User Manual



Rennertronic Plus Touch



Before starting the controller, read and follow the manual carefully!

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1. Safety



The person installing the controller should read the following manual and warranty information. Improper installation and handling of the controller voids the warranty.



Any connection and mounting work can be performed only when the supply voltage is disconnected.



The controller should be installed only by an authorized service or authorized personnel.



To comply with safety standards, the PE terminal of the controller should be connected to a protective conductor or dedicated grounding.



Using the controller without the enclosure is forbidden as it might result in an electric shock.



The device should not be exposed to water or excessive humidity which may cause damage.



Before switching on check the electrical connections according to the connection diagram in the operating manual.



Before starting the controller, make sure that the power supply meets the requirements in the operating manual.



Any repairs can be done only by the manufacturer's service. A repair done by an unauthorized person voids the warranty.



2. User Interface

2.1. Buttons

The HMI provides two physical buttons: start and stop. Any function and device configuration is carried out using the touch screen interfaces.

2.2. Main View



Figure 1: Rennertronic Plus Touch main screen view

Main display view is divided into tiles representing a specific function (as seen from left to right and from top to bottom):

- 1. Net pressure
- 2. Oil temperature
- 3. System pressure
- 4. Time and date
- 5. State of miscellaneous compressor functions
- 6. Compressor information additional fields
- 7. Compressor state
- 8. Slider menu

Most of the tiles can be tapped to reveal additional information. The functions and operation of the specific fields are described in the following subsections.





2.2.1. Net pressure tile



Figure 2: Net pressure tile

Pressure tile presents the following information:

- 1. Net pressure value
- 2. Pressure max (cut-out)
- 3. Pressure min (cut-in)
- 4. Pressure band indicator
- 5. Bar graph

Bar graph displays the pressure level between the active band's cut-in and cut-out pressures. If the current pressure is above the cut-out level the bar graph is black and if the pressure is below the cut-in level the bar graph is white.

The pressure shows the active pressure band that is currently active. The user can define four different pressure bands that can be selected using Modbus communication, digital input selector or with scheduler.

The default color of pressure tile is gray when the compressor is deactivated. During compressor operation pressure tile changes color to:

- 1. Green the pressure is in the allowed region between max and min pressure value (+/- 0.1).
- 2. Yellow the pressure exceeded the minimum/maximum pressure value.
- 3. Red the pressure exceeded minimum/maximum alert value.

When the tile is tapped, the net pressure diagram is displayed.





Figure 3: Net pressure diagram

2.2.2. System pressure tile + BLCO status



Figure 4: System pressure tile

System pressure tile displays current internal pressure value. On the right side of the panel the BLCO active icon is displayed if the BLCO is active.

The tile changes color to red if the sensor fails.

2.2.3. Time and date tile



Figure 5: Time and date tile

The tile displays current date and time. All the relevant settings are described in the section 2.5.6.2.





Figure 6: Time and date tile with scheduler active

If at least one scheduler is active, the tile displays the scheduler icon. For more information and setting descriptions refer to section 5.3.. When the tile is tapped, the scheduler settings menu will be displayed.

2.2.4. State of miscellaneous compressor functions tile



Figure 7: Miscellaneous functions tile

The tile can display up to four miscellaneous compressor functions. The appropriate icons indicate the status of the selected functions. If the specific icon has a dark gray background, the function is currently active/in operation. If the icon is shown only as an outline, the function is inactive.

Description	Symbol	Description	symbol	Description	symbol
Fan		Dryer	**	Water injec- tion	
Network op- eration		Drain		Heater	<pre>>>></pre>

Table 1: Miscellaneous symbols descriptions



2.2.5. Compressor information additional fields tile



Figure 8: Compressor additional parameter fields

The tile can display up to three additional compressor information. To select the visible information tap the tile and choose the parameter from the menu.

Selection of analog values					
Free	•	Select the parameters you want to see on the main window. It will be displayed according to			
Free	•	the selected order.			
Free	•				
<	Deactivated	bar 6.12 min max			

Figure 9: Compressor additional parameter menu

Main view with Free air delivery parameter on.





Figure 10: Main view

2.2.6. Compressor state tile



Figure 11: Compressor state tile

Tile displays current state of the compressor.

Table 2: Compressor state list

Compressor state name	Description
DEACTIVATED	The compressor is not allowed to start.
STARTING	The compressor is active and motor is starting.
COMPRESSION DELAY	The start procedure has been completed and com-
	pressor is waiting to load.
COMPRESSION	The compressor is on load.
IDLE	The pressure has reached pressure max level and
	the motor is idling until pressure drops below pres-
	sure min or idle time elapses.
DEACTIVATION STOPPING	Stopping procedure was activated by a stop com-
	mand and a stop procedure will be ended when all
	conditions to stop have been met.
FAULT CONDITION	An fault has occurred, the compressor stops or has
	stopped and is waiting for the user to acknowledge
	the faults or the fault cause disappears.
READY TO START	The compressor is active and the pressure is above
	the pressure min. When pressure drops down below
	pressure min, compressor starts automatically.

Compressor state name	Description
STOP-START DELAY COUNTING	The stop-start delay is active. Compressor waits un- til the counter reaches the desired value. The de- sired start/stop delay can be modified in the "opera- tion parameters / control timings menu".
NOT READY TO START	The compressor is not ready to start - at least one of the conditions preventing the compressor start is active.
SYSTEM PRESSURE TOO HIGH	System pressure is too high. When the pressure drops below "maximum system pressure to start", compressor starts automatically.
OIL TEMPERATURE TOO LOW	Oil temperature is too low. When oil temperature exceeds min oil temperature, compressor starts automatically.
MOTOR START COUNTER	The motor was started more times than allowed by the maximum starts per hour counter.
IDLE STOPPING	Stopping procedure was activated by a idle timer, but at least one of the conditions preventing the com- pressor stop is active.
DEACTIVATION (KEEP POWER)	There is a frequency converter fault active, the com- pressor is not allowed to start.

Table 2: Compressor state list

2.2.7. Status bar

Status bar is always visible, regardless of what is displayed in the user interface. When the main HMI view is displayed, the status bar contains elements:

ure after power fail.

The compressor has activated auto restart proced-

- 1. MENU button
- 2. Service status icon

AUTO-RESTART



Figure 12: Status bar in the main view

When any other UI view is displayed, the status bar displays additional information - compressor status and the current pressure.



Figure 13: Status bar when a menu is active

In any moment, the status bar displays the service status of the compressor. The icon changes colour depending on the compressor status.



Description	Symbol
Normal operation	X
Active warning	A WARNING
Active warning and error	× ERROR
Active error	× ERROR

Table 3: Compressor service status

By pressing the icon in any menu, the user can request the display of a pop-up with a summary of the active messages, warnings and errors, together with the current counter statuses.

If an event or error occurred, the user can acknowledge the event by pressing the confirmation button. If the event is currently inactive, this will allow the compressor to resume normal operation.

Pressure	max	error
5.53	Warnings, errors and service counters	
max 10 min 0	WARNINGS AND ERRORS	0
System n	09-08-2019 11:51:06 High net pressure fault 09-08-2019 11:51:06 High net pressure warning	
0.00 k		
Power co	Air filter 2000h to warning	
Free air d	Oil filter 2000h to warning	
MENIL	Confirm that you have read the errors to Close Close	<u></u>
	A WAR	

Figure 14: Compressor status pop-up



2.2.8. Sliding menu

When the MENU is pressed, the sliding menu opens, allowing the user to enter the specific menus.



Figure 15: Sliding menu open

From the sliding menu the user has access to following menu entries:

- Statistics menu
- Sensors
- BLCO (Network operation menu) [If BLCO is active]
- Main settings menu
- · Information about compressor and the software

2.3. Statistics

Statistics menu entry contains four submenus:

- 1. Events history
- 2. Utilisation
- 3. Error counter
- 4. Charts



	Statistics			
Fault memory	Utilisation			
Error counter	Charts			
<	Deactivated	bar ^{min}	7.95	X

Figure 16: Statistics menu

2.3.1. Fault memory

	Statistic / Fault memory			
date	time	event		
17-02-2021	13:38:44	Maintenance necessary		
09-03-2020	12:25:30	BLCO slave1 communication fault		
09-03-2020	12:25:25	BLCO master communication fault		
09-03-2020	12:19:27	Maintenance necessary		
09-03-2020	12:16:25	Motor current high		
09-03-2020	12:16:21	Motor current high		
09-03-2020	12:06:35	Overtemperature		
09-03-2020	12:06:35	No temperature sensor		
09-03-2020	12:06:35	No net pressure sensor		
09-03-2020	12:06:35	Motor current high		
<		Deactivated bar 7.95 min max		

Figure 17: Fault memory menu

Event history menu stores all errors and warnings that have occurred during compressor operation. All the registered events are displayed



2.3.2. Utilisation

Statistic / Utilisation				
value	utilisation			
0 h	Running hours			
0 h	Load hours			
0.00 %	Average utilisation			
0	Motorstarts			
1	Deactivated bar 7.95			
	min max			

Figure 18: Utilisation menu

Utilisation menu displays counters related to aggregation of compressor operation time:

- 1. Working hours counts total time of the motor being on.
- 2. Under load hours counts total time of the compression time when the valve is on.
- 3. Average utilisation this parameter shows ratio between "working hours" and "under load hours".
- 4. Motor power cycles counts total cycles of the motor being on.

2.3.3. Error counter

Statistic / Error counter			
Quantity of case	event		
9	Fault (DI2)		
5	BLCO master communication fault		
5	BLCO slave1 communication fault		
5	Motor current high		
4	Emergency stop		
4	Overtemperature		
4	Overtemperature		
4	No net pressure sensor		
4	No temperature sensor		
3	Maintenance necessary		
<	Deactivated bar 7.96 min max	X	







2.3.4. Charts

The Charts show the values of selected parameters over time.



