

Nx Series

iCommand 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 FS-Curtis ICommand-Touch

Software version: VX.28

Item Number: iCommand Touch

iCommand Touch V2018

Note:

All information provided is up to date with the current development level (date 02.03.2021). Changes may be made at any time without prior notification. We accept no liability for printing mistakes. This document replaces all older versions.



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1 Safety Notices

The FS Curtis 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 are permitted to bring the control system into operation, undertake parameter settings and maintain it. This applies when changing batteries in particular.
2. Ambient conditions for storage:
Ambient temperature range (storage) -13 to 167°F
Humidity (storage) max. 90%; non-condensing
3. Ambient conditions during operation:
Ambient temperature range (operation) 23 to 131°F
Humidity (during operation) max. 90%; non-condensing
4. FS Curtis 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 ambient 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 Function and Connection

2.1 Default Function



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

The iCommand-Touch. Abbreviated to ICT, is a smart compressor control system which can be flexibly extended.

It can be used for oil-lubricated screw compressors with a fixed speed and for converter machines.

The ICT also has a basic load cycle function in order to ensure equal utilisation for up to five compressors at the same time (ICT as basic load cycle primary with up to 4 basic load cycle secondary).

All settings can be undertaken via the graphic interface in a code-protected menu system. The default 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.

2.2 Special Versions

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

2.3 Circuit Diagram

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	Heater	
12	Relay output A 6	Condensate valve (with varistor)	
13	Relay output A 7 Normally closed contact	Collective fault	Phoenix COMBICON MSTBA Grid 5.0 mm 3-pin
14	Relay output A 7 Common		
15	Relay output A 7 Normally open contact		

Pin	Designation	Function	Plug / grid
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 limitation	
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	<u>RS-485 standard</u>	Phoenix MINI-COMBICON Grid 3.81 mm, 4-pin
33	RS-485 B(-)		
34	RS-485 A (+)		
35	Not used		
36	Signal B	Option 1:*) <u>BUS interface:</u> Interface for MK200 extension modules, or connection to field bus	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		
41	Not used	Not assigned	N/a

Pin	Designation	Function	Plug / grid
36	- Analogue output 2	Option 2:*) <u>Analogue output interface:</u> Only needed if FC is not connected via serial connection	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		
41	Not used	Not assigned	N/a
36	GND	Option: 3*) <u>DUART interface:</u> Interface for serial output reproduction (two RS485 interfaces). For connection of MK200 modules and/or connection to field bus	Phoenix MINI-COMBICON Grid 3.81 mm, 6 pole
37	Signal B		
38	Signal A		
39	GND		
40	Signal B		
41	Signal A		
44	GND	<u>RS-485 FC:</u>	Phoenix MINI-COMBICON Grid 3.81 mm, 4-pin
45	RS-485 B(-)		
46	RS-485 A(+)		
47	Not used		

Table 1: Terminal assignment

*) Please note that only one of the three options can be used at any one time!

2.4 Interfaces

As default, the ICT has two serial interfaces. Up to two further interfaces can be added later via an optional module.

- RS485 standard:** Networking interface for basic load cycle network, otherwise field bus
- RS485 FC:** Interface to connect with FC machines, otherwise field bus
- BUS interface:** Interface for MK200 modules, otherwise field bus
- DUART interface:** One interface for MK200 modules and one field bus interface

In total, only up to two interfaces can be used for field bus. If used as a basic load cycle secondary, only one interface is available for field bus.

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 37 MK200 modules)

Converter activation:	MK200 4AA	Address 1	only when FC activation is not performed via RS485
Basic load cycle module	MK200 8E4RA	Address 2	for controlling up to four compressors when connected via digital signals (generally third-party compressors)
Accessories:	MK200 8E4RA	Address 4	optional, non-system-dependent
	MK200 8E4RA	Address 5	optional, non-system-dependent
Dryer module	MK200 8E4AE	Address 7	for additional temperature measurements

For configuration of modules, also refer to 37 MK200 modules and 38 Inputs/outputs.

Converter module MK200 4AA – Address 1

Analogue output 1 current variable (4 – 20 mA)

Analogue output 2 current variable (4 – 20 mA)

Basic load cycle module: MK200 8E4RA – Address 2

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

Module 1 accessories: MK200 8E4RA – Address 4

This module can be configured and is expected at address 4 as soon as at least one input or one output of this module has been configured (38 Inputs/outputs).

Input 1 – 8 configurable

Output 1 – 4 configurable

Module 2 accessories: MK200 8E4RA – Address 5

This module can be configured and is expected at address 5 as soon as at least one input or one output of this module has been configured (38 Inputs/outputs). This module only is activated, if the module with address is installed, too.

Input 1 – 8 configurable

Output 1 – 4 configurable

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

MK200 8E-4AE – Address 8

This module is always needed as soon as the motor temperature monitoring is activated:

Input 1 – 8	Not assigned
Analogue input 1	Motor temperature winding U
Analogue input 2	Motor temperature winding V
Analogue input 3	Motor temperature winding W
Analogue input 4	Not assigned

MK200 8E-4AE – Address 9

This module is always needed as soon as the bearing temperature monitoring is activated:

Input 1 – 8	Not assigned
Analogue input 1	Bearing temperature A side
Analogue input 2	Bearing temperature B side
Analogue input 3	Not assigned
Analogue input 4	Not assigned

Profibus module – Address 31

Can be activated in the menu.

3 Operating the Control System

When you start the control system, a welcome screen as shown in Figure 2 is displayed for approximately three seconds. The display then automatically changes to the default screen display.



Figure 2: iCommand Touch welcome screen.

The operating 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

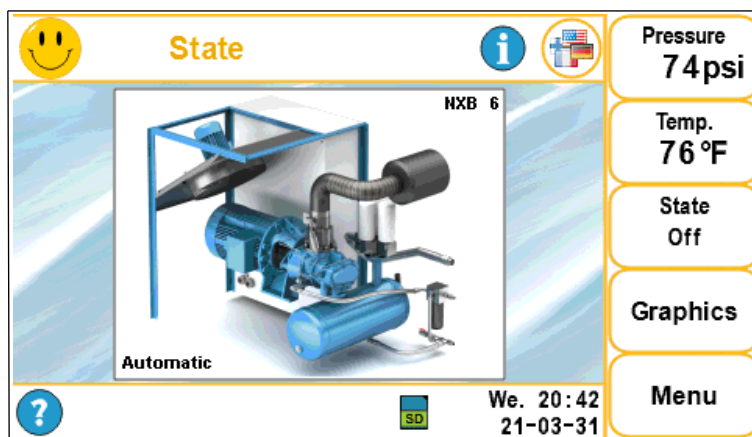


Figure 3: Default screen display (Note: For the purpose of illustration, this display contains combination of symbols which is not possible in a real system)

The following display elements are used in the user interface:

Photo of system

Tapping the image 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.

System status:

The current status of the system is indicated by the following three symbols which appear in the top left corner of all the display screens:



the "Smiley" symbol means no messages are present. The system is working correctly.



as soon as a warning 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 prompt 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 default screen display to select the language to be used in the displays.

Navigation:

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

-  Tap the "Home" button to return to the default screen display from any display screen (this button does not appear in the default 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 default screen display:

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

- Mains 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).
- Temperature:** 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, utilisation 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 compression temperature are saved regularly (for the intervals at which this data is stored, see 34 Diagrams). 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 arrow 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.

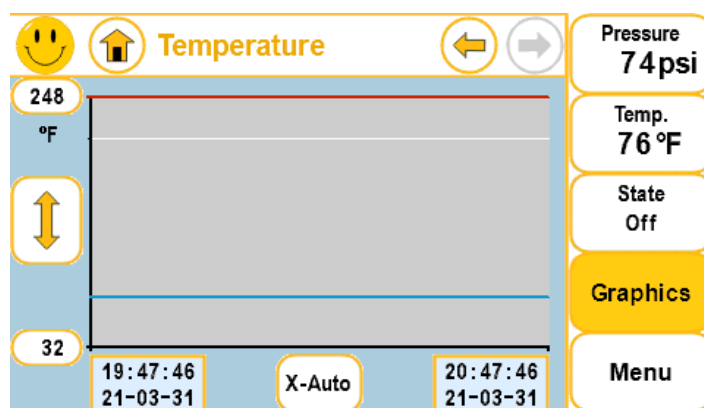


Figure 4: Graphical representation of temperature progression T1.

3.2 Messages

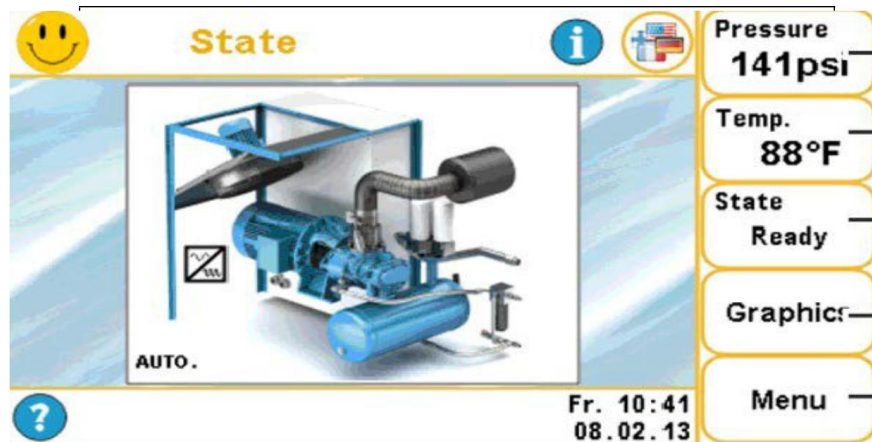


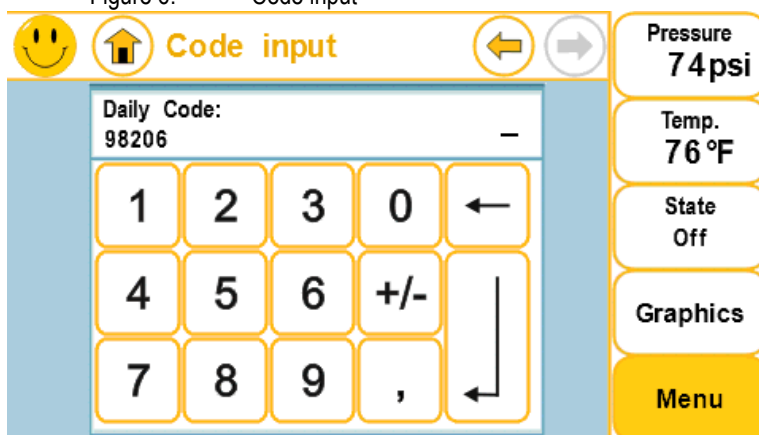
Figure 5: Popup messages in the default screen display.

When a new message is received, you see a flashing warning triangle (warning/maintenance) or tool icon (fault) in the top left of the default 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.

An overview of all possible messages can be found in Section 67 Messages.

3.3 Code Input

Figure 6: Code input



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.

The backspace key  can be used to delete the code character by character.

The Enter key  can be used to confirm the code; the home button in the title bar aborts the input.

When you confirm that a code is correct, the display switches to menu level and/or 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 undertaken by going to Display parameters → Settings. You can access the "Touch lock" function.
3846	Menu	Service	The menu system is displayed in full, except some input/output functions. You can change most parameters. Caution: With factory level or daily code, the service code can be changed in the Configuration menu!
1923	Menu	Factory	Same as "daily code" with full access. Only for commissioning. Is replaced by dynamic daily code. Can only be used for the first 24 hours
55	Info	Hour counter	Display of control system's operating hours and hours under load, changes in load and motor starts (view only)

Code	Code type	Access level / Function	Description
101	Additional function	Activate factory code	The dynamic factory code is activated. Code 1923 becomes invalid with immediate effect.
2112	Additional function	Create screenshots	Once the code has been entered, a screenshot is saved to the SD card when the text in the title bar is touched and/or when the logo in the screen saver / start screen is touched. The control system can still be operated in the normal way. Only possible when a prepared SD card is inserted.
111	Commissioning	Start installation	Starts the run-in phase for FLEX machines. The routine has to be run through in full once. Then the compressor is ready. Can be skipped using code 119.
154	Reset	Reset graph	Deletes all the data for the graph display.
9900	Reset	Reset hours	Resets the number of operating hours to 0 h.
88	Reset	Default setting	Complete reset to default settings resets the graphs, operating hours and parameters.
6362	OEM	OEM FS Curtis	Sets the display version to FS Curtis. Affects the welcome screen, screen saver and system types.

Table 2: Permissible codes and their meanings.

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 authorisations. 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/ FS Curtis, 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 an 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 launch 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, graphics and switching cycles.

3.4 Parameter Input

All the parameters that can be changed appear with a button in the menus (see Figure 7). If a value is display-only (cannot be changed), a field with a light blue background appears instead of the button.

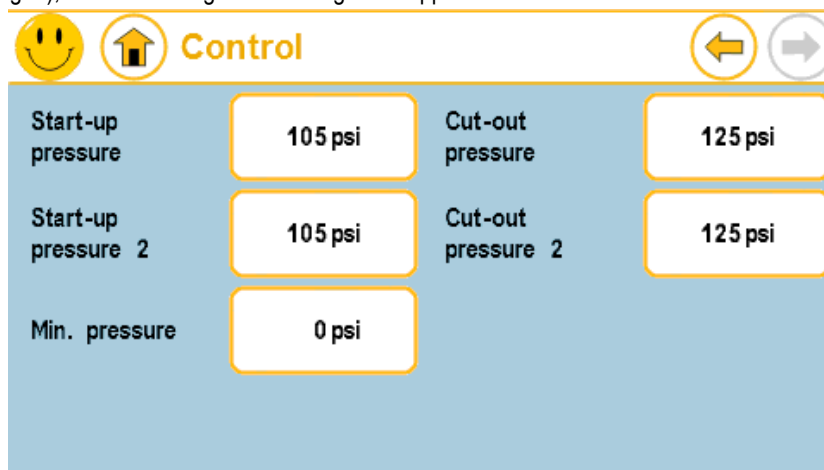


Figure 7: Example of a menu. All the parameters displayed here can also be changed.

