CAP 837 Service Manual
October 2017
Rev. D

Nx Series

iCommand – Touch Controller

Service Manual

WARNING

Personal injury and/or equipment damage will be result by failing to pay attention to the vital safety information and instructions in this manual. Carefully read, understand, and retain all safety information and instructions before operating this compressor.

Operating instructions
FSCurtis ICommand- Touch

Software version:	V1.15
Last updated:	16/12/2015
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Article number:	CAP837

Note:

All information provided is up to date with the current development level. Changes may be made at any time without prior notification. We accept no liability for printing mistakes. This document replaces all older versions.

Contents

List of illustrations

1 Safety notices

The FSCurtis ICommand-Touch is equipped with a color graphic display with a touch screen.

BEFORE BRINGING THE CONTROL SYSTEM INTO OPERATION, YOU MUST READ THE FOLLOWING OPERATING INSTRUCTIONS!

1. Only trained specialist staff is permitted to bring the control system into operation, undertake parameter settings and maintain it. This applies when changing batteries in particular.
2. Environmental conditions for storage:
   Ambient temperature range (storage) -25 to 75°C
   Humidity (storage) max. 90%; non-condensing
3. Environmental conditions during operation:
   Ambient temperature range (operation) -5 to 55°C
   Humidity (during operation) max. 90%; non-condensing
4. FSCurtis retains the right to make changes, additions or improvements to this product (hardware and software). This does not imply any duty to update any devices already supplied.
5. Display: the life expectancy of the display is strongly dependent on the environmental conditions. Protect the control system against direct sunlight and high temperatures so that you can benefit from the high quality of the display for as long as possible!

2 Control System Use and Connection

2.1 Standard function

Figure 1: FSCurtis ICommand-Touch. The actual design of the membrane keyboard may vary from the one
shown in this figure.

The ICommand-Touch is an intelligent compressor control system which can be extended.

It can be used for oil-lubricated screw compressors with a fixed speed and for converter machines. Lento (oil-free) compressors can also be controlled with an extra module which extends the input / output level.

The ICT also has a basic load cycle function to ensure equal utilization in up to five compressors at the same time (ICT as basic load cycle master with up to 4 basic load cycle slaves).

All settings can be made via the graphic interface in the code-protected menu system. The base screen display provides a quick overview of the system type and status at all times.
Extra information such as progression charts and compilations of all pressure and temperature values can be quickly accessed by simply tapping on them.

Replacement battery p/n: F1481503

2.2 Special versions

There are two special versions of the software with slight deviations from the standard process. More information is available from FSCurtis on request.

2.3 Circuit diagram

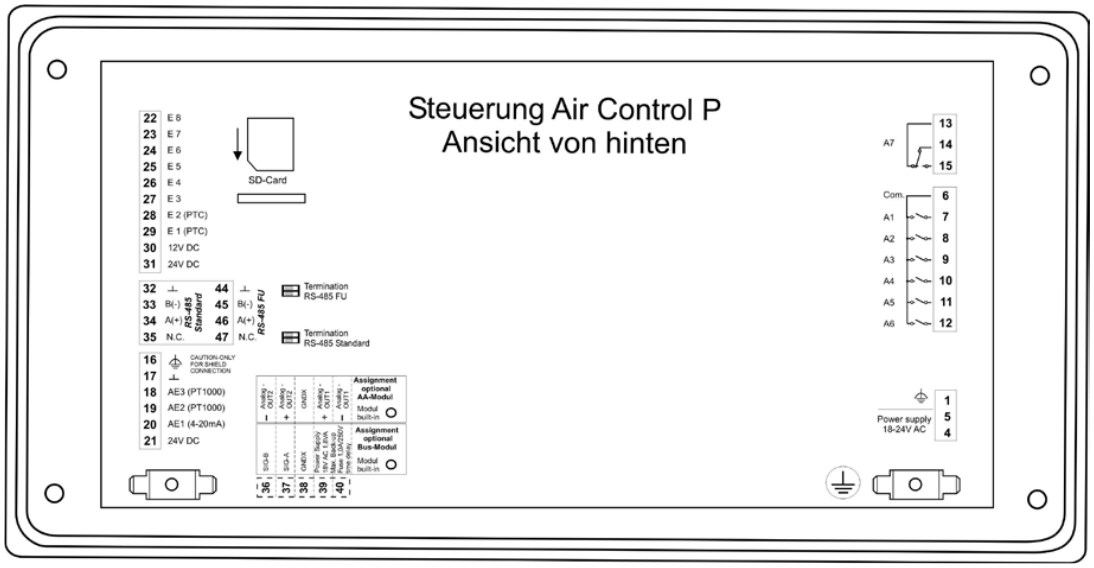

Figure 2: Rear view of control system (terminal assignment).

Pin	Designation	Function	Plug / grid
1	PE	Functional earth (EMC)	Phoenix MINI-COMBICON Grid 3.81 mm, 3-pin
4	0V AC	Control system supply	
5	18V AC .. 24V AC		
6	Relay output A1 – 7 COM	Shared connection for terminals 7 to 12	Phoenix COMBICON MSTBA Grid 5.0 mm 7-pin
7	Relay output A 1	Mains contactor (fixed)	
8	Relay output A 2	Star contactor (freely programmable for FC)	

9	Relay output A 3	Delta contactor (freely programmable for FC)	
10	Relay output A 4	Solenoid valve (with varistor, fixed)	
11	Relay output A 5	Heating	
12	Relay output A 6	Condensate valve (with varistor)	
13	Relay output A 7 Normally closed contact	General fault	Phoenix COMBICON MSTBA Grid 5.0 mm 3-pin
14	Relay output A 7 Common		
15	Relay output A 7 Normally open contact		
16	PE	Screen connection	Phoenix MINI-COMBICON Grid 3.81 mm, 6-pin
17	GND	Ground for analogue inputs AE 2 and AE 3	
18	Analogue input AE 3	PT1000 (compressor temp.)	
19	Analogue input AE 2	PT1000 (oil temperature)	
20	Analogue input AE 1	4 – 20 mA (mains pressure)	
21	24V DC	Transmitter voltage for AE 1	
22	Dig. input E 8	Basic load cycle: loaded / idling	Phoenix MINI-COMBICON Grid 3.81 mm, 10-pin
23	Dig. input E 7	Remote On/Off or basic load cycle OK	
24	Dig. input E 6	Emergency stop (fixed)	
25	Dig. input E 5	Speed limit	
26	Dig. input E 4	Direction of rotation	
27	Dig. input E 3	Overpressure	
28	Dig. input E 2 (PTC)	Overcurrent	
29	Dig. input E 1 (PTC)	Motor temperature	

30	12V DC	Transmitter voltage 12V DC (PTC)	
31	24V DC	Transmitter voltage 24V DC	
32	GND	RS-485 standard	Phoenix MINI-COMBICON Grid 3.81 mm, 4-pin
33	RS-485 B(-)		
34	RS-485 A (+)		
35	Not used		
36	Signal B	**Option:** Interface for MK200 bus modules	Phoenix Direct plug ZEC1.5/5-ST-5.0 5-pin
37	Signal A		
38	GNDX		
39	0V AC supply bus module		
40	18V AC supply bus module		
36	- Analogue output 2	**Option:** Connection for internal analogue output module	Phoenix Direct plug ZEC1.5/5-ST-5.0 5-pin
37	+ Analogue output 2		
38	GNDx		
39	+ Analogue output 1		
40	- Analogue output 1		
44	GND	RS-485 FU (only with "Flex" variant)	Phoenix MINI-COMBICON Grid 3.81 mm, 4-pin
45	RS-485 B(-)		
46	RS-485 A(+)		
47	Not used		

2.4 Interfaces

Description of interface functions will be added later.

2.5 MK200 modules – assignment

Depending on system type and configuration, additional MK200 modules may also be needed to extend the input/output level. (see also 4.6.2)

Converter activation:	MK200 4AA	address 1	only if FC activation is not performed via RS485
Basic load cycle module		MK200 8E4RA Address 2	to activate up to four compressors when connected via digital signals (generally external compressors)
Accessories:	MK200 8E4RA	Address 4	optional, non-system-dependent
	MK200 8E4RA	Address 5	optional, non-system-dependent
Lento:	MK200 8E4RA	Address 6	
Special version	MK200 8E4AE	Address 7	only for special version

For configuration of modules, also refer to 4.6.2 and 4.6.3 .

Converter module MK200 4AA – Address 1

Analogue output 1	Current variable
Analogue output 2	Current variable

Basic load cycle module: MK200 8E4RA – Address 2

to activate up to four compressors when connected via digital signals (generally external compressors)

Lento: SCW module MK200 8E4RA – Address 6

This module cannot be configured and is always expected at address 6 on oil-free systems. The assignment of inputs/outputs is defined for Lento systems:

Input 1 Fan 1 overcurrent

Input 2 Fan 2 overcurrent

Input 3 Converter fault

Input 4 Dryer warning

Input 5 Overfill. Maximum water level reached.

Input 6 Open water outlet

Input 7 Water filter differential pressure

Input 8 Bearing purging pressure build-up

Output 1 Bearing purging solenoid valve

Output 2 Relief valve

Output 3 PU bearing

Output 4 Outlet valve (water drain)

MK200 4AE-4RA – Address 7

This module is always needed as soon as the ambient temperature monitoring is activated or a dryer is present and is always expected at address 7. The assignment of inputs/outputs cannot be changed:

Analogue input 1 Not assigned

Analogue input 2 Not assigned

Analogue input 3 Dew point temperature (only if analogue input on AC P is occupied by oil temperature)

Analogue input 4 Ambient temperature: if ambient temperature monitoring is active

Output 1 Dryer

Output 2 Not assigned

Output 3 Not assigned

Output 4 Not assigned

Profibus module – Address 31

Can be activated in the menu.

3 Using the control system

When you start the control system, a welcome screen as shown in illustration 3 is displayed for approximately three seconds. The display then automatically changes to the base screen display.

Figure 3: ICommand-Touch welcome screen.

The control unit has a resistive color touch screen with a resolution of 480x272 pixels. It is robust enough to cope with industrial use and is convenient and easy to use. The relevant control need simply be gently tapped – with a finger or stylus – for the desired input. The controls can also be used when wearing gloves.

3.1 Display structure

Figure 4: Base screen display . (Note: For the purpose of illustration, this display contains a combination of symbols which is not possible in a real system.)

The following display elements are used in the user interface:

Photo of system

Tapping the photo or i-button in the title bar takes you to the system pass.

 If this symbol is shown in the system photo, it is a converter machine.

Equipment status:

The current status of the equipment is indicated by the following three icons which appear in the upper left-hand corner of all the display screens:

 the "Smiley" icon means no messages are present. The equipment is working correctly.

 as soon as awarning message or maintenance message is present, the "Smiley" is replaced by a warning triangle.

 the flashing tool indicates there is a fault.

Messages are also shown in the system diagram, allowing the origin of the warning, maintenance or fault to be detected.

