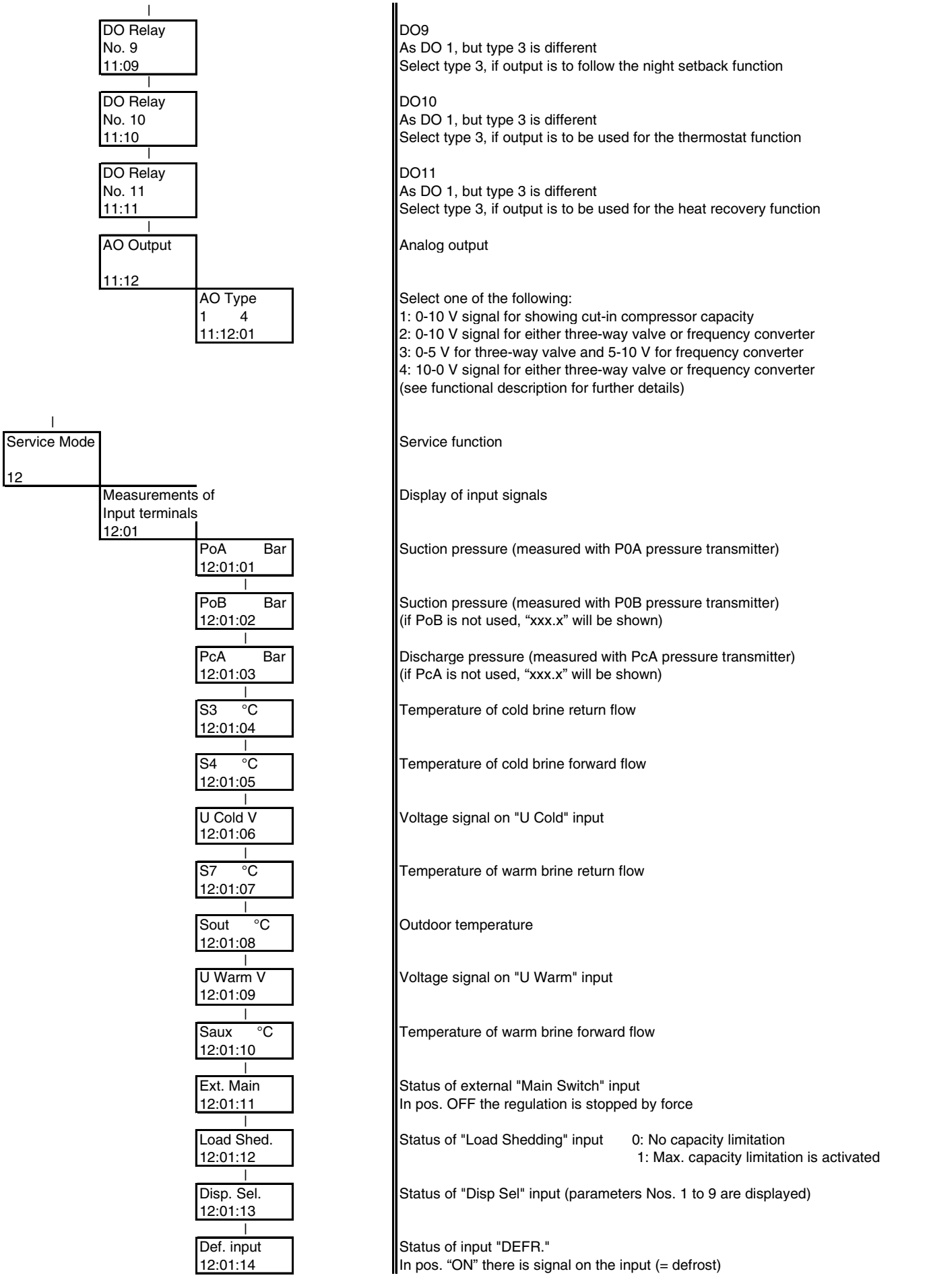
DO4
As DO 1, but type 3 is different
Select type 3, if output is to be used for warm pump 2