Figure 20: Charts

The time period can be set to:

- 1. hour,
- 2. day,
- 3. week,
- 4. 30 days.

The parameter can be selected between:

- 1. Net pressure,
- 2. System pressure,
- 3. Oil temperature,
- 4. Free air delivery.



2.3.5. Sensors

Sensors				
Net Pressure	7.95 bar	Temperature	82.10 °C	
<	De	eactivated	bar 7.95	X
•			min max	

Figure 21: Sensors

2.4. BLCO (Network operation menu)

Network devices				
Master Pressure: 6.1bar Temperature: 39°C Status: Deactivated	Slave Compressor 1 Pressure: 6.1bar Temperature: 36°C Status: Deactivated			
<	Deactivated	bar 6.12 min max		

Figure 22: Network menu with example devices

2.5. Main settings menu

To access the main settings menu the user must provide a correct access password after pressing the Main Menu icon. Depending on the password entered, the user will be granted a different access. In lower access levels some parameters can be invisible or read only.

To get full access to compressor configuration, the user must obtain the unique access code, more information in section 4.2..



While entering the password, the user can preview the already entered characters by pressing the View icon.



Figure 23: Password input dialog

Menu				1/ 2
Pressure settings	Operation parameters	Schedule	Baseload changeover	>
Remote control	Display	Service data	I/O I/O configuration	
<		Deactivated	bar 7.96 min max	X

Figure 24: Main menu 1/2



Menu				2/ 2
Network settings	Frequency converter	Factory settings	Diagnostic	
				<
<		Deactivated	bar 7.96 min max	X

Figure 25: Main menu 2/2

Main settings menu is divided into following parameter lists:

- 1. Pressure settings section 2.5.1.
- 2. Operation parameters section 2.5.2.
- 3. Schedule section 2.5.3.
- 4. BLCO section 2.5.4.
- 5. Remote control section 2.5.5.
- 6. Display section 2.5.6.
- 7. Service data section 2.5.7.
- 8. IO configuration section 2.5.8.
- 9. Network settings section 2.5.9.
- 10. Frequency converter section 2.5.10.
- 11. Factory settings section 2.5.11.
- 12. Diagnostics section 2.5.12.

2.5.1. Pressure settings

Pressure settings allows the user to define four independent pressure bands.



	Pressure Settings						
Band 1. Band 2. Band	a 3. Band	4.					
Net pressure max. alert	bar 10.30						
Net pressure max.	bar 10.00						
Net pressure min.	bar 8.50						
Net pressure min. alert	bar 0.00						
<	Deac	tivated	bar min	7.96	X		

Figure 26: System pressure settings menu

Table 4: Pressure settings parameters

Parameter	Description	Access level
Net pressure max alert	If pressure rises above this level, high pressure warning occurs. Range [Net pressure max + 0.2 bar - Net pressure	Customer
	faul value - 0.2 bar]	
Net pressure max	Upper switching point for pressure control. Range [Pres- sure setpoint + 0.2 bar - Net pressure max alert - 0.2 bar]	Customer
Net pressure min	Lower switching point for pressure control. Range [Net pressure min + 0.2 bar - Net pressure max - 0.2 bar]	Customer
Net pressure min alert	If pressure falls below this level, low pressure warning oc- curs. Range [Net pressure min alert + 0.2 bar - Pressure setpoint - 0.2 bar]	Customer

2.5.2. Operation parameters

Operation parameters menu contains subgroups related to compressor control algorithm and additional compressor functions.



Оре	ration parameters	
System pressure related	Control timings	
Drain	Fan	
Dryer	Frost protection	
<	Deactivated bar	7.96 max

Figure 27: Operation parameters menu

2.5.2.1. System pressure related

Sy	sten	n pressi	ure rela	ted		
Maximum system pressure to start	bar	0.80				
Idle stop system pressure limit	bar	15.00				
User stop system pressure limit	bar	15.00				
Pressure build up monitoring time	s	30				
Build up minimum pressure	bar	1.00				
	_					
<		Deactiv	ated	bar ^{min}	7.95 max	X

Figure 28: System pressure related settings

Parameter	Description	Access level
Maximum system	If system pressure rises above this level, the motor start is	Service
pressure to start	prohibited.	
Idle stop system pres-	If system pressure is higher than this level, the motor stop	Service
sure limit	is prohibited.	
User stop system	If system pressure is higher than this level, user stop with	Service
pressure limit	a push button is prohibited.	

Table 5	5:	System	pressure	related	settings	parameters
---------	----	--------	----------	---------	----------	------------



Parameter	Description	Access level
Pressure build up	Time after which the system pressure is checked during	Service
monitoring time	compresson for the pressure build up.	
Build up minimum	Level of system pressure that must be reached after build	Service
pressure	up delay.	

Table 5: System pressure related settings parameters

2.5.2.2. Control timings

Operatio	on para	ameters	: / Cont	rol timin	gs	1/
Stop-start delay	s	10				
Main contactor delay	ms	50				
Startup time	s	6				
Compression delay	s	1				- 2
Idle time	s	180				
Stop mode time	s	90				
<		Deactiv	ated	bar min	7.95	X

Figure 29: Control timings menu

Table 6: Control timings parameters

Parameter	Description	Access level
Stop-start delay	Time between consecutive stops and starts of the motor to allow the compressor to discharge.	Service
Main power delay	Delay between switching the main power relay on and the start relay on	Service
Startup time	Delay for motor start in star-delta mode.	Service
Compression delay	Delay to switch the valve on after start up time.	Service
Idling time	Delay between reaching pressure cut-off level and switch- ing the motor off	Service
Soft stop delay	Delay between receiving stop command and stopping the motor	Service



Operat	ion param	neters / Cor	trol timing	S	2/ 2
Star delta switch delay	ms	50			
					<
<		Deactivated	bar	7.95	X

Figure 30: Control timings data input

Table 7: Control timings parameters

Parameter	Description	Access level
Stop mode time	Time between pressing the stop button and the motor stop.	Service
Star delta switch delay	Time between star relay disable and delta relay enable. Time count in ms.	Highest permis- sion level

2.5.2.3. Drain configuration

Operatio	n param	eters / I	Drain		
Period time s	60				
Duty cycle %	0				
Drain function active	OFF 🔻				
		_			
<	Deactiv	ated	bar min	7.96	X

Figure 31: Drain configuration menu



Table 8: Drain configuration parameters

Parameter	Description	Access level
Period time	Length of the drain function operation period	Customer
Drain duty cycle	Time of active ouput during operation period.	Customer
Drain function active	Activation or deactivation of the drain function	Customer

2.5.2.4. Fan configuration

Operation parameters / Fan						
Fan function active		OFF 🔻				
Fan off	°C	0.0				
Fan on	°C	0.0				
Fan max speed temperature	°C	300.0				
			_			
<		Deactiv	ated	bar ^{min}	7.95 max	X

Figure 32: Fan configuration menu

Table 9: Fan configuration parameters

Parameter	Description	Access level
Fan function active	Activation or deactivation of the fan function	Service
Fan off	When the temperature drops below this level fan turns off.	Service
Fan on	When the temperature rises above this level fan turns on.	Service
	Must be higher than fan off temperature.	
Fan max speed tem- perature	When the temperature reaches this level the analog fan control reaches max value. Must be higher than fan off temperature.	Service



2.5.2.5. Dryer configuration



Figure 33: Dryer configuration menu

Table 10: Dryer configuration parameters

Parameter	Description	Access level
Pre-run dryer	Activation or deactivation of the dryer function	Service
Pre run time	Time that prohibits the start of the compressor if the dryer reaches the working condition	Service

2.5.2.6. Frost protection

Operation parameters / Frost protection						
Modus heater active		OFF •				
Heater activation temperature	°C	6.0				
Heater deactivation temperature	°C	25.0				
Modus motor running active		OFF 🔻				
Motor running activation temperature	°C	6.0				
Motor running deactivation temperature	°C	25.0				
<		Deactiv	ated	bar min	7.96 max	X

Figure 34: Frost protection configuration menu



Parameter	Description	Access level
Modbus heater active	Activation or deactivation of the heater function	Service
Heater activation tem-	When the temperature drops below this level heater turns	Service
perature	on.	
Heater deactivation	When the temperature rise above this level heater turns off.	Service
temperature		
Modbus motor heating	Activation or deactivation of the motor heationg function	Service
active		
Motor heating activa-	When the temperature drops below this level motor heating	Service
tion temperature	turns on.	
Motor heating deactiv-	When the temperature rise above this level motor heating	Service
ation temperature	turns off.	