Under the system diagram is the status line which continuously provides information about the system's operating status. The following symbols are used:

 Frost protection

 Heater on

 Load valve open

 Fan active

 Motor running

 Communication with RS485 active

 Pressure times timer active

 Compressor timer active

 SD card

Language selection:

Press the  button in the base screen display to select the language to be used in the displays. This button does not work in the current version.

Navigation:

Tap the following buttons in the title bar to navigate through the system.

 Tap the "Home" button to return to the base screen display from any display screen (this button does not appear in the base screen display itself). Any code you have previously entered is rejected.

 Tap the left arrow to go back a screen or a level, depending on context..

 Tap the right arrow to go to the next screen or level, depending on context.

Button bar in the base screen display:

On the right-hand side of the base screen display you will find five buttons which you can use to access all the most important functions and information. These buttons have the following meanings (from top to bottom):

Pressure: The current mains pressure sensor measurement is displayed here. Tap this button to display the mains pressure progression as a graphic. All pressure values for the entire system are shown on the other pages (use arrow keys to page forwards and back).

Oil Temp: The current final compression temperature measurement is displayed here. Tap this button to display the temperature progression as a graphic. All temperature values for the entire system are shown on the other pages (use arrow keys to page forwards and back).

Status: The current compressor status is displayed. Tap this button to display the air circuit and oil circuit as a graphic.

Graphics: This button takes you to an overview of all the graphic evaluations available. Mains pressure, temperature, maintenance intervals, utilization and basic load cycle are available (basic load cycle only when using the basic load cycle function).

Menu: Click the "Menu" button to access the menu system. This is where you will find all the setting parameters.

Graphs

The measurements for mains pressure and final oil compression temperature are saved regularly (for the intervals at which this data is stored, see 4.5.3). The data gathered in this manner can be shown as graphs.

In the graph area, use *one* finger to drag a square to limit the amount of data displayed (zoom in). The following options are available on the x axis:

Max	All the data points currently present are displayed. Both axes are adjusted to give the best possible display.
10 min, 30 min, 1 h	The data at these time intervals is displayed. The direction keys scroll along the x axis in steps of a quarter of the selected interval.
X-Auto	The values are taken from the Display Parameters → Graphs → X Auto menu.
Manual	Use this option to select and set your own date and time.

The y axis is initially scaled with values taken from the Display Parameters → Graphs menu. You can change both the upper and lower limit here. Use the numerical keypad to enter the new values. Tap the double-ended arrow on the y axis to reset the limits to the values taken from the menu.

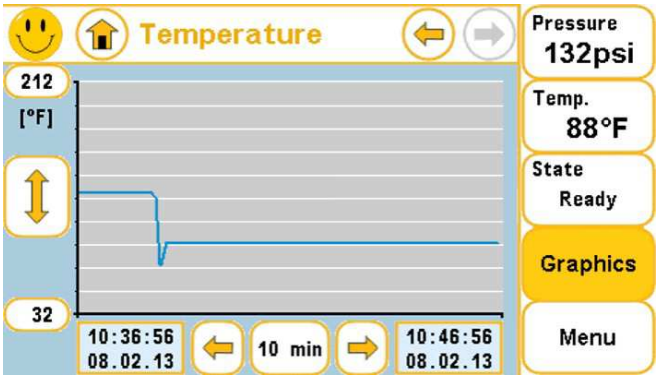

Figure 5: Graphical representation of temperature progression T1.

3.2 Messages

Figure 6: Popup messages in the base screen display.

When a new message arrives, you see a flashing warning triangle (warning/maintenance) or tool icon (fault) in the top left-hand part of the base screen display. The message also appears in plain text in a popup message box on the lower edge of the screen. Tap the Quit button to close the message window. However, the fault icon in the title bar continues to flash until the cause of the fault is dealt with. Tap the warning or fault icon in the title bar to display the plain text message again.

You will find an overview of all the possible messages in Section 5 .

3.3 Entering a code

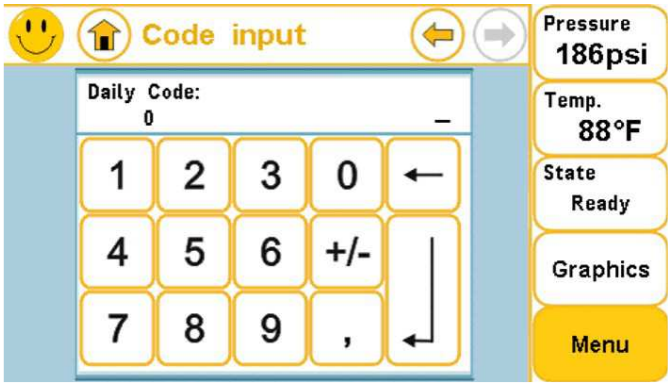

Figure 7: Entering a code

Tap the Menu button in the button bar to open the code input screen.

Here you see a number pad that you can use to enter the access code or the function code.

Use the backspace key ← to delete a code character by character.

Tap the Enter key ↵ to confirm the code. Tap the Home button in the title bar if you want to stop entering the code.

When you confirm that a code is correct, the display switches to menu level, in other words, the associated function is carried out. There are codes with different functionalities:

Code	Code type	Access level / function	Description
---	Menu	No code	The menu system is displayed in full. You cannot change the settings. You can access the "Touch lock" function.
1	Menu	Customer	The menu system is displayed in full. Settings can only be made in the Display Parameters → Settings menu. You can access the "Touch lock" function.

3846	Menu	Service	The menu system is displayed in full. You can change any of the parameters. Caution: As of the factory level, this code cannot be changed in the Configuration menu!

3.3.1 Accessing the menu system

Once a menu code has been entered, the display switches to the main menu. Depending on code level, access is linked with various authorizations. Parameters are either just displayed or can also be modified. The more critical a setting is to the safety of the system, the higher the associated code level (see also Table 1).

After commissioning and/or once ten operating hours are reached, the fixed service code is deactivated and replaced by a dynamically issued 24h code. The control system generates a random number and displays it. If this number is sent to Service/ FSCurtis, a day code, applicable for 24h, is provided.

There is a separate code for specifically deactivating the fixed factory code, regardless of the operating hours counter.

3.3.2 Additional screenshot generation function

The ICommand-Touch allows you to generate screenshots during operation, and save them on SD card. To do this, first enter the appropriate code (see Table 1), insert an SD card that is not write-protected, and ensure it is ready.

To produce a screenshot, click on the title bar in the relevant display.

3.3.3 Commissioning functions

To commission converter machines in the best possible way, you can run a run-in routine. To do this, first enter the appropriate code (see Table 1). Normal operation is not possible until the run-in phase is complete.

If the run-in phase is interrupted, the appropriate cancel code must be entered. See also Table 1.

During the run-in phase, the converter is run in at gradually increasing speed; 20s is spent in each step with a pause of two minutes between each step.

The run-in routine is also activated if the converter setting is changed from "no" to "yes" in the menu.

3.3.4 Reset functions

As well as the classic default setting, which resets the settings to their respective default values, there are other ways of resetting operating hours counters, error memories, graphics and switching cycles.

3.3.5 OEM functions

These codes enable the branding to be changed from FSCurtis (standard) to Dalva, FSCurtis or Kraftmann. The control system's functionality remains exactly the same. However, the welcome screen and screen saver are displayed with the relevant logos and the choice of system types is adapted accordingly.

3.4 Inputting parameters

All the parameters that can be changed appear with a button in the menus (see Illustration 8). If a value is display-only (cannot be changed), a field with a light blue background appears instead of the button.

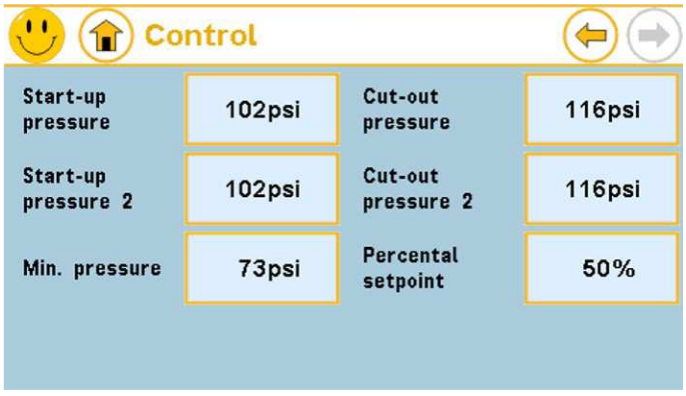

Figure 8: Example of a menu. All the parameters displayed here can also be changed.

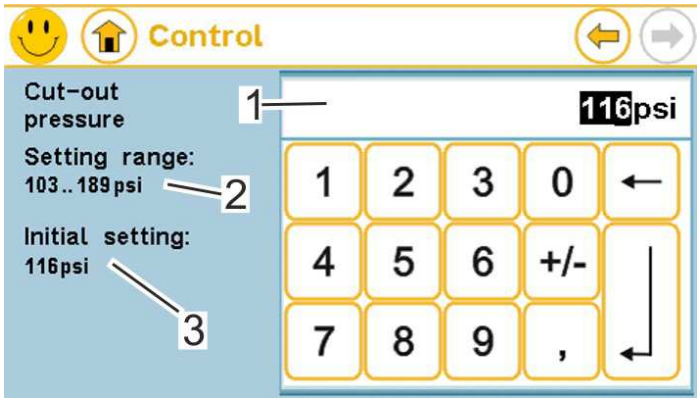

Figure 9: Number pad for entering numerical parameters.

A number pad is provided to enter or change numerical parameters (see Illustration 9). It appears as soon as you tap the parameter value. To the left of the number pad you see the possible setting range, default (factory) setting, and a brief description.

After you have input a new value, you can either accept or reject it:

Accept input and exit

Correct input

Reject input and close input screen

3.5 Software update

If required, you can update the software on the ICT. To do so, switch it off (disconnect the power supply) and when you switch it on keep touching, any point on the touch screen.

You can update the software from SD card or over the RS485 interface.

RS485: To use the RS485 interface, you also need a computer with programming software and a USB-RS485 adapter.

SD card: Insert the SD card with the required software in the control system and tap on the "Update Application (SD-Card)" button.
The system displays all the files found. Select the software.
Once the loading process is complete, you can restart the control system (switch it off, and then on again, or select "Start Application")

CAUTION:

Generally, settings remain unchanged. However, you should check them before you start the system again.
If the original version is a non-approved test software (version number starts with V0.XX), you must reset the software to its defaults after you have performed the update. This will overwrite any settings that have previously been made.