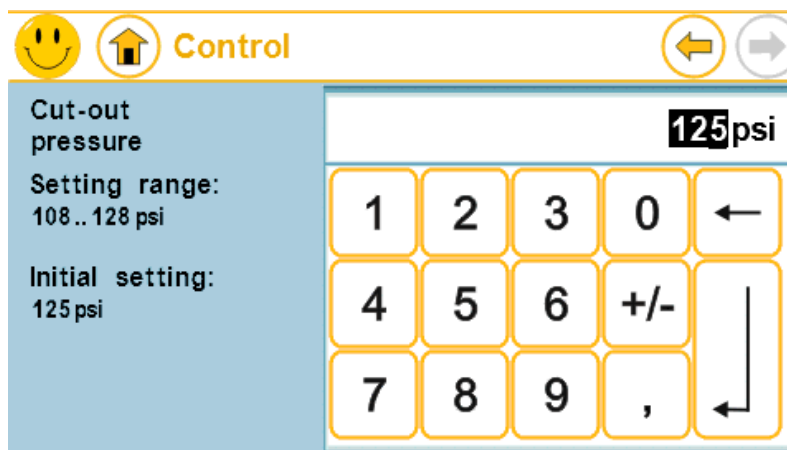


Figure 8: Number pad for entering numerical parameters.

A number pad is provided to enter or change numerical parameters (see Figure 8). It appears as soon as you tap the parameter value. To the left of the number pad you see the possible setting range, default 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 reject 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 press and hold 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 desired 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
- SD card
- Diagnosis
- Basic load cycle primary

4.1 Control Menu

Parameter	Values range/ Default setting/ Comments	System types	Code level
Switch-on pressure	Lower limit for pressure control. Setting range: 50.7 psi – (switch-off pressure – 2.9 psi)	All	Customer
Switch-off pressure	Upper limit for pressure control. Setting range: depending on system type but at least 2.9 psi above switch-on pressure. Default setting: depending on system type	All	Customer
Switch-on pressure 2	Lower limit for pressure control when switching to the second pressure tolerance. Setting range: 50.7 psi – (switch-off pressure - 2.9 psi) Default setting: depending on system type	All	Customer

Parameter	Values range/ Default setting/ Comments	System types	Code level
Switch-off pressure 2	Upper limit for pressure control when switching to the second pressure tolerance. Setting range: depending on system type but at least 2.90 psi 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 (secondary), 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: 50.76 psi – maximum pressure Default setting: 0 psi (no minimum pressure monitoring)	All (only during secondary 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 switch-off pressure. Intermediate settings apply correspondingly. Setting range: 0 – 100% Default setting: 50%	FC	Customer

Table 3: Control menu

4.2 Operating Parameters Menu

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
Restart delay	Delay for automatic start after power outage Setting range: 0 – 120 s Default setting: 30 s	All	Customer

Parameter	Values range/ Default setting/ Comments	System types	Code level
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 38 Inputs/outputs) Setting range: Yes / no Default setting: No	All	Customer
Remote loaded / idling	Specifies whether it is possible to trigger an external load request via digital input or RS485. If yes, the compressor can be requested via a digital input or via the serial interface. If no, a correspondingly programmed digital input is ignored (also refer to 38 Inputs/outputs). Setting range: Yes/ No Default setting: No	All	Customer
Operating mode	Operating mode selection. Determines behaviour 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
Dew point monitoring	Defines whether the dew point temperature monitoring is active and results in a warning or deactivation. Setting range: Off, warning, fault	All apart from Flex	Customer
Max. dew point	Maximum permitted dew point temperature Setting range: Min. dew point – 122°F Default setting: 68°F If the "Max. dew point" threshold is set to 32°F, monitoring of the dew point temp. is deactivated!	if dew point monitoring activated	Customer
Min. dew point	Minimum permitted dew point temperature Setting range: 14°F – Max. dew point Default setting: 24.8°F	if dew point monitoring activated	Customer

Table 4: Operating parameters menu

4.3 Maintenance / Counter Menu

This menu includes the following sub-menus:

- Maintenance intervals
- Counter

4.3.1 . Maintenance Intervals

Parameter	Values range/ Default setting/ Comments	System types	Code level
Maint. interval intake filter	Operating hours interval at which the intake filter is to be maintained. Setting range: 1 – 30000 h Default setting: depending on system type	All	Service
Oil/oil filter maintenance interval	Operating hours interval at which the oil/oil filter is to be maintained. Setting range: 1 – 30000 h Default setting: depending on system type	All	Service
Maint. interval oil separator	Operating hours interval at which the oil separator is to be maintained. Setting range: 1 – 30000 h Default setting: depending on system type	All	Service
Motor maintenance interval	Operating hours interval at which the motor is to be maintained. Setting range: 1 – 30000 h Default setting: depending on system type	All	Service
Compressor maintenance interval	Operating hours interval at which the compressor is to be maintained. Setting range: 1 – 30000 h Default setting: depending on system type	All	Service
Maintenance interval for annual maintenance	Time interval at which the compressor is to be maintained. Setting range: 8760 – 8784 h Default setting: 8760	All	Service
Universal 1 maintenance interval	Freely usable maintenance interval. Designation can be set. Setting range: 0 – 30000 h Default setting: 0 h	All	Service

Parameter	Values range/ Default setting/ Comments	System types	Code level
Universal 2 maintenance interval	Freely usable maintenance interval. Designation can be set. Setting range: 0 – 30000 h Default setting: 0 h	All	Service
Universal 3 maintenance interval	Freely usable maintenance interval. Designation can be set. Setting range: 0 – 30000 h Default setting: 0 h	All	Service
Universal 4 maintenance interval	Freely usable maintenance interval. Designation can be set. Setting range: 0 – 30000 h Default setting: 0 h	All	Service

Table 5: Maintenance intervals sub-menu

4.3.2 . Counter Menu

Parameter	Values range/ Default setting/ Comments	System types	Code level
Operating hours	Operating hours counter. (Motor on) Setting range: Hours under load – 999999 h Default setting: 0 h	All	Factory
Hours under load	Hours under load counter. (Motor on, load valve open) Setting range: 0 – operating hours Default setting: 0 h	All	Factory
Stationary hours	Stationary hours counter. (System on, motor off) Setting range: 0 – 999999 h Default setting: 0 h	All	Factory
Total delivery volume	Cumulated total delivery volume of the compressor. Setting range: 0 – 35,314,666,686.17 ft ³ Default setting: 0 ft ³	All	Factory
Installation on	Generally the installation date is set automatically, but can be changed here manually if required (e.g. replacing a control system).	All	Factory

Table 6: Counter sub-menu

4.4 Timer Menu

This menu includes the following sub-menus:

- Date/Time
- Compressor switching times
- Compressor pressure times
- Output 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 summertime can also be activated here. This takes account of the rules for using CET (Central European Time).

4.4.2 . Compressor Switching Times

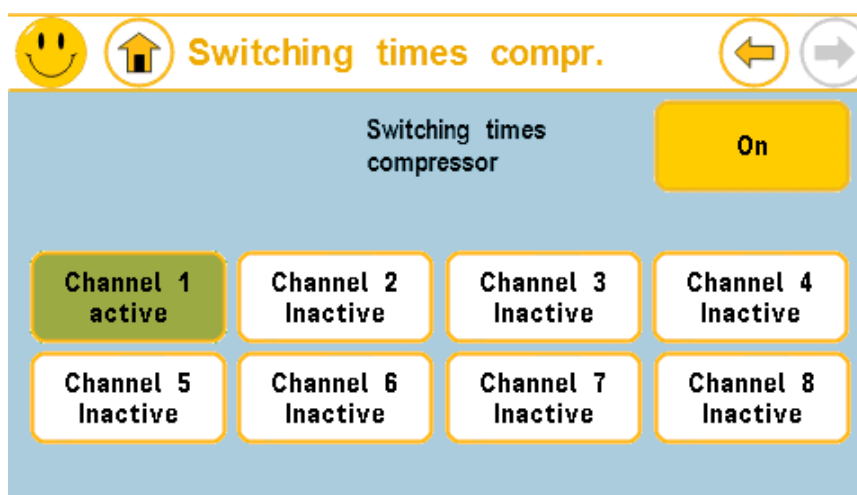


Figure 9: The compressor's switch on/off times are defined in this menu.
Compressor switching times. Start screen.

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. Further times can be defined in the other channels.

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.

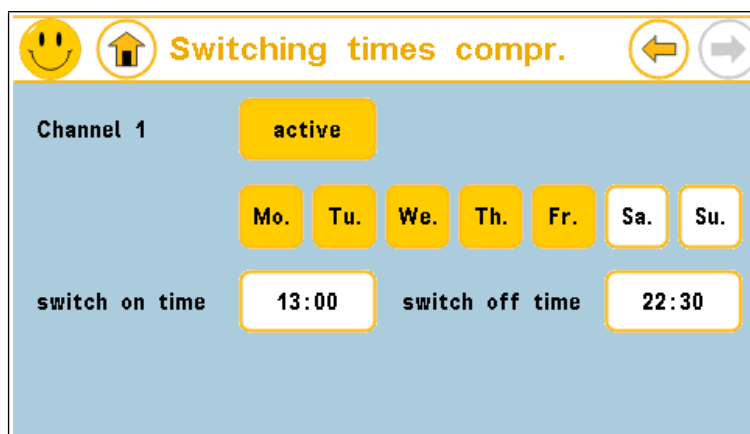


Figure 10: Programming for channel 1.

4.4.3 . Compressor Pressure Times

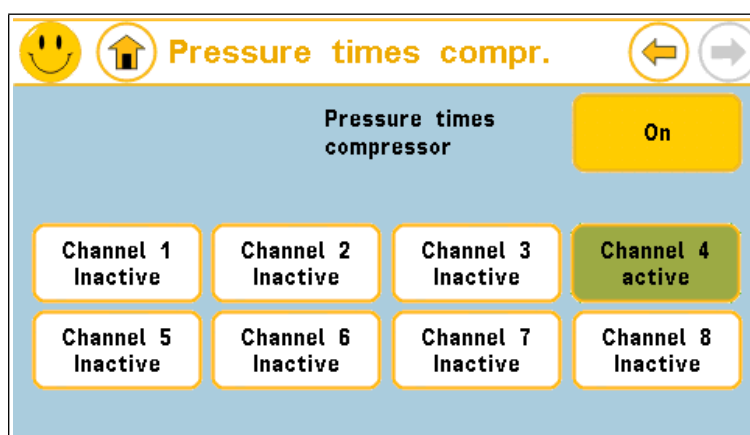


Figure 11: Compressor pressure times. Start screen.

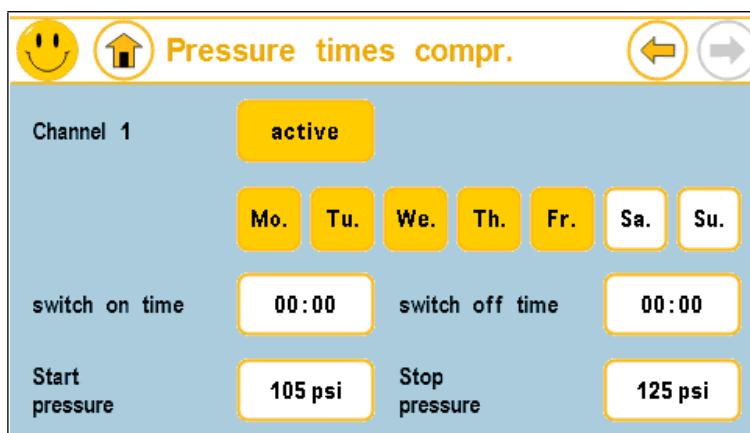
The timer can be fully (de)activated. If "Compressor pressure times" is set to "On", the compressor runs with the defined pressure tolerance for the programmed times. 8 channels are available for programming. The pressure tolerance of the first active channel that has a valid time programmed at that 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 123.28-137.78 psi 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.

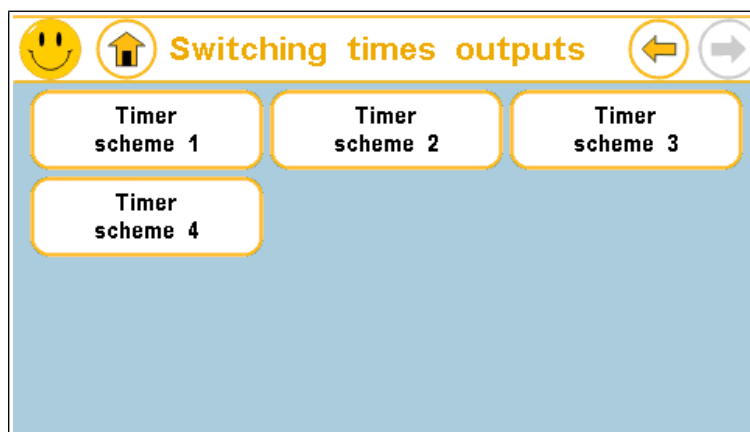


The screenshot shows the 'Pressure times compr.' programming screen for Channel 1. The screen has a blue background with yellow buttons and text. At the top, there is a smiley face icon, a house icon, the title 'Pressure times compr.', and two arrow icons. Below the title, 'Channel 1' is displayed next to an 'active' button. Underneath, there are seven day buttons: Mo., Tu., We., Th., Fr., Sa., and Su. Below the days, there are two time input fields: 'switch on time' set to '00:00' and 'switch off time' set to '00:00'. At the bottom, there are two pressure input fields: 'Start pressure' set to '105 psi' and 'Stop pressure' set to '125 psi'.

Figure 12: Programming for channel 1.

4.4.4 . Output 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 38 Inputs/outputs)



The screenshot shows the 'Switching times outputs' screen. It has a blue background with yellow buttons and text. At the top, there is a smiley face icon, a house icon, the title 'Switching times outputs', and two arrow icons. Below the title, there are four buttons labeled 'Timer scheme 1', 'Timer scheme 2', 'Timer scheme 3', and 'Timer scheme 4' arranged in two rows of two.

Figure 13: Four different time frames can be saved.