Table 11: Frost protection configuration parameters

2.5.3. Schedule

	Schedule	1/ 2
Scheduler is turned off	•===	
Channel 1	Channel 2	>
Channel 3	Channel 4	
Channel 5	Channel 6	
<	Deactivated bar	7.95 max

Figure 35: Schedule menu 1 / 2



	Schedule		2/ 2
Scheduler is turned off	•===		
Channel 7	Channel 8		
			<
<	Deactivated	bar 7.95 min max	X

Figure 36: Schedule menu 2 / 2

Schedule / Channel 7					
Disabled +					
Mon Tue Wed Thu Fri Sat Sun					
Start 00:00 Stop 24:00					
Pressure band 1					
BLC PRIORITIES					
C Deactivated bar 7.96 min max					

Figure 37: Schedule menu - setting for channel 7



	S	Schedule / C	hannel 1		1/ 2
Master	n h			n - normal h - high r - reserve]
Slave 1 Slave 2	n n n h	r 0		0 - off	>
Slave 3	n h	r 0			
Slave 4	n h	r O			
Slave 5	n h	r O			
<		Deactiv	vated	bar 6.* ■ min n	12 hax

Figure 38: Schedule menu - priorities for channel 7

2.5.4. Baseload Changeover



Figure 39: Baseload Changeover menu



Baseload changeover setup						1
BLC Master		Yes 🔹				
Number of slaves		1				
Changing time	h	4				
Start up delay	S	20				- 1
Switch off delay	S	5				
Swittching on over	%	100				
<		Deactiv	ated	bar min	6.12	X

Figure 40: Baseload Changeover menu setup 1/2

Parameter	Description	Access level
BLC Master	If set to 'yes' compressor works as master, if set to 'no' compressor works as a slave	Service
Number of slaves	Number of connected slave devices	Service
Changing time	Time between consecutive base load and compressor switch order changes.	Service
Start up delay	Time of switching on additional compressors when the pressure remains below cut-in level. If the pressure rises above cut-in level during this time start of next compressor is prohibited.	Service
Switch off delay	Time of switching off additional compressors when the pressure remains above cut-in level. If the pressure falls below cut-in level during this time stop of the next compressor is prohibited.	Service
Switch on over	The value of motor speed in percent above which the next compressor is switched on.	Service

Table 12: Baseload Changeover settings 1/3



Baseload changeover setup				2/		
Switching off below	%	0				
Delay time switching on/off over/under	s	150				
Internal hours offset	h	0				
Running hours:	0					
	_					
<		Deactiv	ated	bar	6.12	X

Figure 41: Baseload Changeover menu setup 2/2

Table 12.	Racoload	Changeover	sottings 2/2
Table 13.	Daseluau	Changeover	settings z/s

Parameter	Description	Access level
Switch off below	The value of motor speed in percent below which one of the working compressors is switched off.	Service
Delay time switching on/off over/under	Time between consecutive starts and stops of a com- pressor with a VFD, related to VFD switch on setpoint and VFD switch off setpoint parameters.	Service
Internal hours offset	Number added to work counter to equalize work hours to rest of the slaves.	Service

Baseload changeover / Slave 1				
Interface selection	Serial 3 +			
Address	2			
Running hours offset	0			
Running hours Slave 1	:0			
<	Deactivated	bar 7.95 min max		

Figure 42: Baseload Changeover menu - setting for slave 1



Parameter	Description	Access level
Slave 1 master	Select the serial port to which the slave is connected.	Service
selector		
Slave 1 address	Select Modbus ID for this device.	Service
Slave 1 hours offset	Number added to work counter to equalize work hours to	Service
	rest of the slaves.	

Table 14: Baseload Changeover settings 3/3

For other slaves the configuration process is similar and is carried out in next tabs.

2.5.5. Remote control

Remote control				
Start control	Pressure control			
Auto restart			-	
<	Deactivated	bar min	7.96 max	X

Figure 43: Remote control menu


Remote control / Start control			
Start control	Local 🔻		
<	Deactivated	bar 7.96 min max	

Figure 44: Remote control - Start control settings

Table 15: Remote control - start parameters

Parameter	Description	Access level
Start source	Local or external start source.	Service

Remote	control / Pressu	re control	
Pressure control mode	Local +		
Pressure band select mode	Local +		
Pressure setting	No 👻		
<	Deactivated	bar 7.95 min max	X

Figure 45: Remote control menu - Pressure control

Parameter	Description	Access level
Pressure control mode	Local - the controller utilizes load/unload signal derived from internal pressure sensor. BLCO - the controller util- izes load/unload signal from BLCO master. BLCO option is required for BLCO operation. External - the controller utilizes load/unload signal from digital input.	Service
Pressure band select mode	Local - Bands can be changed only by schedule. Digital input - Every pressure band has a digital input for activating a band.	Service
Pressure setting	No - Option is deactivated. Modbus - it is possible to change max/min pressure value by modbus registers.	Service

Table 16: Remote control - Pressure control

Ren	not	e contr	ol /	Auto	resta	art		
Auto restart function active		OFF	•					
Auto restart delay	s	90						
<		Dea	ctiva	ted		bar min	7.96	X

Figure 46: Remote control - Auto restart settings

Table 17: Remote control - auto restart parameters

Parameter	Description	Access Service	level
Auto restart function active	Auto restart function active. / inactive.	Customer	
Auto restart delay	Delay for the auto restart procedure.	Customer	



2.5.6. Display

	Display			
Units	Time and date			
Language				
<	Deactivated	bar min	7.96 max	X

Figure 47: Display menu

Menu is a group of settings concerning the UI display.

2.5.6.1. Units

	Display / Language	9
Temperature	°C •	
Pressure	bar 🔻	
Flow	I/min ►	

Figure 48: Units configuration menu



2.5.6.2. Time and Date

Dis	Display / Time and date				
Set time (hh:mm) 12:37					
Set date (DD-MM-YYYY) 09-03-2020					
Time format	•				
Automatic summer/winter time switch	No 🔻				
<	Deactivated	bar 7.96	X		

Figure 49: Date and time configuration menu

Table 18: Da	ate and time	parameters
--------------	--------------	------------

Parameter	Description	Access level	
Set time	Change current time	Customer	
Set date	Change current date	Customer	
Time format	Switch between 24h and 12h clock	Customer	
Activate automatic summer/winter time switch	Select if the controller is to automatically change time based on Daylight Saving Time	Customer	



2.5.6.3. Language

	Display / Language				
Language	English +				
<	Deactivated	bar 7.96 min max			

Figure 50: Language selector menu

The manu allows the user to change the display language.

2.5.7. Service data

		Service		
Maintenance		Air filter	2000 h to warning	
Oil filter	2000 h to warning	Oil change	2000 h to warning	
Oil separator	2000 h to warning	Motor	COUNTER OFF	
<		Deactivated	bar 7.96	X

Figure 51: Service counter menu

The menu groups service counter subsystem settings and annual maintenance counter. Main view of the menu lists all the available counters.

Each counter is represented as a tile with the counter's name and status. Status indicates how many hours are left until the counter expires. If the counter reaches 0, the expiry is indicated with a warning symbol and



the status shows how many hours are left until error occurs (if error function is enabled - see 2.5.7.2.).

2.5.7.1. General Maintenance settings

Service / Gene	eral maintenanc	e settings
Last maintenance: 09-03-2020		
ANNUAL MAINTENANCE		
Annual maintenance	No 🔻	
Shutdown after maintenance exceded	No 👻	
Time range after exceeded h	Inactive	
<	Deactivated	bar 7.95 min max

Figure 52: General maintenance menu

General maintenance function allows the user to set the date of the yearly general maintenance.

Table 19: Genera	I maintenance	parameters
------------------	---------------	------------

Parameter	Description	Access level
Annual maintenance	Confirm that the maintenance has just been performed and schedule the maintenance in one year.	Service
Shutdown after main- tenance exceeded	Enable or disable the fault that occurs if minimum one of the service counters has reached fault level and the main- tenance has not been performed after operating more than the number of hours defined in the parameter "Time range after exceeded" after the counter expiry.	Service
Time range after ex- ceeded	Number of hours of operation for service counters before the fault occurs if the maintenance was not performed in the designated time.	Service



2.5.7.2. Counter settings

Service)				
Set the number of hours for the Air filter operation:	1	2	3	×	
	4	5	6		
	7	8	9	0	
DISABLE COUNTER	Ca	ncel	0	K	
C	ed	bar min	7.9	5 ×	X

Figure 53: Counter setup

To enter the counter setup menu, press the tile with a corresponding counter name.

The menu allows the user to change the number of hours after which the counter elapses. All counters count to zero from that value. Entering the number of hours enables the counter. To disable the counter, press the "DISABLE COUNTER" button.

2.5.8. I/O configuration

IO configuration						
Digital inputs	Digital outputs					
Analog inputs	Analog outputs					
<	Deactivated	bar	7.96 max	X		

Figure 54: IO Configuration menu

I/O configuration menu groups the settings associated with the controller's inputs and outputs.



2.5.8.1. Digital input configuration

IO configuration / Digital inputs						
Digital input 1	NO 🕶	Emergency stop	•			
Digital input 2	NC -	Free	•			
Digital input 3	NO 🔻	Free	•	>		
Digital input 4	NO 🔻	External Start-Stop	•			
Digital input 5	NO 🔻	Free	•			
Digital input 6	NO 🔻	Free	•			
<		Deactivated m	ar 6.12 in max	X		

Figure 55: Digital inputs configuration menu

The menu allows the user to assign functions to digital inputs. The controller allows the user to define the function of each available input, both in the master Main Controller and the Main Controller defined as an I/O expander.

Parameter	Description	Access level
Free	No function assigned to the input	Factory
Motor Current High	Digital input. When active it triggers current overflow fault.	Factory
Fault frequency con-	It is digital input for FC fault	Factory
verter		
Fan fault	It is digital input for fan fault	Factory
Phase rotation fault	It is digital input for phase rotation fault	Factory
Fault	The function allows the input to trigger a fault. Can be as-	Factory
	signed to all digital inputs.	
Uncritical fault	The function allows the input to trigger uncritical fault. Can	Factory
	be assigned to all digital inputs.	
Recoverable fault	The function allows the input to trigger recoverable fault.	Factory
	Can be assigned to all digital inputs.	
Warning	The function allows the input to trigger a warning. Can be	Factory
	assigned to all digital inputs.	
External Start-Stop	The function allows the compressor to be started from di-	Factory
	gital input. It can be assigned only to a single input.	
External Load-Unload	External load-unload signal for the compressor.	Factory
100% setpoint	If set, the maximum speed for motor is selected even if	Factory
	pressure value is above the setpoint level.	
Minimum speed 2	If set, the second minium speed for motor is selected.	Factory
Dryer ready	Digital input signal for dryer to indicate that dryer does not	Factory
	work properly. If this input is active the compressor turns	
	off. Behaviour is similar to recoverable fault.	
Band 2 Selector	Digital input to change active band to band 2.	Factory

Table 20.	Digital	innut	configuration	naramotore
aue 20.	Digital	πput	conniguration	parameters



Table 20:	Digital	input	configuration	parameters
-----------	---------	-------	---------------	------------

Parameter	Description	Access level
Band 3 Selector	Digital input to change active band to band 3.	Factory
Band 4 Selector	Digital input to change active band to band 4.	Factory
Scheduler On-Off	Digital input for Scheduler on-off.	Factory

2.5.8.2. Digital output configuration

IO configuration / Digital outputs						
Solenoid valve	NO	Soleno	id valve			
Motor contactors	NO	Motor co	ontactors			
Digital output 5	NO 🔻	Running +				
Digital output 6	NO 🔻	Ready +				
Digital output 7	NO 🔻	Warning +				
Digital output 8	NO 🔻	Fau	ılt	•		
<		Deactivated	bar ^{min}	7.95 max	X	

Figure 56: Digital output configuration menu

The menu allows the user to assign functions to digital outputs. The controller allows the user to define the function of four available outputs, both in the master Main Controller and the Main Controller defined as an I/O expander. First four digital outputs are reserved and used in solenoid control and star-delta control.