4 Menu system

The Main menu includes the following sub-menus:

- Control
- Operating Parameters
- Maintenance counter
- Timer
- Display settings
- Configuration
- Factory settings
- Fault memory
- Basic load cycle
- Diagnosis
- SD card

4.1 Control menu

The menu contains the following parameters:

Parameter	Values range/ Default setting/ Comments	System types	Code level
Switch-on pressure	Lower limit for pressure control. Setting range: 3.5 bar – (shut-off pressure - 0.1bar) Default setting: depending on system type	All	Customer
Shut-off pressure	Upper limit for pressure control. Setting range: depending on system type but at least 0.1 bar above switch-on pressure. Default setting: depending on system type	All	Customer
Switch-on	Lower limit for pressure control when switching	All	Customer

Parameter	Values range/ Default setting/ Comments	System types	Code level
Pressure 2	to the second pressure tolerance. Setting range: 3.5 bar – (shut-off pressure - 0.1bar) Default setting: depending on system type		
Shut-off pressure 2	Upper limit for pressure control when switching to a second pressure tolerance. Setting range: depending on system type but at least 0.1 bar above switch-on pressure. Default setting: depending on system type	All	Customer
Minimum pressure	If the mains pressure falls below the minimum pressure in basic load cycle mode (slave), a "Minimum pressure warning" is triggered. For as long as the warning is present / not acknowledged, the compressor switches to internal pressure control. Setting range: 3.5 bar – (shut-off pressure - 0.1bar) Default setting: 0 bar (no minimum pressure monitoring)	All (only during slave basic load cycle mode)	Customer
Percentage target value	Only for frequency converter: Position of target pressure value within the current pressure tolerance. When the setting is "0 %", the target value is the switch-on pressure and when the setting is "100 %", it is the shut-off pressure. Intermediate settings apply correspondingly. Setting range: 0 to 100% Default setting: 50%	FC	Customer

4.2 Operating Parameters menu

This menu includes the following parameters:

Parameter	Values range/ Default setting/ Comments	System types	Code level
Auto. restart	Automatic start after power outage. Setting range: Yes / No Default setting: No	All	Customer
Mode of operation	Mode of operation selection. Determines behavior when changing load. When loaded / idling, the motor runs continuously; in automatic mode, the motor is totally stopped if there is no load request (if necessary, under consideration of the overrun needed). Setting range: Automatic / Loaded / idling Default setting: Automatic	All	Customer
Remote On / Off	Defines whether it is possible to switch the system on/off remotely. If yes, it can be switched on/off using a digital input. If no, a correspondingly programmed digital input is ignored (also refer to 4.6.3) Setting range: Yes / No Default setting: No	All	Customer
Remote load / idling	Defines whether an external load request can be triggered by digital input. If yes, it can be switched on/off using a digital input. If no, a correspondingly programmed digital input is ignored (also refer to 4.6.3). With a basic load cycle slave, also defines whether activation is via digital inputs or RS485 interface. Setting range: Yes / No Default setting: No	All	Customer

Dew point monitoring	Defines whether the dew point temperature monitoring is active and results in a warning or deactivation. Setting range: Off, warning, fault Default setting: for Lento warning, otherwise off	All	Customer
Max. dew point	Maximum permitted dew point temperature Setting range: 0°C – 50°C Default setting: 12°C If the "Max. dew point" threshold is set to 0°C, monitoring of the dew point temp. is deactivated!	If dew point monitoring is active	Customer
Min. dew point	Minimum permitted dew point temperature Setting range: -10°C – 50°C Default setting: -4°C	If dew point monitoring is active	Customer

4.3 Maintenance/counter menu

4.3.1 Maintenance intervals

This menu includes the following parameters:

Parameter	Values range/ Default setting/ Comments	System types	Code level
Water filter maintenance interval	Time interval in which the water filter is to be maintained. Setting range: 0 – 30000 h Default setting: depending on system type	Lento	Service
Maint. interval suction filter	Time interval in which the suction filter is to be maintained. Setting range: 0 – 30000 h Default setting: depending on system type	All	Service
Oil/oil filter maintenance interval	Time interval in which the oil/oil filter is to be maintained. Setting range: 0 – 30000 h Default setting: depending on system type	All apart from Lento	Service
Maint. interval oil separator	Time interval in which the oil separator is to be maintained. Setting range: 0 – 30000 h Default setting: depending on system type	All apart from Lento	Service
Motor maintenance interval	Time interval in which the motor is to be maintained. Setting range: 0 – 30000 h Default setting: depending on system type	All	Service
Compressor maintenance interval	Time interval in which the compressor is to be maintained. Setting range: 0 – 30000 h Default setting: depending on system type	All	Service

Parameter	Values range/ Default setting/ Comments	System types	Code level
Universal 1 maintenance interval	Freely usable maintenance interval. Name in Display parameters menu → Texts can be adjusted. Setting range: 0 – 30000 h Default setting: 0 h	All	Service
Universal 2 maintenance interval	Freely usable maintenance interval. Name in Display parameters menu → Texts can be adjusted. Setting range: 0 – 30000 h Default setting: 0 h	All	Service
Universal 3 maintenance interval	Freely usable maintenance interval. Name in Display parameters menu → Texts can be adjusted. Setting range: 0 – 30000 h Default setting: 0 h	All	Service

4.3.2 Counter menu

This menu includes the following parameters:

Parameter	Values range/ Default setting/ Comments	System types	Code level
Operating hours	Operating hours counter. (Motor on) Setting range: 0 – 999999 h Default setting: 0 h	All	Factory
Loaded hours	Loaded hours counter. (Motor on, load valve open) Setting range: 0 – operating hours Default setting: 0 h	All	Factory
Stoppage hours	Stoppage hours counter. (System on, motor off) Setting range: 0 – 999999 h Default setting: 0 h	All	Factory

Total delivery volume	Compressor delivery volume calculated from maximum delivery volume of compressor and load hours Setting range: 0 – 999999999 m³ Default setting: 0 m³	All	Factory

4.4 Timer menu

This menu includes the following sub-menus:

- Date/Time
- Compressor switching times
- Compressor pressure times
- Digital outputs switching times

4.4.1 Date/Time

The date and time can be set in this menu. The day of the week is automatically calculated and displayed.

The automatic use of summer time can also be activated here. This takes account of the rules for using CET (Central European Time).

4.4.2 Compressor Switching Times

The compressor's switch on/off times are defined in this menu.

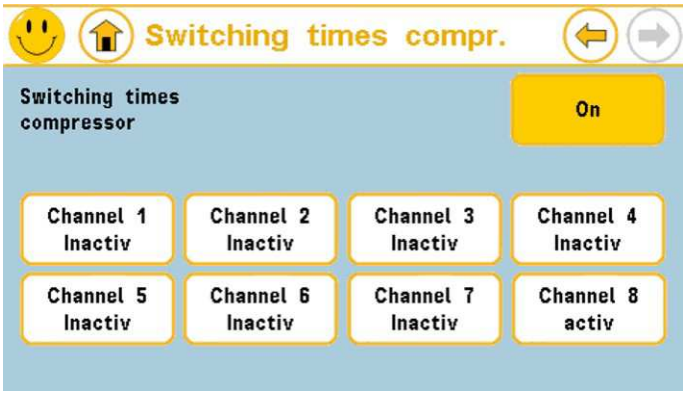

Figure 10: Compressor switching times. Start screen.

The timer can be fully (de)activated. If the "Compressor switching times" is set to "On", the compressor is only released at the programmed times. 8 switching times (channels 1 - 8) are available for programming. These channels are connected with an Or link, i.e. the compressor can only run if permitted by at least one channel.

If the "Compressor switching times" is set to "Off", all time restrictions are cancelled.

Individual channels can also be switched on/off. If a programmed channel is set to "inactive", it is not taken into account when evaluating the timer. The set times are, however, retained and can be activated if necessary.

In the example shown below, the compressor would run at least Monday to Friday from 1 pm to 10.30 pm.

To switch the compressor on continuously for one or more days, select the corresponding days and enter 00.00 as the switching times for all days.

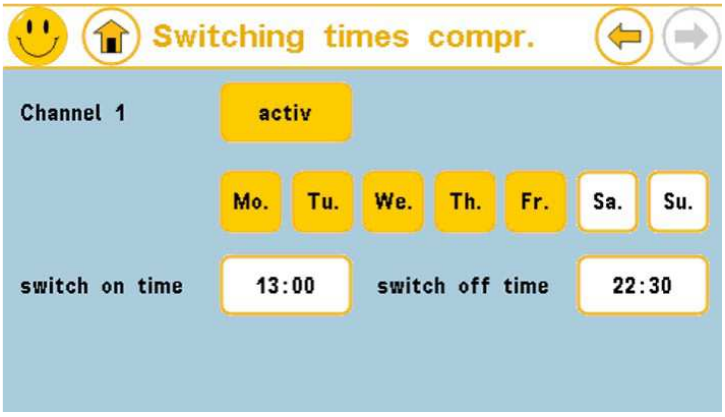

Figure 11: Programming for channel 1.

4.4.3 Compressor Pressure Times

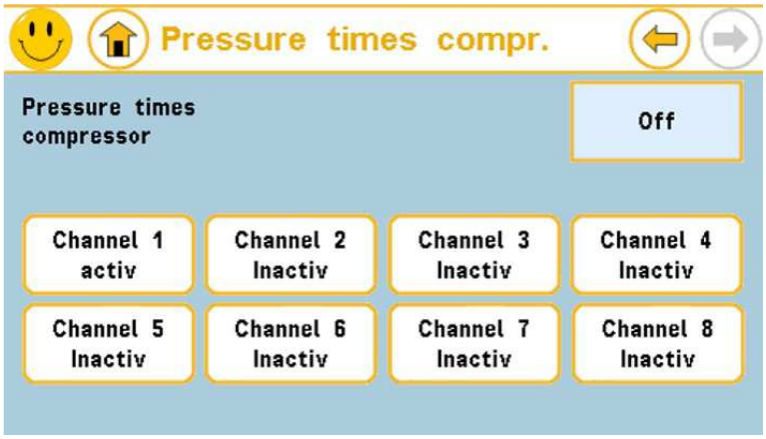

Figure 12: Compressor pressure times. Start screen.

The timer can be fully (de)activated. If "Compressor pressure times" is set to "On", the compressor runs with the defined pressure tolerance for the programmed times. 8 channels are available for programming. The pressure tolerance of the first active channel that has a valid time programmed at that time always applies.

If "Compressor switching times" is set to "Off" or if no channel is programmed for the current time, the compressor runs with the pressure tolerance set in the "Control" menu.

Individual channels can also be switched on/off. If a programmed channel is set to "inactive", it is not taken into account when evaluating the timer. The set times and pressures are, however, retained and can be activated if necessary.

In the example shown below, the compressor's pressure tolerance would be set to 8.5-9.5 bar at the weekend between 10.15 am and 10.30 pm.

To switch a pressure tolerance for the compressor on continuously for one or more days, select the corresponding days and enter 00.00 as the switching times for all days.

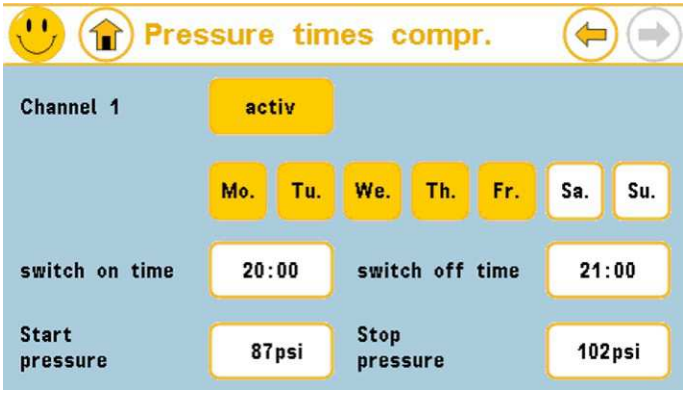

Figure 13: Programming for channel 1.