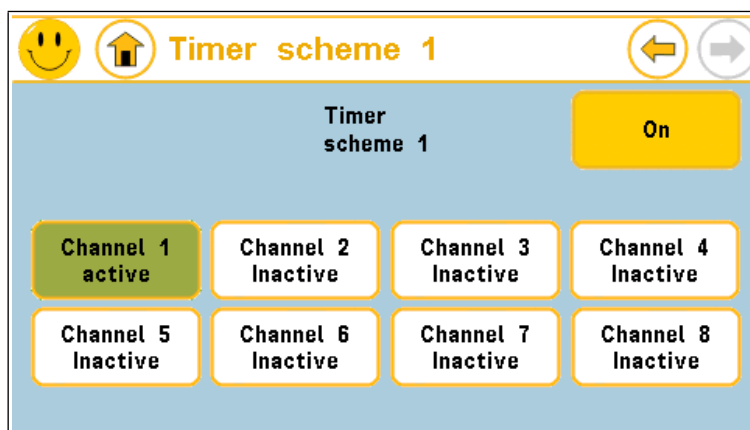


Figure 14: Overview of channels in time frame 1. Channel 1 is active at present.

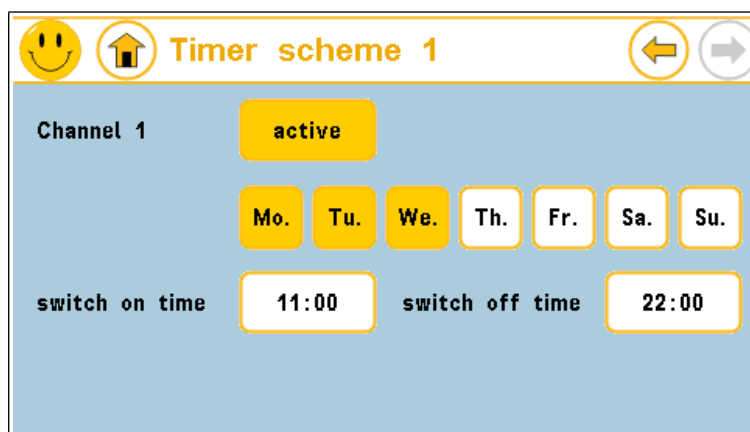


Figure 15: Programming of channel 1 in time frame 1.

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

This menu includes the following parameters:

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: psi	All	Customer
Temperature unit	Display unit for all temperatures. Setting range: °C, °F, K Default setting: °F	All	Customer
Volume unit	Display unit for volumes / delivery volumes. Setting range: m ³ , ft ³ Default setting: ft ³	All	Customer
Pressure offset	Offset from measured pressure value for display. Setting range: -7.25 – 7.25 psi Default setting: 0.0 psi	All	Service

Table 7: Units / offset sub-menu

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
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
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

Table 8: Texts sub-menu

4.5.3 . Diagrams

This menu includes the following parameters:

Parameter	Values range/ Default setting/ Comments	System types	Code level
Storage 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 psi – mains pressure graph for Y axis at top Default: 0.0 psi	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 – 232 psi Default setting: 145.03 psi	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: -58°F – temperature graph for Y axis at top Default: 32 °F	All	Customer
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 – 302°F Default setting: 212 °F	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 ft ³ /min – Volume flow for Y axis at top Default: 0 ft ³ /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 – 3178.32 ft ³ /min Default setting: Maximum delivery volume of system currently selected	All	Customer

Table 9: Diagrams sub-menu

4.5.4 . Screen Saver

This menu includes the following parameters:

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 default screen display is then always displayed. Setting range: Yes / No Default setting: Yes	All	Customer
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: 1 – 60 min Default setting: 5 min	All	Customer
Standard brightness	Specifies the brightness of the display during operation. Setting range: 20 – 100% Default setting: 80%	All	Customer
Screen saver brightness	Sets the display brightness of an active screen saver. Setting range: 0 – 100% Default setting: 10%	All	Customer

Table 10: Screensaver sub-menu

4.5.5 . Lock Screen

You can 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:

- Communication (only if at least one free networking interface is available)
- MK200 modules
- Code
- Heater / Ventilation
- System type
- Converter (only with converter machines)
- Inputs / outputs (only with Factory level and higher)

4.6.1 . Communication

The values X or Y in the parameter designation are replaced by the number of the respective networking interface available. This menu includes the following parameters:

Parameter	Values range/ Default setting/ Comments	System types	Code level
RS485 X protocol	Defines the protocol type on the RS485 networking interface. Setting range: Standard / Modbus RTU Default setting: Standard	All	Service
RS485 X address	Defines the participant address in the RS485 network for the networking interface X. Setting range: 0 – 27 Default setting: 1	All	Service
RS485 X baud rate	Defines the baud rate of the RS485 networking interface X. Setting range: 4800 / 9600 / 19200 / 38400 / 57600 / 115200 Default setting: 19200	All	Service
RS485 X frame	Defines the protocol frame of the RS485 networking interface X. (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 Y protocol	Defines the protocol type on RS485 networking interface Y. Setting range: Standard / Modbus RTU Default setting: Standard	All (only if 2 nd RS485 free & available)	Service

Parameter	Values range/ Default setting/ Comments	System types	Code level
RS485 Y address	Defines the participant address in the RS485 network for the networking interface Y. Setting range: 0 – 27 Default setting: 1	All (only if 2 nd RS485 free & available)	Service
RS485 Y baud rate	Defines the baud rate of the RS485 networking interface Y. Setting range: 4800 / 9600 / 19200 / 38400 / 57600 / 115200 Default setting: 19200	All (only if second RS485 free and available)	Service
RS485 Y frame	Defines the protocol frame of the RS485 networking interface Y. (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 (only if second RS485 free and available)	Service

Table 11: Communications sub-menu

4.6.2 . MK200 Modules

This menu includes the following parameters:

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
MK200 baud rate	Defines the baud rate of the RS485 module interface. Setting range: 4800 / 19200 Default setting: 19200	All	Factory
DUART baud rate	Defines the baud rate of the DUART module (which can be plugged in as option) and is independent of the baud rates of the external interfaces of the DUART module. Setting range: 57600 / 115200 Default setting: 115200	All	Factory

Table 12: MK200 modules sub-menu

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). User-defined texts for 16 input functions can be entered in a further menu "Texts for input functions"

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 and function selected, outputs 4-6 of the iCommand-Touch may be permanently preassigned.

Default setting for ICT digital inputs:

Input 1	PTC input: E073 Motor temp.(motor overtemperature fault)
Input 2	PTC input: E074 Overcurrent
Input 3	E 075 Overpressure
Input 4	E072 Direction of rotation
Input 5	W033 Speed limitation
Input 6	E071 Emergency stop
Input 7	Remote On/Off
Input 8	Remote loaded / 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	Delta (cannot be changed, free for FC systems)
Output 4	Load valve (cannot be changed!)
Output 5	Ventilation, (cannot be changed, if activated, see 42 Heater/Ventilation)
Output 6	Heater (cannot be changed if activated, see 42 Heater/Ventilation)
Output 7	Collective fault

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 30 Output switching times).

Functions available for the configurable digital inputs and outputs are listed in Tables 13 and 14.

P Digital inputs

Designation	Function
Free	Input is not evaluated
Local / remote	Switching between local operation and remote control. This signal is used to enable the "Remote On/Off" input, for example to connect a key switch.
Remote On / Off	Remote On/Off signal via digital input (is only evaluated if activated in the menu: see 24 Operating parameters menu). In addition, any "Local / remote" input that may be programmed must permit remote control.
Remote loaded / idling	Load request via digital input (is only evaluated if activated in the menu: see 24 Operating parameters menu). In addition, any "Basic load cycle – Ok" input that may be programmed must permit control via this input.
Remote basic load cycle	Only relevant for basic load cycle primary control. The basic load cycle primary with all connected secondary can be activated/deactivated using this input. (Remote On/Off for the entire station). This input is evaluated only if the function is activated in the menu 56 Basic load cycle settings.
Basic load cycle - OK	Input for Ok signal from a higher-level control system. This signal is used to enable the "Remote loaded/idling" input.
Enable motor	Motor enabling on. If this signal is absent the compressor cannot start. If the motor is running, the compressor is shut down immediately.
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 oil/ heater W029 water filter W031 cond. drain W032 air filter W033 speed limitation W034 dryer W036 oil filter W037 oil separator W056 ext. war.1 W057 ext. war.2 W058 ext. war.3 W059 ext. war.4 E071 emergency stop E072 direction of rotation E073 motor temp. E074 overcurrent E075 overpressure	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. User-defined texts are used for messages W201 to W208 and E131 to E138.

Designation	Function
E079 build-up of system pressure	
E082 oil separator	
E099 water level	
E110 ext. fault 1	
E111 ext. fault 2	
E112 ext. fault 3	
E113 ext. fault 4	
W201 <user defined>	
W202 <user defined>	
W203 <user defined>	
W204 <user defined>	
W205 <user defined>	
W206 <user defined>	
W207 <user defined>	
W208 <user defined>	
E131 <user defined>	
E132 <user defined>	
E133 <user defined>	
E134 <user defined>	
E135 <user defined>	
E136 <user defined>	
E137 <user defined>	
E138 <user defined>	

Table 13: Possible functions for configurable digital inputs

Texts for input functions

Designations for input functions W201 to W208 and E131 to E138 can be entered in this menu.

Digital outputs

Designation	Function
Free	Output without function
On	Output always on if permitted by time frame.
Remote On	Output on if the remote on/off function is programmed in the menu 24 Operating parameters menu.
Ready	Output on if the compressor is on standby.
Ready / Operation	Output on if the compressor has been keyed in and enabled (ARST, timer for motor release).
Motor on	Output on if motor running.

Designation	Function
Idling	Output on if the compressor is idling or overrunning.
Loaded	Output on if the compressor is running under load
Mains	Output on if the mains contactor is activated.
Star	Output on if the star contactor is activated.
Delta	Output on if the delta contactor is activated.
Load valve	Output on if the load valve is activated.
Heater	Output on if a heater unit is to be activated. See also 42 Heater/Ventilation
Ventilation	Output on if a fan is to be activated. See also 42 Heater/Ventilation
Dryer on	Output on of a dryer is to be activated. See also 42 Heater/Ventilation
Condensate valve	Output on if a condensate valve is to be activated. See also 42 Heater/Ventilation
Water supply	Output on if water supply active.
Fan on, flap open	Output on if the compressor has been keyed in and the motor is running.
Supply air flap open	Output on, the programmed room thermostat input is closed.
Exhaust air flap closed	Output on, the programmed room thermostat input is closed.
Maintenance message	Output on if at least one maintenance message is pending.
Warning message	Output on if at least one warning message is pending.
Warning / maintenance	Output on if at least one warning or maintenance message is pending.
Collective fault	Output on if there are no faults pending.
Warning / fault	Output on if there are no warning or fault messages pending.
Warn./maint. fault	Output on if there are no messages pending.
Belt m. system pressure.	Output on, in the case of fault in system pressure build-up
Pressure dew point high	Output on, the programmed dew point dryer input is closed.
Mains pressure too low	Output on if the mains pressure is at least 14.5 psi under the current switch-on pressure.
C. temp. too high	Output on if the warning "F. temp. too high" is activated.

Table 14: Possible functions for configurable digital outputs

4.6.4 . Heater/Ventilation

This menu includes the following parameters:

Parameter	Values range/ Default setting/ Comments	System types	Code level
Recirculation	Recirculation protects against frost by starting without a request. Especially if there is no heater and/or for water-injected compressors. (See also 63 Recirculation (frost protection)) Setting range: No, Yes Default setting: No	All	Factory
Recirculation switch-on temp.	Defines the switch-on temperature for recirculation (compressor start without a request). Setting range: 34°F – recirculation switch-off temp. Default setting: 41°F	Systems with activated recirculation	Factory
Recirculation switch-off temp.	Defines the switch-off temperature for recirculation (idling without a request). Setting range: Recirculation switch-on temp. – 68°F Default setting: 59°F	Systems with activated recirculation	Factory
Heater	Defines whether the compressor has a heater. If it does, the heater can either be controlled via the oil temperature or the final temperature. (See also 63 Heater) Setting range: No / Final temperature / Oil temperature Default setting: No	All	Factory
Heater switch-on temp.	Defines the switch-on temperature for the heater (programmable output). Setting range: 36°F – heater switch-off temp. Default setting: 41 °F	Systems with activated heater	Factory
Heater switch-off temp.	Defines the switch-off temperature for the heater (programmable output). Setting range: Heater switch-on temp. 176°F Default setting: 46 °F	Systems with activated heater	Factory
Ventilation	Defines whether the compressor uses 2-point or proportional control for a fan. (See also 64 Ventilation) Setting range: No, digital, FC serial Default setting: No	All	Factory
Converter baud rate	Defines the baud rate of the RS485 FC interface. Setting range: 4800 / 9600 / 19200 / 38400 / 57600 / 115200 Default setting: Depending on system type	Systems with activated ventilation (FC serial)	Factory

Parameter	Values range/ Default setting/ Comments	System types	Code level
Ventilation switch-on temp.	Defines the switch-on temperature for the fan (programmable output). (Only with selection "Ventilation: digital") Setting range: Ventilation switch-off temp. – 194 °F Default setting: 149°F	Systems with activated ventilation (digital)	Factory
Ventilation switch-off temp.	Defines the switch-off temperature for the fan (programmable output). (Only with selection "Ventilation: digital") Setting range: 32°F – ventilation switch-on temperature Default setting: 122°F	Systems with activated ventilation (digital)	Factory
Ventilation min. temp	Defines the switch-on temperature (programmable digital output) and the temperature for the minimum speed (FC) of the fan. The switch-off temperature of the fan is switch-on temperature – 34 °F (Only with selection "Ventilation: FC serial") Setting range: 104 – 158 °F Default setting: 131°F	Systems with activated ventilation (FC serial)	Factory
Ventilation max. temp	Defines the temperature for maximum speed (FC) of the fan. (Only with selection "Ventilation: FC serial") Setting range: 158–203°F Default setting: 185°F	Systems with activated ventilation (FC serial)	Factory
Dryer	Defines whether there is a dryer and whether it is controlled (2-point control). Setting range: No, Yes	All apart from Flex	Factory
Dryer switch-on temp.	Defines the switch-on temperature for the dryer (programmable output). Setting range: Dryer switch-off temp. 140°F Default setting: 126 F	Systems with activated dryer	Factory
Dryer switch-off temp.	Defines the switch-off temperature for the dryer (programmable output). Setting range: 32°F – dryer switch-on temperature Default setting: 120°F	Systems with activated dryer	Factory
Dryer switch-off delay	Switch-off delay for the optional dryer. Setting range: 0min - 5min Default setting: 2min	Systems with activated dryer	Factory
Dryer switch-off time	Minimum switch-off time for the optional dryer. Setting range: 30s - 180s Default setting: 60s	Systems with activated dryer	Factory