Table 21:	Digital	output	configuration	parameters
-----------	---------	--------	---------------	------------

Parameter	Description	Access level
Free	No function assigned to the output	Factory
Drain	Control of the condensate drain	Factory
FC Enable	Start stop signal for frequency converter.	Factory
Fan	Control of the cooling fan.	Factory
Dryer	Control of the refrigerator dryer.	Factory
Heater	Control of the heater.	Factory
Warning	Digital output indicating that a warning has occurred.	Factory
Fault	Digital output indicating that a fault has occurred.	Factory
Ready	Digital output indicating that compressor is ready to start.	Factory
Running	Digital output indicating that motor is running.	Factory
On Load	Digital output indicating that compressor is on load.	Factory
Warning / Fault	Digital output indicating that warning or fault has occurred.	Factory
Scheduler channel 1	Digital output indicating that scheduler channel 1 is active.	Factory
Scheduler channel 2	Digital output indicating that scheduler channel 2 is active.	Factory
Scheduler channel 3	Digital output indicating that scheduler channel 3 is active.	Factory
Scheduler channel 4	Digital output indicating that scheduler channel 4 is active.	Factory

Parameter	Description	Access level
Scheduler channel 5	Digital output indicating that scheduler channel 5 is active.	Factory
Scheduler channel 6	Digital output indicating that scheduler channel 6 is active.	Factory
Scheduler channel 7	Digital output indicating that scheduler channel 7 is active.	Factory
Scheduler channel 8	Digital output indicating that scheduler channel 8 is active.	Factory
Any shceduler	Digital output indicating that any scheduler is active.	Factory
Maintenance	Digital output for control maintenance.	Factory
BLCO Ready	Digital output indicating that BLCO is ready.	Factory

Table 21: Digital output configuration parameters

2.5.8.3. Analog input configuration

IO configuration / Analog inputs				
1. Analog input 1	Net pressure	•		
2. Analog input 2	Free	•		
3. Analog input 3	Free	•	>	
4. Analog input 4	Free	•		
5. Temperature sensor 1	Temperature +			
6. Temperature sensor 2	6. Temperature sensor 2 Free			
<	Deactivated bar 7.96		X	

Figure 57: Analog input configuration menu

The menu allows the user to assign functions to analog inputs, both the 4-20mA inputs and the RTD inputs.

Table 22: Analog input 4-20mA configuration parameters

Parameter		Description Access lev	
Free		No function assigned to the output	Factory
Net pressure sensor		Input for net pressure sensor	Factory
System pressure Input for system pressure sensor		Input for system pressure sensor	Factory
sensor			

able 23: Analog input R	D configuration	parameters
-------------------------	-----------------	------------

Parameter	Description	Access level
Free	No function assigned to the output	Factory
Temperature	Input for oil temperature sensor	Factory
Motor temperature	Input for motor temperature sensor	Factory



2.5.8.4. Analog output configuration

IO configuration / Analog outputs					
Analog output 1	Setpoint frequency conv	erter +			
Analog output 2	Fan	•			
/		bar 7.95 🔍			
<	Deactivated	min max			

Figure 58: Analog output configuration menu

Table 24:	Analog input RTD	configuration	parameters
-----------	------------------	---------------	------------

Parameter		Description	Access level
Free		No function assigned to the output	Factory
Setpoint converter	frequency	Speed setpoint for frequency converter	Factory
Fan		Speed setpoint for fan.	Factory



2.5.9. Network settings

Network settings					
Internal serial interface	Serial slot 3				
Address					
<	Deactivated	bar 7	7.96 max		

Figure 59: Network settings configuration menu

Tiles with "Serial 1 configuration", "Serial 2 configuration" and "Serial 3 configuration" are enabled only if external serial communication modules are installed correctly.

Network settings / Internal serial					
Baudrate	115200 +	1			
Parity	Even +				
Stopbits	1 .				
Function	Modbus master •				
RTU master timeout	200				
		-			
					_
<	Deactiv	vated	bar min	7.96 max	X

Figure 60: Network settings / serial parameters

Table 25: Ir	nternal serial	configuration	parameters

Parameter	Description	Access level
Baudrate	Buad rate of the internal RS-485 interface (Default: 19200)	Service
Parity	Parity bit for the communication on the internal RS-485 in- terface (Default: Even)	Service



Parameter	Description	Access level
Stop bits	Stop bit for the communication on the internal RS-485 in- terface (Default: one)	Service
Function	Serial function of the internal interface. None - no function assigned to the internal serial, BLCO Slave - internal serial works as BLCO slave, Modbus Master - internal serial works as Modbus master	Service
RTU master timeout	Time of wait for the response for the communication on the internal RS-485 interface. (Default: 200)	Service

Table 25: Internal serial configuration parameters

Network	settings / Serial	Slot 3	
Baudrate	19200 ►		
Parity	None 🔸		
Stop bits	1 .		
Function Mod	bus master ►		
RTU master timeout	200		
<	Deactivated	bar 7.95	X

Figure 61: Network settings / serial parameters

Table 26: Serial 2 configuration parameters

Parameter	Description	Access level
Baudrate	Baud rate of the internal RS-485 interface (Default: 19200)	Service
Parity	Parity bit for the communication on the internal RS-485 in- terface (Default: Even)	Service
Stop bits	Stop bit for the communication on the internal RS-485 in- terface (Default: two)	Service
Function	Serial function of the internal interface. None - no function assigned to the Serial 2, BLCO Slave - Serial 2 works as BLCO slave, Modbus Master - Serial 2 works as Modbus master	Service
RTU master timeout	Time of wait for the response for the communication on the internal RS-485 interface. (Default: 200)	Service

For serials 1 and 3 there is the same configuration in the next tabs.



Network settings / Address			
Modbus address	2		
1	Deactivated	bar 7.96	
	Deactivated	min max	

Figure 62: Network settings addres configuration

Table 27: Address configuration parameter

Parameter	Description	Access level
Modbus address	Modbus slave ID for the device. All Modbus serials use the	Customer
	assigned ID.	

2.5.10. Frequency converter

Frequency converter					
Minimum speed 1	30				
Minimum speed 2	40				
Maximum speed	100				
			• • •	7.05	
<	Deactivate	ed	bar min	7.95 max	X



Table 28: Frequency converter parameters

Parameter	Description	Access level
Minimum speed 1	Default lower motor speed limit	Service
Minimum speed 2	Lower motor speed limit	Service
Maximum speed	Highest motor speed limit	Service

2.5.11. Factory settings

Factory settings				
Temperatures	Pressures			
Frequency converter	Running hour counter			
Compressor data	IO Calibration			
Backup	Servicecode			
<	Deactivated bar min	7.96 max		

Figure 64: Factory settings menu

The menu groups the parameters that can only be changed by the manufacturer.



2.5.11.1. Temperatures



Figure 65: Factory settings temperature menu

Table 29: Factory set	tings temperature parameters
-----------------------	------------------------------

Parameter	Description	Access level
Overtemperature fault	Value of the oil temperature readout that stops the com- pressor and triggers fault if the temperature is above the value	Factory
Overtemperature warning	Value of the oil temperature readout that triggers warning if the temperature is above the value	Factory
Minimum start temper- ature	Value of the oil temperature readout that stops the com- pressor and triggers fault if the temperature is below the value	Factory



2.5.11.2. Pressure settings

Facto	orys	settings / Pr	essures		
Net pressure fault maximum value	bar	10.50			
System pressure fault enable		ON 🔻			
System pressure fault maximum value	bar	11.00			
System pressure warning enable		OFF 🔻			
System pressure warning maximum value	bar	10.80			
	_				_
<		Deactivated	bar min	7.96 max	X

Figure 66: Factory settings pressure menu

Parameter	Description	Access level
Net pressure fault maximum value	Value of the net pressure readout that stops the com- pressor and triggers fault if the pressure is above the value.	Factory
	Range [Net pressure max alert + 0.2 bar - 16 bar]	
System pressure fault enable	Enable or disable of system pressure fault.	Factory
System pressure fault	Value of the system pressure readout that stops the com-	Factory
maximum value	pressor and triggers fault if the pressure is above the value.	
System pressure warning enable	Enable or disable of system pressure warning.	Factory
System pressure	Value of the system pressure readout that triggers warning	Factory
value		

Table 30: Factory settings pressure parameters



2.5.11.3. Frequency converter

Factory settings / Frequency converter					
Frequency converter	OFF +				
FC Modbus master	Internal 🕨				
FC Modbus protoco	Danfoss				
FC Modbus slave address	1				- 1
FC communication error timeout m	ns 1000				
Proportional gain %/ba	ar 80.00				
<	Deactiv	vated	bar min	7.96 max	X

Figure 67: Factory settings frequency converter menu 1/3

The menu contains all the settings that are associated with the frequency converter control algorithm.

