

FTE2.0 - COMMISSIONING WITH DANFOSS CONTROLLER

<i>Rev.</i>	<i>Date</i>	<i>Modification</i>
<i>1</i>	<i>27/06/22</i>	Modification in chap. 2 – chap. 3 – chap. 6. Added CONCEPT ELECTRICAL LAYOUT at the end of document
<i>0</i>	<i>22/03/18</i>	

This document is deemed as *Classified*. This means that first circulation is limited to selected people, who must diffuse it only as strictly necessary for correct operations.

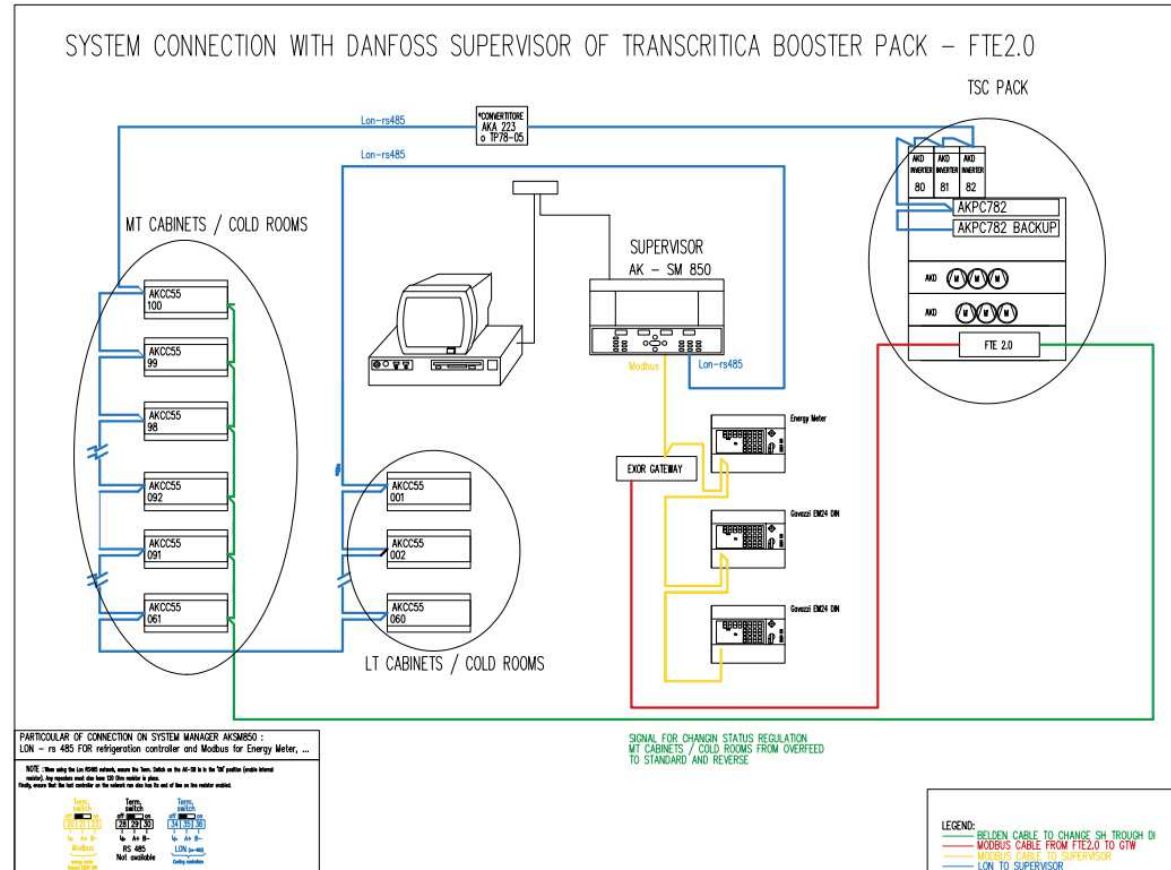
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FTE2.0 - Commissioning with Danfoss controller

1. CONCEPT ELECTRICAL LAYOUT OF FTE2.0

Connection between PACK controller & FTE2.0 controller to the Supervisor with LON-RS485 cable



2. HOW IMPORT FTE2.0 (AND GATEWAY) IN AK-SM 850A (NEW VERSION)

Choose a USB formatted as FAT32;

Unzip the folder “Epta_FTE_R01” and copy in the USB the following files (not integrated in folder!): (**CONTACT SYSTEM ENGINEERING FOR “Epta FTE R01”**)

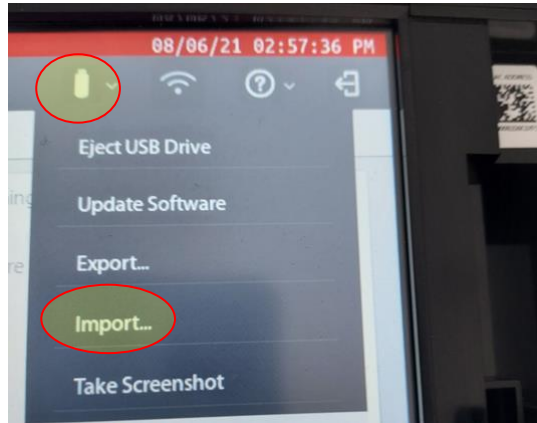
- MC540000.ed3;
- MC540000.epk;
- MC970000.ed3 FILE;
- MC970000.epk;
- device.ls3

Connect the USB key to the 850A and import the files:

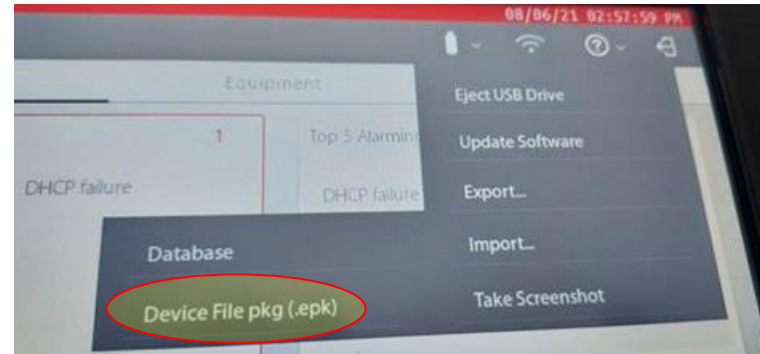
- a. Insert the USB key in A-SM800A;
- b. Select “Import”;
- c. Select “Device file pkg (.epk)”;
- d. The epk files, **if outside any folder**, are automatically identified and proposed. ATTENTION: If the files are inside a folder they are not identified, it is not allowed to navigate within the folders of the USB.

The RMT is software is NOT available with AK-SM 800A.

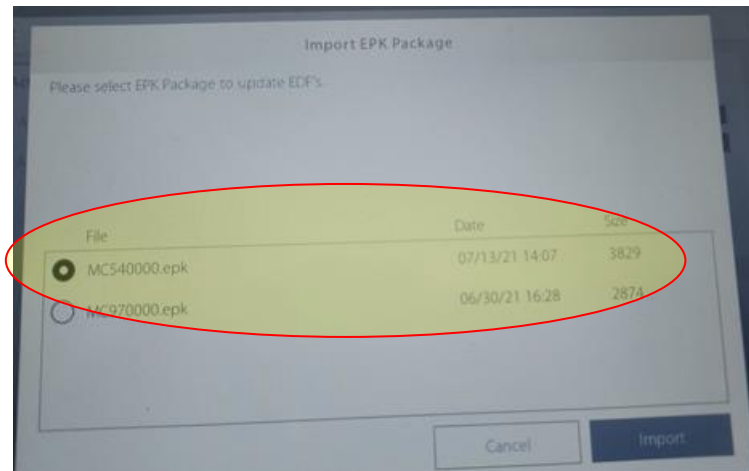
FTE2.0 - Commissioning with Danfoss controller



b. Select "Import"



c. Select "Device File pkg (.epk)"



d. The epk files, if outside the folder, are automatically identified and proposed

FTE2.0 - Commissioning with Danfoss controller

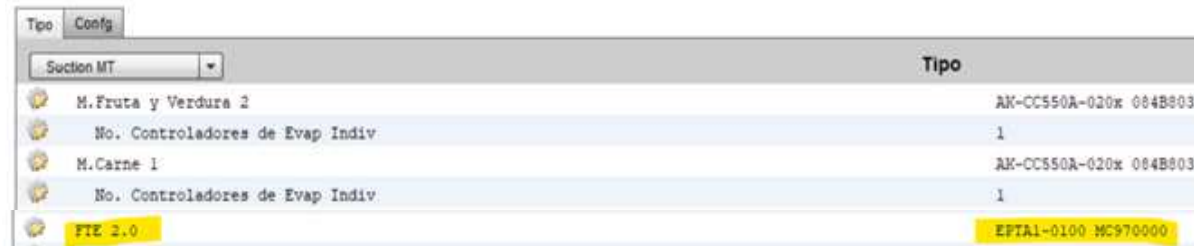
In **AK-SM 850** add two addresses (for FTE2.0 and for multigateway) into the AK-PC782 controller. Associate the files as follow:

- a. *MC970000.ed3* for FTE2.0 controller
- b. *MC540000.ed3* for MULTIGATEWAY controller.

ATTENTION! The multigateway device COULD BE VISIBLE ONLY IF THE **AK-SM 800 Series** IS ALSO ENABLE FOR A/C (is not mandatory to have visible also this controller, not problem if the supervisor is not available for air conditioning).

Scan the line. The association between controllers and addresses should be generated.

In AK-SM, to re-name the FTE controller: **Configuration** tab → **Control** tab → **Refrigeration** tab → **Controllers** tab: in Suction MT line configure the FTE2.0 device with the software EPTA1-0100 MC970000.



Tipo	Config	Tipo
M.Fruta y Verdura 2		AK-CC550A-020x 084B8030
No. Controladores de Evap Indiv		1
M.Carne 1		AK-CC550A-020x 084B8030
No. Controladores de Evap Indiv		1
FTE 2.0		EPTA1-0100 MC970000

Check in the Networks Nodes the scan Status:



Todos los Nod	Controladores	Modulos E/S	Otros Nodos
2	MC970000	EPTA1-0100	01.00
3	084B8030	AK-CC550A-020x	02.0x

IN CASE OF FLOOD EVAP WITH DI, CONNECT THE CABLE WHEN EVERYTHING IS PROPERLY SET IN THE CONTROLLERS (SEE CAP. 5)!!!

3. HOW IMPORT FTE2.0 (AND GATEWAY) IN AK-SM 850 (OLD VERSION)

Make the connections as previous concept layout

Connect the **AK-SM 850** to the **RTM**

Check in the **AK-SM 850** the IP Address of the store (Tab "Configuration" → tab "Com." → "Master IP Address").

Save in your laptop the folder "Epta_FTE_R01" with the files (*):

- c. *MC540000.ed3*,
- d. *MC970000.ed3*,
- e. *device.ls3*

In **RMT** open in local path the folder "Epta_FTE_R01".

Copy the *MC540000.ed3* file in the remote path "edf".

Copy the *MC970000.ed3* file in the remote path "edf".

→ (*) CONTACT SYSTEM ENGINEERING DEPT. FOR THE "Epta FTE R01".

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Offline Programming
Graphic Editor
File Management

Unit 0 - 10.116.224.198

10.116.224.198 Web Server Port 80

Local Path C:\Users\BigaraH\Desktop\Epta_FTE

Name	Type	Size	Modified
device.ls3	LS3 File	548	12/9/2019 7:44 AM
MC540000.ed3	ED3 File	9550	11/12/2019 2:24 PM
MC970000.ed3	ED3 File	8351	12/9/2019 7:44 AM

3 Files Total Size: 18,449 Bytes

1 Selected File(s) Size: 8,351 Bytes

Remote Path edf

File	Type	Size	Date
MC970000.ed3	ED3	8351	12/10/19 11:40
MC540000.ed3	ED3	9550	11/12/19 14:24
80Z0192e.ed4	ED4	37243	04/03/19 15:56
80Z0140b.ed4	ED4	26337	02/08/19 13:09
84B8030c.ed3	ED3	40884	02/08/19 13:09
084B8030_020x	GDF	9125	09/09/19 11:22
084B8030_020C	GDF	9523	09/09/19 11:21
WM30-AV5.ed3	ED3	6075	05/07/15 09:16
MUN168.ed3	ED3	8958	11/01/12 12:41
MC291140.ed3	ED3	29072	05/05/17 09:04
MC291130.ed3	ED3	28851	09/11/17 08:39
MC291121.ed3	ED3	28826	09/11/17 08:39
MC290140.ed3	ED3	29059	05/05/17 09:04

412 Files Total Size: 21,611,128 bytes

Free Space Available: 35,705,856 Bytes (85.29%)

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For the *device.ls3* file:

- i. Download *device.ls3* file version from REMOTE PATH to your laptop and open it

The screenshot shows the File Management interface with the following details:

- Unit 0 - 10.116.224.198
- Web Server Port: 80
- Local Path: C:\Users\BigaraH\Desktop
- Remote Path: edf
- Local Path Table:

Name	Type	Size	Modified
80Z0140b	Folder	-	2/11/2020 7:02 PM
_2018 (EPTAMETIC R448A -EP	Folder	-	1/16/2019 7:59 AM
ALDI USA	Folder	-	1/14/2020 12:26 PM
ASSENZA LUCA	Folder	-	8/1/2019 12:33 PM
Carel	Folder	-	1/14/2020 12:32 PM
Copeland	Folder	-	4/10/2019 12:48 PM
Danfoss	Folder	-	3/2/2020 9:46 AM
Dixell	Folder	-	2/20/2019 7:55 AM
DORIN	Folder	-	7/18/2019 12:17 PM
Epta_FTE	Folder	-	3/3/2020 2:14 PM
Excel	Folder	-	6/7/2019 12:24 PM
Feltre	Folder	-	3/27/2019 8:47 AM
FREDDO	Folder	-	2/3/2020 2:46 PM
FTE PHENIX CITY - USA	Folder	-	2/3/2020 9:31 AM
Grecia	Folder	-	5/9/2019 6:04 PM
MIO	Folder	-	12/18/2019 10:07 AM
- Remote Path Table:

File	Type	Size	Date
ECEBMP.ed3	ED3	4917	10/23/13 10:50
ECBLUE.ed3	ED3	4161	05/22/18 08:46
DT0012XX.ed3	ED3	14057	05/21/18 14:05
DT001216.ed3	ED3	14074	05/21/18 14:02
DT000016.ed3	ED3	14441	05/21/18 13:55
device.ls3	LS3	113588	12/11/19 09:55
CARRIER.ed3	ED3	11481	11/01/12 12:41
AKD_026x.ed3	ED3	46587	05/21/18 13:47
AKD_025x.ed3	ED3	46587	05/21/18 13:43
AKD_024x.ed3	ED3	46587	05/21/18 13:42
AKD_023x.ed3	ED3	46262	05/21/18 13:26
AKD_022x.ed3	ED3	45487	05/21/18 13:07
AKD_021x.ed3	ED3	45487	05/21/18 12:46
AKD_020x.ed3	ED3	45396	05/21/18 12:42

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- ii. Open *device.ls3* from the folder “Epta_FTE_R01”
- iii. Copy rows

MC540000	MGTW	8	0	24	0400	MC540000.ed3	Multigateway
MC970000	EPTA1	1	0	24	0100	MC970000.ed3	FTE
- from *device.ls3* (at point iii.) to *device.ls3* (at point ii.)
- iv. Update the new *device.ls3* file, with the added rows, into the REMOTE path
- v. Wait 1 minute

Reset the unit from **RMT**: tab “Tool” → Reset Unit.

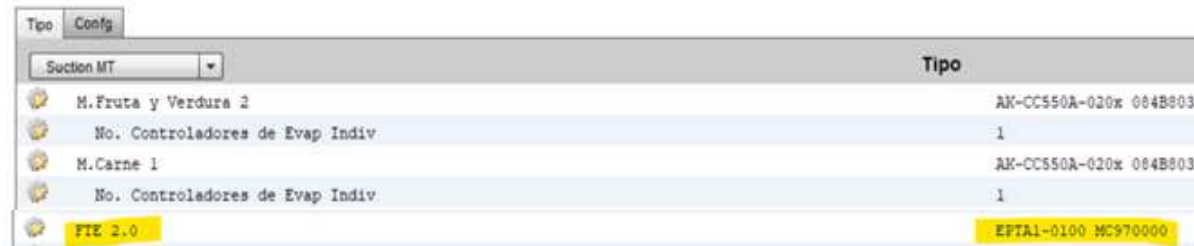
In **AK-SM 850** add two addresses (for FTE2.0 and for multigateway) into the AK-PC782 controller. Associate the files as follow:

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- b. *MC540000.ed3* for MULTIGATEWAY controller.