Parameter	Values range/ Default setting/ Comments	System types	Code level
Dryer when system off	Defines whether the optional dryer is also active when the system is switched off. Setting range: No / Yes Default setting: No	Systems with activated dryer	Factory
Condensate valve	Defines whether the condensate valve is activated. (See also 5.5 Condensate valve) Setting range: No / Yes	All	Factory
Condensate valve pulse time	Defines the condensate valve's switch-on duration. Setting range: 1 - 99s Default setting: 3s	Systems with activated condensate valve	Factory
Condensate valve pause time	Defines the condensate valve's switch-off duration. Setting range: 1 - 999s Default setting: 120 s	Systems with activated condensate valve	Factory

Table 15: Heater / ventilation sub-menu

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) FS Curtis BELT 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. See also section 20 Commissioning functions. Setting range: Yes / No Default setting: Depending on system type	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 – 3496.15 cfm Default setting: depending on system type	All	Factory

Table 16: System type sub-menu

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: - Internal analogue module - Analogue module MK200 2AA - Serial YASKAWA - Serial EMOTRON - Serial REXROTH - Serial ABB - Serial DELTA Default setting: Depending on system type	FC	Factory
Converter baud rate	Defines the baud rate of the RS485 FC interface. Setting range: 4800 / 9600 / 19200 / 38400 / 57600 / 115200 Default setting: Depending on system type	Systems with FC serial	Factory

Parameter	Values range/ Default setting/ Comments	System types	Code level
Converter byte frame	Defines the protocol frame of the RS485 FC interface. (Data bits/ parity/ stop bits) Setting range: 8/NONE/1 8/NONE/2 8/EVEN/1 8/ODD/1 Default setting: Depending on system type	Systems with FC serial	Factory
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 – 100 % Default setting: depending on system type	FC	Factory
Speed reduction from	Defines the lower pressure point from which the speed is reduced. Setting range: 0.0 psi - "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" – 262 psi Default setting: depending on system type	FC	Factory
Maximum speed limitation	Defines the maximum speed below the speed release limit temp. Setting range: 0 – 100 % Default setting: 75 %	FC	Factory
Speed release limit temp.	Defines the temperature limit for the final temperature up to which the maximum speed is limited to the set value. Setting range: 32 – 212°F Default setting: 149°F	FC	Factory
Minimum speed from	Defines the pressure value from which a pressure-dependent linear adjustment of the minimum speed is performed. For this value, the minimum speed from the "Minimum speed from" parameter applies. Setting range: 73 psi – minimum speed to Default setting: Depending on system type	FC	Factory
Minimum speed to	Defines the pressure value up to which a pressure-dependent linear adjustment of the minimum speed is performed. For this value, the minimum speed from the "Minimum speed at" parameter applies. Setting range: Minimum speed to – 189 psi Default setting: Depending on system type	FC	Factory
Minimum speed from	Defines the minimum compressor control range up to the pressure "Minimum speed from". Setting range: 0% – maximum control range Default setting: Depending on system type	FC	Factory

Parameter	Values range/ Default setting/ Comments	System types	Code level
Minimum speed at	Defines the minimum compressor control range from the pressure "Minimum speed to". Setting range: 0% – maximum control range Default setting: Depending on system type	FC	Factory
Maximum control range	Defines the maximum compressor control range. Setting range: Minimum control range – 100 % Default setting: 100 %	FC	Factory
Control factor	Defines the control amplification. Setting range: 1 – 999 Default setting: Depending on system type	FC	Factory
Reset time	Defines the controller's reset time. Setting range: 0 – 999 s Default setting: Depending on system type	FC	Factory

Table 17: Frequency transformer

4.6.7 . Service Code

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

Setting range: 1 - 9999

4.7 Factory Settings

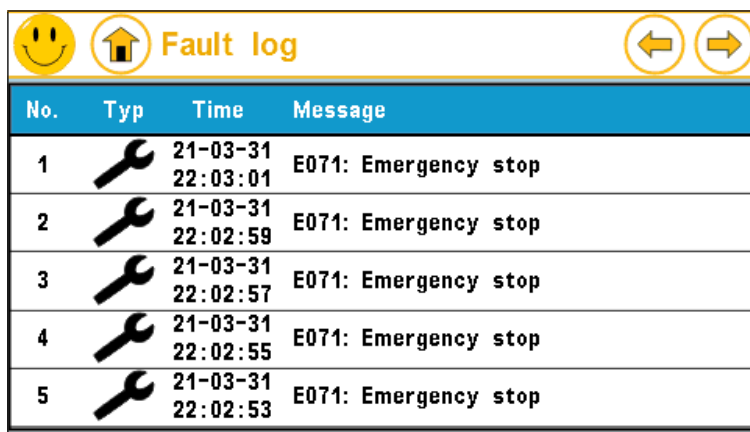
Parameter	Values range/ Default setting/ Comments	System types	Code level
Switching cycle monitoring	Activate / deactivate switching cycle monitoring. Setting range: Yes / No Default setting: Yes	All	Service
Max. switching cycles	When switching cycle monitoring is activated: maximum number of motor starts 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
Stationary time	Defines the minimum overrun time when the compressor is deactivated manually. Setting range: 0 – 120 s Default setting: 120 s	All	Factory
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

Parameter	Values range/ Default setting/ Comments	System types	Code level
Min. final compression temperature	Defines the compressor's minimum start temperature. Default setting: 41 °F	All	Cannot be adjusted
Final compression temperature warning	Defines the upper warning threshold for the compressor's final temperature. Default setting: 221 °F	All	Cannot be adjusted
Max. final compression temperature	Defines the upper deactivation threshold for the compressor's final temperature (fault). Default setting: 230°F	All	Cannot be adjusted
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: -4°F - "Max. ambient temperature" Default setting: 32 °F	All	Factory
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 - 131°F Default setting: 104°F	All	Factory
Bearing temperature	Defines whether bearing temperatures A and B are monitored. If "Yes", the temperature sensors are expected at module addr. 9, analogue input 1 and 2. Setting range: Yes / No / Default setting: No	All	Service
Max. bearing temp.:	Defines the upper deactivation threshold for bearing temperatures. Is only displayed when bearing temperature monitoring is activated. Setting range: 176 – 302°F Default setting: 221°F	All	Service

Parameter	Values range/ Default setting/ Comments	System types	Code level
Motor-temperature	Defines whether motor temperatures U, V and W are monitored. If "Yes", the temperature sensors are expected at module addr. 8, analogue input 1, 2 and 3. Setting range: Yes / No / Default setting: No	All	Service
Max. motor-temp:	Defines the upper deactivation threshold for motor temperatures. Is only displayed when motor temperature monitoring is activated. Setting range: 176 – 302°F Default setting: 275°F	All	Service

Table 18: Factory settings menu

4.8 Fault Memory



No.	Typ	Time	Message
1		21-03-31 22:03:01	E071: Emergency stop
2		21-03-31 22:02:59	E071: Emergency stop
3		21-03-31 22:02:57	E071: Emergency stop
4		21-03-31 22:02:55	E071: Emergency stop
5		21-03-31 22:02:53	E071: Emergency stop

Figure 16: Message memory for faults, messages and maintenance prompts.

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
- Bearing temp. A
- Bearing temp. B
- Winding temp. U
- Winding temp. V
- Winding temp. W

Once the message memory is full, each new message always takes the place of the oldest entry

4.9 SD Card

This menu includes the following sub-menus:

- Data logging
- Saving parameters
- Loading parameters

4.9.1 . Data Logging

In this sub-menu, it is possible to activate and deactivate data logging on the SD card. Activation is only possible if an SD card (without write protection) has been inserted and successfully detected. Data logging must be stopped before the SD card is removed in order to avoid data loss.

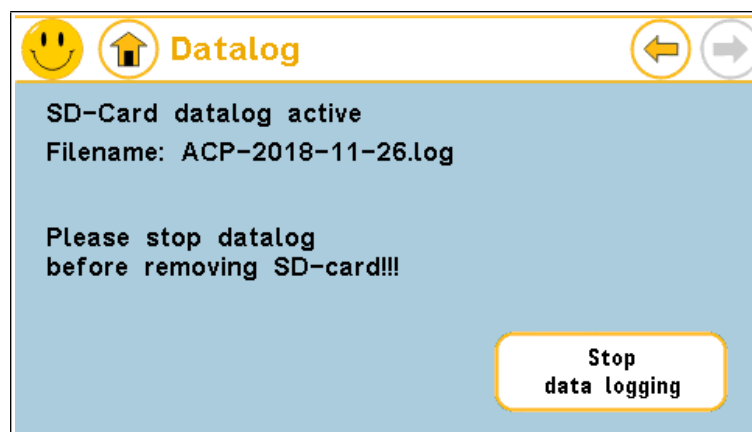


Figure 17: Menu for activating and deactivating data logging

4.9.2 . Saving Parameters

In this sub-menu, it is possible to save the current settings to an SD card. This process involves the creation of two files:

ICT-Param.par: Binary file of the parameters for saving the settings for recovery at a later day or for transfer to another ICT with the same or more recent software.

ICT-Param.csv: Transfer file for reading into a spreadsheet. UTF8 is used for character encoding and tabs are used as separators. This file can no longer be read back into a control system.

If these files already exist on the SD card they will be overwritten without the user being asked to confirm this.

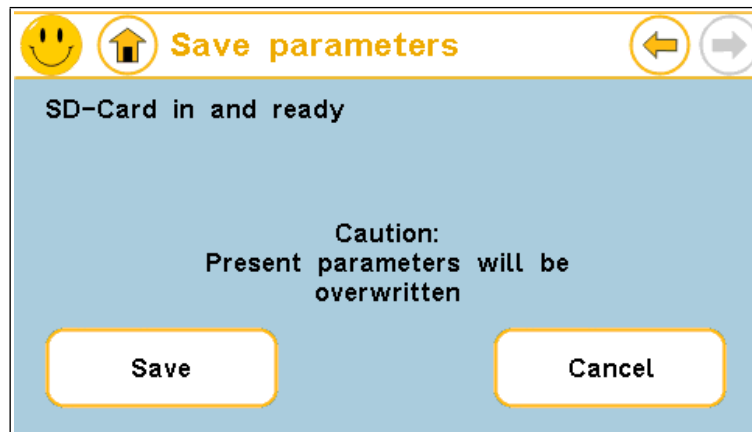


Figure 18: Menu for saving the settings

The control system needs around 2–3 seconds to write the data on the SD card after the "Save" button has been tapped. A corresponding message appears to confirm that the data have been successfully saved.

4.9.3 . Loading Parameters

In this sub-menu, the "ICT-Param.par" file on the SD card can be read into the control system. In this context it should be noted that the control system's software version must at least correspond to the version with which the backup file was created otherwise wrong settings will be made.

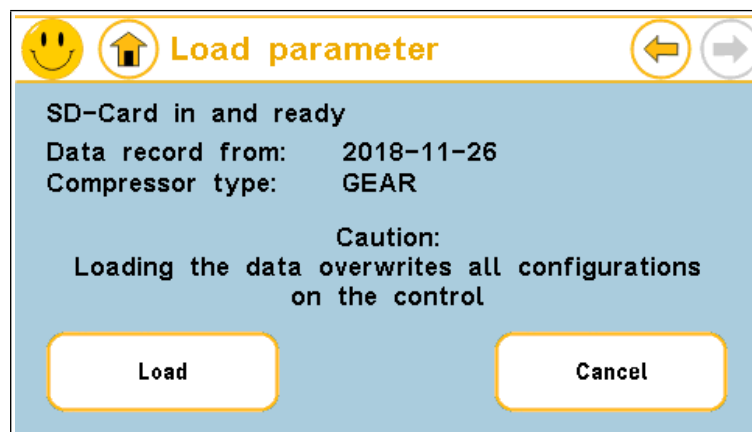


Figure 19: Menu for loading the settings

The control system needs around 1–2 seconds to load the data after the "Load" button has been tapped. A corresponding message appears to confirm that the data have been successfully loaded. The control system then needs another 10–20 seconds to save all data to the non-volatile memory.

4.10 Diagnosis

This menu includes the following sub-menus:

- Diagnosis of inputs/outputs
- Diagnosis of RS485
- Parameters history

4.10.1 . Diagnosis of Inputs/Outputs

The current statuses of the digital inputs and outputs, and analogue inputs of the iCommand-Touch are displayed in this menu. 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.

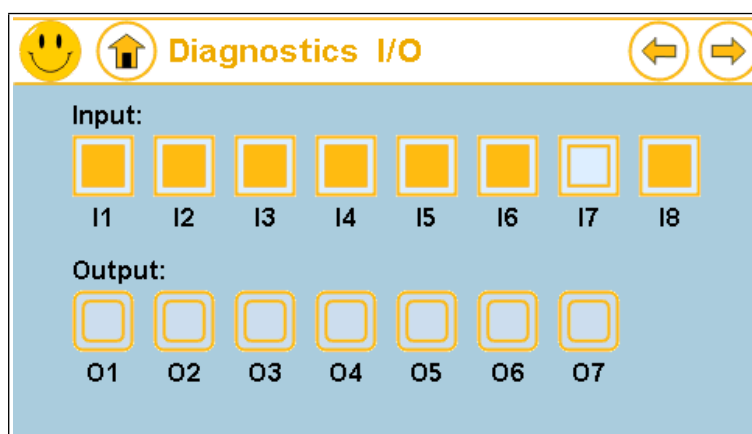


Figure 20: Diagnosis page for the digital inputs/outputs for the iCommand-Touch.