Table 31. Factory settings nequency converter parameter	Table 31:	y converter parameters
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Parameter	Description	Access level
Frequency converter	Select compressor operation mode.	Factory
	OFF - compressor in star-delta configuration	
	 Analog - compressor in frequency converter mode with I/O control 	
FC Modbus master	Select serial bus for frequency converter.	Factory
FC Modbus protocol	Set the type of Modbus device.	Factory
FC Modbus slave ad- dress	Set device Modbus ID for frequency converter.	Factory
FC communication er- ror timeout	Timeout for fault communication.	Factory
Proportional gain	PI parameter which determines influence of proportional coefficient for regulation	Factory



Factory settings / Frequency converter						2/ 3
Integral gain	s	15.00				
Absolute minimum speed	%	30.00				
Change minimum speed after	min	5				
Speed limit start pressure	bar	0.00				
Speed limit pressure gradient	mA/ bar	0.000				<
Speed limit start temperature	°C	0.0				
<		Deactiv	ated	bar min	7.96 max	X

Figure 68: Factory settings frequency converter menu 2/3

Parameter	Description	Access level
Integral gain	PI parameter which determines influence of Integral coef-	Factory
	ficient for regulation	
Absolute minimum	Lowest motor speed limit	Factory
speed		
Change minimum	Time after which the speed limit is changed from minimum	Factory
speed after	1 to speed limit minimum 2.	
Speed limit start pres-	Pressure level on which speed reduction starts.	Factory
sure		
Speed limit pressure	Dependency between presssure and speed setpoint re-	Factory
gradient	duction.	
Speed limit start tem-	Temperature level on which speed reduction starts.	Factory
perature		

Table 32: Factory settings frequency converter parameters



Factory settings / Frequency converter					
Speed limit temperature gradient	A/ 0.000				
					<
<	Deactiva	ted	bar	7.95	X

Figure 69: Factory settings frequency converter menu 3/3

Table 33: Factory settings frequency converter parameters

Parameter	Description	Access level
Speed limit temperat-	Dependency between temperature and speed setpoint re-	Factory
ure gradient	duction.	

2.5.11.4. Running hour counter

	Factory se	ttings /
Running hours	h	0
Load hours	h	0
Running h	ours (controller):0	
Load ho	urs (controller):0	
<		Deacti





Table 34: Factory settings I	hour counters parameters
------------------------------	--------------------------

Parameter	Description	Access level
Running hours	Work hours counter setup	Factory
Load hours	Compressor under load counter setup.	Factory

2.5.11.5. Compressor data

Factory	sett	ings / C	ompres	ssor Data	a	
Serial number		0				
Free air delivery	l/min	1				
Maximum startups per hour		21				
Vendor	F	Renner 🕨				
<		Deactiv	ated	bar min	7.95 max	X

Figure 71: Factory settings - Compressor Data

Table 35:	Factory settings	compressor da	ta parameters
10010 001	i addidi y ddallingd	001110100001 00	a paramotoro

Parameter	Description	Access level
Serial number	Unique number for the compressor, created by the manu-	Factory
	facturer	
Free air delivery	Nominal value of free air delivery.	Factory
Maximum startups	If the number of compressor starts is equal with number	Factory
per hour	declared in the parameter, compressor can't start.	
Vendor	It's used to change the vendor logo on the main view.	Factory



2.5.11.6. IO Calibration

	Factory	settings / IC) calib	ration		
AI	Current [mA]	Offset [mA]				
Analog input 0	11.96	0.00				
Analog input 1	11.98	0.00				
Analog input 2	11.98	0.00				
Analog input 3	11.95	0.00				
		Deactivate	:d	bar min	7.95	

Figure 72: Factory settings - IO Calibration

2.5.11.7. Backup



Figure 73: Backup menu

Parameter	Description	Access level
Dump settings	Records encrypted settings to USB	Factory
Override factory settings	Remembers the current settings in the internal memory. The stored settings are then restored with factory reset.	Factory



Table 36: Backup menu

Parameter	Description	Access level
Dump factory settings	Records encrypted settings to USB and a public file to view stored settings	Factory
Factory reset	Restores the settings stored in the internal memory using override factory settings	Factory
Restore settings	Restore the settings from the flash drive. There must be an encrypted file on the USB, created with Dump settings or Dump factory settings.	Factory
Dump sensor history	Record to USB file with sensors measurement history	Factory

2.5.11.8. PIN codes



Figure 74: Factory settings - PIN codes



2.5.12. Diagnostics

			Diagno	ostic			
DI 1	OFF	RC 1	RC 2	AI1	AI2		
DI 2	OFF						
DI 3	OFF	RC 3	RC 4	1	1	Ξ.	
DI 4	OFF			12.0mA	12.0mA	A01	A02
DI 5	OFF	REL 1	REL 2	AI3	AI4	RTD1	RTD2
DI 6	OFF					1313Ω	1304Ω
DI 7	OFF	RNOC 1	RNOC 2	1	1	RTD3	RTD4
DI 8	OFF			12.0mA	12.0mA	1308Ω	1306Ω
						7.04	
<			Deacti	vated	bar min	7.96 max	X

Figure 75: Diagnostics

2.6. Notifications

While the compressor is running, notifications may appear in the system. Notifications are shown as red pop up windows in the middle of the screen. Below is a example notification.

Operation parame	eters /	Syster	n press	sure relate	ed settii	ngs
Maximum system pressure to start	bar	1.50				
Idle stop system pressure limit	bar	2.00				
User stop system pressure limit Lack of proper per	missions.	You can se change	e some par	ameters that ca	nnot be	
<		Schedul	ed off	bar min	5.98 max	X

Figure 76: Example notification

List of messages:

- Connecting ...
- Main controller not detected ...
- Updating HMI. Do not turn off the power supply!



- UPDATE SUCCEED. REBOOTING ...
- UPDATE FAILED!
- There was detected more than one updatable file on the data storage. Remove additional files and restart update.
- There is no file with the .update extension present on the data storage in the /update folder.
- Updating Main Controller: starting update
- Updating Main Controller: step 1 of 3
- Updating Main Controller: step 2 of 3
- Updating Main Controller: step 3 of 3
- No main controller for update available
- · Performing enforced update of the main controller
- Reset DIP switch 1 to continue
- No data storage detected
- MAINTENANCE. DO NOT POWER OFF THE DEVICE. The display may flicker or temporarily switch off.
- Collecting data: step 1 of 5
- Collecting data: step 2 of 5
- Collecting data: step 3 of 5
- Collecting data: step 4 of 5
- Collecting data: step 5 of 5
- Saving data to storage failed
- Collecting settings
- Restoring settings
- Processing ...
- Disable the compressor to be able to change parameters
- Factory access not authenticated.
- Database clear
- Events and sensor history clear
- Factory access blocked.
- Wrong code. Retries: 3
- New code generated!
- Do you want to leave without resetting the annual maintenance counter?
- Lack of proper permissions. You can see some parameters that cannot be changed
- The password must be 4 digits, please try entering new password again.

3. Faults and warnings

Faults are divided into groups:

- 1. Critical faults faults that stop the compressor immediately
- 2. Non-critical faults faults that stop the compressor using a stop procedure
- 3. Recoverable faults faults that stop the compressor using a stop procedure and resume the compressor operation after the fault cause ceases dissapears.

3.1. Critical faults

Critical fault	Description
No oil temperature sensor	Oil temperature sensor not attached or incorrect connection to the sensor.
Short circuit of oil temperature sensor	Oil temperature may be shorted, damaged or the wire may be shorted.
Overtemperature fault	Oil temperature above fault level. If the temperature rises above the fault level, the compressor stops. Can be changed in Factory settings / temperature menu. See 2.5.11.1.
Short circuit of net pressure sensor	Net pressure sensor may be shorted, damaged or the wire may be shorted.
High net pressure fault	Net pressure above the fault level. Can be changed in Factory settings / temperature menu. See 2.5.11.1.
No system pressure sensor	System pressure not attached or incorrect connection to the sensor.
Short circuit of system pressure sensor	System pressure sensor may be shorted, damaged or the wire may be shorted.
High system pressure fault	System pressure above the fault level. Can be changed in Factory settings / Pressure menu. See 2.5.11.2. <i>Not in UI</i>
Generic fault	Generic fault assigned to a digital input. See 2.5.8.1.
Emergency stop	Emergency stop button was pressed.

Table 37: List of critical faults

3.2. FC critical faults

Table 38:	List of	FC critical	faults

FC critical Fault	Description
Frequency converter fault	
Frequency converter communic- ation fault	Communication with frequency converter was lost.
Frequency converter trip fault	Trip faults can be reset using the automatic reset function in fre- quency converter.
Frequency converter trip lock fault	Alarms that are trip locked offer additional protection, meaning that the mains supply must be switched off before the alarm can be reset. After having been switched back on, the frequency con- verter is no longer blocked and can be reset as described in fre- quency converter manual.



3.3. Non-critical faults

Table 39: List of non-critical faults

Non critical fault	Description
NUII-CITIICAI TAUIL	Description
Air filter service counter fault	Air filter service counter has reached fault value.
Oil filter service counter fault	Oil filter service counter has reached fault value.
Oil change service counter fault	Oil change service counter has reached fault value.
Oil separator service counter	Oil separator service counter has reached fault value.
fault	
Belt change service counter fault	Belt change service counter has reached fault value.
Generic non-critical fault	Generic non-critical fault assigned to a digital input. See 2.5.8.1.
System pressure build up fault	System pressure does not rise after start up.
Motor temperature too high	Motor temperature above fault level. If the temperature rises
	above the fault level, the compressor stops.