ATTENTION! The multigateway device COULD BE VISIBLE ONLY IF THE **AK-SM 800 Series** IS ALSO ENABLE FOR A/C (is not mandatory to have visible also this controller, not problem if the supervisor is not available for air conditioning).

Scan the line. The association between controllers and addresses should be generated.

In AK-SM, to re-name the FTE controller: **Configuration** tab → **Control** tab → **Refrigeration** tab → **Controllers** tab: in Suction MT line configure the FTE2.0 device with the software EPTA1-0100 MC970000.



Section MT		Tipo
M.Fruta y Verdura 2		AK-CC550A-020x 084B8030
No. Controladores de Evap Indiv		1
M.Carne 1		AK-CC550A-020x 084B8030
No. Controladores de Evap Indiv		1
FTE 2.0		EPTA1-0100 MC970000

Check in the Networks Nodes the scan Status:

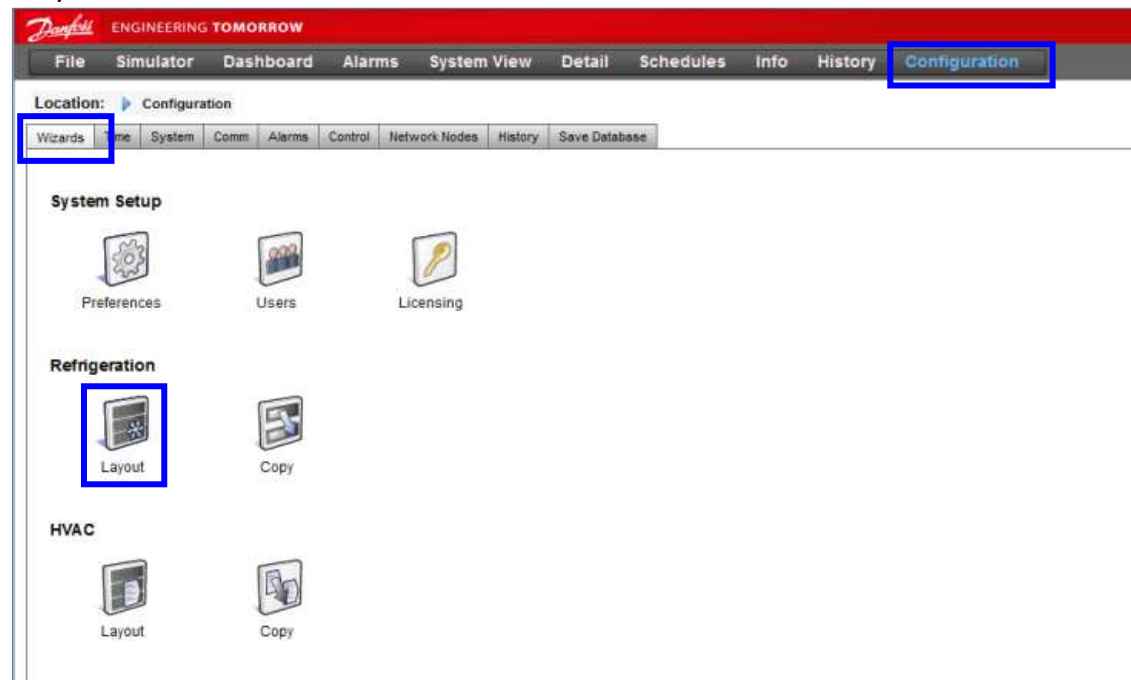
Todos los Nod	Controladores	Modulos E/S	Otros Nodos	
2	MC970000	EPTA1-0100	01.00	Modbus
3	084B8030	AK-CC550A-020x	02.0x	Lon

IN CASE OF FLOOD EVAP WITH DI, CONNECT THE CABLE WHEN EVERYTHING IS PROPERLY SET IN THE CONTROLLERS (SEE CAP. 5)!!!

4. ASSOCIATE LOADS TO PACKS (LT & MT) WITH AK-PC781

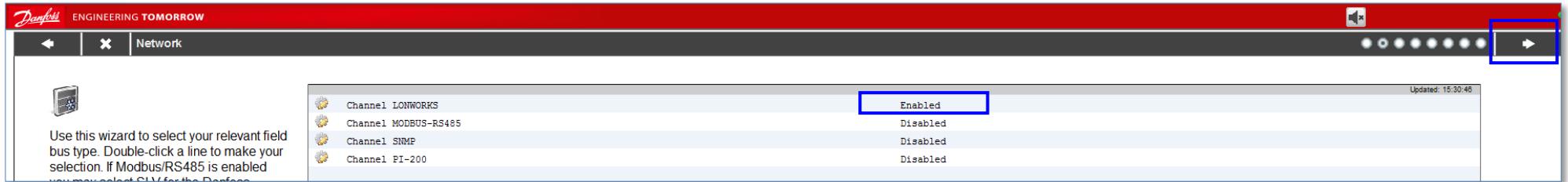
a. From supervisor follow the steps:

Configuration → Wizard → Layout

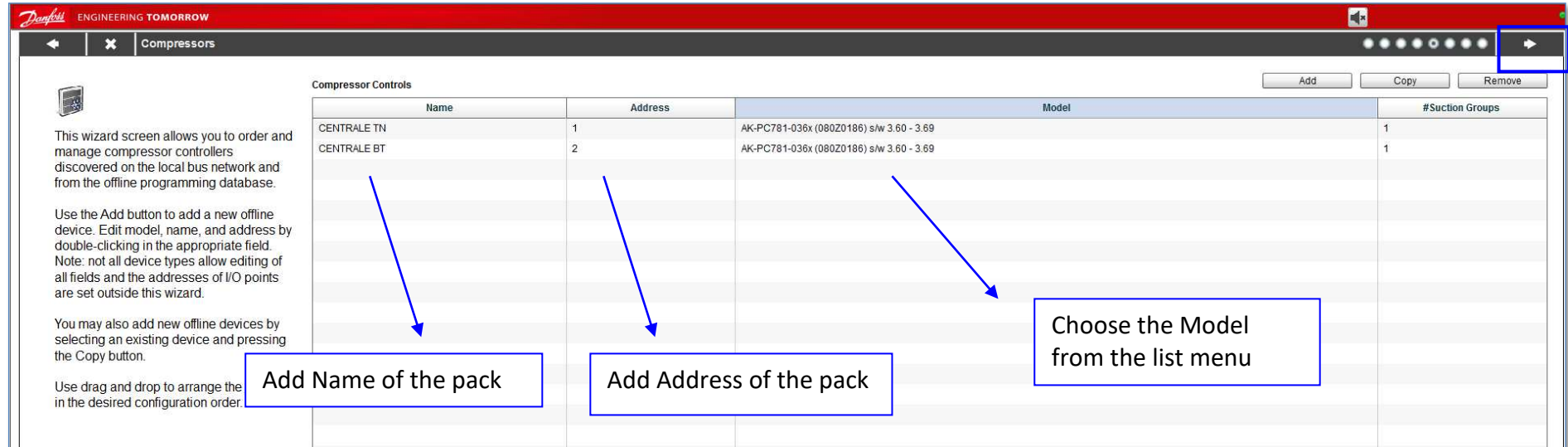


FTE2.0 - Commissioning with Danfoss controller

b. Enable the line where loads are associated. Go on:

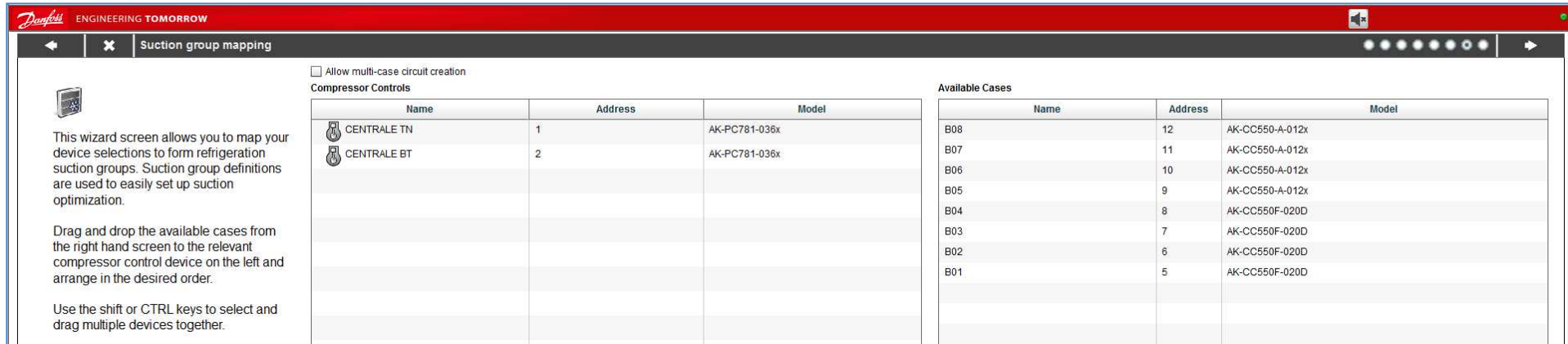


Add the pack (one for Low Temperature and one for Medium Temperature) as indicated here. Go on:



FTE2.0 - Commissioning with Danfoss controller

d. Link MT loads to MT pack, link LT loads to LT pack:



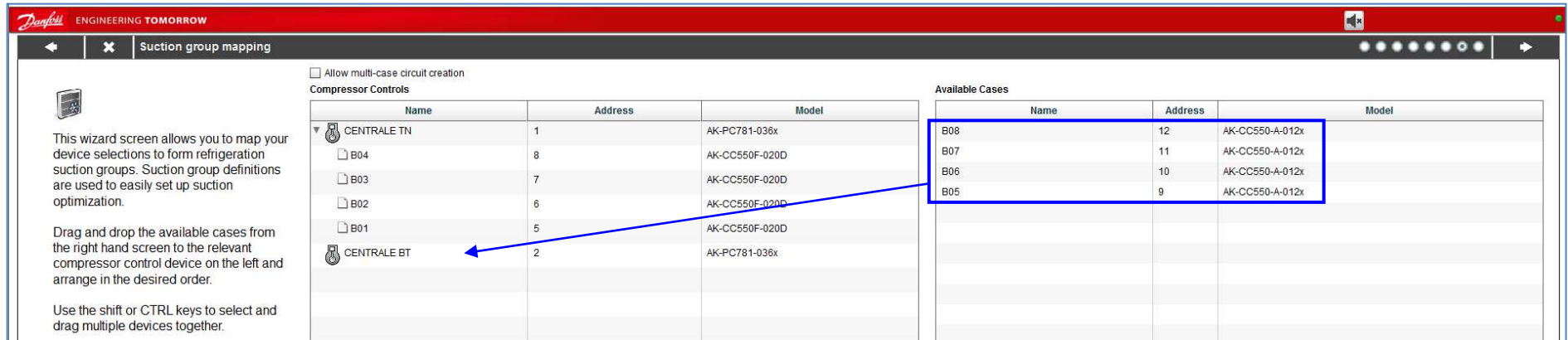
Compressor Controls

Name	Address	Model
CENTRALE TN	1	AK-PC781-036x
CENTRALE BT	2	AK-PC781-036x

Available Cases

Name	Address	Model
B08	12	AK-CC550-A-012x
B07	11	AK-CC550-A-012x
B06	10	AK-CC550-A-012x
B05	9	AK-CC550-A-012x
B04	8	AK-CC550F-020D
B03	7	AK-CC550F-020D
B02	6	AK-CC550F-020D
B01	5	AK-CC550F-020D

With drag and drop:



Compressor Controls

Name	Address	Model
CENTRALE TN	1	AK-PC781-036x
B04	8	AK-CC550F-020D
B03	7	AK-CC550F-020D
B02	6	AK-CC550F-020D
B01	5	AK-CC550F-020D
CENTRALE BT	2	AK-PC781-036x

Available Cases

Name	Address	Model
B08	12	AK-CC550-A-012x
B07	11	AK-CC550-A-012x
B06	10	AK-CC550-A-012x
B05	9	AK-CC550-A-012x



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**SYSTEM
ENGINEERING**

Project: Insert PJ

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e. Click on Finish:

The screenshot shows the 'Final Refrigeration Layout' screen in the Danfoss Engineering Tomorrow software. The interface includes a navigation bar at the top with a 'Finish' button highlighted in blue. On the left, there is a sidebar with a device icon and instructions: 'This screen presents your previous device mappings for your final approval. You may set the addresses of offline controllers here or return to previous screens to make modifications. Press the finish button to send your configuration to the SM850 and close the wizard. Please wait for configuration to complete before exiting this screen.'

Name	Address	Type	Model
▼ CENTRALE TN	1	PACK	AK-PC781-036x (080Z0186) s/w 3.60 - 3.69
<input type="checkbox"/> B04	8	Case	AK-CC550F-020D 084B8073 app o61=4 s/w 2.00 - 2.09
<input type="checkbox"/> B03	7	Case	AK-CC550F-020D 084B8073 app o61=4 s/w 2.00 - 2.09
<input type="checkbox"/> B02	6	Case	AK-CC550F-020D 084B8073 app o61=4 s/w 2.00 - 2.09
<input type="checkbox"/> B01	5	Case	AK-CC550F-020D 084B8073 app o61=4 s/w 2.00 - 2.09
▼ CENTRALE BT	2	PACK	AK-PC781-036x (080Z0186) s/w 3.60 - 3.69
<input type="checkbox"/> B05	9	Case	AK-CC550-A-012x 084B8030 app o61=1 s/w 1.20 - 1.29
<input type="checkbox"/> B06	10	Case	AK-CC550-A-012x 184B8030 app o61=1 s/w 1.20 - 1.29
<input type="checkbox"/> B07	11	Case	AK-CC550-A-012x 184B8030 app o61=1 s/w 1.20 - 1.29
<input type="checkbox"/> B08	12	Case	AK-CC550-A-012x 184B8030 app o61=1 s/w 1.20 - 1.29

5. ASSOCIATE LOADS TO PACKS (LT & MT) WITH AK-PC782A (double suction level)

a. DO NOT CONFIGURE THE LOADS WITH WIZARD BUT FOLLOW THE INSTRUCTION BELOW

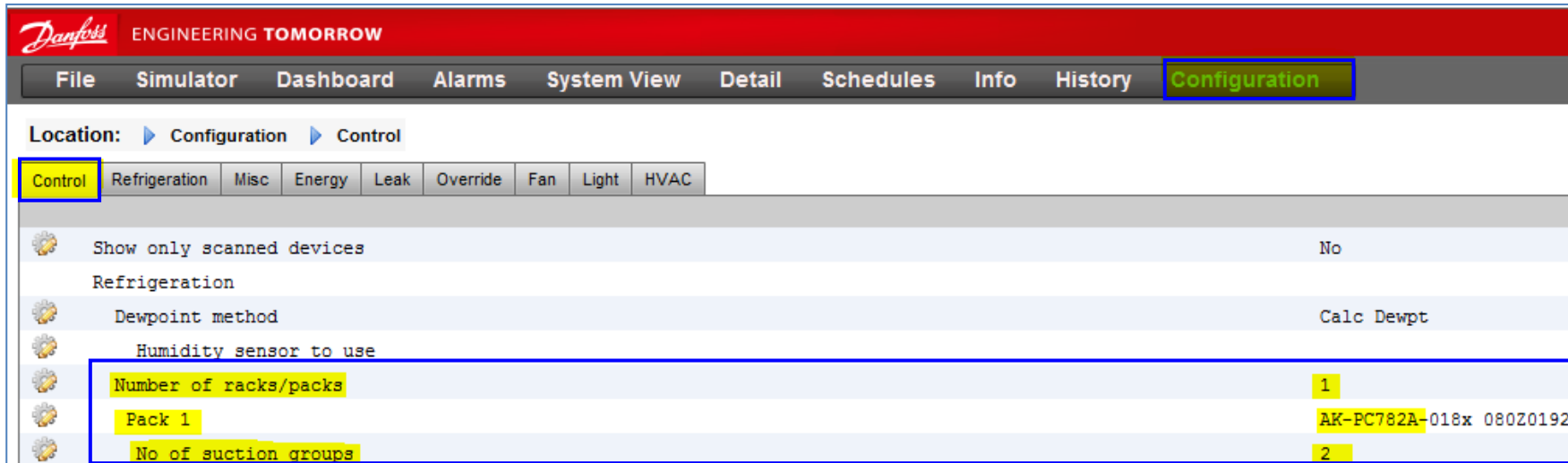
b. From supervisor follow the steps:

Configuration → Control: set

“Number of rack/packs” = 1

“Pack 1” = AK-PC782A-xxx

“No of suction groups” = 2

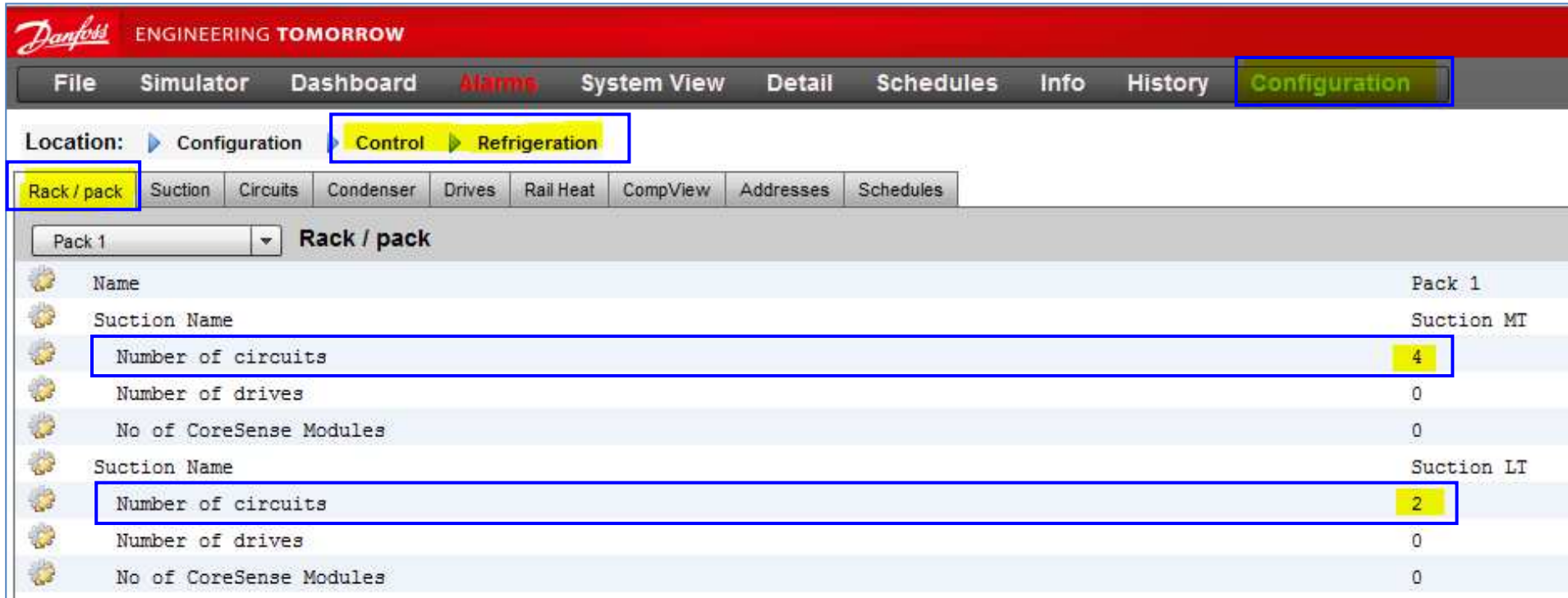


The screenshot shows the Danfoss Engineering Tomorrow web interface. The top navigation bar includes 'File', 'Simulator', 'Dashboard', 'Alarms', 'System View', 'Detail', 'Schedules', 'Info', 'History', and 'Configuration' (highlighted). The 'Location' breadcrumb is 'Configuration > Control'. Below this, there are tabs for 'Control', 'Refrigeration', 'Misc', 'Energy', 'Leak', 'Override', 'Fan', 'Light', and 'HVAC'. The 'Control' tab is active. The main content area shows a list of configuration items:

Show only scanned devices	No
Refrigeration	
Dewpoint method	Calc Dewpt
Humidity sensor to use	
Number of racks/packs	1
Pack 1	AK-PC782A-018x 080Z0192
No of suction groups	2

c. Configuration → Control → Refrigeration → Rack/pack

Insert the number of circuits (loads) per each suction level

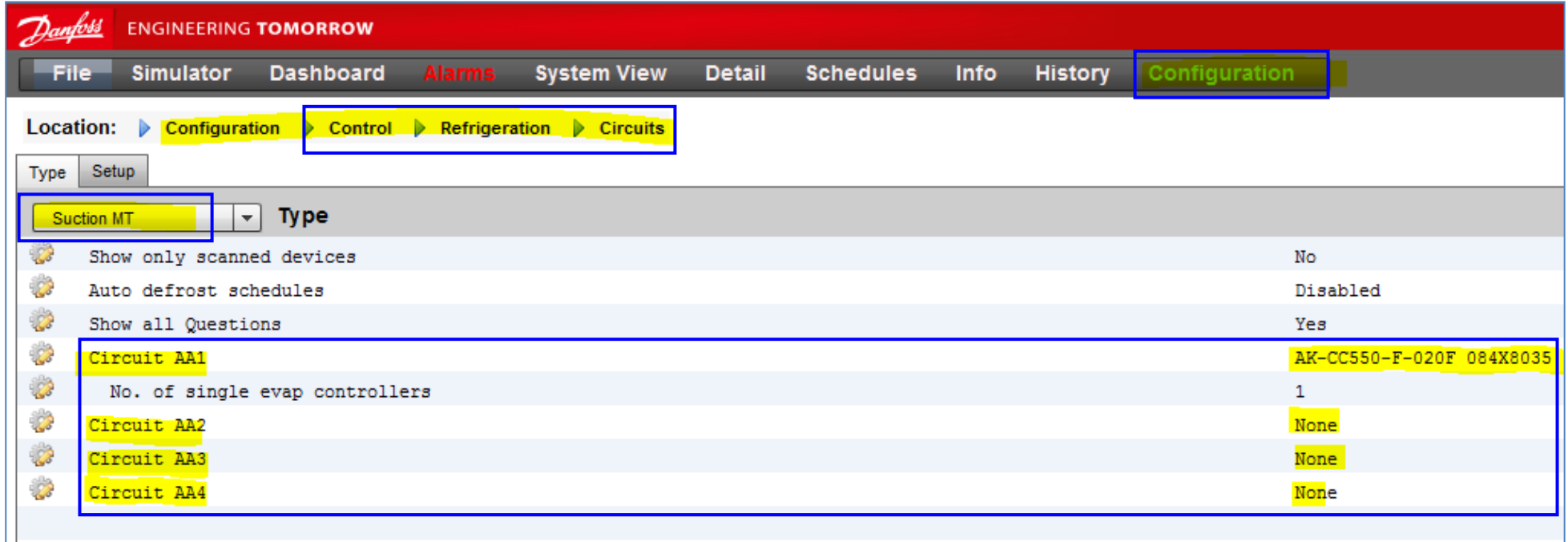


The screenshot shows the Danfoss Engineering Tomorrow software interface. The navigation menu includes File, Simulator, Dashboard, Alarms, System View, Detail, Schedules, Info, History, and Configuration. The Configuration menu is expanded to show Location: Configuration > Control > Refrigeration. The Rack / pack menu is also expanded to show Suction, Circuits, Condenser, Drives, Rail Heat, CompView, Addresses, and Schedules. The Rack / pack configuration table is displayed below.

Pack 1		Rack / pack
Name		Pack 1
Suction Name		Suction MT
Number of circuits	4	
Number of drives	0	
No of CoreSense Modules	0	
Suction Name		Suction LT
Number of circuits	2	
Number of drives	0	
No of CoreSense Modules	0	

d. Configuration → Control → Refrigeration → Circuits

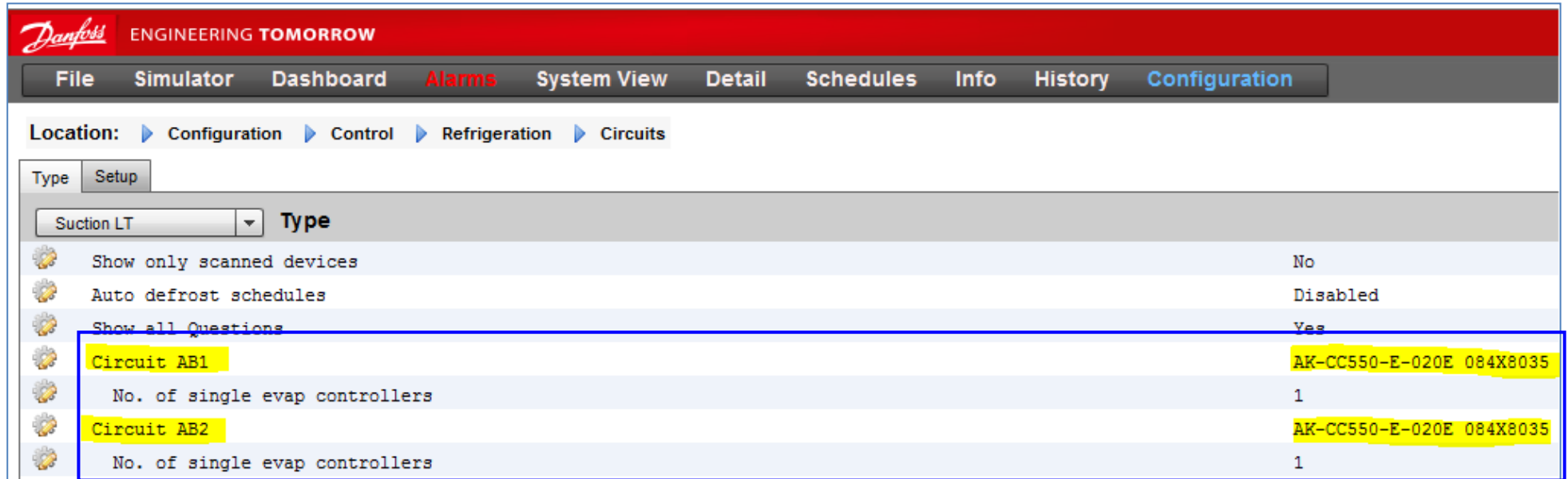
Associate the kind of controller for each circuit (=load). Double click on “None” and choose the controller from list



The screenshot shows the Danfoss Engineering Tomorrow software interface. The navigation menu includes File, Simulator, Dashboard, Alarms, System View, Detail, Schedules, Info, History, and Configuration. The Configuration menu is expanded to show the path: Configuration > Control > Refrigeration > Circuits. Below the navigation, there are tabs for Type and Setup. A dropdown menu is set to 'Suction MT'. The main area displays a table of circuit configurations:

Type	Value
Show only scanned devices	No
Auto defrost schedules	Disabled
Show all Questions	Yes
Circuit AA1	AK-CC550-F-020F 084X8035
No. of single evap controllers	1
Circuit AA2	None
Circuit AA3	None
Circuit AA4	None

Repeat it for Suction LT



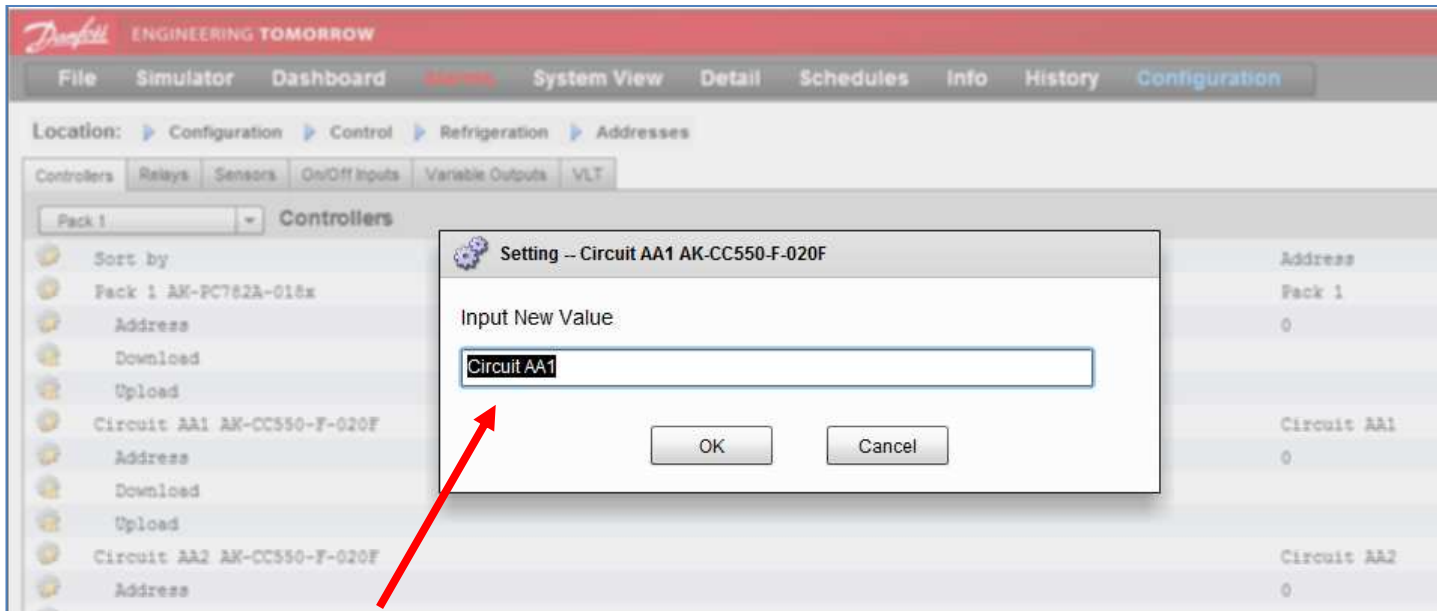
The screenshot shows the Danfoss Engineering Tomorrow software interface. The navigation menu includes 'File', 'Simulator', 'Dashboard', 'Alarms', 'System View', 'Detail', 'Schedules', 'Info', 'History', and 'Configuration'. The 'Configuration' menu is expanded to show 'Location: Configuration > Control > Refrigeration > Circuits'. The 'Type' dropdown is set to 'Suction LT'. The table below shows the configuration for 'Suction LT'.

Type	Setup
Show only scanned devices	No
Auto defrost schedules	Disabled
Show all Questions	Yes
Circuit AB1	AK-CC550-E-020E 084X8035
No. of single evap controllers	1
Circuit AB2	AK-CC550-E-020E 084X8035
No. of single evap controllers	1

e. Configuration → Control → Refrigeration → Addresses → Controllers

Associate name and address for each circuit (=load) AND associate the address for the Pack.

- For name: double click on “Circuit AA1 AK-CC550-x-xxxx”
- For addresses: double click on “0”



6. FTE COMMISSIONING IN FIELD

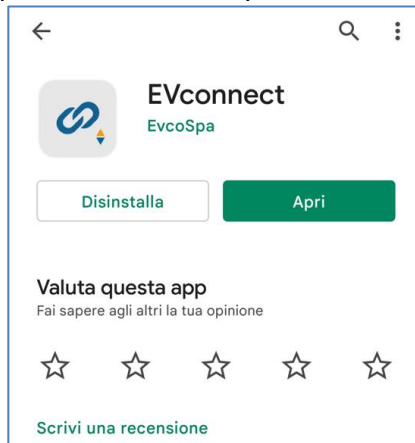
This part must be done in field with the FTE mechanically excluded (by-passed) from the system and empty (void):

1. Verify the Danfoss pack controller version: 1.8 or higher.
2. In menu “Receiver control” of the pack controller, change the parameter “Min delta P MT” at the value of 3-5 bar instead of 10bar:



3. Verify the status of the system, which specific focus on:
 - a. Verify the oil level inside the oil reservoir;
 - b. Verify the level of the liquid receiver;
 - c. Verify the alarm on the system;
 - d. Verify that the pressure switch for the LT compressor (discharge pressure) is pre-set at 38bar (+ 4,3 °C).
4. Switch ON the FTE2.0 controller.
5. It is possible to change the parameters in EVCO controller from Supervisor and from App.