4.4.4 Outputs Switching Times

The time frames for the digital outputs are programmed in the same way as the compressor switching times. There are four time frames available. These can be assigned to the digital outputs as required (also refer to Section 4.6.3)

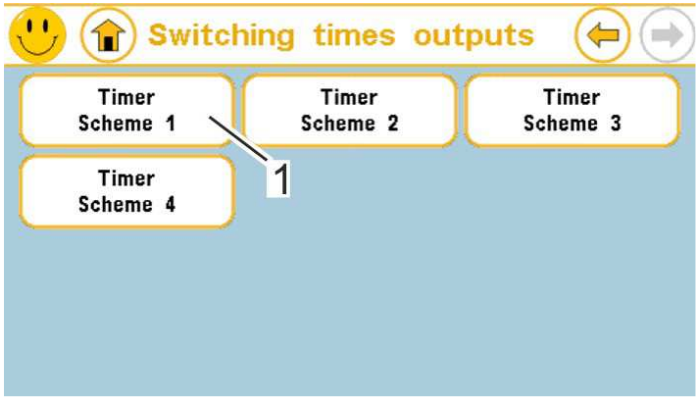

Figure 14: Four different time frames can be saved.

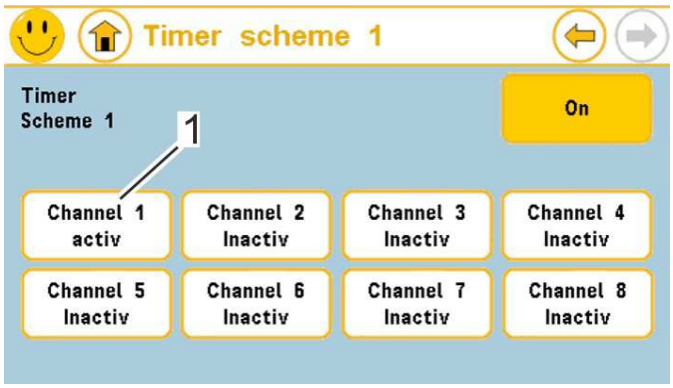

Figure 15: Overview of channels in time frame 1. Channel 1 is active at present.

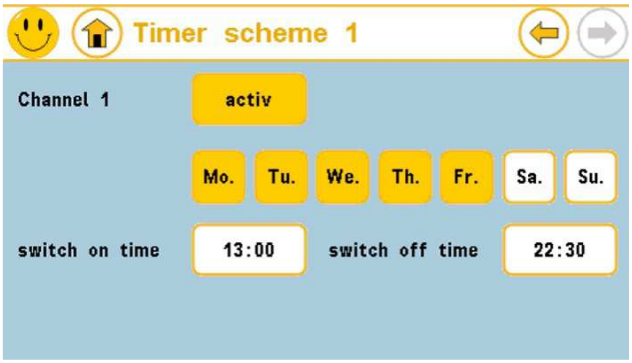

Figure 16: Programming of channel 1 in time frame 1.

4.5 Display parameters menu

This menu includes the following sub-menus:

- Units / Offset
- Diagrams
- Texts
- Screen saver
- Lock screen

4.5.1 Units / Offset

Parameter	Values range/ Default setting/ Comments	System types	Code level
Pressure unit	Display unit for all pressure values. Setting range: bar, MPa, psi Default setting: bar	All	Customer
Temperature unit	Display unit for all temperatures. Setting range: °C, °F, K Default setting: °C	All	Customer
Volume unit	Display unit for volumes / delivery volumes. Setting range: m³, ft³ Default setting: m³	All	Customer
Pressure offset	Offset from measured pressure value for display. Setting range: -0.5 – 0.5 bar Default setting: 0.0 bar	All	Service
Dew point offset	Offset from measured dew point temperature for display. Setting range:-10 - 10°C Default setting: 0°C	All systems with dryer or activated dew point monitoring	Service

4.5.2 Texts

Texts for the system pass can be entered in this menu using a QWERTY keyboard.

Parameter	Values range/ Default setting/ Comments	System types	Code level
Hotline	A service number can be saved here. It is displayed in both the system pass and the popup message box. 26 characters are available. Default setting: no text stored	All	Service
Model	A free text with up to 16 characters can be stored here. Displayed in system pass. Default setting: no text stored	All	Service
Factory no.	A free text with up to 10 characters can be stored here. Displayed in system pass. Default setting: no text stored	All	Factory
DP no.	A free text with up to 16 characters can be stored here. Displayed in system pass. Default setting: no text stored	All	Factory
Commission no.	A free text with up to 10 characters can be stored here. Displayed in system pass. Default setting: no text stored	All	Factory
Circuit diagram no.	A free text with up to 16 characters can be stored here. Displayed in system pass. Default setting: no text stored	All	Service
Installation date	Generally the installation date is set automatically, but can be changed here manually if required (e.g. replacing a control system).	All	Factory

4.5.3 Diagrams

Parameter	Values range/ Default setting/ Comments	System types	Code level
Save interval	Defines the recording interval for the progression diagrams. Setting range: 1 – 60 s Default setting: 6 s	All	Customer
X-Auto time period	Defines the time period of the progression diagram displayed when 'X-Auto' is selected. Setting range: 1 – 1440 min Default setting: 60 min	All	Customer
Mains pressure graph for Y axis at bottom	Defines the lower limit of the Y axis when the double arrow button (Y-Restore) is pressed in the mains pressure progression diagram. Setting range: 0.0 bar – Mains pressure graph for Y axis at top Default: 0.0 bar	All	Customer
Mains pressure graph for Y axis at top	Defines the upper limit of the Y axis when the double arrow button (Y-Restore) is pressed in the mains pressure progression diagram. Setting range: Mains pressure graph for Y axis at bottom – 16.0 bar Default setting: 10.0 bar	All	Customer
Temperature graph for Y axis at bottom	Defines the lower limit of the Y axis when the double arrow button (Y-Restore) is pressed in the temperature progression diagram. Setting range: -50°C – temperature graph for Y axis at top Default: 0 °C	All	Customer

Parameter	Values range/ Default setting/ Comments	System types	Code level
Temperature graph for Y axis at top	Defines the upper limit of the Y axis when the double arrow button (Y-Restore) is pressed in the temperature progression diagram. Setting range: Temperature graph at bottom – 150 °C Default setting: 100 °C	All	Customer
Volume flow for Y axis at bottom	Defines the lower limit of the Y axis when the double arrow button (Y-Restore) is pressed in the volume flow progression diagram. Setting range: 0 m³/min – Volume flow for Y axis at top Default: 0 m³/h	All	Customer
Volume flow for Y axis at top	Defines the upper limit of the Y axis when the double arrow button (Y-Restore) is pressed in the volume flow progression diagram. Setting range: Volume flow for Y axis at bottom – 90.00 m³/min Default setting: Maximum delivery volume of system currently selected	All	Customer

4.5.4 Screen saver

Parameter	Values range/ Default setting/ Comments	System types	Code level
Screen saver active	Defines whether the screen saver function is active. If it is, the screen saver appears after the delay and if necessary is dimmed to the "Screen saver brightness". Touching any point on the screen removes the screen saver. The base screen display is then always displayed. Setting range: Yes / No Default setting: Yes	All	Customer

Parameter	Values range/ Default setting/ Comments	System types	Code level
Screen saver delay	This is where you define how long a screen remains active when not being used. After this period the display dims down to the "Screen saver brightness" value and the screen saver appears. Setting range: 0 – 60 min Default setting: 5 min	All	Customer
Standard brightness	Specifies the brightness of the display during operation. Setting range: 20 to 100% Default setting: 80%	All	Customer
Screen saver brightness	Sets the display brightness of an active screen saver. Setting range: 0 to 100% Default setting: 50%	All	Customer

4.5.5 Lock screen

You use this function to prevent someone from entering data accidentally when they are cleaning the display. The control system is locked for one minute and cannot be used after you start this function.

This function works independently of the code level.

4.6 Configuration

This menu includes the following sub menus:

- Communications
- Heating/Ventilation
- MK200 Modules
- Inputs/Outputs
- Compressor Type
- Frequency Converter
- CODE

4.6.1 Communications

Parameter	Values range/ Default setting/ Comments	System types	Code level
RS485 protocol	Defines the protocol type on the RS485 networking interface. Setting range: MODBUS / Multimaster Default setting:	All	Service
RS485 address	Defines the participant address in the RS485 network. Setting range: 0 – 27 Default setting: 1	All	Service
RS485 baud rate	Setting range: 4800 / 9600 / 19200 / 38400 / 57600 / 115200 Default setting: 19200	All	Service
RS485 frame	Defines the protocol frame when networking via MODBUS. (Data bits/ parity/ stop bits) Setting range: 8/NONE/1 8/NONE/2 8/EVEN/1 8/ODD/1 Default setting: 8/NONE/1	All	Service

RS485 access	Defines the authorization for changes via the RS485 interface. Depending on the setting, either no parameters or only parameters of the corresponding code level can be changed. Depending on the code entered, not all settings are available Setting range: Read only Read / write, customer Read / write, service Read / write, factory Default setting: Read / write, service	All	Service/ factory

4.6.2 MK200 modules

Various MK200 modules can be connected to the RS485 bus. Each module must have its own address and each address may only be used once. In principle, up to 32 participants are possible. The settings in this menu determine whether the ICT establishes communication with a module and monitors module presence and/or faults.

Parameter	Values range/ Default setting/ Comments	System types	Code level
MK200 Profibus	Defines whether a Profibus module is addressed on the MK200 module bus. Fixed address: 31. Setting range: Yes / No Default setting: No	All	Service
No. of extension modules	Number of extension modules connected to the MK200 module bus. Addresses 9 to 30. Setting range: 0 – 22 Default setting: 0	All	Service

Issuing of addresses:

The addresses are set directly on the MK200 modules using Dip switches. The following addresses are intended for the modules and must be observed: Also refer to 2.5 .

Address 0: reserved – do not use.

Address 1: MK200 4AA module for activating a frequency converter. Also refer to 4.6.6 .

Address 2 MK200 8E4RA module (basic load cycle module) to activate up to four basic load cycle slaves. Also refer to 4.10.2 .

Address 3 Do not use

Address 4-5 Up to two MK200 8E4RA modules as accessory modules 1 and 2. Inputs and outputs can be freely configured. Also refer to 4.6.3 .

Address 6 MK200 8E4RA module as SCW module (Lento). The inputs and outputs are permanently assigned. When a Lento system is selected, the module is expected and evaluated. Also refer to 4.6.3 .

Address 7 Do not use

Address 8 Only for special versions

Address 9-30 Up to 22 MK200 8E4RA extension modules. (Are not evaluated in this software!)

Address 31 MK200 Profibus module

4.6.3 Inputs/outputs

Functions can be assigned to the digital inputs and outputs of the ICommand-Touch and accessory modules in this menu. The logic of the digital inputs can also be defined (NO or NC).