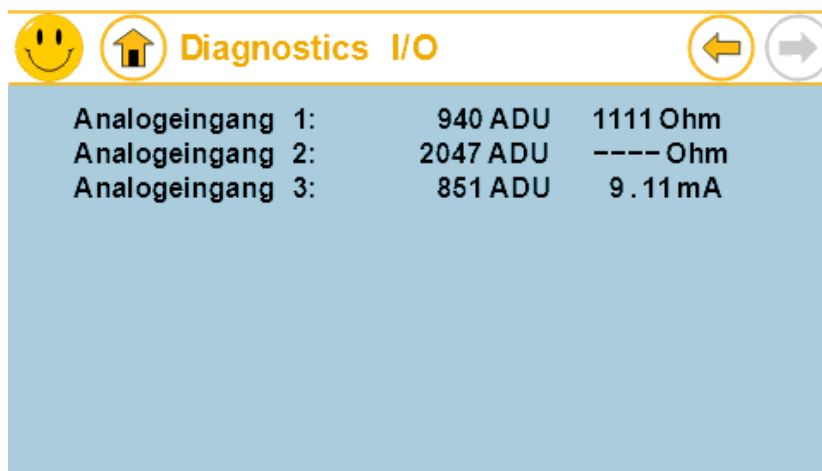
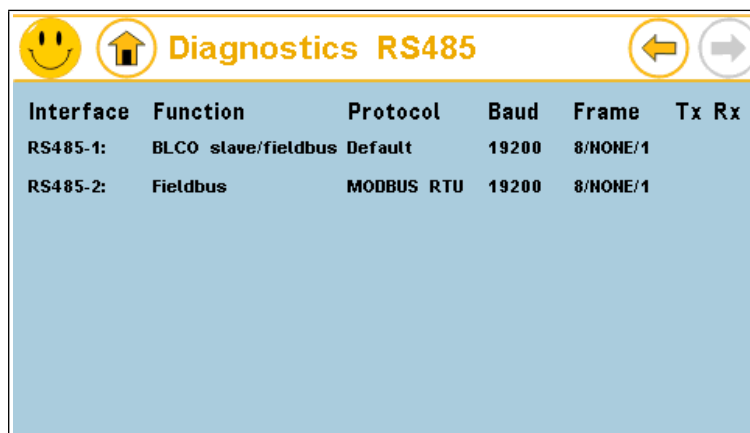


Figure 21: Diagnosis page for the analogue inputs for the iCommand-Touch.

4.10.2 . Diagnosis of RS485

The current configurations and statuses of the serial interfaces of the iCommand-Touch can be found in this menu.



Interface	Function	Protocol	Baud	Frame	Tx	Rx
RS485-1:	BLCO slave/fieldbus	Default	19200	8/NONE/1		
RS485-2:	Fieldbus	MODBUS RTU	19200	8/NONE/1		

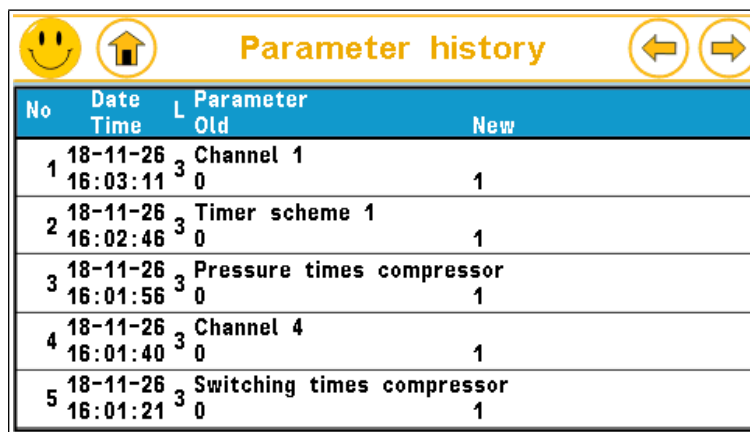
Figure 22: Diagnosis page for RS485 for the iCommand-Touch.

- Interface:** Control system's physical interface
- Function:** Function of the interface currently selected
- Protocol:** Protocol of the interface currently selected (standard / Modbus RTU)
- Baud:** Current baud rate of the interface
- Frame:** Current byte frame

Red and yellow dots in columns Tx and Rx indicate that characters are being sent and received.

4.10.3 . Parameters History

In this menu, there is a modification history of the AirControl P's menu parameters with time stamp, code level (L), parameter designation, old value and new value (maximum of 200 entries).



No	Date Time	L	Parameter	New
1	18-11-26 16:03:11	3	Channel 1	1
2	18-11-26 16:02:46	3	Timer scheme 1	1
3	18-11-26 16:01:56	3	Pressure times compressor	1
4	18-11-26 16:01:40	3	Channel 4	1
5	18-11-26 16:01:21	3	Switching times compressor	1

Figure 23: Parameters history for the iCommand-Touch.

4.11 Basic Load Cycle Primary

This menu includes the following sub-menus:

- Basic load cycle settings
- Basic load cycle control (only visible with digital or RS485 basic load cycle)
- Basic load cycle compressors (only visible with digital or RS485 basic load cycle)
- Basic load cycle pressure times (only visible with digital or RS485 basic load cycle)
- Priorities for basic load cycle times (only visible with digital or RS485 basic load cycle)

4.11.1 . 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 10 MK200 modules – assignment). 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	Basic load cycle primary	Service
Remote basic load cycle	Defines whether the entire compressor station controlled via the ICT – i.e. that of the basic load cycle primary and all connected secondary - can be shut down. It is switched on/off via an appropriately programmed digital input: "Remote basic load cycle" (see 38 Inputs/outputs) Setting range: Yes / No Default setting: No	Basic load cycle primary	Customer

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	Basic load cycle primary	Factory
Priority 1 change interval	Time between relaying of the basic load cycle for the compressors with priority 1. Setting range: 1 – 168 h Default setting: 24 h	Basic load cycle primary	Customer
Priority 2 change interval	Time between relaying of the basic load cycle for the compressors with priority 2. Setting range: 1 – 168 h Default setting: 24 h	Basic load cycle primary	Customer
Priority 3 change interval	Time between relaying of the basic load cycle for the compressors with priority 3. Setting range: 1 – 168 h Default setting: 24 h	Basic load cycle primary	Customer

Table 19: Basic load cycle settings sub-menu

4.11.2 . 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. Value range: 0–3527.93ft ³ Default setting: 176.5ft ³	Basic load cycle primary	Customer
Percentage target value	Only for secondary with 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 switch-off pressure. Intermediate settings apply correspondingly. Setting range: 0 – 100% Default setting: 50%	Basic load cycle primary	Customer

Parameter	Values range/ Default setting/ Comments	System types	Code level
Activation pressure	Defines the (lower) pressure threshold for activating a compressor. Setting range: 51 psi – deactivation pressure Default setting: Switch-on pressure (from Control menu)	Basic load cycle primary	Customer
Deactivation pressure	Defines the (upper) pressure threshold for deactivating a compressor. Setting range: Activation pressure – permitted maximum pressure of current system type Default setting: Switch-off pressure (from Control menu)	Basic load cycle primary	Customer
Activation damping sequence switching	Defines the minimum time before further compressors are activated (if the pressure continues to fall after preceding activation(s)) Setting range: 0 – 99 s Default setting: 10 s	Basic load cycle primary	Service
Deactivation damping sequence switching	Defines the minimum time before further compressors are deactivated (if the pressure continues to fall after preceding deactivation(s)) Setting range: 0 – 99 s Default setting: 5 s	Basic load cycle primary	Service
Activation at	Defines the calculated utilisation above which a further compressor is activated. A setting of 0 % deactivates this function. Setting range: 0 – 100 % Default setting: 0 %	Basic load cycle primary	Service
Deactivation at	Defines the utilisation above which a compressor is deactivated if at least one other compressor is active. A setting of 0 % deactivates this function. Setting range: 0 – 100 % Default setting: 0 %	Basic load cycle primary	Service
Delay in additional activation at	Defines the time for which the condition under "Activation at" must be met before a further compressor is activated. Setting range: 0 – 250 s Default setting: 60 s	Basic load cycle primary	Service
Delay in deactivation at	Defines the time for which the condition under "Deactivation at" must be met before a further compressor is deactivated. Setting range: 0 – 250 s Default setting: 60 s	Basic load cycle primary	Service
Control factor	Controller boost for the basic load cycle pressure controller for relaying to the speed-controlled secondary Setting range: 1 – 999 Default setting: 200	Basic load cycle primary	Service
Reset time	Reset time for the basic load cycle pressure controller for relaying to the speed-controlled secondary Setting range: 0 – 999s Default setting: 20s	Basic load cycle primary	Service

Table 20: Basic load cycle control sub-menu

4.11.3 . Basic Load Cycle Compressors

This menu contains the settings for the individual compressors.

- Compressor 1
- Compressor 2
- Compressor 3
- Compressor 4
- Compressor 5

The menu structure is the same for all compressors; the following description uses compressor 1 as an example. As far as possible, the data is automatically filled in by querying the secondary in the case of basic load cycle via RS485. Some of these data can therefore no longer be modified manually. In this mode, new compressors in the network are also automatically identified.

Parameter	Values range/ Default setting/ Comments	System types	Code level
Compressor technology	Defines the compressor technology (for the display). This parameter can also be used to add a compressor (screw, piston or turbo) or to remove one from the network (not available). Permanent removal is only possible, however, if there is no serial communication to the compressor. Setting range: Not available Screw Piston Turbo Default setting: Compressor 1: Screw Compressor 2-5: Not available	Basic load cycle primary	Service
Compressor designation	Here, a name with up to 12 characters can be given to the compressor.	Basic load cycle primary	Service
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: 0 - Off (compressor deactivated) 1 - low 2 - normal 3 - high Default setting: 0 – off 2 - normal (with RS485 connection)	Basic load cycle primary	Service

Parameter	Values range/ Default setting/ Comments	System types	Code level
Maximum delivery volume	Defines the maximum compressor delivery volume. Cannot be set if the value has been read out serially from the compressor. Setting range: 0.00 – 3496.15 ft ³ /min Default setting: 0.00 ft ³ /min	Basic load cycle primary	Service
Minimum control range	Defines the minimum compressor control range. This value is required to calculate various display values. 100% with non-FC machines. Cannot be set if the value has been read out serially from the compressor. Setting range: 0 – 100 % Default setting: 0 %	Basic load cycle primary	Service
Operating hours	Defines the current operating hours of the compressor. Cannot be set if the value has been read out serially from the compressor. Setting range: 0 – 999999 h Default setting: 0 h	Basic load cycle primary	Service
Hours under load	Defines the current hours under load of the compressor. Cannot be set if the value has been read out serially from the compressor. Setting range: 0 – 999999 h Default setting: 0 h	Basic load cycle primary	Service
Stationary hours	Defines the current stationary hours of the compressor. Cannot be set if the value has been read out serially from the compressor. Setting range: 0 – 999999 h Default setting: 0 h	Basic load cycle primary	Service
Loaded power output	Defines the maximum power consumption of the compressor when running under load. This value is required to calculate various display values Setting range: 0 – 9999 kW Default setting: 0 kW	Basic load cycle primary	Service
Idling power output	Defines the idling power consumption of the compressor. This value is required to calculate various display values Setting range: 0 – 9999 kW Default setting: 0 kW	Basic load cycle primary	Service

Table 21: Basic load cycle compressors sub-menu

4.11.4 . 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 primary. Programming is as described for the "Compressor pressure times" in 29 Compressor pressure times.

By programming one channel with switch-on pressure = 0.0 psi and switch-off pressure = 0.0, it is possible to completely shut down the station for this period of time.

4.11.5 . Times for Basic Load Cycle Priorities

The switching times for the priorities of the individual compressors within the basic load cycle are defined in this menu. This only applies to the basic load cycle primary. Programming is as for other timers, such as "Compressor switching times" in Section 28 Compressor switching times, but the compressor priorities valid for this period are also specified.

By programming one channel with priority = "0 - off" for all compressors, it is possible to completely shut down the station for this period.

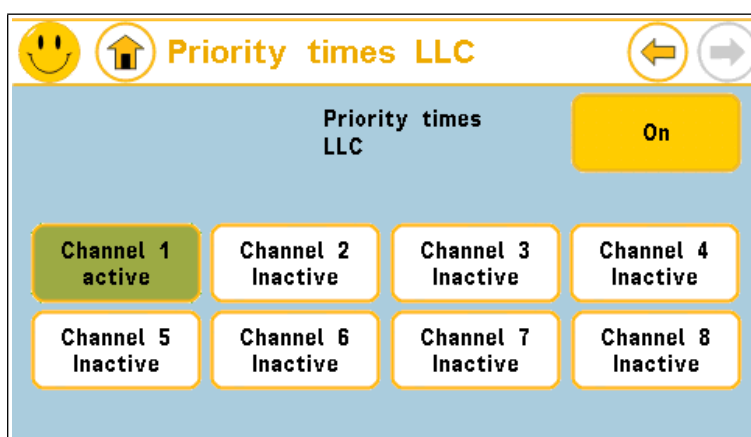


Figure 24: Timer for changing over priorities for basic load cycle.

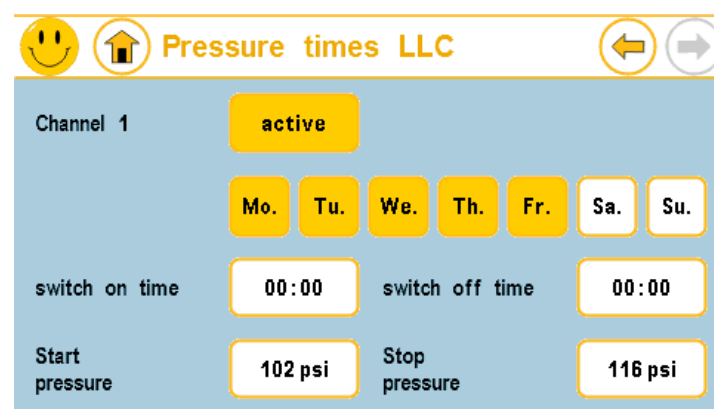


Figure 25: Page 1 of channel settings for times for basic load cycle priorities.

The priorities for each of the switching times can be seen on page 2 of the channel. The same priority levels as those defined under 59 compressors are available.

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Priority times LLC
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Priority compressor 1	2 - Normal	Priority compressor 2	2 - Normal
Priority compressor 3	0 - Off	Priority compressor 4	0 - Off
Priority compressor 5	0 - Off		

Figure 26: Page 2 of channel settings for times for basic load cycle priorities.

5 Functions

5.1 Recirculation (Frost Protection)

When Recirculation is activated, the compressor starts up even without a request if the final temperature is less than or equal to the temperature set at "Recirculation switch-on temp." and the temperature is still above the internal start temperature for enabling. If there is a pressure request during recirculation, the system will transition to normal control mode.

If the final temperature exceeds the temperature set at "Recirculation switch-off temp." without a pressure request being received prior to this, the compressor is shut down immediately without any overrun time.