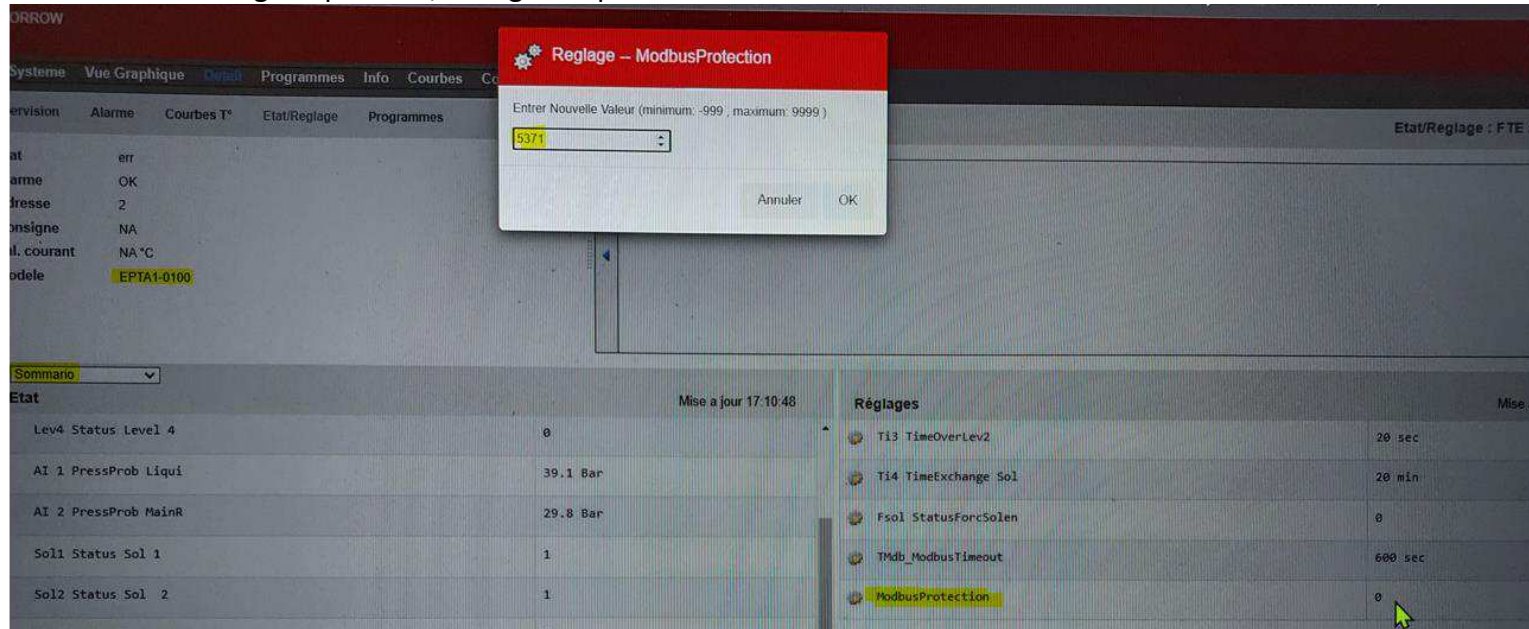
The App is available in Play Store as well as in AppStore:



In case of connection through App, switch on the bluetooth and connect to EVLINK#
Enter with the password: **5371**

FTE2.0 - Commissioning with Danfoss controller

In case of connection through Supervisor, change the parameter **ModbusProtection = 5371**



FTE2.0 - Commissioning with Danfoss controller

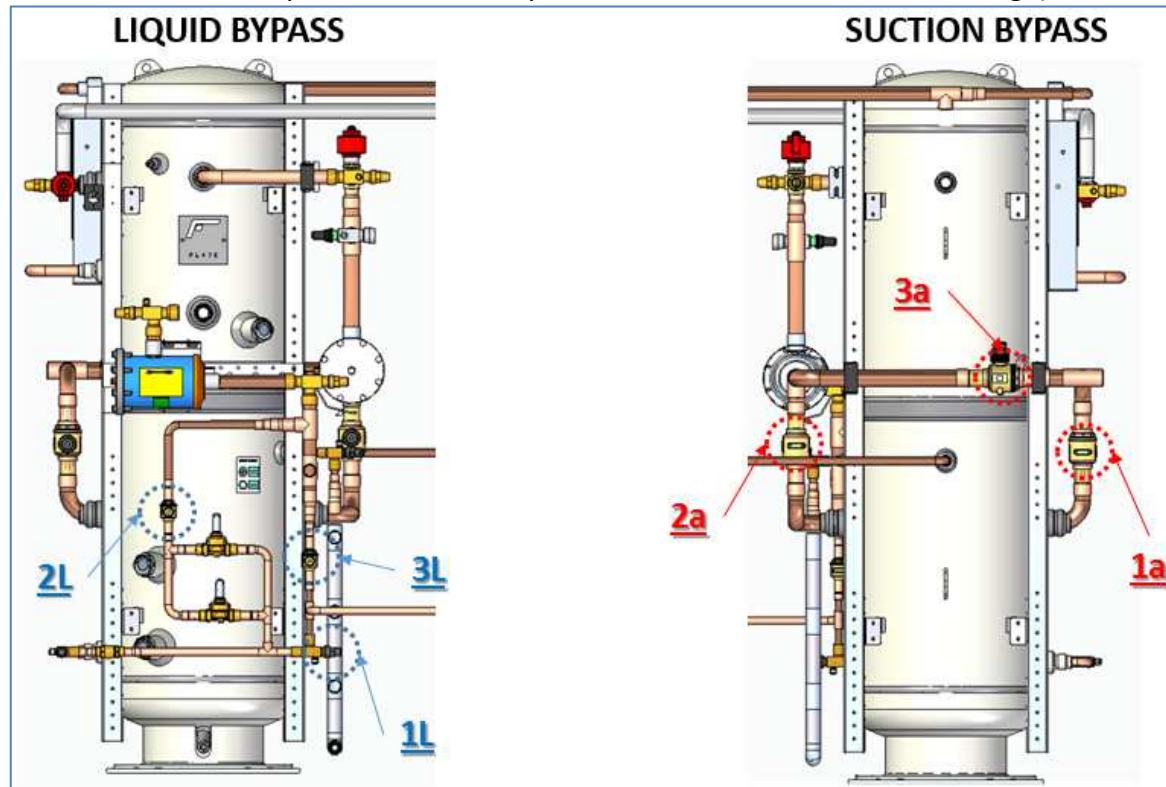
6. Check/Modify the following parameter in App or from Supervisor:
- If present, check if the probe AI2 is enable in the FTE2.0 controller: **A2En = 1**;
 - Enable se advanced function of FTE2.0: **AdEn = 1**;
 - Change the value of **Pday**:
 - = 4015 means infinite contract with EPTA SERVICE;
 - = between 1 and 4014 means the exact number of contract days with EPTA SERVICE;
 - = 0 means no contract with EPTA SERVICE;



7. Put in pressure the receiver proceeding as follow:
- Open valve 1a;
 - Then open valve 2a and at the same time close valve 3a before start the overfeeding;
 - Put in pressure the FTE (only from gas line). Open slowly the valve to avoid dry ice formation;
 - Excite the solenoid valves to break the void also in the liquid line between 2L and the solenoids.

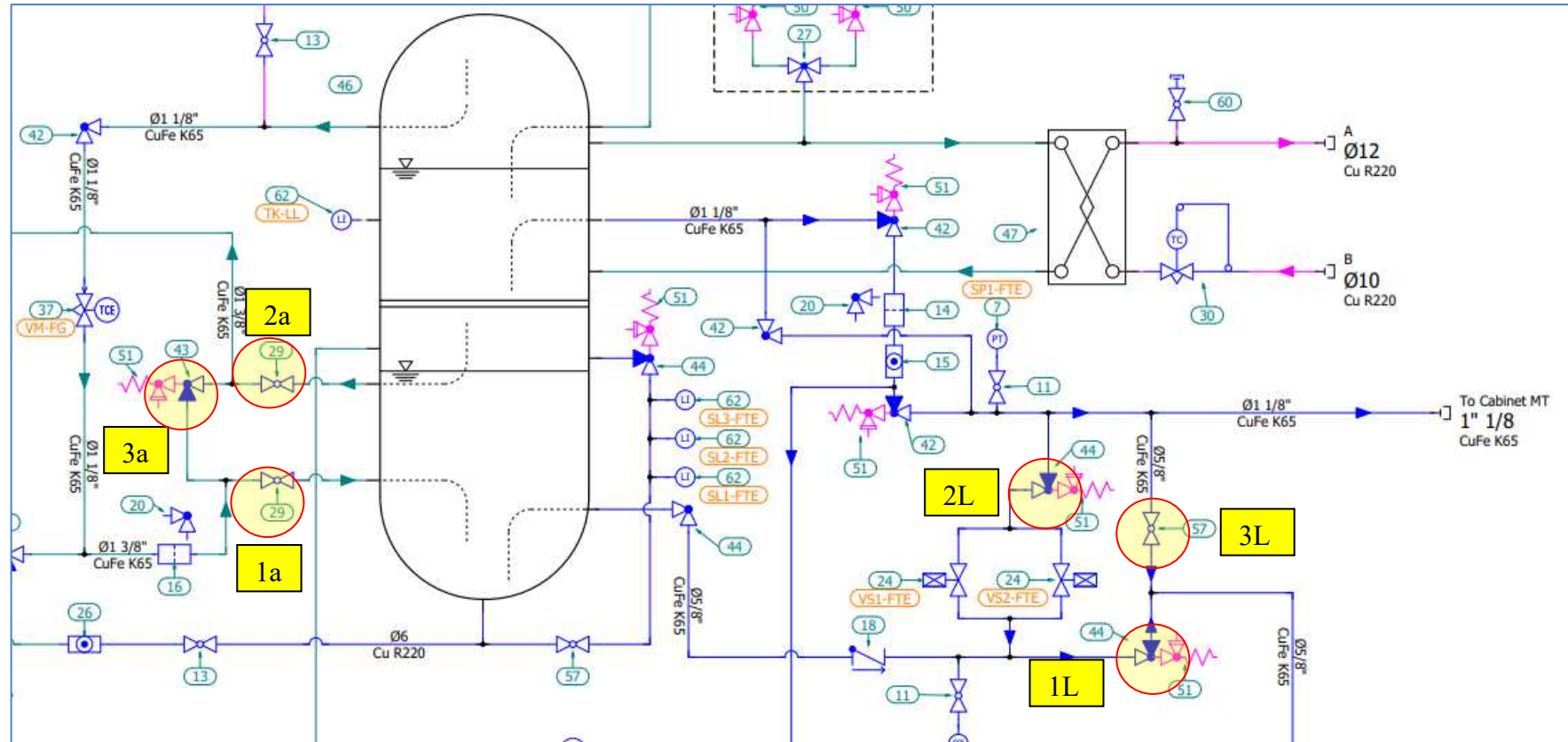
FTE2.0 - Commissioning with Danfoss controller

8. After breaking the void, verify the value of pressure probe to be sure that there are not leakages through the check valves (if installed) or the ball valves (closed position). The value that can be expected is the value of the suction pressure read in the pack main controller (the same pressure level of the suction line shall be expected, if not verify the check-valve of the FTE for leakage);



Layout concept with by-pass for FTE2.0 connection

FTE2.0 - Commissioning with Danfoss controller



Layout concept with by-pass for FTE2.0 connection

FTE2.0 - Commissioning with Danfoss controller

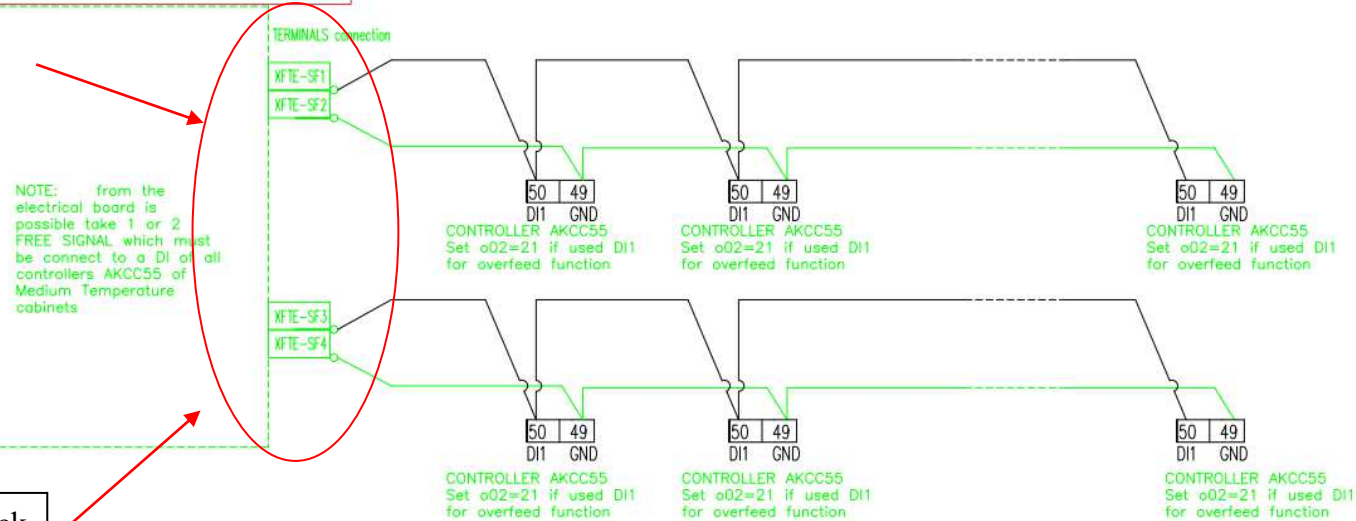
9. Electrically disconnect the solenoids (closed), open valve 2L and verify the value of pressure probe to be sure that there are not leakages through the solenoids (the same pressure level of the suction line shall be expected, if not check the solenoid valves).
10. Open 1L and 2L and then close 3L (not vice versa).
11. Follow the operations from supervisor as explained in next points
 - a. **5. MASTER CONTROL** (page 22) – if FLOOD EVAP is managed with this function and not with DI, otherwise ignore this cap.;
 - b. **6. Po OPTIMIZATION** (page 25);
 - c. **7. SETTING PARAMETERS FOR FLOODED OPERATION MODE IN MT CONTROLERS** (page 27).
12. In case of **FLOOD EVAP WITH DI, CONNECT THE CABLE NOW:**

FTE2.0 - Commissioning with Danfoss controller

CONNECTIONS SIGNAL FROM PACK ELECTRICAL BOARD AND CONTROLLERS OF MEDIUM CABINETS TEMPERATURE CABINETS FOR MANAGING OF OVERFEED FUNCTION

Note: For Digital Input DI of controllers, in general pay attention IF THE SIGNAL IS TO BE RECEIVED BY SEVERAL CONTROLLERS IT IS IMPORTANT THAT ALL CONNECTIONS ARE MOUNTED THE SAME WAY (DI to DI and GND to GND)

FTE ELECTRICAL BOARD











Check the switch in the pack or FTE electrical board.