3.4. Recoverable faults

Table 40: List of recoverable faults

Recoverable Fault	Description
Generic recoverable fault	Generic recoverable fault assigned to a digital input. See 2.5.8.1.
Low oil temperature fault	Oil temperature below fault level.
	Can be changed in Factory settings / temperature menu. See
	2.5.11.1.
No net pressure sensor	Net pressure sensor not attached or incorrect connection to the
	sensor.
Power failure fault	Power supply was turned off.
Dryer not ready	Dryer does not work properly. If the fault occurs the compressor turns off, similar to recoverable fault.

3.5. Warnings

Table 41: List of warnings

Warning message	Description
High oil temperature	Oil temperature above the warning level.
	Warning level can be changed in the Factory settings / Temper-
	atures menu
High net pressure warning	Net pressure above the warning level.
	Warning level can be changed in Pressure settings menu
Low net pressure warning	Net pressure below the warning level
	Warning level can be changed in Pressure settings menu
High system pressure warning	System pressure below the warning level
	Warning level can be changed in Pressure settings menu
	Not in UI
Maintenance counter warning	General maintenance was not performed in a required period.
Air filter service counter warning	Air filter service counter elapsed.
Oil filter service counter warning	Oil filter service counter elapsed.
Oil change service counter	Oil change service counter elapsed.
warning	
Oil separator service counter	Air filter service counter elapsed.
warning	
Belts change service counter	Belts change service counter elapsed.



Table 41: List of warnings

Warning message	Description
Counter warning	Warning after a counter has elapsed.
Generic warning	Generic warning assigned to one of the digital inputs. See 2.5.8.1.
Frequeny converter warning	There is a frequency converter fault active. Description of the warning provides information on warning type. For details see chapter 3.2.



4. Operation theory

4.1. Start prerequisites

This section describes the conditions that must be fulfilled to start / stop the compressor. Depending on the start / stop signal source, the prerequisites differ.

- 1. Start / stop source: automatic start / stop
 - System pressure must fall below "Idle stop system pressure limit". It can be changed in Operation parameters / System pressure related settings, this can prevent problem with next compressor start.
 - If pressure drops soon next start will be possible without violating "Maximum startups per hour". It can be changed in Factory settings / Compressor Data.
- 2. Start / stop source: user request
 - System pressure must fall below "User stop system pressure limit". It can be changed in Operation parameters / System pressure related settings, this can prevent this problem with next compressor start. This is usually set higher than "Idle stop system pressure limit".
- 3. Start / stop source: fault
 - When the compressor stops because a fault was detected, no conditions are checked.

If compressor can not start, it is necessary to check:

- System pressure level must be lower than level set in Operation parameters / System pressure related / Maximum system pressure to start.
- Oil temperature level must be higher than 5 degrees Celsius.
- Motor will not start soon after stop. It can be changed in Operation parameters / Control timings / Stop-start delay.
- Motor is not permitted to start more than number of times per hour as set in Factory settings / Compressor Data / Maximum startups per hour.
- If dryer is enabled it's output must be enabled for some time before proceeding. It is set in Operation parameters / Dryer configuration.

4.2. Challenge response code authorization system

Challenge response code authorization system protects the compressor from changes made by not-authorized user. To get the full configuration access to the compressor controller, the authorization is carried out as follows:

- 1. Enter Main settings menu, press the icon with padlock symbol
- 2. When 9-digit code will appear, contact the compressor manufacturer and provide the generated code
- 3. The manufacturer will provide the user with a 9-digit response code
- 4. Enter the generated code in the authorization menu
- 5. If the entered code is correct, the main system menu is open and full permissions will be granted for 24 hours.
 - If the entered code is incorrect, the system will generate a new challenge code and the code generation procedure is to be retried.



	1	2	3			
	4	5	6		Confirm	
	7	8	9			
		0	×	Tem for F	porary verification code Renner	
<				Deactivated	bar 7.88 min max	X

Figure 77: Challenge response with hidden code



Figure 78: Challenge response with example code



	1	2	3		0	
	4	5	6		Confirm	
	7	8	9			
		0	×	Auth for r time	nenticated. Press button new challenge. Remaining n: 23h59m	
<				Deactivated	bar 7.88 min max	X

Figure 79: Challenge response with permmission granted



Figure 80: Challenge response with bad response

After the modifications requiring full access are finished, it is necessary to de-authorize. In main settings menu, enter Factory settings and PIN codes and press the "Deauth" button. Full configuration access is revoked. To perform additional, changes, the challenge-response procedure is to be performed again.



				Change PIN
	1	2	3	Service code CHANGE
	4	5	6	Factory code
	7	8	9	CHANGE
		0	×	Log out
<				Deactivated bar 9.56 min max

Figure 81: Factory settings - Deauthorization button

5. Function setup

This section describes how to enable and setup some of the controller functions.

5.1. Frequency converter

The controller supports two frequency converter control methods:

- Analog frequency converter, controlled using digital and analog input/outputs,
- Modbus frequency converter, controlled using serial port with Modbus RTU.

5.1.1. Analog frequency converter setup

To setup the analog frequency converter, the following parameters must be changed:

- 1. VFD type
- 2. IO assignment for VFD control signals
- 3. VFD operation parameters

5.1.1.1. Analog frequency converter configuration - setup VFD type

From settings menu, enter Factory settings / Frequency converter and set the converter type to "Analog" in parameter "Frequency converter".

Factory settings / Frequ				Frequency converter
Frequency converter FC Modbus master	A	nalog + nternal +		OFF Analog Modbus
FC Modbus protoco FC Modbus slave address FC communication error timeout	ms	1 1000		
Proportional gain %/	/bar	80.00		
<		Deactiva	ite	

Figure 82: Analog frequency converter type setup

5.1.1.2. Analog frequency converter configuration - DI setup

From settings menu, enter IO configuration / Digital input menu and assign Fault frequency converter function to one of the digital inputs.



	IO configu	Digital input 3	
Digital input 1	NO 🕶	Eme	Free
Digital input 2	NC -		Motor Current High
Digital input 3	NO 🕶	Fault free	Fault frequency converter
Digital input 4	NO 🕶	Exter	Fan fault
Digital input 5	NO 🕶		Fault
Digital input 6	NO 🔻		Uncritical fault
			Recoverable fault
<		Deactivate	1/3

Figure 83: Analog frequency converter Digital Input menu

5.1.1.3. Analog frequency converter configuration - DO setup

From settings menu, enter IO configuration / Digital output menu and assign an FC enable function to one of the relay outputs.

10 0	configuration / D	Digital output 6
Solenoid valve	NO	Free
Motor contactors	NO	Drain
Digital output 5	NO 🕶	FC Enable
Digital output 6	NO 🔻	Dryer
Digital output 7	NO 🕶	Heater
Digital output 8	NO 🔻	Warning
	_	Fault
<	Deactivat	e 1/3 🔨 🗸

Figure 84: Analog frequency converter Digital Output menu

5.1.1.4. Analog frequency converter configuration - AO setup

From settings menu, enter IO configuration / Analog output menu and assign a Setpoint frequency converter to one of the analog outputs.



10 (configuration / An	Analog output 1
Analog output 1 Analog output 2	Setpoint fre	Free Setpoint frequency converter Fan
<	Deactivate	

Figure 85: Analog frequency converter Analog Output menu

5.1.1.5. Analog frequency converter configuration - VFD parameter modification

If all the steps were done correctly, the Analog frequency converter should work properly. If required, enter Factory settings / Frequency converter menu and modify the converter parameters:

- 1. Minium FC speed
- 2. Maximum FC speed
- 3. PID parameters
- 4. Speed reduction functions

From settings menu, enter Frequency converter and if necessary modify speed limits.

5.1.2. Modbus frequency converter

To setup the Modbus-controlled frequency converter, the following parameters must be changed:

- 1. VFD type
- 2. Serial interface type for VFD control
- 3. VFD operation parameters

5.1.2.1. Modbus frequency converter - setup VFD type

From settings menu, enter Factory settings / Frequency converter and set the converter type to "Modbus" in parameter "Frequency converter".



Factory sett	Frequency converter	
Frequency converter	Modbus +	OFF Analog
FC Modbus master	Danfoss	Modbus
FC Modbus slave address	1	
FC communication error timeout m	ns 1000	
Proportional gain %/b	ar 80.00	
<	Deactivate	

Figure 86: Modbus frequency converter type setup

Set the "FC Modbus master" to the interface (serial port) to which the frequency converter is connected to.

Factory settings / Frequ			FC Modbus master
Frequency converter	М	lodbus 🕨	Internal
FC Modbus master	Internal +		Serial 2
FC Modbus protoco	Danfoss		Serial 3
FC Modbus slave address		1	
FC communication error timeout	ms /bar	80.00	
	o Dai	80.00	
<		Deactivate	

Figure 87: Modbus frequency converter serial port

Set the "FC Modbus protocol" to the type of the FC.


Factory se	ettin	igs / Fre	quency	convei	rter	1/ 3
Frequency converter	Μ	lodbus 🕨				
FC Modbus master	Ir	nternal 🕨				
FC Modbus protoco	D	anfoss				>
FC Modbus slave address		1				
FC communication error timeout	ms	1000				
Proportional gain 9	%/bar	80.00				
	_					
<		Deactiv	ated	bar ■ min	6.12 max	X

Figure 88: Modbus frequency converter model

Set the FC Modbus slave address.

Factory settings / Frequency converter							1/ 3	
Frequency converter	N	lodbus ►		FC	/lodbus s	slave ad	dress	
FC Modbus master	Ir	nternal 🕨		1	2	3	×	
FC Modbus protoco	D	anfoss		4	5	6		
FC Modbus slave address		11		7	8	9	0	
FC communication error timeout	ms	1000		- Col				<
Proportional gain %	/bar	80.00		Gai	icei		'N	
<		Deactiv	vated		bar ■ min	6.12 ma	2 ×	X

Figure 89: Modbus frequency converter ID

The parameter "FC communication error timeout" can be adjusted if the controller reports communication errors too early.