5.2 Heater

The heater function is generally active if the "Heater" parameter is not set to "No" and there are no faults. In such a case, a distinction is made between the following cases to determine the switch-on and switch-off threshold for the heater:

Compressor is keyed in:

The parameter Heater switch-on temp. is used as switch-on threshold when the recirculation is deactivated (Recirculation = "No"). If the recirculation function is activated (Recirculation = "Yes"), the switch-on temperature is set permanently to 32 F.

The parameter Heater switch-off temp. is always used as switch-off threshold, regardless of the Recirculation.

The compressor is not keyed in:

The switch-on threshold is set to the parameter Min. final compression temperature 30°F.

The switch-off threshold is set to the parameter Min. final compression temperature 36°F.

For activating the heater, depending on the settings of the Heater (final temp/oil temp.) parameter, the thresholds determined are then compared either with the sensor value of the final temperature or the oil temperature.

The heater output is deactivated for as long as the motor is running or the warning "W025: check oil level/heater" is pending.

If the heater function is activated, Output 6 of the control is permanently assigned to the heater function.

5.3 Ventilation

The fan function is generally active if the Ventilation parameter is not set to "No". The following conditions also have to be met to enable the fan controller:

Other system types

- Motor running.

If the above conditions are met, the Ventilation parameter then also differentiates between the two modes "Digital" and "FC serial"

Digital:

The output programmed with the "Fan" function is set when the current final temperature is greater than or equal to the temperature programmed in the Ventilation switch-on temp. parameter. Correspondingly, the fan output is deactivated again when the temperature reaches or falls below the one stipulated in the Ventilation switch-off temp. parameter.

FC serial:

The nominal speed value of the fan is specified in proportion to the current final temperature depending on the two parameters Ventilation min. temp and Ventilation max. temp via the serial interface. With a final temperature less than or equal to Ventilation min. temp, the nominal value is 0 %. Between the limits, the nominal value rises in a linear fashion from 0 to 100%. With a final temperature greater than or equal to Ventilation max. temp, the nominal fan temperature is 100%.

In addition, the output programmed with the "Fan" function is set if the current final temperature is greater than or equal to the temperature programmed in the Ventilation min. temp parameter. Below this temperature, the fan output is deactivated again.

If the fan function is activated, Output 5 of the control is permanently assigned to the fan function.

5.4 Dryer

The function is generally active if the Dryer parameter is set to "Yes". The following conditions also have to be met to enable dryer activation:

- Sensor value of the dew point temperature available
- No "Emergency Stop" fault
- System keyed in or parameter Dryer when system off set to "Yes"

If the following conditions are met, a programmed dryer output is activated depending on the following conditions:

The output is set if the dew point temperature is higher than the temperature stipulated in parameter Dryer switch-on temp. and the minimum pause time stipulated in parameter Dryer switch-off time has expired.

The output is switched off if the dew point temperature for the time set at Dryer switch-off delay is less than or equal to the temperature specified in parameter Dryer switch-off temp..

With the Dryer function activated, if the two outputs Output 5 and Output 6 have already been assigned to other functions, or if there is no temperature input available on the control system for recording the dew point temperature, a corresponding MK200 module (dryer) will be automatically be activated at address 7. Otherwise, Output 5 of the control system will be permanently assigned to the dryer function if it not already assigned to the function Ventilation, otherwise Output 6 is assigned.

6 Messages

6.1 Maintenance and Warning Messages

When a new maintenance or warning message is received, a flashing warning triangle appears at the top left of the default 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.

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.	All
M003: Oil separator	The time until the next maintenance is less than 100h.	All
M004: Motor	The time until the next maintenance is less than 100h.	All
M005: Compressor	The time until the next maintenance is less than 100h.	All
M008: annual	The time until the next maintenance is less than 100h.	All
M009: Universal maintenance 1	See also section 26 Maintenance intervals. The time until the next maintenance is less than 100h.	All
M010: Universal maintenance 2	See also section 26 Maintenance intervals. The time until the next maintenance is less than 100h.	All
M011: Universal maintenance 3	See also section 26 Maintenance intervals. The time until the next maintenance is less than 100h.	All
M012: Universal maintenance 4	See also section 26 Maintenance intervals. The time until the next maintenance is less than 100h.	All
M016: Battery	The control system battery must be replaced.	All

Table 22: List of maintenance messages

Warning message	Comments	System types
W021: Compressor temp. increased	The maximum permitted final compression temperature (warning limit) was exceeded. See Chapter 48 Factory settings.	All
W022: Mains pressure increased	The mains pressure has exceeded the limit (maximum permitted mains pressure – 4.35 psi).	All
W023: Temperature low	The temperature has fallen below the minimum temperature needed for the start. See Chapter 48 Factory settings.	All
W024: Lower pressure threshold	Pressure fallen below minimum pressure. Only relevant for basic load cycle secondary mode. See chapter 23 Control menu.	All
W025: Check oil level/heater	Heater limitation warning: With heater 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
W031: Condensate drain	The digital input programmed at "W031: Condensate drain" was activated.	All
W032: Air filter	The digital input programmed at "W032: Air filter" was activated. Warning triggered with 15-minute delay	All
W033: Speed limitation	The digital input programmed at "W033: Speed limitation" was activated. Delay of 1s.	All
W034: Dryer	The digital input programmed at "W034: Dryer" was activated	All
W035: Dew point dryer	The maximum dew point temperature was exceeded in standby mode. Only with activated dew point monitoring. See Chapter 24 Operating parameters menu.	All
W036: Oil/oil filter	The digital input programmed at "W036: Oil/oil filter" was activated. Warning triggered with 15-minute delay	All
W037: Oil separator	The digital input programmed at "W037: Oil separator" was activated. Warning triggered with 15-minute delay	All
W038: Low dew point temp	During operation (motor running): dew point temperature too low. With dew point monitoring activated as warning. See Chapter 24 Operating parameters menu.	All
W039: High dew point temp	During operation (motor running): dew point temperature too high. With dew point monitoring activated as warning. See Chapter 24 Operating parameters menu.	All
W044: DUART module	The DUART module is not responding. This monitoring is only active, if the DUART module is recognized at power on.	
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

Warning message	Comments	System types
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 primary operation with digital activation of the basic load cycle secondary.	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
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 activated.	All
W057: Ext. war. 2	The digital input programmed at W057 Ext. war. 2 was activated.	All
W058: Ext. war. 3	The digital input programmed at W058 Ext. war. 3 was activated.	All
W059: Ext. war. 4	The digital input programmed at W059 Ext. war. 4 was activated.	All
W201: <user defined> ... W208: <user defined>	The digital input programmed at W201...W208 was activated. The text of the message corresponds to the user-defined text of the input function.	All

Table 23: List of warning messages

6.2 Fault Messages

When a new fault message is received you see a flashing tool icon in the upper left-hand part of the default 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.

Error message	Comments	System types
E065: Power outage	The supply voltage has failed. (Only if "Automatic restart" is not programmed)	All
E066: Compressor temp. cable def.	Final compression temperature measurement outside measurement range. Sensor defective or cable break.	All
E067: Oil temp. cable def.	Oil temperature measurement outside measurement range. Sensor defective or cable break.	All
E068: Pressure cable def.	Mains pressure measurement outside measurement range. Sensor defective or cable break.	All
E070: Dew point cable def.	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	Digital input for direction of rotation monitoring activated. Delay 250 ms.	All
E073: Motor temperature	Input for monitoring of motor temperature activated. Delay 1 s.	All
E074: Overcurrent	Input for overcurrent monitoring activated. Delay of 500ms.	All
E075: Overpressure	Input for overpressure monitoring activated. Delay 500 ms.	All
E076: Switching cycle exceeded	Only with activated switching cycle monitoring. The maximum number of switching cycles per hour has been exceeded. See Chapter 48 Factory settings.	All
E077: F. 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	The system pressure switch digital input was activated after 35s of running under load.	All
E081: Converter fault	All: Converter fault with ABB or DELTA converters.	FC
E083: Ambient temp. cable def.	Ambient temperature measurement outside measurement range. Sensor defective or cable break. Only with activated ambient temperature monitoring.	All

Error message	Comments	System types
E084: Min. ambient temp.	Ambient temperature too low. Ambient temperature has fallen below the set lower limit. Only with activated ambient temperature monitoring.	All
E085: Max. ambient temp.	Ambient temperature too high. Ambient temperature has exceeded the set upper limit. Only with activated ambient temperature monitoring.	All
E089: DUART module	A DUART plug-in module previously identified is not responding.	All
E090: Low dew point temp	During operation (motor running): dew point temperature too low. With dew point monitoring activated as fault. See Chapter 24 Operating parameters menu.	All
E091: High dew point temp	During operation (motor running): dew point temperature too high. With dew point monitoring activated as fault. See Chapter 24 Operating parameters menu.	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 37 and 38).	All
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 37 and 38).	All
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
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

Error message	Comments	System types
E112: Ext. fault 3	The digital input programmed at "External fault 3" has triggered.	All
E113: Ext. fault 4	The digital input programmed at "External fault 4" has triggered.	All
E115: I/A module (addr. 8)	The additional module at address 8 (type MK200 8E4AE) is not responding. This monitoring is only active if monitoring of the motor temperature is selected.	All
E116: I/A module (addr. 9)	The additional module at address 9 (type MK200 8E4AE) is not responding. This monitoring is only active if monitoring of the bearing temperature is selected.	All
E120: Bearing temp. cable def. A side	Measurement for Bearing temperature A side outside measurement range. Sensor defective or cable break.	All
E121: Bearing temp. cable def. B side	Measurement for bearing temperature B side outside measurement range. Sensor defective or cable break.	All
E122: Bearing temp. A side too high	A-side bearing temperature too high. Temperature has exceeded set maximum temperature.	All
E123: Bearing temp. B side too high	B-side bearing temperature too high. Temperature has exceeded set maximum temperature.	All
E124: winding temp. cable def. U	Measurement for Winding temperature U outside the measurement range. Sensor defective or cable break.	All
E125: Winding temp. cable def. V	Measurement for Winding temperature V outside the measurement range. Sensor defective or cable break.	All
E126: Winding temp. cable def. W	Measurement for Winding temperature W outside the measurement range. Sensor defective or cable break.	All
E127: Winding temp. U too high	Winding temperature U too high. Temperature has exceeded set maximum temperature.	All
E128: Winding temp. V too high	Winding temperature V too high. Temperature has exceeded set maximum temperature.	All
E129: Winding temp. W too high	Winding temperature W too high. Temperature has exceeded set maximum temperature.	All
E131: <user defined> ... E138 : <user defined>	The digital input programmed at E131 ... E138 was activated. The text of the message corresponds to the user-defined text of the input function.	All
E170: Communication FC addr. 1	Communication failure with frequency converter (main drive)	FC
E171: Communication FC addr. 2	Communication failure with frequency converter (fan)	All
E301: FC overcurrent (OC,GF)	Only with Yaskawa converter. FC overcurrent fault	FC
E302: FC overvoltage (OV)	Only with Yaskawa converter. FC overvoltage fault	FC
E303: FC overload (OL2)	Only with Yaskawa converter. FC overload fault	FC

Error message	Comments	System types
E304: FC overheating (OH1/2)	Only with Yaskawa converter. FC overheating fault	FC
E305: FC motor brake (RR,RH)	Only with Yaskawa converter. FC motor brake fault	FC
E306: FC feedback (FbL,FbH)	Only with Yaskawa converter. FC feedback fault	FC
E307: FC overcurrent (OC,GF)	Only with Yaskawa converter. FC overcurrent fault	FC
E308: FC external (EF0-6)	Only with Yaskawa converter. FC external fault	FC
E309: FC hardware (OFx)	Only with Yaskawa converter. FC hardware fault	FC
E310: FC motor overload (OL1)	Only with Yaskawa converter. FC motor overload fault	FC
E311: FC connection (PGO)	Only with Yaskawa converter. FC connection (PGO) fault	FC
E312: FC interm. undervoltage (UV)	Only with Yaskawa converter. FC intermediate circuit undervoltage fault	FC
E313: FC underv. (UV1)	Only with Yaskawa converter. FC undervoltage fault	FC
E314: FC phase (LF,PF)	Only with Yaskawa converter. FC phase fault	FC
E315: FC communication (CE)	Only with Yaskawa converter. MEMOBUS communications error fault	FC
E316: FC operating unit (OPR)	Only with Yaskawa converter. FC operating unit not connected fault	FC
E317: FC undervoltage	Only with Rexroth converter.	FC
E318: FC overcurrent (const)	Only with Rexroth converter.	FC
E319: FC overcurrent (accel.)	Only with Rexroth converter.	FC
E320: FC overcurrent (delay)	Only with Rexroth converter.	FC
E321: FC overvoltage K	Only with Rexroth converter.	FC
E322: FC overvoltage B	Only with Rexroth converter.	FC
E323: FC overvoltage V	Only with Rexroth converter.	FC
E324: FC motor overload	Only with Rexroth converter.	FC
E325: FC overtemperature	Only with Rexroth converter.	FC
E326: FC protection active	Only with Rexroth converter.	FC
E327: FC EMC CPU -	Only with Rexroth converter.	FC
E328: FC input phase missing	Only with Rexroth converter.	FC
E329: FC output phase missing	Only with Rexroth converter.	FC

Error message	Comments	System types
E331: FC reserved	Only with Rexroth converter.	FC
E332: FC reserved	Only with Rexroth converter.	FC
E333: FC motor I2t	Only with Emotron converter.	FC
E334: FC PTC	Only with Emotron converter.	FC
E335: FC motor off	Only with Emotron converter.	FC
E336: FC rotor blocked	Only with Emotron converter.	FC
E337: FC ext. error	Only with Emotron converter.	FC
E338: FC mon max alarm	Only with Emotron converter.	FC
E339: FC mon min alarm	Only with Emotron converter.	FC
E340: FC com error	Only with Emotron converter.	FC
E341: FC PT100	Only with Emotron converter.	FC
E342: FC free	Only with Emotron converter.	FC
E343: FC pump	Only with Emotron converter.	FC
E344: FC ext mot temp	Only with Emotron converter.	FC
E345: FC LC level	Only with Emotron converter.	FC
E346: FC brake	Only with Emotron converter.	FC
E347: FC option	Only with Emotron converter.	FC
E348: FC overtemp	Only with Emotron converter.	FC
E349: FC overcurrent F	Only with Emotron converter.	FC
E350: FC overvolt Vz	Only with Emotron converter.	FC
E351: FC overvolt G	Only with Emotron converter.	FC
E352: FC overvolt M	Only with Emotron converter.	FC
E353: FC overspeed	Only with Emotron converter.	FC
E354: FC underv.	Only with Emotron converter.	FC
E355: FC power error	Only with Emotron converter.	FC
E356: FC desat	Only with Emotron converter.	FC
E357: FC interm circuit error	Only with Emotron converter.	FC
E358: FC int. error	Only with Emotron converter.	FC
E359: FC overvolt MMax	Only with Emotron converter.	FC
E360: FC overv.	Only with Emotron converter.	FC

Table 24: List of fault messages

7 Modbus RTU Communication

To activate this operating mode, the interface at 36 Communication must be selected as "Modbus RTU" protocol.