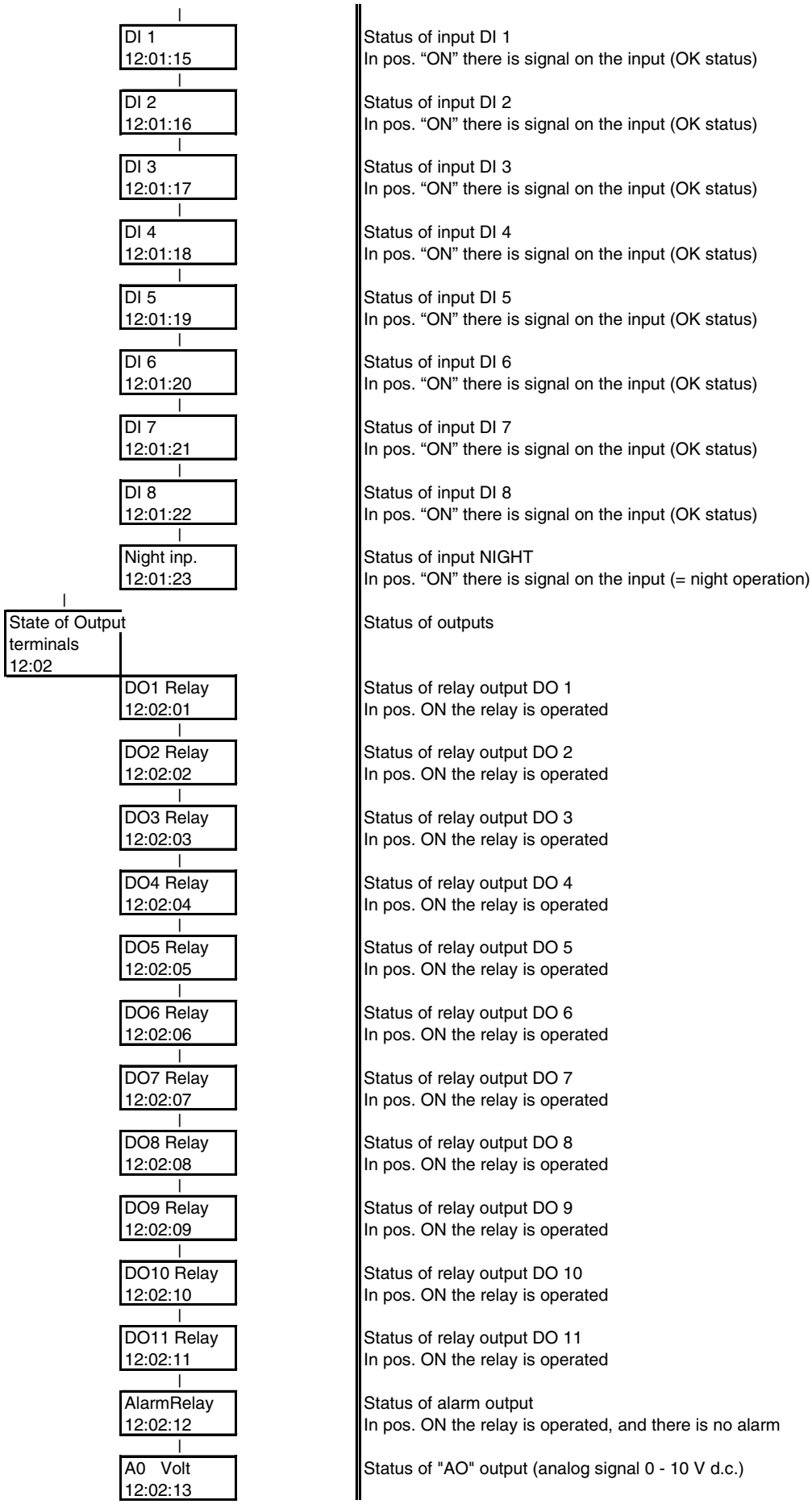
DO5
As DO 1, but type 3 is different
(there is no type 3 option)