5.1.2.2. Modbus frequency converter - serial configuration

From settings menu, enter Network settings and enter the configuration menu for the interface that the FC is connected to. Set all the communication parameters according to the VFD settings in "Internal serial function". The example below shows the configuration for the Danfoss VFD on the internal serial.



Netwo	rk settings /	/ Interna	l serial		
Baudrate	115200 +				
Parity	Even +				
Stopbits	1 →				
Function	Modbus master •				
RTU master timeout	200				
		-			
					_
<	Deactiv	vated	bar ■ min	6.12 max	X

Figure 90: Modbus frequency converter on internal serial

From settings menu, enter Network settings and Address configuration. Choose the "Modbus address" refers to the address of the master interface and not the VFD ID.

	Network settings / Address					
Modbus address		2				
	_			har	6 1 2	57
<		Deactiv	ated	Dar ■ min	max	X

Figure 91: Device Modbus address

5.1.2.3. Analog frequency converter - setup VFD type

If all the steps were done correctly, the Modbus frequency converter should work properly. If required, enter Factory settings / Frequency converter menu and modify the converter parameters:

- 1. Minium FC speed
- 2. Maximum FC speed
- 3. PID parameters
- 4. speed reduction functions

From settings menu, enter Frequency converter and if necessary modify speed limits.

5.2. BLCO setup

5.2.1. BLCO Master configuration

To configure BLCO master, the following parameters must be changed on the master controller:

- 1. Serial port used for BLCO
- 2. Pressure control input
- 3. BLCO configuration
- 4. Individual slave configuration

5.2.1.1. BLCO Master serial port configuration

From settings menu, enter Network settings on the chosen serial port (Internal / Serial 1 / Serial 2 / Serial 3) which will be using for BLCO Network. Set the communication parameters to reflect the communication parameters that the BLCO net uses.

The following example is for Serial 3.

Network s	settings	/ Serial S	Slot 3		
Baudrate	19200 +				
Parity	None 🕨				
Stop bits	1 ▶				
Function Mode	ous master ►				
RTU master timeout	200				
		_			
<	Deactiv	ated	bar ■ min	6.12 max	X

Figure 92: BLCO Master communication setup

Parameter "Function" must be set to Modbus master, the rest of the parameters must be the same as on BLCO slave devices.

From settings menu, enter Network setting and Address configuration and set "Modbus address" - this is the interface Modbus master ID.



Network settings / Address				
Modbus address	2			
<	Deactivated	bar 6.12 min max		

Figure 93: BLCO Device modbus address setup

5.2.1.2. BLCO Master pressure control input configuration

From settings menu, enter Remote control / Pressure control and set the pressure control mode to "BLCO" if the master compressor is to be used and controlled by BLCO.

Remote	control	/ Pre	Pressure control mode
Pressure control mode Pressure band select mode Pressure setting	BLCO Local No	•	Local BLCO External
<	Dea	ctivate	

Figure 94: BLCO Master pressure source

5.2.1.3. BLCO Master BLCO net configuration

From settings menu, enter Baseload changeover / Baseload changeover setup Parameters required to enable BLCO master:

1. "Master enable" - set to yes



- 2. "Slave count" set to the number of slaves in the BLCO net. If this value is wrong, the network will be slower.
- 3. Rest of the parameters do not affect BLCO communication but influence the BLCO algorithm behaviour

Baseload changeover setup						
BLC Master	Yes 🔻					
Number of slaves	1					
Changing time h	4				>	
Start up delay s	20					
Switch off delay s	5					
Start up delay alert pressure s	5					
<	Deactiv	ated	bar ■ min	6.12 max	X	

Figure 95: Baseload changeover setup 1 / 2

Baseload changeover setup					
Swittching on over %	6 100				
Switching off below %	6 0				
Delay time switching on/off over/under	5 150				
Internal hours offset	n 0				
Running hours: 3	_	-			<
<	Deactiv	ated	bar •	6.12	X

Figure 96: Baseload changeover setup 2 / 2

5.2.1.4. BLCO Master BLCO slave configuration

From settings menu, enter Baseload changeover. There the user can configure each of the slaves in their respective menu.

For each of the slaves, configure:

1. Slave serial port to which the slave is connected



2. Device address

3. Hours offset

Basel	oad changeover	/ Slave 1	
Interface selection	Serial 3		
Address	2		
Running hours offset	0		
Running hours Slave	1:0		
<	Deactivated	bar € ■ min	5.12 max

Figure 97: BLCO Master slave 1 configuration

5.2.2. BLCO Slave configuration

To configure BLCO slave, the following parameters must be changed on the slave controller:

- 1. Serial port used for BLCO
- 2. Pressure control input

5.2.2.1. BLCO Slave serial configuration

From settings menu, enter Network settings on the chosen serial port (Internal / Serial 1 / Serial 2 / Serial 3) which will be using for BLCO Network. Set the communication parameters to reflect the communication parameters that the BLCO net uses.

The following example is for Serial 3.



Network s	settings / Seria	l Slot 3	
Baudrate	19200 +		
Parity	None 🔸		
Stop bits	1 .		
Function Mode	ous master ►		
RTU master timeout	200		
<	Deactivated	bar 6.12 min max	X

Figure 98: Network settings / Serial menu

Parameter "Function" must be set to BLCO slave, the rest of the parameters must be the same as on BLCO master device.

From settings menu, enter Network setting and Address configuration and set "Modbus address" - this is the interface Modbus master ID.

Netwo	Network settings / Address					
Modbus address	2					
<	Deactivate	d bar min	6.12 max	X		

Figure 99: Network settings / Address configuration

5.2.2.2. BLCO Slave pressure control selection

From settings menu, enter Remote control / Pressure control and set the pressure control mode to "BLCO" if the master compressor is to be used and controlled by BLCO.



Remote	control	/ Pre	Pressure control mode
Pressure control mode Pressure band select mode Pressure setting	BLCO Local No	•	Local BLCO External
<	Dea	ctivate	

Figure 100: Remote control / Pressure control menu

5.3. Schedule

Scheduler allows to configure up to eight channels that can modify certain compressor operation parameters. From settings menu, enter Schedule and select the channel which settings are to be modified.

	Schedule	1/ 2
Scheduler is turned off	•	
Channel 1	Channel 2	>
Channel 3	Channel 4	
Channel 5	Channel 6	
<	Deactivated bannin	r 6.12 max

Figure 101: Schedule menu 1 / 2



	Schedule		2/ 2
Scheduler is turned off	•		
Channel 7	Channel 8		
			<
<	Deactivated	bar 6.12 min max	X

Figure 102: Schedule menu 2 / 2

Schedule / Channel 1				
Disabled +				
Mon Tue Wed Thu Fri Sat Sun				
Start 00:00 Stop 00:00				
Pressure band 1				
BLC PRIORITIES				
C Deactivated	bar 6.12 min max			

Figure 103: Schedule menu - settings for channel 1

Schedule configuration options for each of the channels:

- 1. Channel function: "Compressor active" or "Output active" or "Compressor and output active"
- 2. Days on which the selected channel is active
- 3. Channel activation and deactivation times
- 4. Pressure band if the compressor is active during the active scheduler channel

If the scheduler is modified on the BLCO master device, slave device priorities can be adjusted.



		Schedule	/ Channel '	1	1/ 2
Master	n h	r O	_	n - normal	
Slave 1	n h	r O	_	r - reserve 0 - off	
Slave 2	n h	r O	_	0-011	→ >
Slave 3	n h	r O	_		
Slave 4	n h	r O			
Slave 5	n h	r O			
<		Dea	ctivated	bar 6.	12

Figure 104: Schedule menu - BLCO priorities

To enable the scheduler, click on the "Scheduler is turned off" tile. After successful activation, the text changes to "Scheduler is active".

	Schedule		1/ 2
Scheduler is turned off			
Channel 1	Channel 2		>
Channel 3	Channel 4		
Channel 5	Channel 6		
<	Deactivated	bar 6.12 min max	X

Figure 105: Schedule menu

In the main view, the scheduler can be enabled and disabled by pushing the time and date tile. The calendar icon indicates that the scheduler is active.



Pressure 6.12 bar max 8.50 bar min 6.00 bar	max RENN Kompresso		Temperature error 39.2°C
System pressure 0.00 bar	11:46 18-03-202	0	₩ 🗶 💓
Power consumption Free air delivery C Compressed air temp.	 Il/min 	Dead	ctivated
MENU >			X

Figure 106: Main view with active sheduler

In order for the scheduler to be active, the compressor must be in enabled stage (the user must press the green start button).

5.4. Drain

From settings menu, enter Operation parameters / Drain configuration. To enable the function, set "Drain function active" to ON.

Operatio	on paran	neters / I	Drain		
Period time s	\$ 0				
Duty cycle %	5 O				
Drain function active	OFF 🔻				
		_			
			hav	6 10	
<	Deacti	vated	Dar ■ min	max	Ĩ

Figure 107: Drain configuration menu

Drain configuration options:

- 1. Drain period time Length of the drain function operation period
- 2. Drain duty cycle How long in the operation period the drain output is active



If drain is activated, it is necessary to set one of the digital outputs to drain function. In order to do this, from settings menu enter IO configration / Digital outputs configuration and set one of the outputs as a drain function.

10 0	configuration / Di	Digital output 5
Solenoid valve	NO	Free
Motor contactors	NO	Drain
Digital output 5	NC -	FC Enable
Digital output 6	NC -	Fan
Digital output 7	NC -	Uryer Heater
Digital output 8	NC -	Warning
		Fault
<	Deactivate	1/3

Figure 108: Drain digital output configuration

5.5. Fan

From Operation parameters, enter Fan configuration. To enable the function, set "Fan function active" to ON.