Abbreviations used:

Bit: Bit register (16 bits)

UInt8: 8 bit unsigned

UInt16: 16 bit unsigned

UInt32: 32 bit unsigned

Int8: 8 bit signed

Int16: 16 bit signed

Int32: 32 bit signed

7.1 Compressor register addresses for command 03_h – read data register

Register	Address	Contents	Data/comments
40001	0000h	Maintenance messages	Bit 0: M001 Intake filter 1: M002 Oil filter 2: M003 Oil separator 3: M004 Motor lubrication 4: M005 Compressor 6: M007 Water filter 7: M008 Annual maintenance 8: M009 Universal 1 9 M010 Universal 2 10: M011 Universal 3 11: M012 Universal 4 12: M016 Battery

Register	Address	Contents	Data/comments
40002	0001h	Warning 1 messages	Bit 0: W021 Compressor temp. increased 1: W022 Mains pressure increased 2: W023 Temperature low 3: W024 Lower pressure threshold reached 4: W025 Check oil level / heater 5: W026 Calibration incorrect 8: W029 Water filter 9: W030 Diff. press. water filter 10: W031 Condensate drain 11: W032 Air filter 12: W033 Speed limitation 13: W034 Dryer 14: W035 Dew point temperature 15: W036 Oil filter
40003	0002h	Warning 2 messages	Bit 0: W037 Oil separator 1: W038 Dew point temperature too low 2: W038 Dew point temperature too high 7: W044: DUART module 8: W045 I/O module (addr.1) 9: W046 I/O module (addr.2) 13: W050 Profibus module (addr.31) 14: W051 Overc. fan 1 15: W052 Overc. fan 2
40004	0003h	Warning 3 messages	Bit 2: W055 SD card access 3: W056 Ext. war. 1 4: W057 Ext. war. 2 5: W058 Ext. war. 3 6: W059 Ext. war. 4 8: W201: <user defined> 9: W202: <user defined> 10: W203: <user defined> 11: W204: <user defined> 12: W205: <user defined> 13: W206: <user defined> 14: W207: <user defined> 15: W208: <user defined>
40005	0004h	Warning 4 messages	Bit Not assigned

Register	Address	Contents	Data/comments
40006	0005h	Fault 1 messages	Bit 0: E061 EEPROM 2: E063 Parameter incorrect 4: E065 Power outage 5: E066 F. temp cable def. 6: E067 Oil temp. cable def. 7: E068 Pressure cable def. 9: E070 Dew point cable def. 10: E071 EMERGENCY STOP confirmed 11: E072 Direction of rotation incorrect 12: E073 Motor temperature 13: E074 Overcurrent 14: E075 Overpressure 15: E076 Switching cycles exceeded
40007	0006h	Fault 2 messages	Bit 0: E077 F temp too high 1: E078 Mains pressure too high 2: E079 System pressure build-up 4: E081 Converter fault 5: E082 Diff. pressure oil separator 6: E083: Ambient temp. cable def. 7: E084: Min ambient temp. 8: E085: Max ambient temp. 12: E089: DUART module 13: E090 Dew point temperature too low 14: E091 Dew point temperature too high
40008	0007h	Fault 3 messages	Bit 2: E095 I/O module (addr. 4) 3: E096 I/O module (addr. 5) 4: E097 I/O module (addr.6) 5: E098 I/O module (addr.7) 6: E099 Min. waterlevel 7: E100 Max. water level 8: E101 Diff. press. water filter 10: E103 Fan overcurrent 13: E106 Press. build-up bearing flush
40009	0008h	Fault 4 messages	Bit 0: E109: Dryer fault 1: E110 Ext. fault 1 2: E111 Ext. fault 2 3: E112 Ext. fault 3 6: E115: I/O module (addr.8) 7: E116: I/O module (addr.9) 11: E120: Bearing temp. cable def. A side 12: E121: Bearing temp. cable def. B side 13: E122: Bearing temp. A side too high 14: E123: Bearing temp. B side too high 15: E124: Cable def. winding temp. U

Register	Address	Contents	Data/comments
40010	0009h	Fault 5 messages	Bit 0: E125: Cable def. winding temp. V 1: E126: Cable def. winding temp. W 2: E127: Winding temp. U too high 3: E128: Winding temp. V too high 4: E129: Winding temp. W too high 6: E131: <user defined> 7: E132: <user defined> 8: E133: <user defined> 9: E134: <user defined> 10: E135: <user defined> 11: E136: <user defined> 12: E137: <user defined> 13: E138: <user defined>
40011	000Ah	Fault 6 messages	Bit Not assigned
40012	000Bh	Fault 7 messages	Bit 13: E170: Communication FC addr. 1 14: E171: Communication FC addr. 2
40013	000Ch	Fault 8 messages FC faults YASKAWA	Bit 0: E301 FC overcurrent (OC, GF) 1: E302 FC overvoltage (OV) 2: E303 FC overload (OL2) 3: E304 FC overheating (OH1/2) 4: E305 FC motor brake (RR, RH) 5: E306 FC overcurrent (OC, GF) 6: E307 FC feedback(Fbl, FbH) 7: E308 FC external (EF0-6) 8: E309 FC hardware (OFx) 9: E310 FC motor overload (OL1) 10: E311 FC connection (PGO) 11: E312 FC interm. undervoltage (UV) 12: E313 FC undervoltage (UV1) 13: E314 FC phase (LF, PF) 14: E315 FC communication (CE) 15: E316 FC operating unit (OPR)

Register	Address	Contents	Data/comments
40014	000Dh	Fault 9 messages FC faults Bosch Rexroth	Bit 0: E317: FC undervoltage 1: E318: FC overcurrent (const) 2: E319: FC overcurrent (accel.) 3: E320: FC overcurrent (delay) 4: E321: FC overvoltage K 5: E322: FC overvoltage B 6: E323: FC overvoltage V 7: E324: FC motor overload 8: E325: FC overtemperature 9: E326: FC protection active 10: E327: FC EMC CPU- 11: E328: FC input phase missing 12: E329: FC output phase missing 13: E330: FC external fault 14: E331: FC reserved 15: E332: FC reserved
40015	000Eh	Fault 10 messages FC faults Emotron 1	Bit 0: E333 FC motor I ² t 1: E334 FC PTC 2: E335 FC motor off 3: E336 FC rotor blocked 4: E337 FC ext. error 5: E338 FC mon max alarm 6: E339 FC mon min alarm 7: E340 FC com error 8: E341 FC PT100 9: E342 FC free 10: E343 FC pump 11: E344 FC ext mot temp. 12: E345 FC LC level 13: E346 FC brake 14: E347 FC option 15: E348 FC overtemperature
40016	000Fh	Fault 11 messages FC faults Emotron 2	Bit 0: E349 FC overcurrent F 1: E350 FC overvoltage Vz 2: E351 FC overvoltage G 3: E352 FC overvoltage M 4: E353 FC overvoltage 5: E354 FC undervoltage 6: E355 FC power error 7: E356 FC desat 8: E357 FC interim circuit error 9: E358 FC int. error 10: E359 FC overvolt MMay 11: E360 FC overv
40017	0010h	Free (messages)	Bit Not assigned

Register	Address	Contents	Data/comments
40018	0011h	Free (messages)	Bit Not assigned
40019	0012h	Free (messages)	Bit Not assigned
40020	0013h	Free (messages)	Bit Not assigned
40021 - 40022	0014h - 0015h	Reserved	
40023	0016h	Compressor status	Bit 0: Operation 1: Motor running 2: Loaded 3: Ramp-up / idling / overrun 4: Automatic restart 5: Maintenance message 6: Warning message 7: Fault message 8: Ramp-up phase 9: Overrun phase
40024 - 40027	0017h - 001Ah	Free	
40028	001Bh	Frequency converter power consumption	UInt16 [A]
40029	001Ch	Frequency converter torque	UInt16 [Nm]
40030	001Eh	Frequency converter speed	UInt16 [U/min]
40031	001Eh	Frequency converter percent display	UInt16 [%]
40032	001Fh	Delivery volume	UInt16 [3.53 ft³/h]
40033	0020h	Mains pressure	UInt16 [.0145 psi] (8000h = invalid)
40034	0021h	Compressor temperature	Int16 [32.18°F] (8000h = invalid)
40035	0022h	Oil temperature	Int16 [32.18°F] (8000h = invalid)
40036	0023h	Dew point temperature	Int16 [32.18°F] (8000h = invalid)
40037	0024h	Ambient temperature	Int16 [32.18°F] (8000h = invalid)
40038	0025h	Power consumption of compressor	UInt16 [0.01 kW] (8000h = invalid)
40039	0026h	A-side bearing temperature	Int16 [32.18°F] (8000h = invalid)
40040	0027h	B-side bearing temperature	Int16 [32.18°F] (8000h = invalid)
40041	0028h	Winding temperature U	Int16 [32.18°F] (8000h = invalid)

Register	Address	Contents	Data/comments
40042	0029h	Winding temperature V	Int16 [32.18°F] (8000 _h = invalid)
40043	002Ah	Winding temperature W	Int16 [32.18°F] (8000 _h = invalid)
40044 - 40047	002Bh - 002Eh	Reserved	
40048 - 40056	002Fh - 0037h	Free	
40057 - 40058	0038h - 0039h	Operating hours	UInt32 [h]
40059 - 40060	003Ah - 003Bh	Hours under load	UInt32 [h]
40061 - 40062	003Ch - 003Dh	Stationary hours	UInt32 [h]
40063 - 40064	003Eh - 003Fh	Total delivery volume	UInt32 [m ³]
40065	0040h	Water filter maintenance interval	UInt16 [h]
40066	0041h	Intake filter maintenance interval	UInt16 [h]
40067	0042h	Oil filter maintenance interval	UInt16 [h]
40068	0043h	Oil separator maintenance interval	UInt16 [h]
40069	0044h	Motor maintenance interval	UInt16 [h]
40070	0045h	Compressor maintenance interval	UInt16 [h]
40071	0046h	Reserved	
40072	0047h	Universal 1 maintenance interval	UInt16 [h]
40073	0048h	Universal 2 maintenance interval	UInt16 [h]
40074	0049h	Universal 3 maintenance interval	UInt16 [h]
40075	004Ah	Universal 4 maintenance interval	UInt16 [h]
40076	004Bh	Annual maintenance interval	UInt16 [h]
40077 - 40080	004Ch - 004Fh	Free	

Register	Address	Contents	Data/comments
40081	0050h	Time until next maintenance: water filter	Int16 [h]
40082	0051h	Time until next maintenance: intake filter	Int16 [h]
40083	0052h	Time until next maintenance: oil filter	Int16 [h]
40084	0053h	Time until next maintenance: oil separator	Int16 [h]
40085	0054h	Time until next maintenance: motor	Int16 [h]
40086	0055h	Time until next maintenance: compressor	Int16 [h]
40087	0056h	Reserved	
40088	0057h	Time until next maintenance: universal 1	Int16 [h]
40089	0058h	Time until next maintenance: universal 2	Int16 [h]
40090	0059h	Time until next maintenance: universal 3	Int16 [h]
40091	005Ah	Time until next maintenance: universal 4	Int16 [h]
40092	005Bh	Time until next maintenance: annual	Int16 [h]
40093- 40096	005Ch - 005Fh	Free	
40097- 40100	0060h - 0063h	Free	
40101	0064h	Switch-on pressure	UInt16 [1.45 psi]
40102	0065h	Switch-off pressure	UInt16 [1.45 psi]
40103	0066h	Switch-on pressure 2	UInt16 [1.45 psi]
40104	0067h	Switch-off pressure 2	UInt16 [1.45 psi]
40105	0068h	Minimum pressure	UInt16 [1.45 psi]
40106	0069h	Percentage target value	UInt16 [%]
40107 - 40110	006Ah - 006Dh	Free	
40111	006Eh	Automatic restart	0 = No 1 = Yes

Register	Address	Contents	Data/comments
40112	006Fh	Operating mode	0 = Automatic mode 1 = Loaded/idling
40113	0070h	Remote On / Off	0 = No 1 = Yes
40114	0071h	Remote loaded / idling	0 = No 1 = Yes
40115	0072h	Dew point monitoring	0 = Off, 1 = Warning, 2 = Fault
40116	0073h	Min. dew point	Int16 [°F]
40117	0074h	Max. dew point	Int16 [°F]
40118 - 41024	0075h - 03FFh	Reserved	

Table 25: List of Modbus registers, command 03h for the compressor

7.2 Basic Load Cycle Register Addresses for Command 03_h – Read Data Register

7.2.1 . Basic Load Cycle Compressors – Status and Analogue Values

Register	Address	Contents	Data/comments
41025	0400h	Compressor 1 reserved	
41026	0401h	Compressor 1 status	Bit mask 0x0001: Ready 0x0002: Motor on 0x0004: Loaded 0x0008: Automatic restart or local 0x0010: Reserved 0x0020: Maintenance 0x0040: Warning 0x0080: Fault 0x0100: Ramp-up phase 0x0200: Overrun phase 0x0400: Free 0x0800: Free 0x1000: Free 0x2000: Free 0x4000: Manual 0x8000: Communications error
41027	0402h	Reserved	
41028	0403h	Compr. 1 utilisation	UInt16 [%]
41029	0404h	Compr. 1 overrun time	UInt16 [s]
41030	0405h	Reserved	
41031	0406h	Compr. 1 delivery volume	UInt16 [3.53 ft ³ /h]
41032	0407h	Reserved	
41033	0408h	Compr. 1 mains pressure	UInt16 [.0145 psi] (8000 _h = invalid)
41034	0409h	Compr. 1 compressor temperature	Int16 [32.18°F] (8000 _h = invalid)
41035	040Ah	Compr. 1 oil temperature	Int16 [32.18°F] (8000 _h = invalid)
41036	040Bh	Compr. 1 dew point temperature	Int16 [32.18°F] (8000 _h = invalid)
41037	040Ch	Compr. 1 ambient temperature	Int16 [32.18°F] (8000 _h = invalid)