There are eight digital inputs and seven digital outputs on the ICommand-Touch. Depending on default setting, these are preassigned as appropriate but can be changed if necessary.
Depending on system type, outputs 1-4 of the ICommand-Touch may be permanently pre- assigned.

There are another eight inputs and four outputs per accessory module. The operator is free to select how they are assigned. The logic can be defined for the inputs. Outputs can be linked with one of four time frames (timer; see Section 4.4.4).

Functions available for the configurable digital inputs and outputs are listed in Tables 2 and 3.

Default setting for ICT digital inputs:

Input 1 (inverted) PTC input: E073 Motor temp.(motor overtemperature fault)

Input 2 (inverted) E074 overcurrent

Input 3 E 075 overpressure

Input 4 E072 direction of rotation and/or with Lento E099 water level

Input 5 W033 speed limitation

Input 6 E071 emergency stop

Input 7 Remote on/off

Input 8 Remote load / idling

Default setting for ICT digital outputs:

Output 1 Mains (cannot be changed!)

Output 2 Star (cannot be changed, free for FC systems)

Output 3 Triangle (cannot be changed, free for FC systems)

Output 4 Load valve (cannot be changed!)

Output 5 Ventilation Combi T: Dryer

Output 6 Heating Combi T: Condensate valve

Output 7 Collective fault

Lento: SCW module address 6 (MK200 8E4RA)

This module cannot be configured. The assignment of inputs/outputs is defined for Lento systems:

Input 1 Fan 1 overcurrent

Input 2 Fan 2 overcurrent

Input 3 Converter fault

Input 4 Dryer warning

Input 5 Overfill. Maximum water level reached.

Input 6 Open water outlet

Input 7 Water filter differential pressure

Input 8 Bearing purging pressure build-up

Output 1 Bearing purging solenoid valve

Output 2 Relief valve

Output 3 PU bearing

Output 4 Outlet valve (water drain)

There are another eight inputs and four outputs per accessory module. The operator is free to select how they are assigned. The logic can be defined for the inputs. Outputs can be linked with one of four time frames (timer; see Section 4.4.4).

The following functions are available:

Digital inputs

Designation	Function
Free	Input is not evaluated
Local / remote	This input can be used to switch between local operation and remote control.
Remote On / Off	Remote On signal via digital input (is only evaluated if activated in the menu: see 4.2)
Remote Load / Idling	Load request via digital input (is only evaluated if activated in the menu: see 4.2)
Remote basic load cycle	Only relevant for basic load cycle master control. The basic load cycle master with all connected slaves can be activated/deactivated using this input. (Remote on/off for the entire station)

Designation	Function
Basic load cycle - OK	Input for OK signal of a superordinate control system (is only evaluated if the control system is configured in the menu as basic load cycle slave: see 4.2)
Pressure tolerance 2	Changeover to second pressure tolerance
Bridge timer	Timer is ignored if there is a signal at the input.
Room thermostat	The "Supply air flap open" and "Exhaust air flap closed" outputs are switched if there is a signal at the input.
Dew point dryer	The "High pressure dew point" output is switched if there is a signal at the input.
W025 heating W033 speed limitation W034 dryer W031 cond. drain W032 air filter W029 water filter W036 oil filter W037 oil separator W056 external warning 1 W057 external warning 2 W058 external warning 3 W059 external warning 4 E071 emergency stop E072 direction of rotation E073 motor temp. E074 overcurrent E075 overpressure E079 build-up of system pressure E099 water level E110 external fault 1 E111 external fault 2 E112 external fault 3 E113 external fault 4	A corresponding warning or fault message is triggered if there is a signal at the input. Depending on system type, not all the options stated may be available.
Motor release	If there is no input signal, the motor does not run

Table 2: Possible functions for configurable digital inputs.

Digital outputs

Designation	Function
Free	Output without function
On	Output always on if permitted by time frame.
Mains pressure too low	Output on if mains pressure too low
Ready	Output on if compressor ready
Loaded	Output on if compressor loaded
Idle mode	Output on if compressor idling
Motor on	Output on if motor running.
Fan on, flap open	Output on if fan running and flap open.
Supply air flap open	Output on if motor supply air flap open.
Exhaust air flap closed	Output on if exhaust air flap closed.
General fault	Output on if there is at least one fault.
Maintenance message	Output on if there is at least one maintenance message.
Warning message	Output on if there is at least one warning message.
Belt m. system pressure.	Output on if belt monitoring system pressure.
Pressure dew point high	Output on if pressure dew point too high
Dryer on	Output on if dryer on
Ventilation	Output on if ventilation active.
Heating	Output on if heating active.
Water supply	Output on if water supply active.
Coolant pump	Output on if coolant pump running.
Condensate valve	Output switches condensate valve.
Remote On	Output switches in parallel with Remote On digital input.

Table 3: Possible functions for configurable digital outputs.

4.6.4 Heating / ventilation

Parameter	Values range/ Default setting/ Comments	System types	Code level
Coolant pump on at	switch-on threshold for the optional coolant pump. Setting range: Coolant pump off at – 60 °C Default setting: 52 °C	Lento	Service
Coolant pump off at	switch-off threshold for the optional coolant pump. Setting range: 0 °C – coolant pump on at Default setting: 49 °C	Lento	Service
Coolant pump overrun	Overrun time for the optional coolant pump. Setting range: 0 – 5 min Default setting: 0 min	Lento	Service
Heating	Defines whether the compressor has heating. If it does, the heating can either be controlled via the oil temperature or the final temperature. Setting range: No Final temperature Oil temperature Default setting: No	All apart from Lento	Factory
Heating switch-on temp.	Defines the switch-on temp. for the heating (programmable output). Setting range: 2 °C – heating switch-off temp. Default setting: 5 °C	Systems with activated heating	Factory
Heating switch-off temp.	Defines the deactivation temperature for the heating (programmable output). Setting range: Heating switch-on temp. – 80 °C Default setting: 8°C (Lento 7°C)	Systems with activated heating	Factory
Recirculation	Recirculation protects against frost. Especially if there is no heating and/or for water-injected compressors. Setting range: No, Yes Default setting: No	All	Factory

Parameter	Values range/ Default setting/ Comments	System types	Code level
Recirculation switch-on temp.	Defines the switch-on temp. for recirculation (compressor start without a request). Setting range: 2°C – recirculation switch-off temp. Default setting: 5°C	All	Factory
Recirculation switch-off temp.	Defines the switch-off temp. for recirculation (idling without a request). Setting range: Recirculation switch-on temp. – 20°C Default setting: 15°C	All	Factory
Ventilation	Defines whether the compressor uses 2-point control for a fan. Setting range: No, Yes Default setting: No	All	Factory
Ventilation switch-on temp.	Defines the switch-on temp. for the fan (programmable output). Setting range: Ventilation switch-off temp. – 90 °C Default setting: 65°C (Lento 15°C)	All systems with activated ventilation	Factory
Ventilation switch-off temp.	Defines the deactivation temperature for the fan (programmable output). Setting range: 0°C – ventilation switch-on temperature Default setting: 50°C (Lento 10°C)	All systems with activated ventilation	Factory
Dryer	Defines whether there is a dryer and whether it is controlled (2-point control). Setting range: No, Yes Default setting: No (Combi T: yes)	All	Factory
Dryer switch-on temp.	Defines the switch-on temp. for the dryer (programmable output). Setting range: Dryer switch-off temp. – 20 °C Default setting: 9°C	All systems with activated dryer	Factory

Parameter	Values range/ Default setting/ Comments	System types	Code level
Dryer switch-off temp.	Defines the switch-off temperature for the dryer (programmable output). Setting range: 0°C – dryer switch-on temperature Default setting: 1°C	All systems with activated dryer	Factory
Dryer switch-off delay	Switch-off delay for dryer: when the temperature falls below the switch-off temperature, the dryer continues running for the set time. Setting range: 0 - 5min Default setting: 2.0 min	All systems with activated dryer	Factory
Dryer switch-off time	Minimum switch-off time for the optional dryer. Setting range: 30s - 600s Default setting: 300s	All systems with activated dryer	Factory
Dryer when system off	If "Yes" is set here, the dryer remains active when the system is not running (motor off). During continuous operation the temperature limits and set times are evaluated just as when not in continuous operation. Setting range: No / Yes Default setting: No	All systems with activated dryer	Factory
Condensate valve	Defines whether the condensate valve is activated. Setting range: Yes / No Default setting: No (Combi T: yes)	All	Service
Condensate valve pulse time	Defines the condensate valve's switch-on temperature. Setting range: 1 - 99s Default setting: 3s	All systems with activated condensate valve	Service

Parameter	Values range/ Default setting/ Comments	System types	Code level
Condensate valve pause time	Defines the condensate valve's switch-off duration. Setting range: 1 - 999s Default setting: 120 s	All systems with activated condensate valve	Service
Condensate valve on at	When the condensate valve is to be activated can be defined here. Setting range: Dryer on loaded Default setting: Dryer on	Combi T	Service

4.6.5 System type

Parameter	Values range/ Default setting/ Comments	System types	Code level
Main type	Defines the compressor family for subsequent compressor selection. Setting range depends on OEM type) VARIABLE **FSCurtis** **Dalva** **Kraftmann** VARIABLE REGUL ALTAIR GEAR GERCULES TAURUS DIRECT TITAN SIRIUS BELT NORMA VEGA FLEX APOLLO CAPELLA LENTO POLARIS CALLISTO COMBI OPTIMA PACK COMBI-T OPTIMA-T PACK-T Default setting: --------	All	Factory
Compressor selection	Defines the compressor. Caution! If this parameter is changed, the type-specific parameters are set to the relevant default settings. Default setting: --------	All	Factory

Parameter	Values range/ Default setting/ Comments	System types	Code level
Frequency converter	Defines whether the motor is activated via a frequency converter or via star/delta. If a switch is made here from "No" to "Yes", the converter run-in routine is started. Also refer to Section . Setting range: Yes / No Default setting: No	All	Factory
Pressure range selection	Defines the maximum compressor pressure. Setting range: depending on system type Default setting: depending on system type	All	Factory
Maximum delivery volume	Defines the maximum compressor delivery volume. Setting range: 0 – 90.00 m³/min Default setting: depending on system type	All	Factory

4.6.6 Frequency converters

Parameter	Values range/ Default setting/ Comments	System types	Code level
Converter activation	Defines the connection type of the control system for the converter. Caution: If 'Analogue module, internal' is selected, all MK200 modules are deactivated. Setting range: Analogue module, internal Analogue module MK200 2AA Serial Modbus Default setting: Serial Modbus	FC	Factory

Parameter	Values range/ Default setting/ Comments	System types	Code level
Converter type	Defines the connected converter type. Setting range: YASKAWA EMOTRON ABB DELTA REXROTH Default setting: EMOTRON	FC	Factory
Minimum control range	Defines the minimum speed in relation to maximum speed. Setting range: 0 to 100 % Default setting: depending on system type	FC	Customer
Limit temp. Speed-free.	Defines the temperature limit for the final temperature up to which the maximum speed is limited to the set value. Setting range: 0 to 100 °C Default setting: 0 °C	FC Not with Lento	Factory
Maximum speed limitation	Defines the maximum speed below the temperature limit entered in relation to the maximum motor speed entered. Setting range: 0 to 100 % Default setting: 100%	FC Not with Lento	Factory
Control factor	Defines the controller gain. Setting range: 1 – 999 Default setting: depending on system type	FC	Service
Reset time	Defines the controller's reset time. Setting range: 0 – 999 s Default setting: depending on system type	FC	Service
Speed reduction from	Defines the lower pressure point from which the speed is reduced. Setting range: 0.0 bar - "Speed reduction to" Default setting: depending on system type	FC	Factory
Speed reduction to	Defines the upper pressure point at which the speed is reduced by the stated value. Setting range: "Speed reduction from" - 16.0 bar Default setting: depending on system type	FC	Factory

Parameter	Values range/ Default setting/ Comments	System types	Code level
Speed reduction by	Defines the value (as a percentage) by which the maximum speed is reduced in the "Speed reduction to" point. Setting range: 0 to 100 % Default setting: depending on system type	FC	Factory

4.6.7 Service code

The service code can be changed once the factory code has been entered. A code deviating from the standard code can therefore be defined.