Operatio	on parar	neters /	Fan		
Fan function active	OFF 🔻				
Fan off °C	0.0				
Fan on °C	0.0				
Fan max speed temperature °C	0.0				
		_			
<	Deactiv	ated	bar min	6.12 max	X

Figure 109: Fan configuration menu

Fan configuration options:

1. Fan off temperature - When the temperature drops below this level fan turns off.



- 2. Fan on temperature When the temperature rises above this level fan turns on. Must be higher than fan off temperature.
- 3. Fan max speed temperature When the temperature reaches this level the analog fan control reaches max value. Must be higher than fan off temperature.

If fan is activated, it is necessary to set one of the digital outputs to fan function. In order to do this, from settings menu enter IO configration / Digital outputs configuration and set one of the outputs as a fan function.

10	configuration / Di	Digital output 5
Solenoid valve	NO	Free
Motor contactors	NO	Drain
Disital output 5		FC Enable
		Fan
Digital output 6	NC -	Dryer
Digital output 7	NC 🔻	Heater
Digital output 8	NC 🔻	Warning
		Fault
<	Deactivate	1/3

Figure 110: Fan digital output configuration

When a digital output is set, the next step is to setup the analog output. In order to do this, from settings menu enter IO configration / Analog outputs configuration and set one of the outputs as a fan function.

IO configuration / An	Analog output 2
Analog output 1	Free
Analog output 2	Setpoint frequency converter
	Fan
C Deactivate	





5.6. Dryer

	Operation	n paramet	ers / Dryer		
Pre-run dryer		OFF 🔻			
Pre run time	S	0			
			bar	6.12	- a

From Operation parameters, enter Dryer configuration and set parameter "Dryer function active" to ON.

Figure 112: Dryer configuration menu

Dryer configuration options:

1. Pre run time - Time that prohibits the start of the compressor if the dryer reaches the working condition.

If dryer is activated, it is necessary to set one of digital output to dryer function. To do this, go to IO configuration enter digital output configuration choose output and set to dryer function.

10 0	configuration / Di	Digital output 5
Solenoid valve	NO	Free
Motor contactors	NO	Drain
Digital output 5	NC 🔻	FC Enable Fan
Digital output 6	NC 🔻	Dryer
Digital output 7	NC 🔻	Heater
Digital output 8	NC -	Warning
		Fault
<	Deactivate	1/3

Figure 113: Drain digital output configuration

The user can optionally set the "Dryer ready" input. This input is used to indicate that the dryer does not work correctly. If this input is active the compressor turns off.



To enable the signal, enter Settings menu / IO Configuration / Digital inputs and select the input to be used as a dryer ready input.

	IO configuration / D	Digital input 2
Digital input 1	NC T Eme	Warning
Digital input 2		External Start-Stop
Digital input 2		External Load-Unload
Digital input 3		100% Setpoint
		Minimum speed 2
Digital input 5	NC 👻	Dryer ready
Digital input 6	NC 🔻	Pressure band 2
,		
<	Deactivate	2/3

Figure 114: Drain digital input configuration

5.7. Frost protection

From Operation parameters, enter Frost protection configuration. To enable the function, set "Heater active" to ON.

Operation	para	ameters	/ Frost	protecti	on	
Modus heater active		ON 🔻				
Heater activation temperature	°C	6.0				
Heater deactivation temperature	°C	25.0				
Modus motor running active		ON 🔻				
Motor running activation temperature	°C	6.0				
Motor running deactivation temperature	°C	25.0				
<		Deactiv	ated	bar ■ min	6.12 max	X

Figure 115: Frost protection configuration menu

Frost protection configuration options:

1. Heater active - Activation or deactivation of the heater function.



- 2. Heater activation temperature When the temperature drops below this level heater turns on.
- 3. Heater deactivation temperature When the temperature rise above this level heater turns off.
- 4. Motor heating active Activation or deactivation of the motor heationg function.
- 5. Motor heating activation temperature When the temperature drops below this level motor heating turns on.
- 6. Motor heating deactivation temperature When the temperature rise above this level motor heating turns off.

If Frost protection is activated, it is necessary to set one of the digital outputs to heater function. In order to do this, from settings menu enter IO configration / Digital outputs configuration and set one of the outputs as a Heater function.

10 c	configuration / Di	Digital output 5
Solenoid valve	NO	Free
Motor contactors	NO	Drain
Digital output 5	NC -	FC Enable
Digital output 6	NC 🔻	Drver
Digital output 7	NC -	Heater
Digital output 8	NC -	Warning
		Fault
<	Deactivate	1/3

Figure 116: Heater digital output configuration

5.8. Build up monitor

From settings menu, enter Operation parameters / System pressure related and setup the parameters according to the requirements.



Sy	sten	n pressi	ure rela	ted		
Maximum system pressure to start	bar	0.80				
Idle stop system pressure limit	bar	15.00				
User stop system pressure limit	bar	15.00				
Pressure build up monitoring time	s	30				
Build up minimum pressure	bar	1.00				
<		Deactiv	ated	bar ■ min	6.12 max	X

Figure 117: System pressure related menu

Build up monitor configuration options:

- 1. Pressure build up monitoring time Time after which system pressure will be checked in compressing state for the pressure build up.
- 2. Build up minimum pressure Level of system pressure that must be reached after build up delay.

If the compressor does not reached the "build up minimum pressure" level after the "build up delay", the fault occurs and the compressor stops.

5.9. Software update

The update process consists of two steps:

- 1. HMI update initiated by the user
- 2. Main controller update performed automatically after the HMI update

5.9.1. HMI update

To begin the update process, plug the USB key with the update file located in the update/ directory to the USB port on the HMI. From the bottom sliding menu, enter Information menu and press the "Update" button.



	Information	
Software version	v16765 (16765)	Update
Serial number	0	Log
Vendor	Renner GmbH Kompres	soren
Drive type	Star-delta	
Free air delivery	1 l/min	
<	Deactivated	bar 6.12 ■ min max

Figure 118: Information menu

The update procedure starts. Do not turn off the power supply during the update process.

Ver	sion: v16765	Information		
	Software version	v16765 (16765)	Update	
	Serial number	0	Log	
	Vendo			
	Drive t	Processing		
L	Free air delivery	1 l/min		
	<	Deactivated	bar 6.12 min max	X

Figure 119: Update process

During the update process the diagnostic information will be displayed.

Table 42: HMI Update messages

Update message	Details / suggested action
Updating HMI. Do not turn off the	The update is in progress.
power supply!	
Update succeess. Rebooting	The HMI update was completed and the device is rebooting.

Update message	Details / suggested action
There was detected more than	On the USB key's update directory, there is more than one file
one file with .update extension	with the update package.
on the removable drive. Re-	To fix the issue:
move additional files and restart	
update.	1. Disconnect the USB key from the HMI
	2. Plug the USB key back to the HMI
	3. Retry the update
	4. If problem persists, connect to PC and verify if the update
	package was uploaded to the USB key properly
There is no file with .update ex-	On the USB key's update directory, there isno file with the update
tension present on the remov-	package.
able drive in the update foder.	To fix the issue:
	1. Disconnect the USB key from the HMI
	2. Plug the USB key back to the HMI
	3. Retry the update
	4. If problem persists, connect to PC and verify if the update
	package was uploaded to the USB key properly
	5. If the update package exists in the update directory, verify if
	it is a proper update file for a device
	6. Disconnect the USB key from the PC and retry the update
UPDATE FAILED	Generic error.
	To fix the issue:
	1. Retry the update
	2. Disconnect the USB key from the HMI
	3. Plug the USB key back to the HMI
	4. Retry the update
	5. If problem persists, connect to PC and verify if the update
	package was uploaded to the USB key properly
	6. If the update package exists in the update directory, verify if
	it is a proper update file for a device
	7. Disconnect the USB key from the PC and retry the update
	8. If problem persists, try updating the HMI using the fallback
	update method.

Table 42: HMI Update messages

5.9.1.1. Fallback HMI updater

If the HMI update fails or the user cannot enter the Information menu, there is a possibility to update the software system using the fallback updater.

To use a fallback updater:

- 1. Connect the USB key with a update package to the HMI USB port
- 2. Power off the HMI
- 3. Power on the HMI
- 4. When the splash screen is shown, press a 0 button several times and wait for the fallback updater to display the messages.

5.9.2. Main Controller update

In order for the Main Controller software to be updated, it needs to be connected to the HMI and powered on. After successful connection to the Main Controller, HMI detects if the software version on the Main Controller is the same as on the HMI and initiates the update if necessary. During the Main Controller update, the diagnostic information will be displayed.

Update message	Details / suggested action
Updating Main Controller: start- ing update	The update has started
Updating Main Controller: step 1 of 3	The update is in progress
Updating Main Controller: step 2 of 3	The update is in progress
Updating Main Controller: step 3 of 3	The update is in progress
Updating Main Controller failed	The update has failed and will be retried

Table 43: Main Controller Update messages

5.9.2.1. Fallback Main controller update

If updating the Main Controller fails it is possible to enable the emergency updater and force the update.

In order to carry out the emergency update procedure, it is required to enable the switch position 1 on the main controller and restart the controller. The emergency update procedure starts and HMI will display the notification about updating the MC using the emergency updater. Possible notifications:

Update message	Details / suggested action
Emergency updating Main Con- troller: starting update	The update has started
Emergency updating Main Con- troller: step 1 of 3	The update is in progress
Emergency updating Main Con- troller: step 2 of 3	The update is in progress
Emergency updating Main Con- troller: step 3 of 3	The update is in progress
Toggle a switch to proceed	Toggle the switch position 1 on the main controller to "off" and wait for the procedure to end.

Table 44: Main Controller Update messages