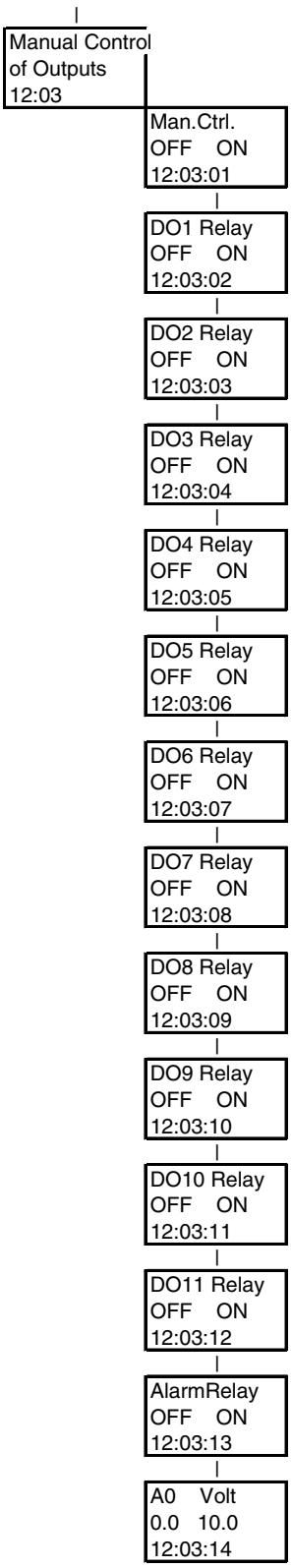
DO6
As DO 1, but type 3 is different
Select type 3, if output is to be used for injection function B

DO7
As DO 1, but type 3 is different
Select type 3, if output is to be used for injection function A

DO8
As DO 1, but type 3 is different
Select type 3, if output is to be used for defrost


DO Relay
No. 9
11:09
DO9
As DO 1, but type 3 is different
Select type 3, if output is to follow the night setback function
DO Relay
No. 10
11:10
DO10
As DO 1, but type 3 is different
Select type 3, if output is to be used for the thermostat function
DO Relay
No. 11
11:11
DO11
As DO 1, but type 3 is different
Select type 3, if output is to be used for the heat recovery function
AO Output
11:12
Analog output
AO Type
1 4
11:12:01
Select one of the following:
1: 0-10 V signal for showing cut-in compressor capacity
2: 0-10 V signal for either three-way valve or frequency converter
3: 0-5 V for three-way valve and 5-10 V for frequency converter
4: 10-0 V signal for either three-way valve or frequency converter
(see functional description for further details)
Service Mode
12
Service function
Measurements of
Input terminals
12:01
Display of input signals
PoA Bar
12:01:01
Suction pressure (measured with P0A pressure transmitter)
PoB Bar
12:01:02
Suction pressure (measured with P0B pressure transmitter)
(if PoB is not used, “xxx.x” will be shown)
PcA Bar
12:01:03
Discharge pressure (measured with PcA pressure transmitter)
(if PcA is not used, “xxx.x” will be shown)
S3 °C
12:01:04
Temperature of cold brine return flow
S4 °C
12:01:05
Temperature of cold brine forward flow
U Cold V
12:01:06
Voltage signal on "U Cold" input
S7 °C
12:01:07
Temperature of warm brine return flow
Sout °C
12:01:08
Outdoor temperature
U Warm V
12:01:09
Voltage signal on "U Warm" input
Saux °C
12:01:10
Temperature of warm brine forward flow
Ext. Main
12:01:11
Status of external "Main Switch" input
In pos. OFF the regulation is stopped by force
Load Shed.
12:01:12
Status of "Load Shedding" input 0: No capacity limitation
1: Max. capacity limitation is activated
Disp. Sel.
12:01:13
Status of "Disp Sel" input (parameters Nos. 1 to 9 are displayed)
Def. input
12:01:14
Status of input "DEFR."
In pos. “ON” there is signal on the input (= defrost)