Setting range: 1 - 9999

4.7 Factory settings

Parameter	Values range/ Default setting/ Comments	System types	Code level
Switching cycle monitoring	Activate / deactivate switching cycle monitoring. Setting range: Yes / No Default setting: Yes	All	Service
Max. switching cycles	When switching cycle monitoring is activated: maximum number of motor starts permitted per hour. Setting range: 1 – 60 /h Default setting: depending on system type	All	Service
Ramp-up time	Defines the motor's ramp-up time. Setting range: 3 – 30 s Default setting: depending on system type	All	Factory

Parameter	Values range/ Default setting/ Comments	System types	Code level
Stationary time	Defines the minimum overrun time when the compressor is deactivated manually. This value is used as a restart delay in the event of a power outage. Setting range: 0 – 120 s Default setting: 120 s	All	Service
Overrun time	Defines the compressor's overrun time in automatic mode and/or should the specified switching cycles be exceeded. Setting range: 10 – 3600 s Default setting: depending on system type	All	Factory
Min. final compression temperature	Defines the compressor's minimum start temperature. Setting range: 0 to 10 °C Default setting: 5 °C	All	FSCurtis
Final compression temperature warn.	Defines the upper warning threshold for the compressor's final temperature. Setting range: 90 – 115 °C Lento: 45 - 65°C Default setting: 105 °C Lento: 55°C	All	FSCurtis
Max. final compression temperature	Defines the upper deactivation threshold for the compressor's final temperature (fault). Setting range: 95 – 120 °C Lento: 50 - 70°C Default setting: 110°C Lento: 60°C	All	FSCurtis
Bearing purging pressure build-up time	Maximum time for "Bearing purging pressure build-up". The fault message is delayed by 30s. Bearing purging and monitoring are only undertaken in "Standby". Setting range: 10 – 600 s Default setting: 45 s	Lento	Service
Max. dif. Press. Wa. Filter	Maximum delay before "Water filter differential pressure" fault is triggered if signal is missing from appropriately configured input. Setting range: 1 – 48h Default setting: 1 h	Lento	Service
Switch-on time	Opening time for relief valve after changing from loaded to idling. Setting range: 0 – 500 s Default setting: 70 s	Lento	Service

Parameter	Values range/ Default setting/ Comments	System types	Code level
Delayed for water max.	Delay for the "Overfill" signal Setting range: 0 – 100 min Default setting: 1 min	Lento	Service
Max. time water discharge	Maximum time for monitoring the "Water discharge" valve. If the water level is still too high after this time (digital input 5 at module addr. 6 max. water), fault message E100: max. water level is triggered. Setting range: 1 – 300 s Default setting: 180 s	Lento	Service
Time for water supply	Time for which optional "Water supply" valve is open. Water supply output is activated when "Min. water level" digital input is triggered and system is loaded. Setting range: 0 – 180 s Default setting: 0 s	Lento	Service
Ambient temperature	Defines whether the ambient temperature is monitored. If "Yes", the temperature sensor is expected at module addr. 7, analogue input 4. Setting range: Yes / No Default setting: No	All	Service
Min. ambient temperature	Defines the lower deactivation threshold for ambient temperature. Is only displayed when ambient temperature monitoring is activated. Setting range: -50°C - "Max. ambient temperature" Default setting: -15°C	All	Service
Max. ambient temperature:	Defines the upper deactivation threshold for ambient temperature. Is only displayed when ambient temperature monitoring is activated. Setting range: "Min. ambient temperature - 100°C Default setting: 65°C	All	Service

4.8 Fault memory

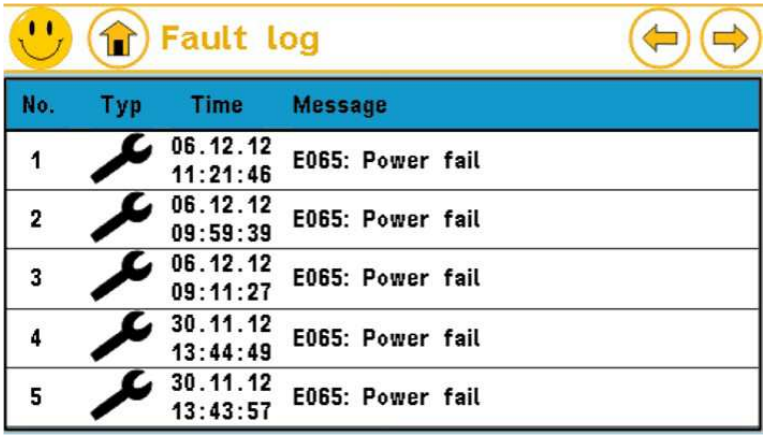

Figure 17: Message memory for faults, messages and maintenance.

The last 20 messages are saved in the message memory. The most recent message is shown first. You have to scroll to older messages.

The following information is provided for each entry:

- Entry number
- Warning or fault symbol
- Time when cause of message occurred
- Message in plain text

Messages still live – i.e. not yet acknowledged – flash.

Select a message to display more information. If present, the following sensor values that applied at the time the fault occurred are also displayed:

- Mains pressure
- Compressor temperature
- Oil temperature
- Ambient temperature
- Dew point temperature

The memory can be cleared by entering a corresponding code. This is not normally necessary. Once the message memory is full, each new message always takes the place of the oldest entry.

4.9 Diagnosis

The current statuses of the digital inputs and outputs of the ICommand-Touch can be found in this menu.

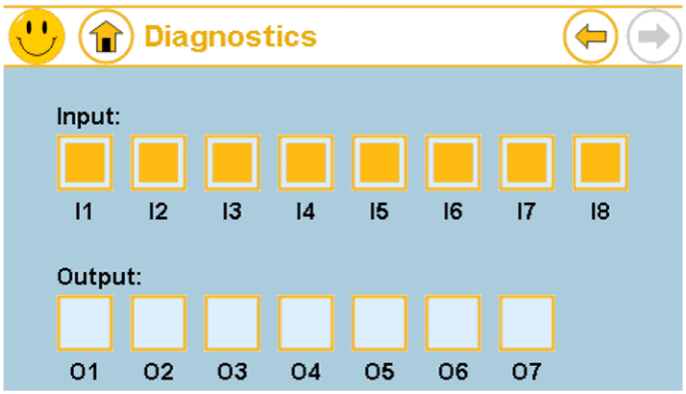

Figure 18: Diagnosis page for the ICommand-Touch.

If this page is selected with at least service code, the outputs can be activated and deactivated by tapping them. For reasons of safety, only one output can be active at any one time.

4.10 Basic load cycle

4.10.1 Basic load cycle settings

Parameter	Values range/ Default setting/ Comments	System types	Code level
Basic load cycle	States whether and how communication is to take place for the basic load cycle function (and/or whether a basic load cycle module is present). Setting range: No (no basic load cycle) Digital (basic load cycle via additional module) RS485 (basic load cycle via RS485 networking) If "Digital" is selected, a basic load cycle module is expected at address 2 (see also 4.6.2). Default setting: No	All	Service
RS485 baud rate	Baud rate for communication with basic load cycle via RS485. Setting range: 4800 9600 19200 38400 57600 115200 Default setting: 19200	All	Service
RS485 frame	Defines the protocol frame when networking via RS485. (Data bits/ parity/ stop bits) Setting range: 8/NONE/1 8/NONE/2 8/EVEN/1 8/ODD/1 Default setting: 8/NONE/1	All	Service

Parameter	Values range/ Default setting/ Comments	System types	Code level
Immediate change	Defines whether the basic load cycle order is rotated immediately after the change interval (recommended) or only once the activation/deactivation threshold is reached. Attention: if No is selected, the change interval may be greatly exceeded. Setting range: Yes / No Default setting: No	All	Service
Remote basic load cycle	Defines whether the entire compressor station controlled via the ICT – i.e. that of the basic load cycle master and all connected slaves - can be shut down. It is switched on/off via an appropriately programmed digital input: "Remote basic load cycle" (see 4.6.3) Setting range: Yes / No Default setting: No	All	Customer
Priority 1 change interval	Time between the basic load cycle switching further for the compressors with priority 1. Setting range: 1 – 168 h Default setting: 24 h	All	Customer
Priority 2 change interval	Time between the basic load cycle switching further for the compressors with priority 2. Setting range: 1 – 168 h Default setting: 24 h	All	Customer
Priority 3 change interval	Time between the basic load cycle switching further for the compressors with priority 3. Setting range: 1 – 168 h Default setting: 24 h	All	Customer

4.10.2 Basic load cycle control

Parameter	Values range/ Default setting/ Comments	System types	Code level
Network volume	The manually calculated (or estimated) network volume can be entered here. Receivers and all compressed air lines must be taken into consideration. When using the internal network volume, the value entered here is also used as a start value for the calculation. A start value is needed to calculate the network volume. On this basis, the actual network volume is calculated automatically during operations from the pressure progression and delivery volume. The value displayed here is however always an approximation. If a different start value is to be used, this must be entered in the "Network volume external" parameter. Value range: 0 – 99.9 m³ Default setting: 5.0 m³	All	Customer
Activation pressure	Defines the (lower) pressure threshold for activating a compressor. Setting range: 3.5 bar – (deactivation pressure - 0.1bar) Default setting: Switch-on pressure (from Control menu)	All	Customer
Deactivation pressure	Defines the (upper) pressure threshold for deactivating a compressor. Setting range: (Activation pressure + 0.1bar) – permitted maximum pressure of current system type Default setting: Switch-off pressure (from Control menu)	All	Customer

Parameter	Values range/ Default setting/ Comments	System types	Code level
Percentage target value	Setting range: 1 – 99 % Default setting: 50%	All	Customer
Activation at	Defines the calculated utilization above which a control compressor is activated. Only if function is activated by setting a value greater than 0% for the "Deactivation at" parameter: Setting range: "Deactivation at" – 100 % Default setting: 100%	All	Customer
Deactivation at	Defines the utilization above which a control compressor is deactivated if at least one other compressor is active. A setting of 0% deactivates this function. Setting range: 0% - "Activation at" Default setting: 0%	All	Customer
Activation damping initial activation	Defines the minimum time before the second compressor is activated (first compressor is activated instantly). Setting range: 0 – 600 s Default setting: 5s	All	Customer
Deactivation damping initial deactivation	Defines the minimum time before the second compressor is deactivated. (First compressor is deactivated instantly) Setting range: 0 – 60 s Default setting: 2s	All	Customer
Activation damping sequence switching	Defines the minimum time before further compressors (as of the third one) are activated (if the pressure continues to fall after activation(s)) Setting range: 1 – 600 s Default setting: 5s	All	Customer
Deactivation damping sequence switching	Defines the minimum time before further compressors (as of the third one) are deactivated (if the pressure continues to fall after deactivation(s)) Setting range: 2 – 60 s Default setting: 2s	All	Customer

Parameter	Values range/ Default setting/ Comments	System types	Code level
Control factor	Setting range: 1 – 999 Default setting: 100	All	Factory
Reset time	Setting range: 0 to 999 s Default setting: 10s	All	Factory

4.10.3 Basic load cycle priorities

This menu contains the settings for the assignment of priorities for the individual compressors. The values set here only apply if none of the timer channels of the basic load cycle priorities timer are active.