ABOUT CONTROLLER AKCC55:
Set o02=21 if used DI1 (50-49)
Set o37=21 if used DI2 (61-60)

Change of superheat with Digital Input

FTE2.0 - Commissioning with Danfoss controller

13. For each MT loads (cabinet and cold rooms) change the parameter MOP (maximum operating pressure) threshold to +1°C (Injection Control menu):

Status		Updated: 11:23:08	Settings	
--- Ctrl State		(s11) Stopped	 r12 Main Switch	1-Start
u17 Ther Air	0.8 °C		 o30 Refrigerant	28 - R744
u12 S3 Air Temp	1.7 °C		 o20 Min Trans Pres	-1.0 Bar
u16 S4 Air Temp	0.8 °C		 o21 Max Trans Pres	34.0 Bar
--- AKV OD %	0 %		 n10 Min SH	6.0 K
u26 Evap Temp Te	-4.5 °C		 n09 Max SH	10.0 K
u20 S2 Temp	-3.5 °C		 n11 MOP Temp	1.0 °C
u09 S5 Temp	-0.1 °C		 n13 AKV Period	6 sec

14. Gradually charge the system with additional refrigerant:

- a. Wait the low liquid sensor or the sight glass of the receiver highlight the fact that there is no liquid;
- b. Start to add refrigerant: start with 10kg each 10 minutes (for the max of one cylinder);
- c. Wait 30 minutes and check the status of the FTE liquid sensor:
 - i. If MLL is activated, stop adding refrigerant;
 - ii. Otherwise check the LLL on the receiver: if refrigerant is missing, adds more refrigerant.

Repeat the procedure until this equilibrium is obtained: the receiver doesn't show low liquid alarm and the level of liquid is between 30% and 50%.

As general rules it must be expected an additional refrigerant charge between 30% and 50% of the volume of the FTE.

FTE2.0 - Commissioning with Danfoss controller

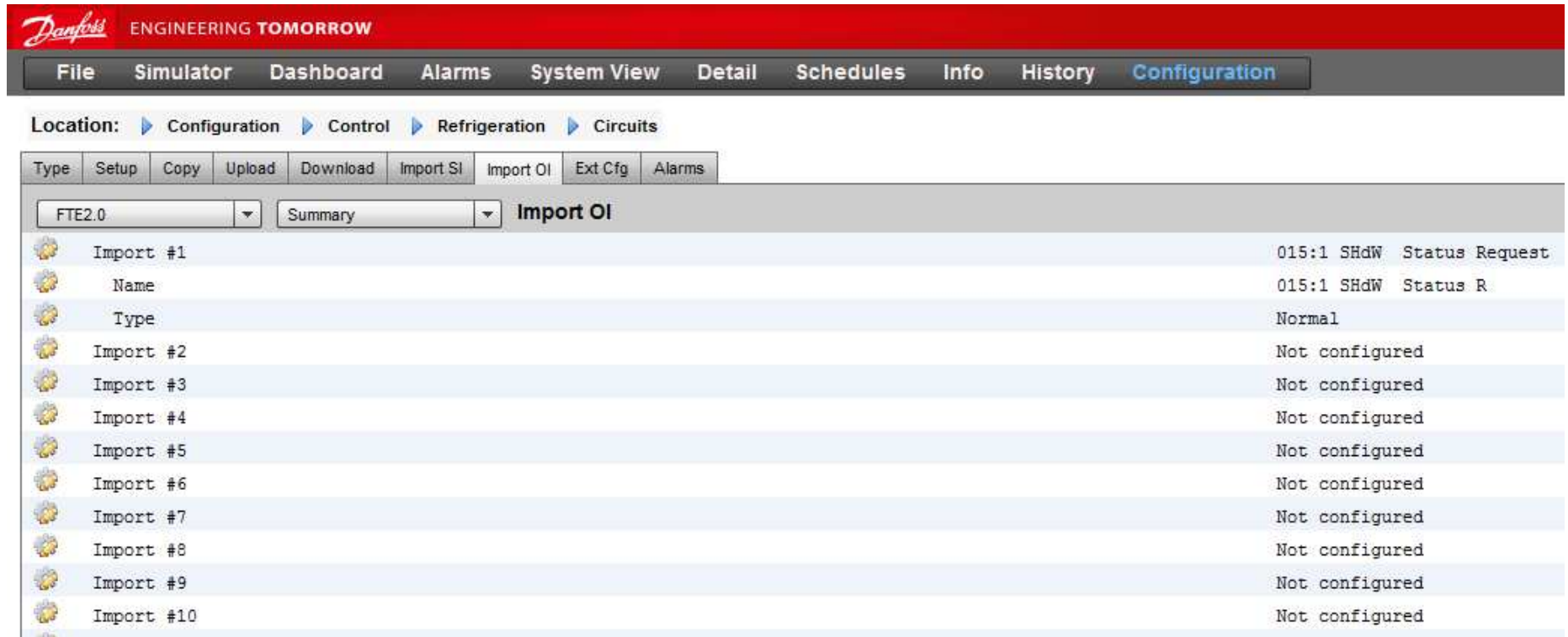
15. With the FTE activated and running:

- Increase the main liquid receiver pressure set-point to 36bar (or up to 37bar if receiver pressure is smooth and stable);
- Schedule of the defrost must be done taking into account the MT and LT loads:
 - LT defrost must not be scheduled after a MT defrost;
- Increase the liquid injection set-point (AKV intervention) values from 20K to 30K;
- Reduce the parameter of the hot gas injection (suggested value: 5K with 3K differential);
- Check the oil level in the reservoir and eventually add oil to the system if missing. It is suggested to verify the status of the oil reservoir after one week.

7. MASTER CONTROL

The MT loads can switch in “Flooded Operation Mode” thanks to the implementation of that schedule

- a. Configure the OI for the Master Control function. The input is the request of decrease the SH from FTE2.0 controller:



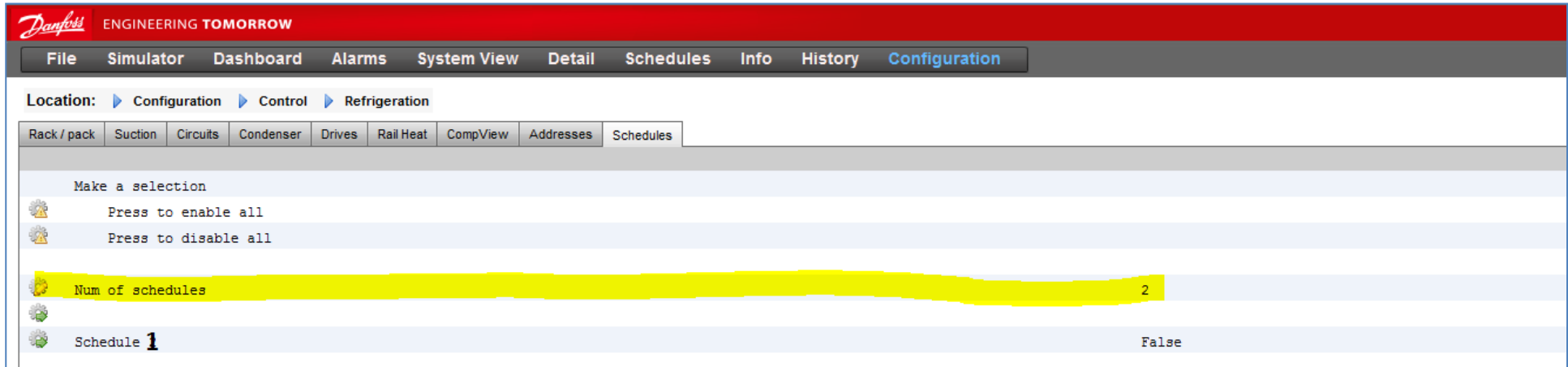
Location: Configuration Control Refrigeration Circuits

Type Setup Copy Upload Download Import SI Import OI Ext Cfg Alarms

FTE2.0 Summary Import OI

Import #	Configuration
Import #1	015:1 SHdW Status Request
Name	015:1 SHdW Status R
Type	Normal
Import #2	Not configured
Import #3	Not configured
Import #4	Not configured
Import #5	Not configured
Import #6	Not configured
Import #7	Not configured
Import #8	Not configured
Import #9	Not configured
Import #10	Not configured

- b. Add + 1 schedule (to the already existing number), as following:
Configuration → Control → Refrigeration → Schedules



ENGINEERING TOMORROW

File Simulator Dashboard Alarms System View Detail Schedules Info History Configuration

Location: Configuration Control Refrigeration

Rack / pack Suction Circuits Condenser Drives Rail Heat CompView Addresses Schedules

Make a selection

Press to enable all

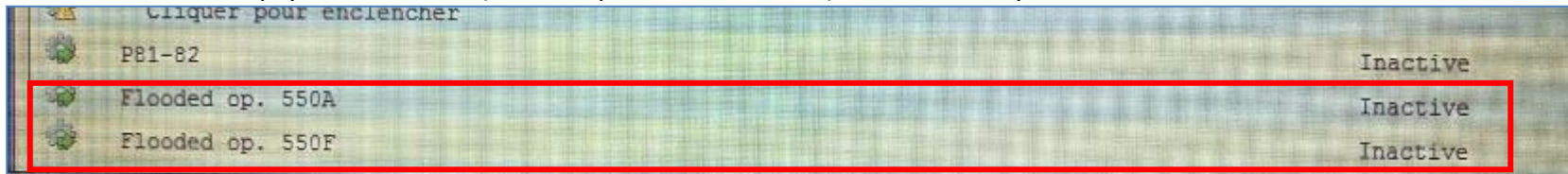
Press to disable all

Num of schedules 2

Schedule 1 False

The new schedule to configure will appear, as highlighted.

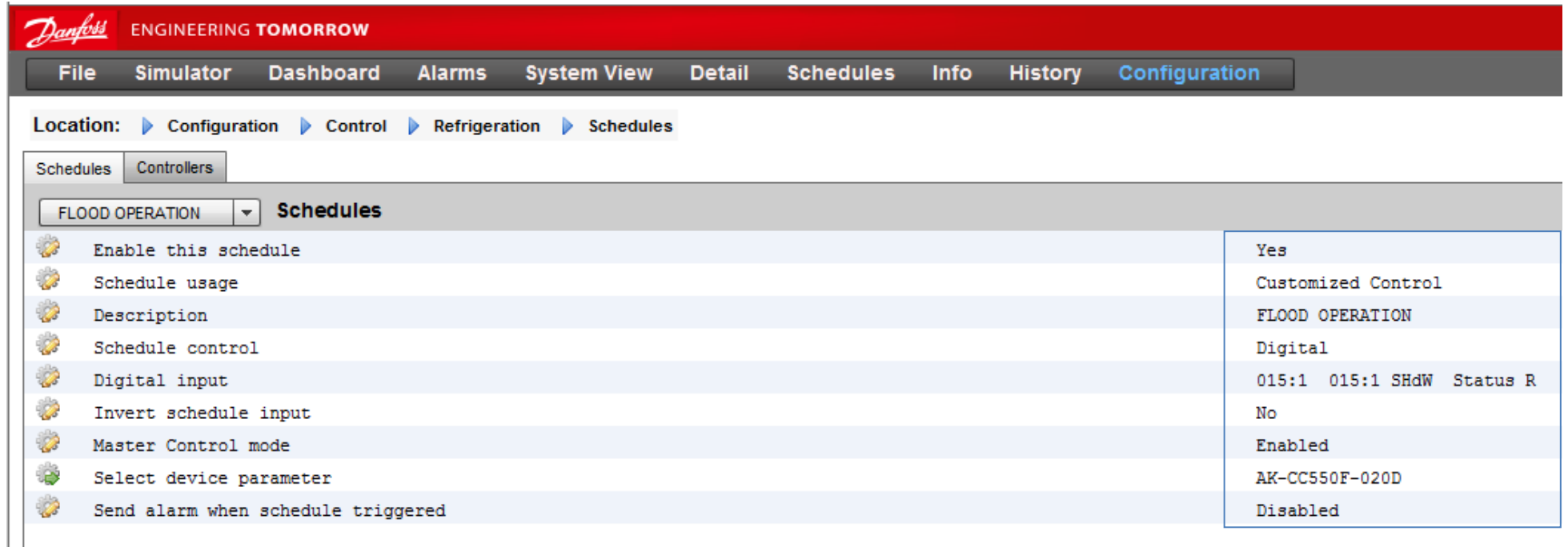
In case of different tipsy of controllers (for example 550A and 550F) it is mandatory schedules different rules:



Cliquer pour enclencher

PB1-82	Inactive
Floded op. 550A	Inactive
Floded op. 550F	Inactive

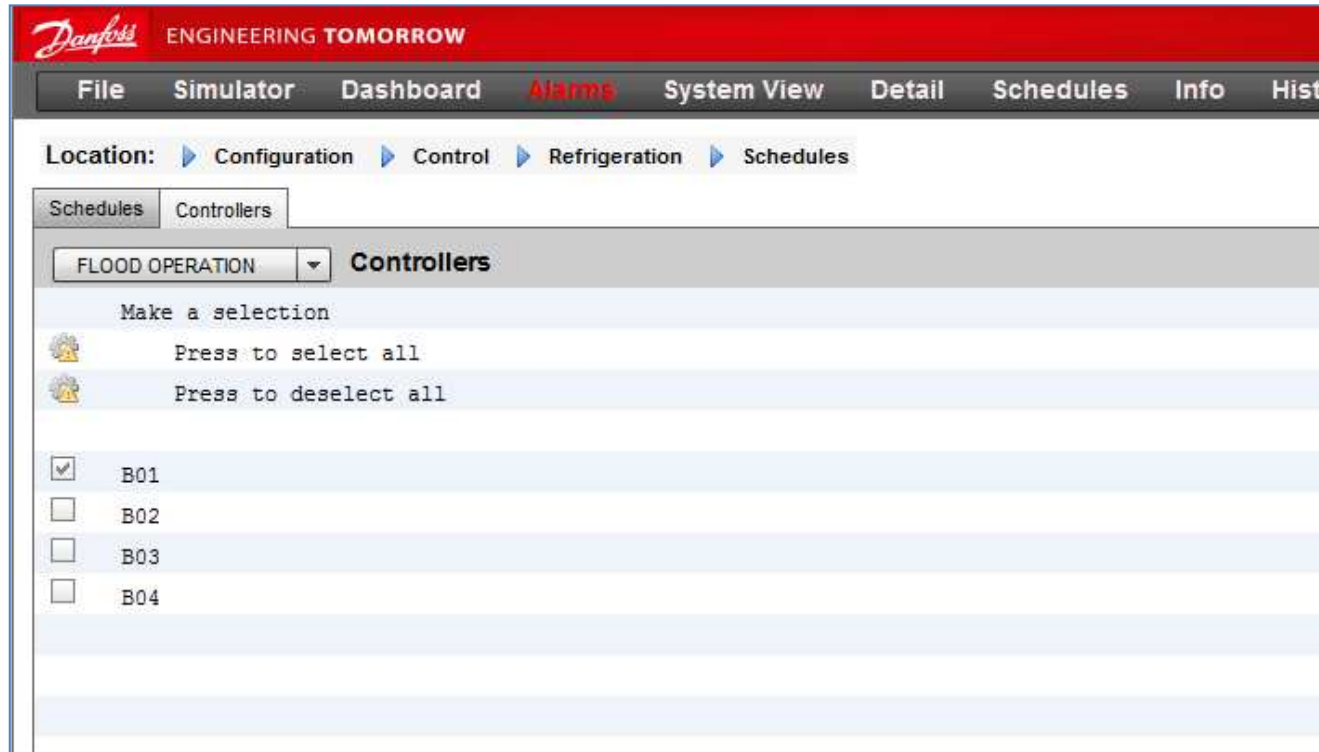
c. Click on new schedule created and choose the values as following from the list menu:



The screenshot shows the Danfoss Engineering Tomorrow software interface. The top navigation bar includes 'File', 'Simulator', 'Dashboard', 'Alarms', 'System View', 'Detail', 'Schedules', 'Info', 'History', and 'Configuration'. The breadcrumb trail is 'Location: Configuration > Control > Refrigeration > Schedules'. The 'Schedules' tab is active, and a dropdown menu is open for 'FLOOD OPERATION'. The configuration table is as follows:

Parameter	Value
Enable this schedule	Yes
Schedule usage	Customized Control
Description	FLOOD OPERATION
Schedule control	Digital
Digital input	015:1 015:1 SHdW Status R
Invert schedule input	No
Master Control mode	Enabled
Select device parameter	AK-CC550F-020D
Send alarm when schedule triggered	Disabled

d. Flag the controllers of MT cabinets and coldrooms:

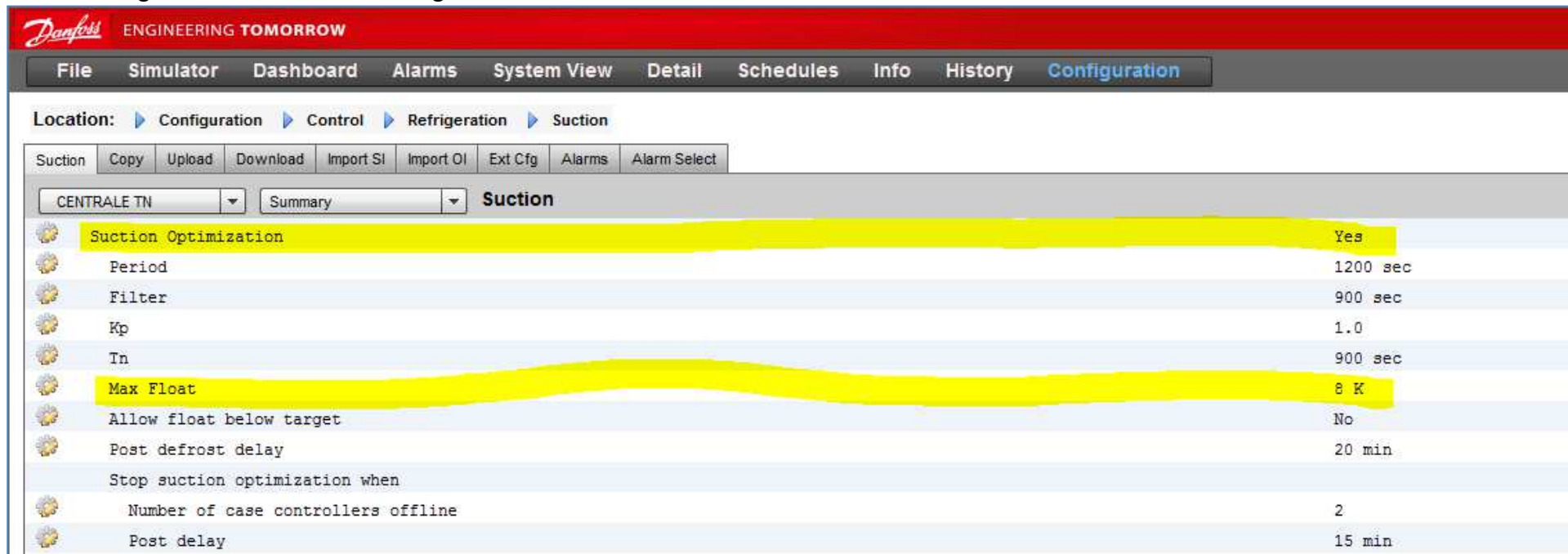


8. Po OPTIMIZATION

The following instructions permits to enable the floating suction.

- a. In the menu below change the parameters highlighted:

Configuration → Control → Refrigeration → Suction



The screenshot shows the Danfoss Engineering Tomorrow web interface. The navigation menu includes File, Simulator, Dashboard, Alarms, System View, Detail, Schedules, Info, History, and Configuration. The breadcrumb trail is Location: Configuration > Control > Refrigeration > Suction. The page title is 'Suction' and the location is 'CENTRALE TN'. The configuration table is as follows:

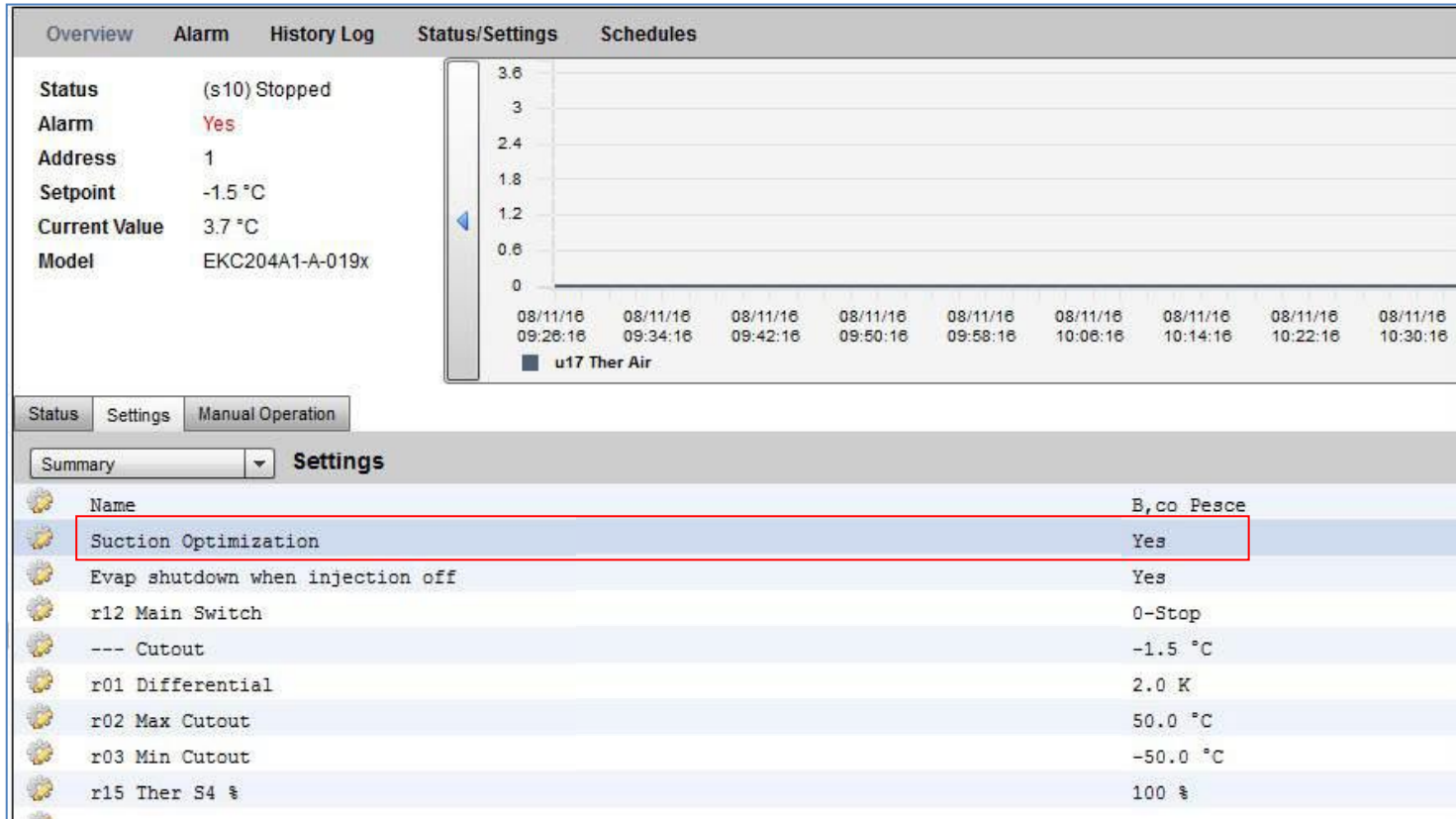
Parameter	Value
Suction Optimization	Yes
Period	1200 sec
Filter	900 sec
Kp	1.0
Tn	900 sec
Max Float	8 K
Allow float below target	No
Post defrost delay	20 min
Stop suction optimization when	
Number of case controllers offline	2
Post delay	15 min

“Max Float” indicates the interval on which the suction floats acts.

FTE2.0 - Commissioning with Danfoss controller

- b. All the controllers linked to the pack, with suction float activated, will be automatically configured for Po Optimization. If it is necessary, it is possible to exclude some controllers by this function.

In tab “Settings” of the menu of controller, set “No” from the menu list for the function “Suction Optimization”.



The screenshot shows the controller's interface with the following details:

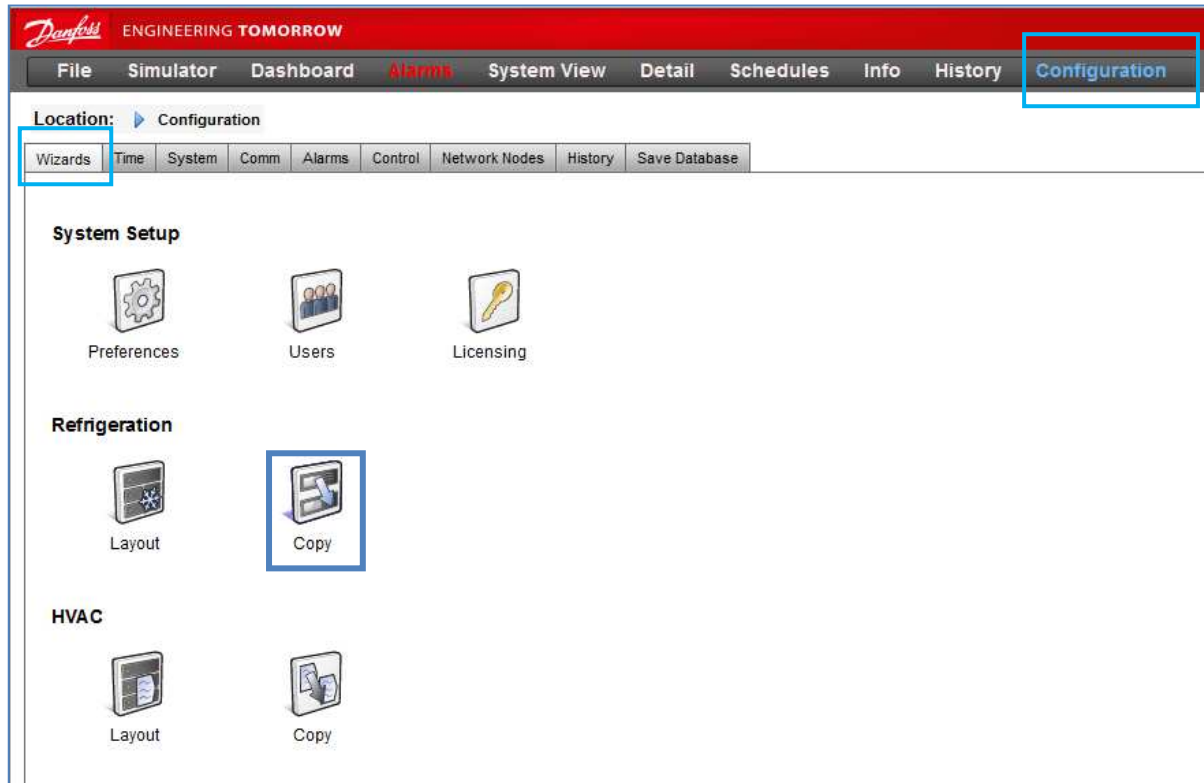
- Overview:** Status (s10) Stopped, Alarm Yes, Address 1, Setpoint -1.5 °C, Current Value 3.7 °C, Model EKC204A1-A-019x.
- Graph:** A line graph showing temperature over time for 'u17 Ther Air'.
- Settings Table:**

Name	Value
Suction Optimization	Yes
Evap shutdown when injection off	Yes
r12 Main Switch	0-Stop
--- Cutout	-1.5 °C
r01 Differential	2.0 K
r02 Max Cutout	50.0 °C
r03 Min Cutout	-50.0 °C
r15 Ther S4	100 %

9. SETTING PARAMETERS FOR FLOODED OPERATION MODE IN MT CONTROLLERS 550

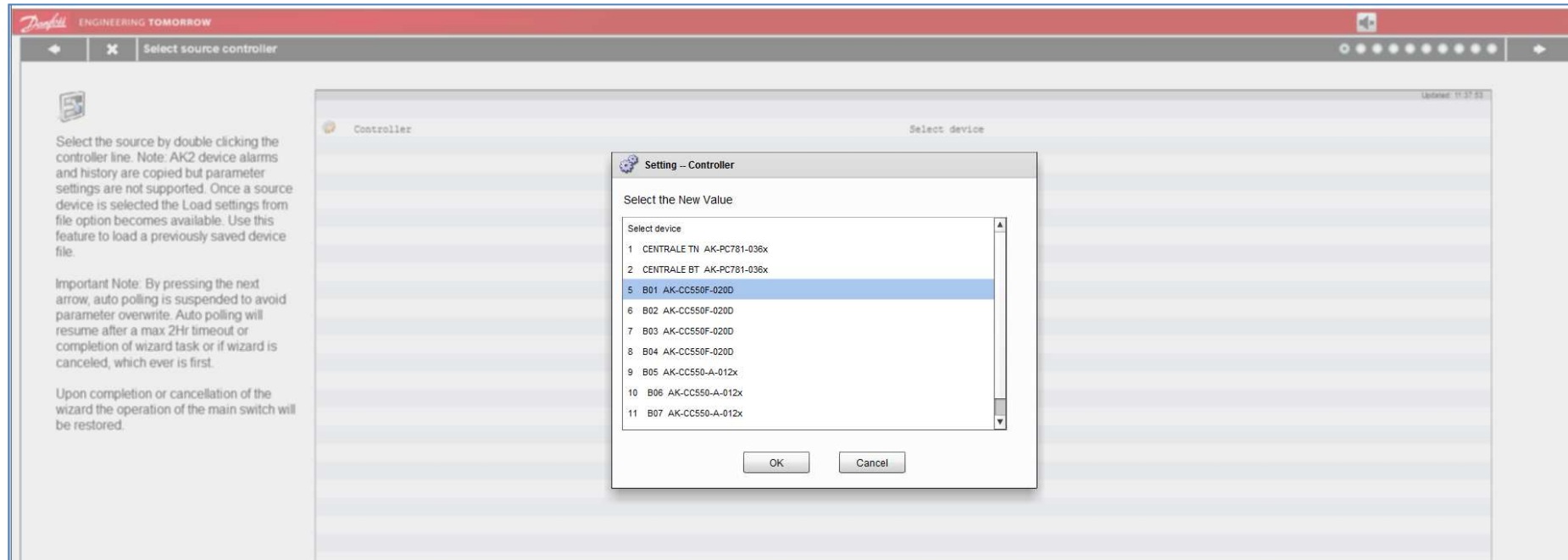
a. It is possible copy the parameters from one controller to the whole group of MT controller:

Configuration → Wizards → Copy



FTE2.0 - Commissioning with Danfoss controller

b. Click on “Controller” and select one of the MT controllers



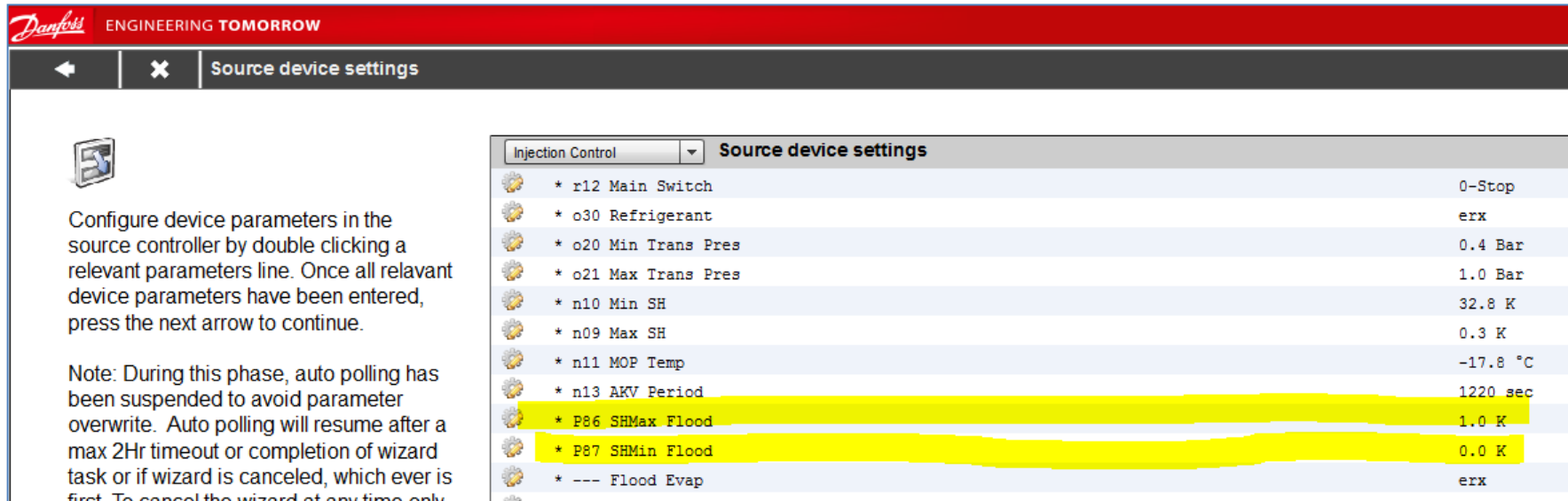
FTE2.0 - Commissioning with Danfoss controller

c. The controller has been selected. Go on until the screen below:



FTE2.0 - Commissioning with Danfoss controller

- d. Modify the following 5 parameters.
 - i. From "Injection Control" menu: change the values of P86 and P87 parameters



Danfoss ENGINEERING TOMORROW

← × Source device settings

Injection Control Source device settings

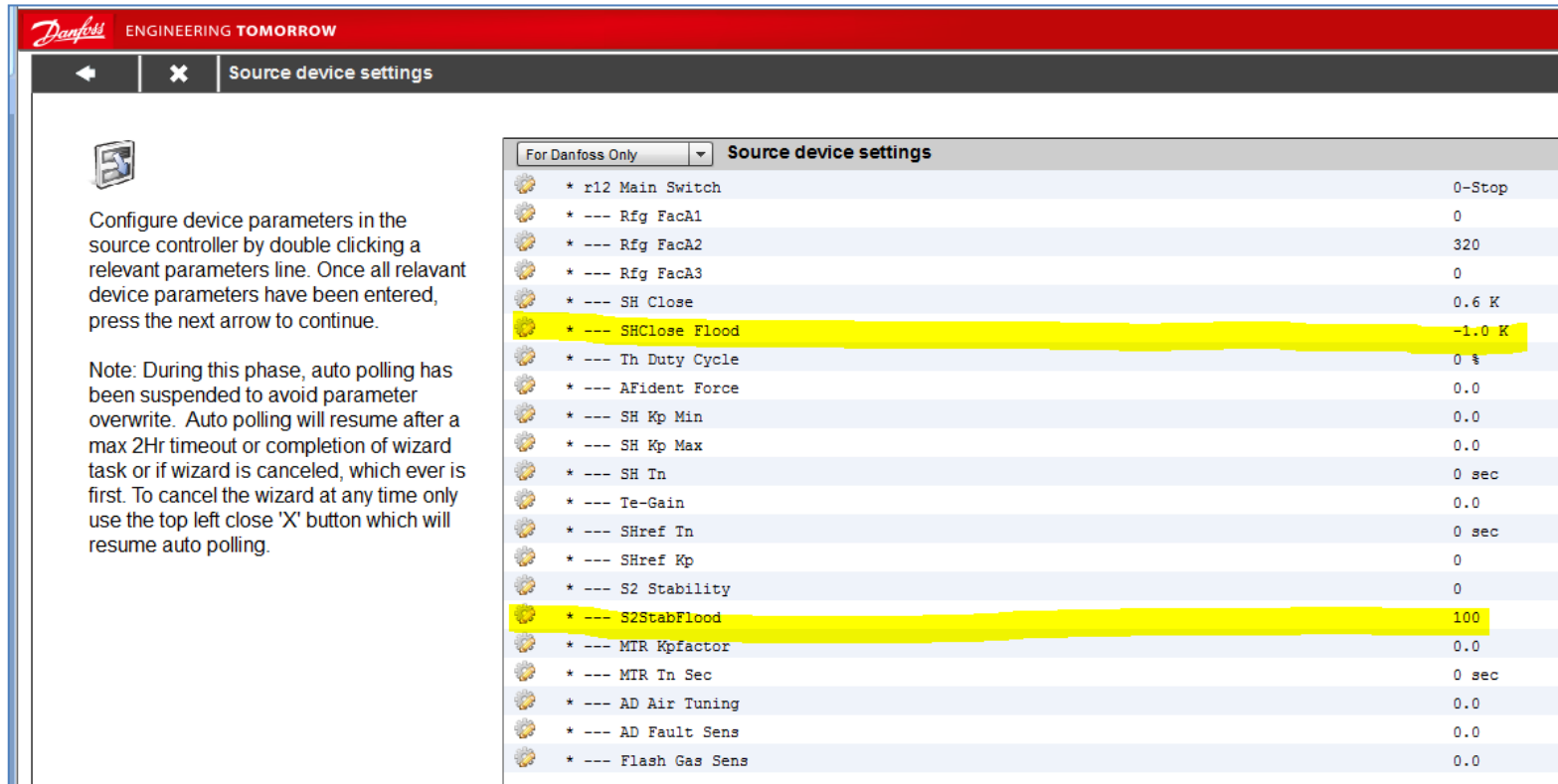
* r12 Main Switch	0-Stop
* o30 Refrigerant	erx
* o20 Min Trans Pres	0.4 Bar
* o21 Max Trans Pres	1.0 Bar
* n10 Min SH	32.8 K
* n09 Max SH	0.3 K
* n11 MOP Temp	-17.8 °C
* n13 AKV Period	1220 sec
* P86 SHMax Flood	1.0 K
* P87 SHMin Flood	0.0 K
* --- Flood Evap	erx

Configure device parameters in the source controller by double clicking a relevant parameters line. Once all relevant device parameters have been entered, press the next arrow to continue.

Note: During this phase, auto polling has been suspended to avoid parameter overwrite. Auto polling will resume after a max 2Hr timeout or completion of wizard task or if wizard is canceled, which ever is first. To cancel the wizard at any time only

FTE2.0 - Commissioning with Danfoss controller

ii. From “For Danfoss Only” menu: change the values of *SHClose Flood* and *S2StabFlood* parameters



Danfoss ENGINEERING TOMORROW

Source device settings

Configure device parameters in the source controller by double clicking a relevant parameters line. Once all relevant device parameters have been entered, press the next arrow to continue.

Note: During this phase, auto polling has been suspended to avoid parameter overwrite. Auto polling will resume after a max 2Hr timeout or completion of wizard task or if wizard is canceled, which ever is first. To cancel the wizard at any time only use the top left close 'X' button which will resume auto polling.


Parameter	Value
* r12 Main Switch	0-Stop
* --- Rfg FacA1	0
* --- Rfg FacA2	320
* --- Rfg FacA3	0
* --- SH Close	0.6 K
* --- SHClose Flood	-1.0 K
* --- Th Duty Cycle	0 %
* --- AFident Force	0.0
* --- SH Kp Min	0.0
* --- SH Kp Max	0.0
* --- SH Tn	0 sec
* --- Te-Gain	0.0
* --- SHref In	0 sec
* --- SHref Kp	0
* --- S2 Stability	0
* --- S2StabFlood	100
* --- MIR Kpfactor	0.0
* --- MIR Tn Sec	0 sec
* --- AD Air Tuning	0.0
* --- AD Fault Sens	0.0
* --- Flash Gas Sens	0.0

FTE2.0 - Commissioning with Danfoss controller

iii. From “Thermostat Control” menu: change the values of *r14 Therm Mode* parameter

ENGINEERING TOMORROW

← ✕ Source device settings



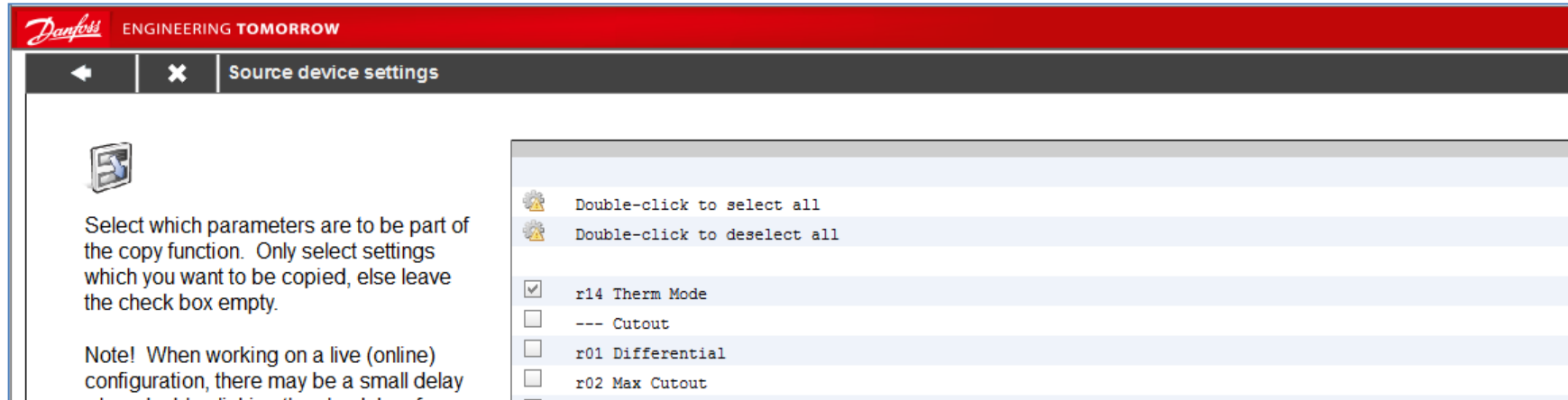
Configure device parameters in the source controller by double clicking a relevant parameters line. Once all relevant device parameters have been entered, press the next arrow to continue.

Note: During this phase, auto polling has been suspended to avoid parameter overwrite. Auto polling will resume after a max 2Hr timeout or completion of wizard task or if wizard is canceled, which ever is first. To cancel the wizard at any time only use the top left close 'X' button which will resume auto polling.

Thermostat Control	Source device settings	
* r12 Main Switch		0-Stop
* r14 Therm Mode		Modulating
* --- Cutout		-3.0 °C
* r01 Differential		2.0 K
* r02 Max Cutout		-1.0 °C
* r03 Min Cutout		-4.0 °C
* r15 Ther S4 %		100 %
* --- Night Setbck		Off
* r13 Night Offset		0.0 K
* --- Forced Cool		Off
* r21 Cutout2 Temp		2.0 °C
* o17 Disp S4 %		100 %
* r04 Disp Adj K		0.0 K
* r16 Melt Interval		0 hr
* r17 Melt Period		0 min
* r61 Ther S4% Ngt		30 %

FTE2.0 - Commissioning with Danfoss controller

e. Go on until the screen below. Flag the parameters just modified:



Danfoss ENGINEERING TOMORROW

← × Source device settings

Select which parameters are to be part of the copy function. Only select settings which you want to be copied, else leave the check box empty.

Note! When working on a live (online) configuration, there may be a small delay

- Double-click to select all
- Double-click to deselect all
- r14 Therm Mode
- Cutout
- r01 Differential
- r02 Max Cutout



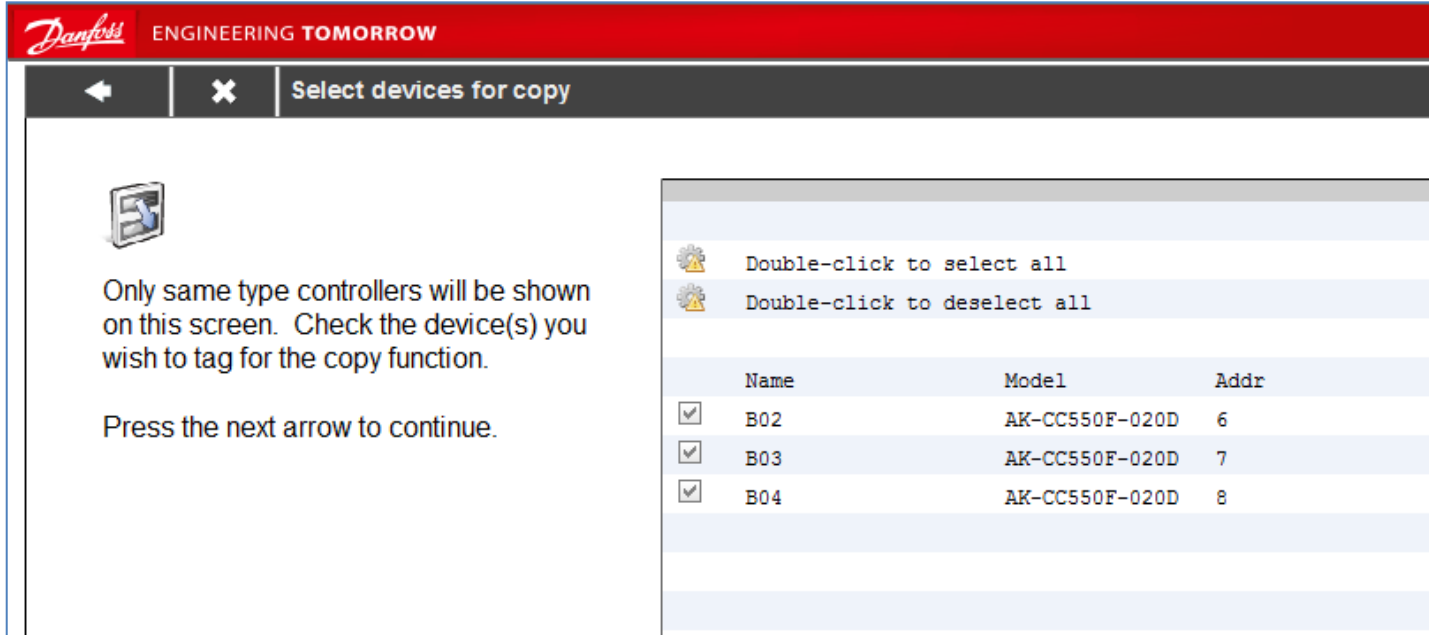
- n13 AKV Period
- P86 SHMax Flood
- P87 SHMin Flood
- Flood Evap
- Forced Close

FTE2.0 - Commissioning with Danfoss controller

Press the next arrow to continue.

- SH Close
- SHClose Flood
- Th Duty Cycle
- AFident Force
- SH Kp Min
- SH Kp Max
- SH In
- Te-Gain
- SHref In
- SHref Kp
- S2 Stability
- S2StabFlood
- MTR Kpfactor
-

- f. Go on. Flag the controllers on which the parameters of flooded operation mode have to be copied:



ENGINEERING TOMORROW

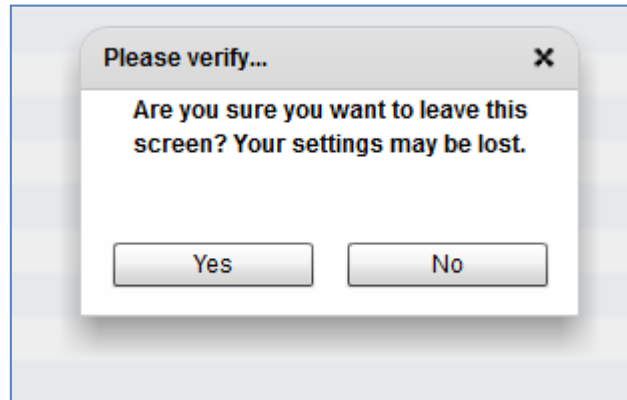
Select devices for copy

Only same type controllers will be shown on this screen. Check the device(s) you wish to tag for the copy function.

Press the next arrow to continue.

	Name	Model	Addr
<input checked="" type="checkbox"/>	B02	AK-CC550F-020D	6
<input checked="" type="checkbox"/>	B03	AK-CC550F-020D	7
<input checked="" type="checkbox"/>	B04	AK-CC550F-020D	8

g. To complete the action, click “Finish” and then “Yes”.