DI 1
12:01:15
Status of input DI 1
In pos. “ON” there is signal on the input (OK status)
DI 2
12:01:16
Status of input DI 2
In pos. “ON” there is signal on the input (OK status)
DI 3
12:01:17
Status of input DI 3
In pos. “ON” there is signal on the input (OK status)
DI 4
12:01:18
Status of input DI 4
In pos. “ON” there is signal on the input (OK status)
DI 5
12:01:19
Status of input DI 5
In pos. “ON” there is signal on the input (OK status)
DI 6
12:01:20
Status of input DI 6
In pos. “ON” there is signal on the input (OK status)
DI 7
12:01:21
Status of input DI 7
In pos. “ON” there is signal on the input (OK status)
DI 8
12:01:22
Status of input DI 8
In pos. “ON” there is signal on the input (OK status)
Night inp.
12:01:23
Status of input NIGHT
In pos. “ON” there is signal on the input (= night operation)
State of Output terminals
12:02
Status of outputs
DO1 Relay
12:02:01
Status of relay output DO 1
In pos. ON the relay is operated
DO2 Relay
12:02:02
Status of relay output DO 2
In pos. ON the relay is operated
DO3 Relay
12:02:03
Status of relay output DO 3
In pos. ON the relay is operated
DO4 Relay
12:02:04
Status of relay output DO 4
In pos. ON the relay is operated
DO5 Relay
12:02:05
Status of relay output DO 5
In pos. ON the relay is operated
DO6 Relay
12:02:06
Status of relay output DO 6
In pos. ON the relay is operated
DO7 Relay
12:02:07
Status of relay output DO 7
In pos. ON the relay is operated
DO8 Relay
12:02:08
Status of relay output DO 8
In pos. ON the relay is operated
DO9 Relay
12:02:09
Status of relay output DO 9
In pos. ON the relay is operated
DO10 Relay
12:02:10
Status of relay output DO 10
In pos. ON the relay is operated
DO11 Relay
12:02:11
Status of relay output DO 11
In pos. ON the relay is operated
AlarmRelay
12:02:12
Status of alarm output
In pos. ON the relay is operated, and there is no alarm
A0 Volt
12:02:13
Status of "AO" output (analog signal 0 - 10 V d.c.)



Forced operation of outputs under service

ON: Manual control permitted (see 2:02:01)
PLEASE NOTE: No monitoring
When manual setting is finished, the setting must be changed to OFF

Manual operation of relay output DO 1
ON: Relay activated
OFF: Relay not activated

Manual operation of relay output DO 2
ON: Relay activated
OFF: Relay not activated

Manual operation of relay output DO 3
ON: Relay activated
OFF: Relay not activated

Manual operation of relay output DO 4
ON: Relay activated
OFF: Relay not activated

Manual operation of relay output DO 5
ON: Relay activated
OFF: Relay not activated

Manual operation of relay output DO 6
ON: Relay activated
OFF: Relay not activated

Manual operation of relay output DO 7
ON: Relay activated
OFF: Relay not activated

Manual operation of relay output DO 8
ON: Relay activated
OFF: Relay not activated