Parameter	Values range/ Default setting/ Comments	System types	Code level
Compressor 1 - 5 priority	Defines a priority level for each compressor in the basic load cycle network. Preference is given to compressors with a high priority when activating. Basic loads are only changed between compressors of the same priority. Setting range: Off (compressor is never activated) Low Normal High Default setting: Standard	All	Customer

4.10.4 Basic load cycle switching times

The basic load cycle's switch on/off times are defined in this menu. This only applies to the basic load cycle master. Programming is as described for the "Compressor switching times" in Section 4.4.2

4.10.5 Basic load cycle pressure times

The basic load cycle pressure times are defined in this menu (raise / lower). This only applies to the basic load cycle master. Programming is as described for the "Compressor pressure times" in Section 4.4.3

4.10.6 Times for basic load cycle priorities

The switching times for changing the priorities of the basic load cycle are defined in this menu. This only applies to the basic load cycle master. Programming is as for other timers, for example "Compressor switching times" in Section .

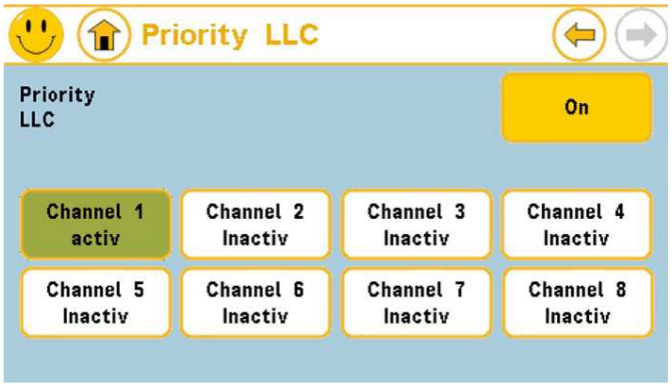

Figure 19: Timer for changing over priorities for basic load cycle.

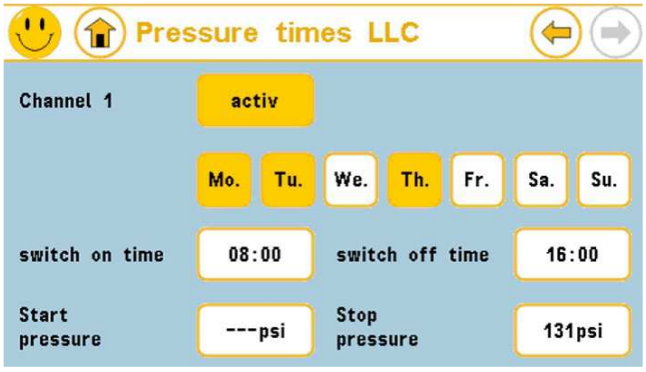

Figure 20: Page 1 of channel settings for times for basic load cycle priorities.

The priorities for each of the switching times can be seen on page 2 of the channel (see Figure 21). The same priority levels as those defined under are available.

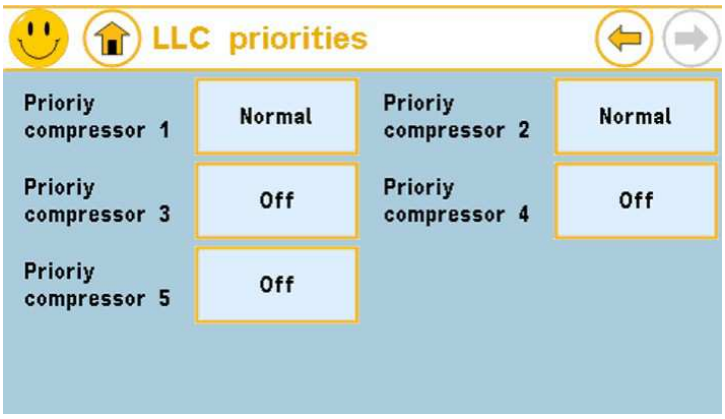

Figure 21: Page 2 of channel settings for times for basic load cycle priorities.

4.10.7 Basic load cycle compressors

Parameter	Values range/ Default setting/ Comments	System types	Code level
Compressor designation	Change designation for selected compressor. 12 characters of free text are available. Setting range: 12 characters of free text Default setting: Compr. X	All	Customer
Maximum delivery volume	Defines the maximum compressor delivery volume. Attention! Note unit when transferring from type plate! Value range: 0 – 9000m³/min Default setting: 0	All	Customer
Minimum control range	Defines the compressor's minimum control limit. Below this limit, the compressor (only with FC) is deactivated. Value range: 0 - 100% Default setting: 100%	All	Customer

Parameter	Values range/ Default setting/ Comments	System types	Code level
Loaded power output	Informs the ICT of the compressor's maximum power consumption. Value range: 0 – 9999 kW Default setting: 0 kW	All	Customer
Idling power output	Informs the ICT of the compressor's power consumption when idling. Value range: 0 – 9999 kW Default setting: 0 kW	All	Customer

4.11 SD card

All functions with access to the SD card can be found in this menu. A corresponding card must be inserted in order to use them.

4.11.1 Saving parameters

The current set of parameters is written to the SD card. An SD card without write protection must be inserted.

Caution: If data has already been saved on the inserted SD card, this is overwritten and therefore permanently lost.

A set of parameters saved with this function can be read again using the "Load parameters" function. It doesn't matter which control system was used to save the data. A set of data can therefore be transferred to any number of control systems (with the same software version).

4.11.2 Loading parameters

This function can be used to read a set of parameters from the SD card. An SD card containing the file "ICTParam.par" must be inserted.

Before the data is actually loaded, the storage date and system type of the set of data appear. Please check for plausibility first!

Caution: When the data from the SD card is loaded, all current control system settings are overwritten and therefore permanently lost.

4.11.3 Starting/stopping data logging

This function starts data logging to an SD card. An SD card without write protection must be inserted. The following data is also written:

Date Software version System type

12.08.14 V1.07 DIRECT

Time stamp
System status
Mains pressure
Final temperature
Dew point temperature (only with Lento)
Oil temperature (not with Lento)
Delivery volume per hour
Total delivery volume
Ambient temperature (if configured)
Statuses of all connected compressors (only with basic load cycle)

Pressure, delivery volume and temperatures are each saved in the display dimension set on the control (bar/ psi/ Mpa, m³/ cft, °C/ °F/ Kelvin), statuses are saved in the set language. One file is created per calendar day in csv format (dividers: tabs). If data logging is running, the text on the button changes from Start data logging to Stop data logging. When this happens, an active data logging process can be stopped.

5 Messages

5.1 Warning and maintenance messages

When a new warning or maintenance message arrives, you see a flashing warning triangle in the top left-hand part of the base screen display. The message also appears in plain text in a popup message box on the lower edge of the screen. Tap the Quit button to close the message window. The warning triangle icon in the title bar stops flashing but remains present until the cause of the message is resolved. The message is displayed again by tapping the warning triangle.

Warning message	Comments	System types
W021: Compressor temp. increased	The maximum permitted final discharge temperature (warning limit) was exceeded. See Factory settings menu.	All
W022: Mains pressure increased	The mains pressure has exceeded the limit (maximum permitted mains pressure - 0.3 bar).	All
W023: Temperature low	The temperature has fallen below the minimum temperature needed for the start. See Factory settings menu.	All apart from Lento
W024: Lower pressure threshold	Pressure fallen below minimum pressure. Only relevant for basic load cycle slave mode. See Control menu.	All
W025: Check oil level/heating	Heating limitation warning: With heating activated, the "Overpressure fault" input has been triggered (delay of 0.5s).	All
W026: Calibration incorrect	At least one analogue input calibration value is incorrect.	All
W029: water filter	Water filter digital input warning has triggered.	Lento
W030: Water filter diff. pressure	Digital input 7 "Water filter differential pressure" at module addr. 6 was opened. Delay of 1s.	Lento
W031: Condensate drains	The digital input programmed at "W031: condensate drain" was closed.	All

Warning message	Comments	System types
W032: Air filter	The digital input programmed at "W032: air filter" was closed. Warning triggered with 15-minute delay	All
W033: Speed limit	The digital input programmed at "W033: speed limit" was opened. Delay of 1s.	All
W034: Dryer	The digital input programmed at "W034: dryer" was opened. Delay with Lento of 1s, otherwise no delay.	All
W035: Dew point dryer	The digital input programmed at "W035: dew point dryer" was opened. Only with activated dew point monitoring.	If module addr. 7 is present
W036: Oil/oil filter	The digital input programmed at "W036: oil/oil filter" was closed. Warning triggered with 15-minute delay	All
W037: Oil separator	The digital input programmed at "W037: oil separator" was closed. Warning triggered with 15-minute delay	All
W038: Low dew point temp	During operation (motor running): Dew point too low. With dew point monitoring active, if set to "Warning". See also .	All
W039: High dew point temp	During operation (motor running): Dew point too low. With dew point monitoring active, if set to "Warning". See also .	All
W044: Extension module	At least one of the configured MK200 extension modules is not responding (possible addresses 9 to 30)	All
W045: I/O module (address 1)	The analogue output module at address 1 is not responding. This monitoring is only active when this module is activated (FC activation via external analogue module).	FC
W046: I/O module (address 2)	The basic load cycle module at address 2 is not responding. This monitoring is only active during basic load cycle master operation with digital activation of the basic load cycle slaves.	All

Warning message	Comments	System types
W048: I/O module (address 4)	The accessories module at address 4 is not responding. This monitoring is only active when this module is selected.	All
W049: I/O module (address 5)	The accessories module at address 5 is not responding. This monitoring is only active when this module is selected.	All
W050: Profib. Mod.(addr. 31)	The profibus module at address 31 is not responding. This monitoring is only active when this module is selected.	All
W051: Overc. fan 1	Overcurrent at fan 1 (input 1, module addr. 6 was opened). But fan 2 is OK, delay 1s.	Lento
W052: Overc. fan 2	Overcurrent at fan 2 (input 2, module addr. 6 was opened). But fan 1 is OK, delay 1s.	Lento
W055: SD card access	An error has occurred when accessing the SD card.	All
W056: Ext. war. 1	The digital input programmed at W056: Ext. war. 1 was opened.	All
W057: Ext. war. 2	The digital input programmed at W057: Ext. war. 2 was opened.	All
W058: Ext. war. 3	The digital input programmed at W058: Ext. war. 3 was opened.	All
W059: Ext. war. 4	The digital input programmed at W059: Ext. war. 4 was opened.	All