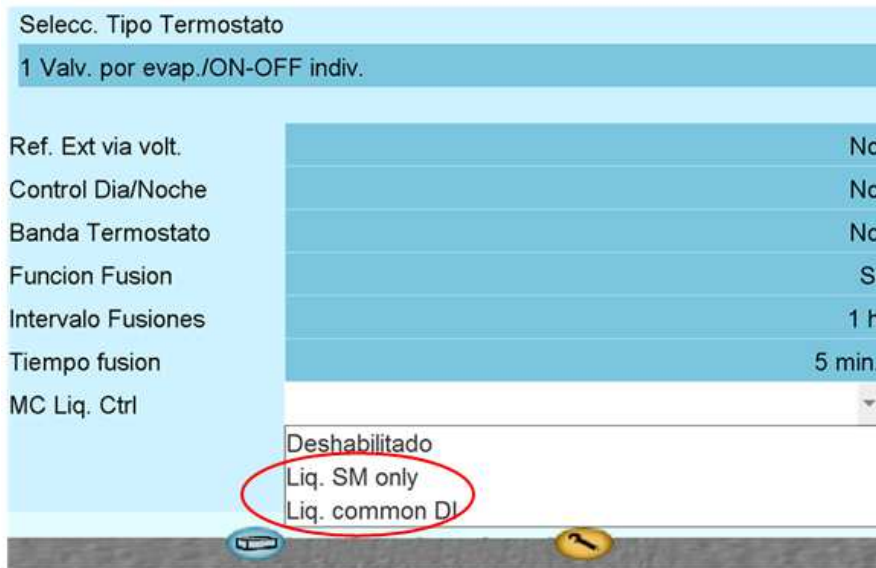
10. SETTING PARAMETERS FOR FLOODED OPERATION MODE IN MT CONTROLLERS 750

With these controllers is NOT possible to use the wizard function of 850.

It is mandatory change the Flood Evap parameters through the Service Tool, connected at each single controller.

Enter in setting and common thermostat

Select in MC Liq. Ctrl.



Selec. Tipo Termostato

1 Valv. por evap./ON-OFF indiv.

Ref. Ext via volt.	No
Control Dia/Noche	No
Banda Termostato	No
Funcion Fusion	Si
Intervalo Fusiones	1 h
Tiempo fusion	5 min.

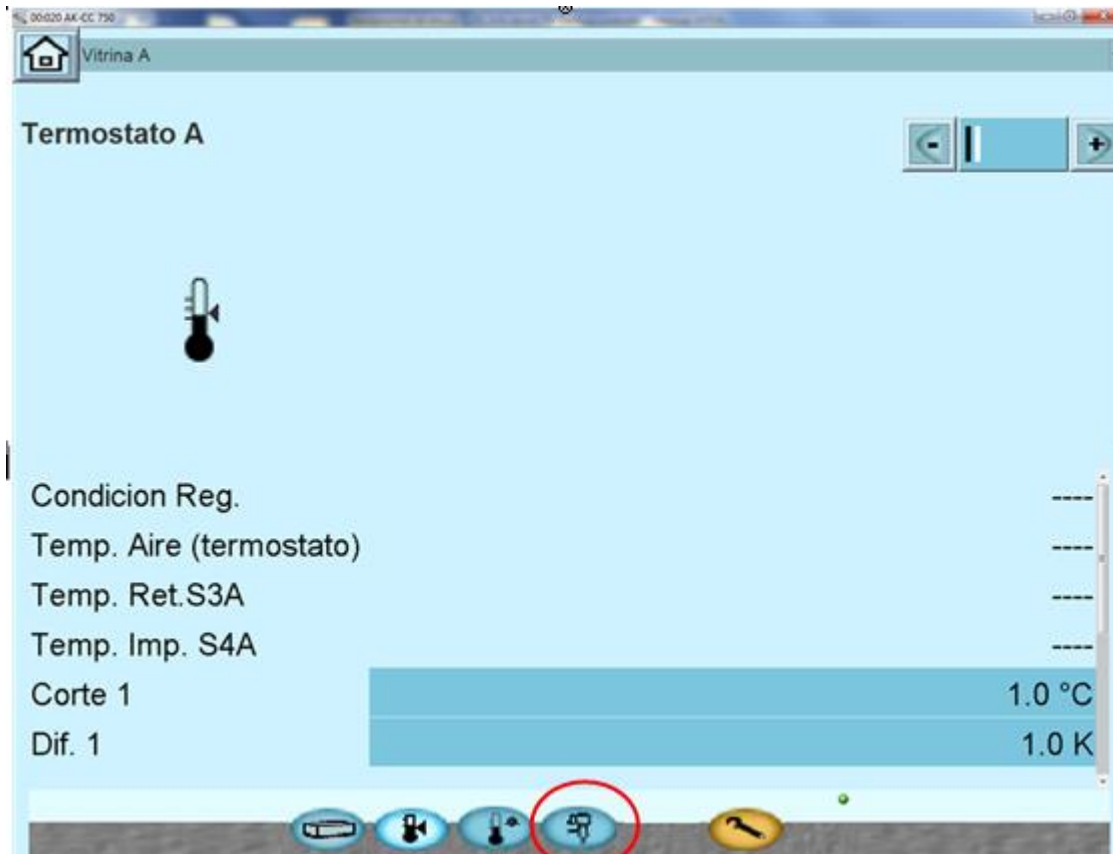
MC Liq. Ctrl

- Deshabilitado
- Liq. SM only
- Liq. common DI

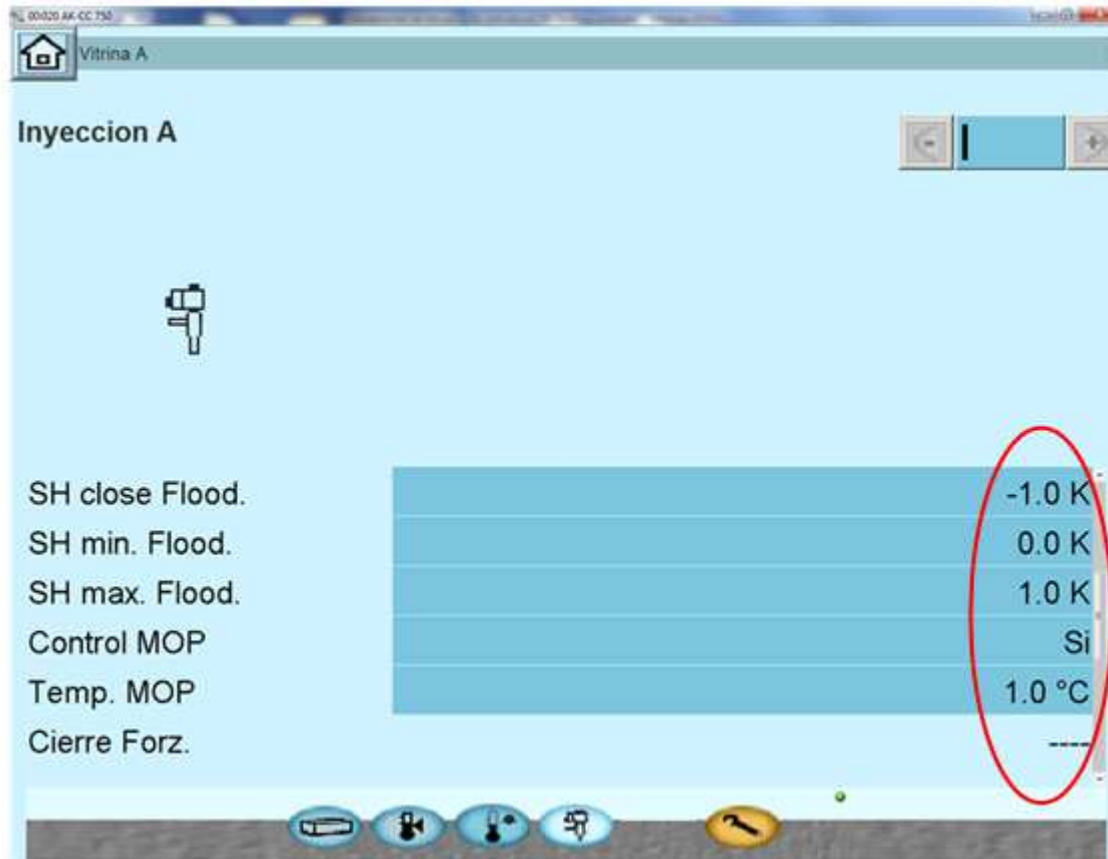
- If you select “SM only” you can control flood evap only through System Manager
- If you select “Liq. Common DI” you can control flood evap through wire to Digital Input



FTE2.0 - Commissioning with Danfoss controller



FTE2.0 - Commissioning with Danfoss controller



And you must do it in all evaporators (B and C).

11. CHANGE PARAMETER IN THE CONTROLLER



Config: Receiver control	
Receiver control	1 Stepper
Vrec min. OD	10 %
Vrec max. OD	100 %
Show Trec on overview	No
Prec setpoint	37.00 bar
Trec setpoint	3.4 °C
Kp	10.0
Tn	90 s
Prec min.	32.00 bar
Trec min.	-1.9 °C
Prec max.	42.00 bar
Prec min limit P-band	1.00 bar
Prec max limit P-band	1.00 bar
Monitor liquid level	None
Use hot gas dump	No
Show advanced settings	Yes

Decrease the value of *Prec max.* to 40 bar instead of the 42 bar.

In case of error, try also to decrease the set point (*Prec setpoint*) to 36 instead of 37.

Attention, decrease gradually the value of *Prec max.*

12. VERIFY THE PARAMETERS OF OIL MANAGEMENT

The parameters of oil management must be updated to fit with new running pressure on MT.

Refrigeration

- 1C/3C Booster
 - Condenser A
 - HP control
 - Receiver control
 - Heat reclaim
 - 1C BOOSTER POS
 - 3C BOOSTER NEG
 - 1C/3C Backup

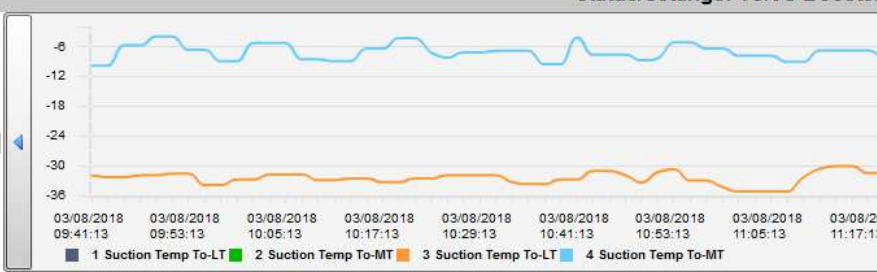
Overview Alarm History Log Status/Settings Schedules			
Name	Alarm	Value	Status
1C BOOSTER POS	OK	-8.9 °C	Normal Ctrl
3C BOOSTER NEG	OK	-32.8 °C	Normal Ctrl
Heat reclaim	OK	32.3 °C	Idle
Condenser A	OK	31.7 °C	Running
HP control	OK	78.6 Bar	Cop Max
Receiver control	OK	37.5 Bar	Normal

Pressure switch: ▼ Summary ▼

Status		Updated: 11:45:00
Th1 Actual Temp	8.2 K	
Th1 Actual State	OFF	
Th2 Actual Temp	-11.3 °C	
Th2 Actual State	OFF	
Th3 Actual Temp	33.2 °C	
Th3 Actual State	OFF	

Settings	
Pressostat Name 1	SP-OR oil receiver -SP
P1 Cut In Pressure	33.0 Bar
P1 Cut Out Pressure	37.0 Bar
P1 High Alarm Delay	5 min
P1 High Alarm Limit	45.0 Bar
P1 Low Alarm Delay	5 min
P1 Low Alarm Limit	-2.0 Bar

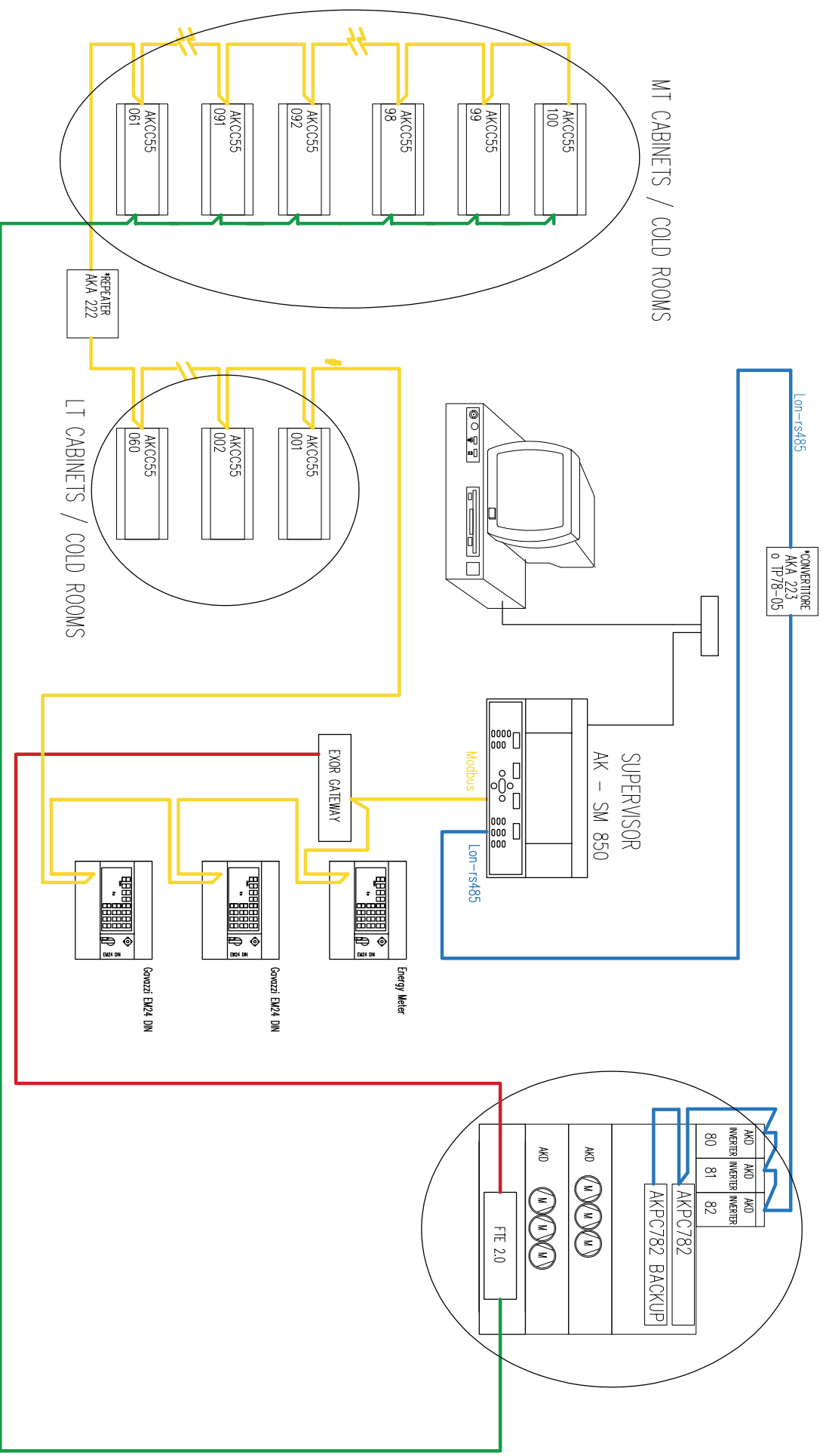
Status/Settings: 1C/3C Booster



- P1 Cut In Pressure: 33bar;
- P1 Cut Out Pressure: 37bar;
- P1 High Alarm Limit: 43 or 45bar.

SYSTEM CONNECTION WITH DANFOSS SUPERVISOR OF TRANSCRITICA BOOSTER PACK – FTE2.0

TSC PACK



PARTICULAR OF CONNECTION ON SYSTEM MANAGER AKSM850 :
 LON – rs 485 FOR refrigeration controller and Modbus for Energy Meter, ...

NOTE : When using the Lon RS485 network, ensure the firm, Switch on the AK-SM is in the '0V' position (cable terminal resistor). Any resistors must also have 120 Ohm resistor in place. Finally, ensure that the hot conductor on the network can also has the end of line on the resistor enabled.

Term.	Term.	Term.
Switch of Lon on [20] [1] [22]	Switch of Lon on [28] [2] [30]	Switch of Lon on [34] [3] [36]
Modbus A+ B-	Modbus A+ B-	Modbus A+ B-
RS 485 Not available	RS 485 Not available	RS 485 Not available
Control Unit on	Control Unit on	Control Unit on

SIGNAL FOR CHANGING STATUS REGULATION MT CABINETS / COLD ROOMS FROM OVERFEED TO STANDARD AND REVERSE

LEGEND:

BEIDEN CABLE TO CHANGE SH THROUGH DI
MODBUS CABLE FROM FTE2.0 TO GTW
MODBUS CABLE TO SUPERVISOR
LON TO SUPERVISOR