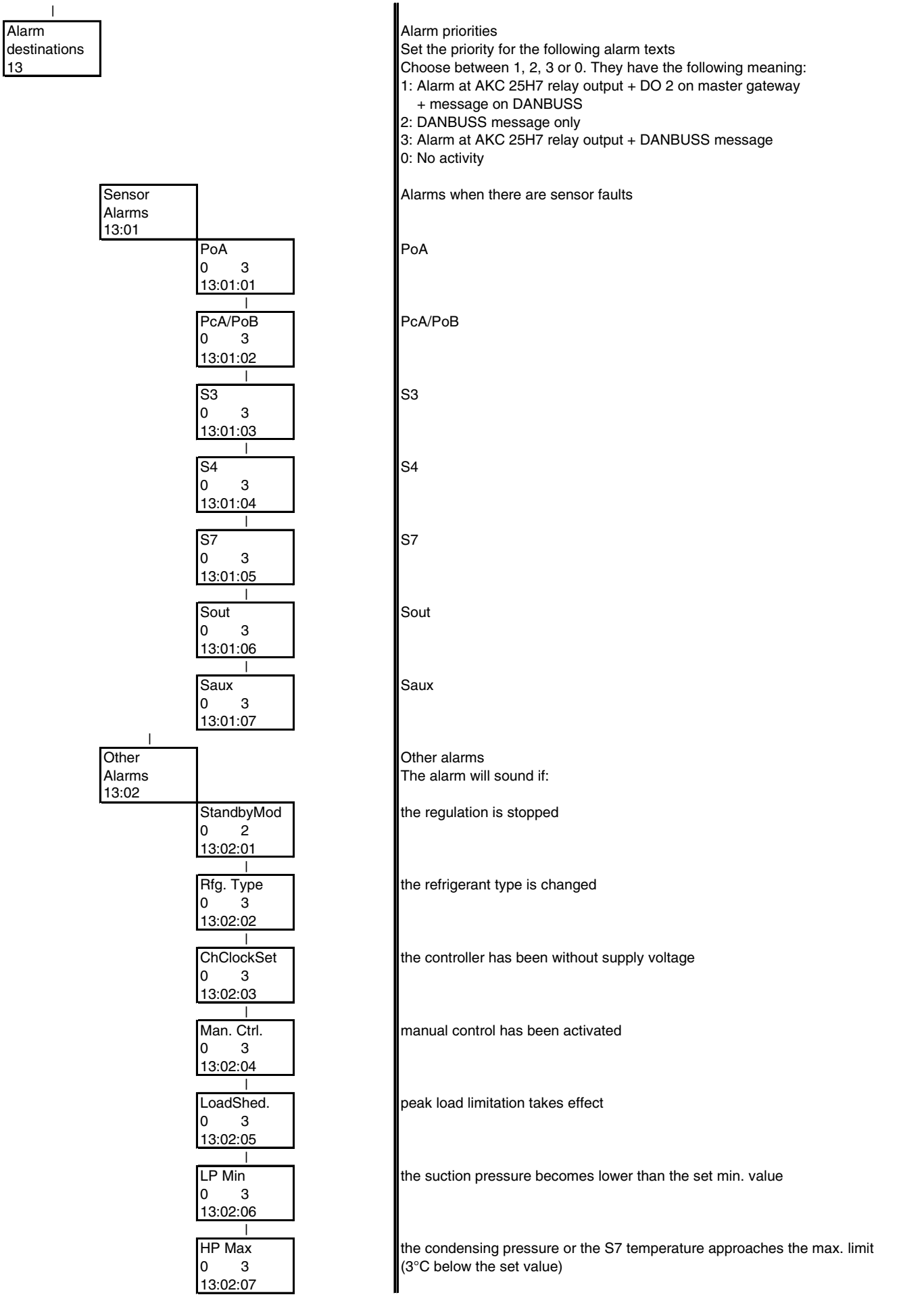
Manual operation of relay output DO 9
ON: Relay activated
OFF: Relay not activated