Maintenance message	Comments	System types
M001: Intake filter	The time until the next maintenance is less than 100h.	All
M002: Oil/oil filter	The time until the next maintenance is less than 100h.	Not Lento
M003: Oil separator	The time until the next maintenance is less than 100h.	Not Lento
M004: Motor	The time until the next maintenance is less than 100h.	All

Maintenance message	Comments	System types
M005: Compressor	The time until the next maintenance is less than 100h.	All
M006: Dryer	The time until the next maintenance is less than 100h.	All
M007: water filter	The time until the next maintenance is less than 100h.	Lento
Universal maintenance 1	Also refer to Section 4.3.1 .The time until the next maintenance is less than 100h.	All
Universal maintenance 2	Also refer to Section 4.3.1 .The time until the next maintenance is less than 100h.	All
Universal maintenance 3	Also refer to Section 4.3.1 .The time until the next maintenance is less than 100h.	All
M012: Battery	The control system battery must be replaced.	All

5.2 Fault messages

When a malfunction report is received you see a flashing tool icon in the upper left-hand part of the base screen display. The message also appears in plain text in a popup message box on the lower edge of the screen. Tap the Quit button to close the message window. The malfunction icon in the title bar stops flashing but remains present until the cause of the error is resolved.

Tap the icon in the title bar to call up the plain text message again.

A fault message will shut the computer off until corrected

Error message	Comments	System types
E065: Power failure	The supply voltage has failed. (Only if "Automatic restart" is not programmed)	All
E066: Cable defect Compressor temp.	Final compression temperature measurement outside measurement range. Sensor defective or cable break.	All
E067: Cable defect oil temp.	Oil temperature measurement outside measurement range. Sensor defective or cable break.	All
E068: Cable defect pressure	Mains pressure measurement outside measurement range. Sensor defective or cable break.	All

Error message	Comments	System types
E070: Cable defect dew point	Dew point temperature outside measurement range. Sensor defective or cable break.	All
E071: Emergency stop pressed	The emergency stop was pressed.	All
E072: Incorrect direction of rotation	Direction of rotation monitoring digital input opened. Delay of 250ms.	All
E073: Motor temperature	Motor temperature monitoring input opened. Delay of 1s.	All
E074: Overcurrent	Overcurrent monitoring input opened. Delay of 500ms.	All
E075: Overpressure	Overpressure monitoring input opened. Delay of 500ms.	All
E076: Switching cycle exceeded	Only with activated switching cycle monitoring.	All
E077: C. temperature too high	Final temperature too high. Temperature has exceeded set maximum temperature.	All
E078: Mains pressure too high	Mains pressure too high. Mains pressure has exceeded set upper limit.	All
E079: System pressure build-up	System pressure switch digital input has not yet opened after 35s of loaded operation.	All
E081: Converter fault	Converter fault digital input (input 3 at module addr. 6) has triggered (opened). Delay of 2s. Or communication fault with Yaskawa or Emotron converter.	Lento with FC
E090: Low dew point temp	During operation (motor running): Dew point too low. With dew point monitoring active, if set to "Fault". See also .	All
E091: High dew point temp	During operation (motor running): Dew point too low. With dew point monitoring active, if set to "Fault". See also .	All
E095: I/O module (address 4)	The additional module at address 4 (type MK200 8E4RA) is not responding. This monitoring is only active when this module is selected (see sections 4.6.2 and 4.6.3).	All

Error message	Comments	System types
E096: I/O module (address 5)	The additional module at address 5 (type MK200 8E4RA) is not responding. This monitoring is only active when this module is selected (see sections 4.6.2 and 4.6.3).	All
E097: I/O module (address 6)	The Lento module at address 6 (type MK200 8E4RA) is not responding. This monitoring is only active if the system is a Lento system.	Lento
E098: I/O module (address 7)	The module at address 6 (type MK200 8E4RA) is not responding. This monitoring is only active if either the ambient temperature monitoring is activated or a dryer is expected at the module (= oil heater and dryer present at the same time)	All
E099: Water level	Water level low digital input has triggered. Delay for water supply 10s. For systems with water supply when loaded, delayed by the time set under "Water supply time".	Lento
E100: Max. water level	Water level too high (Max. water delay) digital input has triggered. And maximum drain time exceeded. Only monitored with motor running.	Lento
E101: Dif.press.water fi.	The "Differential pressure water filter warning" (digital input module addr. 6) has been active for longer than the time defined in the "Max. differential pressure water filter" parameter (see Operating parameters).	Lento
E103: Fan overcurrent	The two inputs "Fan 1 overcurrent" and "Fan 2 overcurrent" (inputs 1 and 2, module addr. 6) have triggered. Delay of 1s.	Lento
E106: Pres.b-up.bear.press.	Bearing purging pressure build-up fault Digital input 8 at module addr. 6 has still not opened after the "Bearing purging pressure build-up" time set in the menu.	Lento
E110: Ext. fault 1	The digital input programmed at "External fault 1" has triggered.	All
E111: Ext. fault 2	The digital input programmed at "External fault 2" has triggered.	All
E112: Ext. fault 3	The digital input programmed at "External fault 3" has triggered.	All

Error message	Comments	System types
E113: Ext. fault 4	The digital input programmed at "External fault 4" has triggered.	All
E120: FC overcurrent (OC,GF)	Only with Yaskawa converters. FC overcurrent fault	FC
E121: FC overvoltage (OV)	Only with Yaskawa converters. FC overvoltage fault	FC
E122: FC overload (OL2)	Only with Yaskawa converters. FC overload fault	FC
E123: FC overheating (OH1/2)	Only with Yaskawa converters. FC overheating fault	FC
E124: FC motor brake (RR,RH)	Only with Yaskawa converters. FC motor brake fault	FC
E125: FC feedback (FbL,FbH)	Only with Yaskawa converters. FC feedback fault	FC
E126: FC external (EF0-6)	Only with Yaskawa converters. FC external fault	FC
E127: FC hardware (OFx)	Only with Yaskawa converters. FC hardware fault	FC
E128: FC motor overload (OL1)	Only with Yaskawa converters. FC motor overload fault	FC
E129: FC connection (PGO)	Only with Yaskawa converters. FC connection (PGO) fault	FC
E130: FC interm. undervoltage (UV)	Only with Yaskawa converters. FC intermediate circuit undervoltage fault	FC
E131: FC underv. (UV1)	Only with Yaskawa converters. FC undervoltage fault	FC
E132: FC phase (LF,PF)	Only with Yaskawa converters. FC phase fault	FC
E133: FC communication (CE)	Only with Yaskawa converters. MEMOBUS communication error fault	FC
E134: FC control unit (OPR)	Only with Yaskawa converters. FC control unit not connected fault	FC
E135: FC motor I2t	Only with Emotron converters.	FC
E136: FC PTC	Only with Emotron converters.	FC
E137: FC motor off	Only with Emotron converters.	FC

Error message	Comments	System types
E138: FC rotor blocked	Only with Emotron converters.	FC
E139: FC ext. error	Only with Emotron converters.	FC
E140: FC mon max alarm	Only with Emotron converters.	FC
E141: FC mon min alarm	Only with Emotron converters.	FC
E142: FC com error	Only with Emotron converters.	FC
E143: FC PT100	Only with Emotron converters.	FC
E144: FC free	Only with Emotron converters.	FC
E145: FC pump	Only with Emotron converters.	FC
E146: FC ext mot temp	Only with Emotron converters.	FC
E147: FC LC level	Only with Emotron converters.	FC
E148: FC brake	Only with Emotron converters.	FC
E149: FC option	Only with Emotron converters.	FC
E150: FC overtemp	Only with Emotron converters.	FC
E151: FC overcurrent F	Only with Emotron converters.	FC
E152: FC overvolt Vz	Only with Emotron converters.	FC
E153: FC overvolt G	Only with Emotron converters.	FC
E154: FC overvolt M	Only with Emotron converters.	FC
E155: FC overspeed	Only with Emotron converters.	FC
E156: FC underv.	Only with Emotron converters.	FC
E157: FC power error	Only with Emotron converters.	FC
E158: FC desat	Only with Emotron converters.	FC
E159: FC interm circuit error	Only with Emotron converters.	FC
E160: FC int. error	Only with Emotron converters.	FC
E161: FC overvolt MMax	Only with Emotron converters.	FC
E162: FC overv.	Only with Emotron converters.	FC

Error message	Comments	System types
E173: Filter monitoring	Only for special version	
E174: Cable defect M-temp. 1		
E175: Cable defect M-temp. 2		
E176: Cable defect M-temp. 3		
E177: Cable defect ambient temp.	Ambient temperature measurement outside measurement range. Sensor defective or cable break. Only with activated ambient temperature monitoring.	All
E178: Min. ambient temp.	Ambient temperature too low. Ambient temperature has fallen below the set lower limit. Only with activated ambient temperature monitoring.	All
E179: Max. ambient temp.	Ambient temperature too high. Ambient temperature has exceeded the set upper limit. Only with activated ambient temperature monitoring.	All
E180: I/O module (address 8)	Only for special versions	
E181: Motor not ready		
E182: Motor not running		

6 Version history of document

Date	Software version	author	Comment
30/10/2012	V0.14rc1 15/10/2012	JR	First version of the description
13/08/2014	V1.07 17/07/2014	JR	Updated description without special versions. Description of RS485 interfaces still open.
28/03/2015	V1.11 16/03/2015	JR	Description adapted to current software version: Changes include the following: – Adjustable service code – Adjustable installation date – Dew point monitoring – Dew point offset for display – OEM Curtis introduced – Dryer switch-off delay, continuous operation – Condensate valve activation Description without special versions. The software contains other changes which do not affect the description.
22/09/2015	V1.12 17/06/2015	JR	Description adapted to current software version: Changes include the following: – Input and display of delivery volumes and volume flows in m³/min rather than m³/h – With FSCurtis branding, the display units are automatically changed to psi, °F and ft

22/09/2015	V1.13 20/07/2015	JR	Occasional communication faults have been remedied and special software S04 has been prepared (acknowledge via digital input). The "Software update" section was added to this description.
28/09/2015	V1.13 20/07/2015	JR	Correction of typos on p37, p49 (comma in delivery volume)
18/01/2016	V1.14 RC2 27/10/2015	BL	- New "motor release" digital input - W023 suppressed during Power On - First activation/deactivation now refers to the second running and/or deactivating compressor, subsequent activation/deactivation to all others. - Default switching cycle monitoring to "On" - Default data logging to "On"
18/01/2016	V1.15 28/10/2015	BL	"Remote On" digital output issues the status of "Remote On" digital input.

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