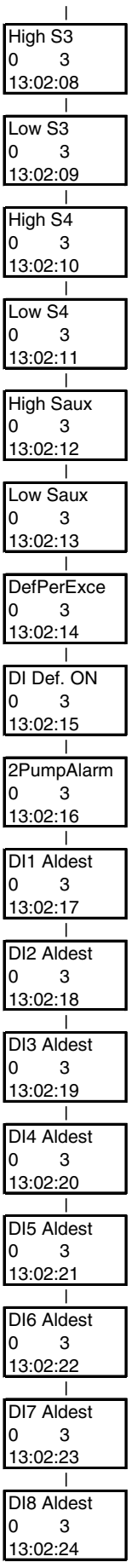
Manual operation of relay output DO 10
ON: Relay activated
OFF: Relay not activated

Manual operation of relay output DO 11
ON: Relay activated
OFF: Relay not activated

Manual operation of alarm relay
ON: Relay activated (no alarm)
OFF: Relay not activated

Manual control of analog output "AO"


Alarm destinations 13
Alarm priorities
Set the priority for the following alarm texts
Choose between 1, 2, 3 or 0. They have the following meaning:
1: Alarm at AKC 25H7 relay output + DO 2 on master gateway + message on DANBUSS
2: DANBUSS message only
3: Alarm at AKC 25H7 relay output + DANBUSS message
0: No activity
Sensor Alarms 13:01
Alarms when there are sensor faults
PoA 0 3 13:01:01
PoA
PcA/PoB 0 3 13:01:02
PcA/PoB
S3 0 3 13:01:03
S3
S4 0 3 13:01:04
S4
S7 0 3 13:01:05
S7
Sout 0 3 13:01:06
Sout
Saux 0 3 13:01:07
Saux
Other Alarms 13:02
Other alarms
The alarm will sound if:
StandbyMod 0 2 13:02:01
the regulation is stopped
Rfg. Type 0 3 13:02:02
the refrigerant type is changed
ChClockSet 0 3 13:02:03
the controller has been without supply voltage
Man. Ctrl. 0 3 13:02:04
manual control has been activated
LoadShed. 0 3 13:02:05
peak load limitation takes effect
LP Min 0 3 13:02:06
the suction pressure becomes lower than the set min. value
HP Max 0 3 13:02:07
the condensing pressure or the S7 temperature approaches the max. limit (3°C below the set value)



the S3 temperature exceeds the max. limit

the S3 temperature goes below the min. value

the S4 temperature exceeds the max. limit

the S4 temperature goes below the min. value

the Saux temperature exceeds the max. limit

the Saux temperature goes below the min. value

defrost is stopped on max. time (defrost stop temperature not reached within the set safety time)

there is still signal on the DEFR input 30 minutes after the termination of a defrost

there are faults on both parallel pumps in one of the refrigeration circuits

there is an alarm on the DI 1 input (voltage disappears)

there is an alarm on the DI 2 input (voltage disappears)

there is an alarm on the DI 3 input (voltage disappears)

there is an alarm on the DI 4 input (voltage disappears)

there is an alarm on the DI 5 input (voltage disappears)

there is an alarm on the DI 6 input (voltage disappears)

there is an alarm on the DI 7 input (voltage disappears)

there is an alarm on the DI 8 input (voltage disappears)

Alarm message

The following display read-outs are only visible if there is an active error.
Active alarm messages can be seen by pushing the "F1" button.
When the error is corrected, the Alarm message can be removed by pressing ENTER.

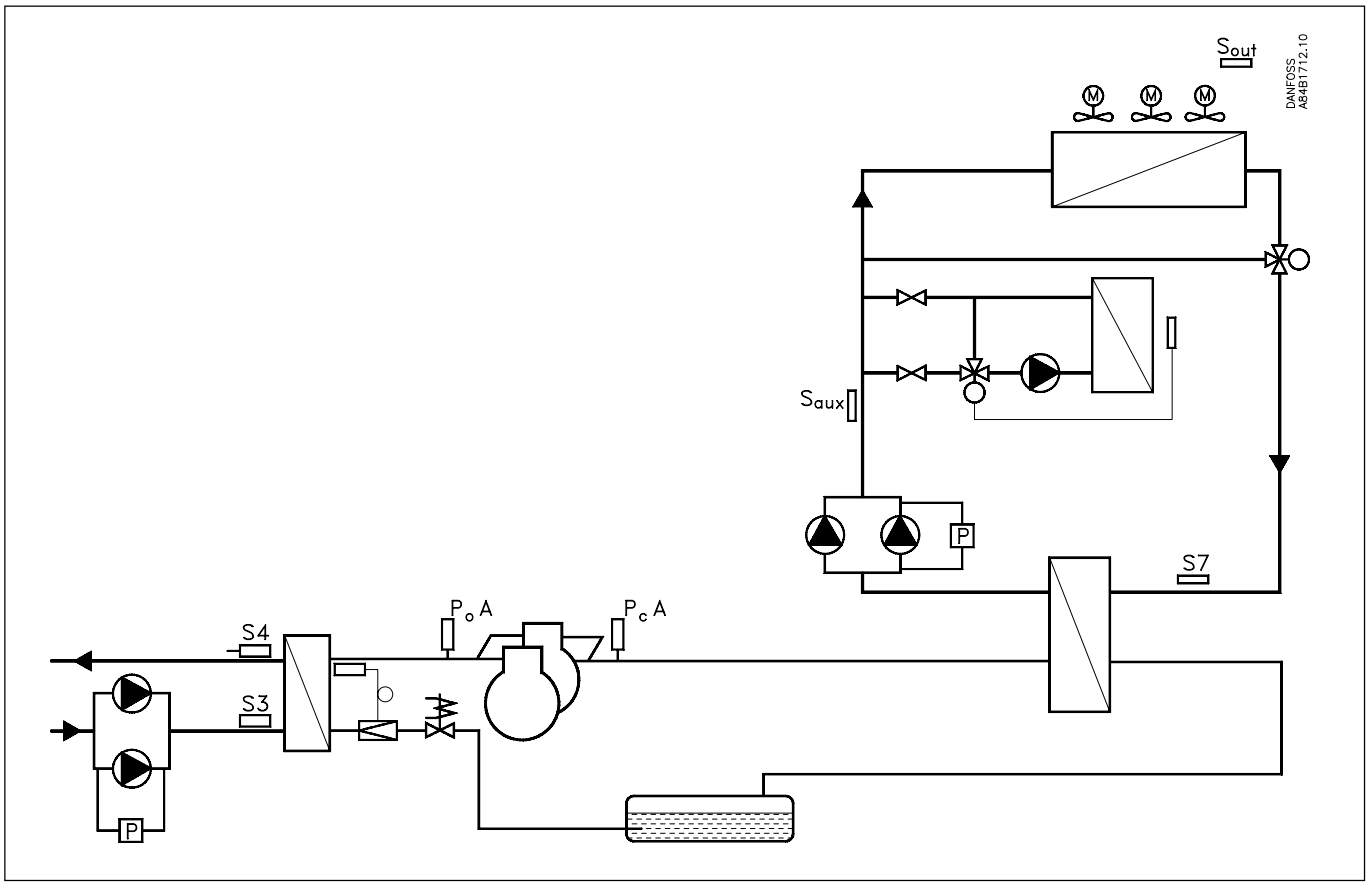
Alarm message	Cause	Remedy
PoA error	Faulty pressure transmitter	Check connection
PoB error	Faulty pressure transmitter	Check connection
PcA error	Faulty pressure transmitter	Check connection
S3 error	Faulty sensor	Check connection/sensor resistance
S4 error	Faulty sensor	Check connection/sensor resistance
Saux error	Faulty sensor	Check connection/sensor resistance
S7 error	Faulty sensor	Check connection/sensor resistance
Sout error	Faulty sensor	Check connection/sensor resistance
Standby mode	Regulation has stopped	The function switch (Main switch) is either set in the position "Controller stopped" or "Service function" (see 2:02:01) or the “Main switch” input has been cut out
Check Clock setting	Voltage has been interrupted	Check timer in controller
Rfg. Type Not selected	No selection of refrigerant	Select refrigerant (2:02:04)
Rfg.Type change after power up	Changed refrigerant	Check the selected refrigerant. Regulation with changed refrigerant may not be done until the controller has been de-energised
Condensing temp. too high	Too high condensing temperature	Pc or S7 exceeds the “HP Max°C” setting Check the condenser’s function
Suction temp. too low	Too low suction pressure temperature	P0 lower than "LP Min °C" setting
Man. compr. cap. Ctrl. set ON	Regulation is overridden	The forced control function for the compressor capacity is active
Man. cond. cap. Ctrl. set ON	Regulation is overridden	The forced control function for the condenser capacity is active
Compr. no ( ) safety cut-out	Signal on terminal DI () interrupted	Check compressors safety circuit
Compr. no ( ) not in auto	Wrong setting of switch on AKC 22H	Put switch on AKC 22H in pos. "AUT."
Compr. no ( ) disch temp. cut-out	Alarm from AKC 22H	Check compressors safety circuit Too high pressure gas temperature
Compr. no ( ) motor prot. cut-out	Alarm from AKC 22H	Check compressors safety circuit Motor protection cut out

Compr. no ( ) over current cut-out	Alarm from AKC 22H	Check compressors safety circuit Motor starter cut out
Compr.no ( ) oil press. cut-out	Alarm from AKC 22H	Check compressors safety circuit Oil pressure cut out
Compr. no ( ) disch press. cut-out	Alarm from AKC 22H	Check compressors safety circuit High pressure cut out
Load shedding activated	Peak load limitation	Peak load limitation activated via “Load shed” input
No DI defined for compressor	A "DI-input" for a compressor is not defined	Define the input under "Configuration of inputs" or set alarm destination at "0".
Cond. no ( ) safety cut-out	Signal on terminal DI () interrupted	Check condenser's safety circuit
Cold Brine Pump 1 Alarm	Signal on terminal DI 1 interrupted	Check the pumps safety circuit
Cold Brine Pump 2 Alarm	Signal on terminal DI 1 interrupted	Check the pumps safety circuit
Warm Brine Pump 1 Alarm	Signal on terminal DI 2 interrupted	Check the pumps safety circuit
Warm Brine Pump 2 Alarm	Signal on terminal DI 2 interrupted	Check the pumps safety circuit
Max Def. Time exceeded	Max. defrosting period exceeded	Defrosting finished according to time not as selected according to temperature
Wrong signal on Def. start input	Wrong defrost demand	Active defrost signal on DEFR-input contrary to just finished defrosting.
Oil Pressure fault	Too low oil pressure	Check compressor oil pressure
High pressure fault	High-pressure fault	Check high-pressure monitoring and condenser operation
Low pressure fault	Low-pressure fault	Check low-pressure monitoring and compressor operation
Fan fault	Fan fault	Check fan operation
Phase fault	Wrong supply voltage	Check supply voltage
Low liquid level	Low level of refrigerant	Check refrigerant quantity
Liquid flow switch alarm	Error message from liquid flow switch	Check the flow switch
Refrigerant leak	Refrigerant leaking	Check the unit that monitors refrigerant leaks
High S3 temperature	Too high S3 temp.	The set temperature limit has been exceeded
Low S3 temperature	Too low S3 temp.	The temperature has fallen below the set limit
High S4 temperature	Too high S4 temp.	The set temperature limit has been exceeded

Low S4 temperature	Too low S4 temp.	The temperature has fallen below the set limit
High Saux temperature	Too high Saux temp.	The set temperature limit has been exceeded
Low Saux temperature	Too low Saux temp.	The temperature has fallen below the set limit

Example of system

Mentioned in the menu description are such terms as hot and warm brine, warm and cold pump, sensors with different designations, etc.
This example is intended to provide an overview of the location in the system of the individual components.



RC-ET