Register	Address	Contents	Data/comments
41038	040Dh	Compr. 1 power consumption	UInt16 [0.01 kW]
41039	040Eh	Compr. 1 A-side bearing temperature or temperature after first stage	Int16 [32.18°F] (8000 _h = invalid)
41040	040Fh	Compr. 1 B-side bearing temperature or temperature before second stage	Int16 [32.18°F] (8000 _h = invalid)
41041	0410h	Compr. 1 winding temperature U or temperature after second stage	Int16 [32.18°F] (8000 _h = invalid)
41042	0411h	Compr. 1 winding temperature W or pressure before first stage	Int16 [32.18°F] (8000 _h = invalid), or Int16 [.0145 psi] (8000 _h = invalid)
41043	0412h	Compr. 1 winding temperature W or pressure after first stage	Int16 [32.18°F] (8000 _h = invalid), or Int16 [.0145 psi] (8000 _h = invalid)
41044	0413h	Compr. 1 pressure before second stage	Int16 [.0145 psi] (8000 _h = invalid)
41045	0414h	Compr. 1 pressure after second stage	Int16 [.0145 psi] (8000 _h = invalid)
41046	0415h	Compr. 1 electrical performance first stage	UInt16 [0.01 kW] (8000 _h = invalid)
41047	0416h	Compr. 1 electrical performance second stage	UInt16 [0.01 kW] (8000 _h = invalid)
41048	0417h	Compressor 1 reserved	

Table 26: List of Modbus registers, command 03h – status and analogue values, basic load cycle compressor 1

Register	Address	Contents	Data/comments
41049	0418h	Compressor 2 reserved	
41050	0419h	Compressor 2 status	Bit mask 0x0001: Ready 0x0002: Motor on 0x0004: Loaded 0x0008: Automatic restart or local 0x0010: Reserved 0x0020: Maintenance 0x0040: Warning 0x0080: Fault 0x0100: Ramp-up phase 0x0200: Overrun phase 0x0400: Free 0x0800: Free 0x1000: Free 0x2000: Free 0x4000: Manual 0x8000: Communications error
41051	041Ah	Reserved	
41052	041Bh	Compr. 2 utilisation	UInt16 [%]
41053	041Ch	Compr. 2 overrun time	UInt16 [s]
41054	041Dh	Reserved	
41055	041Eh	Compr. 2 delivery volume	UInt16 [3.53 ft³/h]
41056	041Fh	Reserved	
41057	0420h	Compr. 2 mains pressure	UInt16 [.0145 psi] (8000h = invalid)
41058	0421h	Compr. 2 compressor temperature	Int16 [32.18°F] (8000h = invalid)
41059	0422h	Compr. 2 oil temperature	Int16 [32.18°F] (8000h = invalid)
41060	0423h	Compr. 2 dew point temperature	Int16 [32.18°F] (8000h = invalid)
41061	0424h	Compr. 2 ambient temperature	Int16 [32.18°F] (8000h = invalid)
41062	0425h	Compr. 2 power consumption	UInt16 [0.01 kW]
41063	0426h	Compr. 2 A-side bearing temperature or temperature after first stage	Int16 [32.18°F] (8000h = invalid)
41064	0427h	Compr. 2 B-side bearing temperature, or temperature before second stage	Int16 [32.18°F] (8000h = invalid)

Register	Address	Contents	Data/comments
41065	0428h	Compr. 2 winding temperature U, or temperature after second stage	Int16 [32.18°F] (8000 _h = invalid)
41066	0429h	Compr. 2 winding temperature V, or pressure before first stage	Int16 [32.18°F] (8000 _h = invalid), or Int16 [.0145 psi] (8000 _h = invalid)
41067	042Ah	Compr. 2 winding temperature W, or pressure after first stage	Int16 [32.18°F] (8000 _h = invalid), or Int16 [.0145 psi] (8000 _h = invalid)
41068	042Bh	Compr. 2 pressure before second stage	Int16 [.0145 psi] (8000 _h = invalid)
41069	042Ch	Compr. 2 pressure after second stage	Int16 [.0145 psi] (8000 _h = invalid)
41070	042Dh	Compr. 2 electrical performance first stage	UInt16 [0.01 kW] (8000 _h = invalid)
41071	042Eh	Compr. 2 electrical performance second stage	UInt16 [0.01 kW] (8000 _h = invalid)
41072	042Fh	Compressor 2 reserved	

Table 27: List of Modbus registers, command 03h – status and analogue values, basic load cycle compressor 2

Register	Address	Contents	Data/comments
41073	0430h	Compressor 3 reserved	
41074	0431h	Compressor 3 status	Bit mask 0x0001: Ready 0x0002: Motor on 0x0004: Loaded 0x0008: Automatic restart or local 0x0010: Reserved 0x0020: Maintenance 0x0040: Warning 0x0080: Fault 0x0100: Ramp-up phase 0x0200: Overrun phase 0x0400: Free 0x0800: Free 0x1000: Free 0x2000: Free 0x4000: Manual 0x8000: Communications error
41075	0432h	Reserved	
41076	0433h	Compr. 3 utilisation	UInt16 [%]
41077	0434h	Compr. 3 overrun time	UInt16 [s]
41078	0435h	Reserved	
41079	0436h	Compr. 3 delivery volume	UInt16 [3.53 ft ³ /h]
41080	0437h	Reserved	
41081	0438h	Compr. 3 mains pressure	UInt16 [.0145 psi] (8000h = invalid)
41082	0439h	Compr. 3 compressor temperature	Int16 [32.18°F] (8000h = invalid)
41083	043Ah	Compr. 3 oil temperature	Int16 [32.18°F] (8000h = invalid)
41084	043Bh	Compr. 3 dew point temperature	Int16 [32.18°F] (8000h = invalid)
41085	043Ch	Compr. 3 ambient temperature	Int16 [32.18°F] (8000h = invalid)
41086	043Dh	Compr. 3 power consumption	UInt16 [0.01 kW]
41087	043Eh	Compr. 3 A-side bearing temperature or temperature after first stage	Int16 [32.18°F] (8000h = invalid)
41088	043Fh	Compr. 3 B-side bearing temperature, or temperature before second stage	Int16 [32.18°F] (8000h = invalid)

Register	Address	Contents	Data/comments
41089	0440h	Compr. 3 winding temperature U, or temperature after second stage	Int16 [32.18°F] (8000 _h = invalid)
41090	0441h	Compr. 3 winding temperature V, or pressure before first stage	Int16 [32.18°F] (8000 _h = invalid), or Int16 [.0145 psi] (8000 _h = invalid)
41091	0442h	Compr. 3 winding temperature W, or pressure after first stage	Int16 [32.18°F] (8000 _h = invalid), or Int16 [.0145 psi] (8000 _h = invalid)
41092	0443h	Compr. 3 pressure before second stage	Int16 [.0145 psi] (8000 _h = invalid)
41093	0444h	Compr. 3 pressure after second stage	Int16 [.0145 psi] (8000 _h = invalid)
41094	0445h	Compr. 3 electrical performance first stage	UInt16 [0.01 kW] (8000 _h = invalid)
41095	0446h	Compr. 3 electrical performance second stage	UInt16 [0.01 kW] (8000 _h = invalid)
41096	0447h	Compressor 3 reserved	

Table 28: List of Modbus registers, command 03h – status and analogue values, basic load cycle compressor 3

Register	Address	Contents	Data/comments
41097	0448h	Compressor 4 reserved	
41098	0449h	Compressor 4 status	Bit mask 0x0001: Ready 0x0002: Motor on 0x0004: Loaded 0x0008: Automatic restart or local 0x0010: Reserved 0x0020: Maintenance 0x0040: Warning 0x0080: Fault 0x0100: Ramp-up phase 0x0200: Overrun phase 0x0400: Free 0x0800: Free 0x1000: Free 0x2000: Free 0x4000: Manual 0x8000: Communications error
41099	044Ah	Reserved	
41100	044Bh	Compr. 4 utilisation	UInt16 [%]
41101	044Ch	Compr. 4 overrun time	UInt16 [s]
41102	044Dh	Reserved	
41103	044Eh	Compr. 4 delivery volume	UInt16 [3.53 ft ³ /h]
41104	044Fh	Reserved	
41105	0450h	Compr. 4 mains pressure	UInt16 [.0145 psi] (8000h = invalid)
41106	0451h	Compr. 4 compressor temperature	Int16 [32.18°F] (8000h = invalid)
41107	0452h	Compr. 4 oil temperature	Int16 [32.18°F]] (8000h = invalid)
41108	0453h	Compr. 4 dew point temperature	Int16 [32.18°F]] (8000h = invalid)
41109	0454h	Compr. 4 ambient temperature	Int16 [32.18°F]] (8000h = invalid)
41110	0455h	Compr. 4 power consumption	UInt16 [0.01 kW]
41111	0456h	Compr. 4 A-side bearing temperature or temperature after first stage	Int16 [32.18°F]] (8000h = invalid)
41112	0457h	Compr. 4 B-side bearing temperature, or temperature before second stage	Int16 [32.18°F]] (8000h = invalid)

Register	Address	Contents	Data/comments
41113	0458h	Compr. 4 winding temperature U, or temperature after second stage	Int16 [32.18°F] (8000 _h = invalid)
41114	0459h	Compr. 4 winding temperature V, or pressure before first stage	Int16 [32.18°F] (8000 _h = invalid), or Int16 [.0145 psi] (8000 _h = invalid)
41115	045Ah	Compr. 4 winding temperature W, or pressure after first stage	Int16 [32.18°F] (8000 _h = invalid), or Int16 [.0145 psi] (8000 _h = invalid)
41116	045Bh	Compr. 4 pressure before second stage	Int16 [.0145 psi] (8000 _h = invalid)
41117	045Ch	Compr. 4 pressure after second stage	Int16 [.0145 psi] (8000 _h = invalid)
41118	045Dh	Compr. 4 electrical performance first stage	UInt16 [0.01 kW] (8000 _h = invalid)
41119	045Eh	Compr. 4 electrical performance second stage	UInt16 [0.01 kW] (8000 _h = invalid)
41120	045Fh	Compressor 4 reserved	

Table 29: List of Modbus registers, command 03h – status and analogue values, basic load cycle compressor 4

Register	Address	Contents	Data/comments
41121	0460h	Compressor 5 reserved	
41122	0461h	Compressor 5 status	Bit mask 0x0001: Ready 0x0002: Motor on 0x0004: Loaded 0x0008: Automatic restart or local 0x0010: Reserved 0x0020: Maintenance 0x0040: Warning 0x0080: Fault 0x0100: Ramp-up phase 0x0200: Overrun phase 0x0400: Free 0x0800: Free 0x1000: Free 0x2000: Free 0x4000: Manual 0x8000: Communications error
41123	0462h	Reserved	
41124	0463h	Compr. 5 utilisation	UInt16 [%]
41125	0464h	Compr. 5 overrun time	UInt16 [s]
41126	0465h	Reserved	
41127	0466h	Compr. 5 delivery volume	UInt16 [3.53 ft ³ /h]
41128	0467h	Reserved	
41129	0468h	Compr. 5 mains pressure	UInt16 [.0145 psi] (8000h = invalid)
41130	0469h	Compr. 5 compressor temperature	Int16 [32.18°F] (8000h = invalid)
41131	046Ah	Compr. 5 oil temperature	Int16 [32.18°F] (8000h = invalid)
41132	046Bh	Compr. 5 dew point temperature	Int16 [32.18°F] (8000h = invalid)
41133	046Ch	Compr. 5 ambient temperature	Int16 [32.18°F] (8000h = invalid)
41134	046Dh	Compr. 5 power consumption	UInt16 [0.01 kW]
41135	046Eh	Compr. 5 A-side bearing temperature or temperature after first stage	Int16 [32.18°F] (8000h = invalid)
41136	046Fh	Compr. 5 B-side bearing temperature, or temperature before second stage	Int16 [32.18°F] (8000h = invalid)

Register	Address	Contents	Data/comments
41137	0470h	Compr. 5 winding temperature U, or temperature after second stage	Int16 [32.18°F]] (8000 _h = invalid)
41138	0471h	Compr. 5 winding temperature V, or pressure before first stage	Int16 [32.18°F]] (8000 _h = invalid), or Int16 [.0145 psi] (8000 _h = invalid)
41139	0472h	Compr. 5 winding temperature W, or pressure after first stage	Int16 [32.18°F]] (8000 _h = invalid), or Int16 [.0145 psi] (8000 _h = invalid)
41140	0473h	Compr. 5 pressure before second stage	Int16 [.0145 psi] (8000 _h = invalid)
41141	0474h	Compr. 5 pressure after second stage	Int16 [.0145 psi] (8000 _h = invalid)
41142	0475h	Compr. 5 electrical performance first stage	UInt16 [0.01 kW] (8000 _h = invalid)
41143	0476h	Compr. 5 electrical performance second stage	UInt16 [0.01 kW] (8000 _h = invalid)
41144	0477h	Compressor 5 reserved	

Table 30: List of Modbus registers, command 03h – status and analogue values, basic load cycle compressor 5

Register	Address	Contents	Data/comments
41145 - 41408	0478h - 057Fh	Reserved	

7.2.2 . Basic Load Cycle Compressors – Bit Registers for Messages

Register	Address	Contents	Data/comments
41409	0580h	Compressor 1 Maintenance messages	Bit mask depending on control system
41410 - 41413	0581h - 0584h	Compressor 1 Warning messages	Bit mask depending on control system
41414 - 41432	0585h - 0597h	Compressor 1 Fault messages	Bit mask depending on control system
41433 - 41440	0598h - 059Fh	Compressor 1 reserved	

Table 31: List of Modbus registers, command 03h – bit registers for basic load cycle compressor 1 messages

Register	Address	Contents	Data/comments
41441	05A0h	Compressor 2 Maintenance messages	Bit mask depending on control system
41442 - 41445	05A1h - 05A4h	Compressor 2 Warning messages	Bit mask depending on control system
41446 - 41464	05A5h - 05B7h	Compressor 2 Fault messages	Bit mask depending on control system
41465 - 41472	05B8h - 05BFh	Compressor 2 reserved	

Table 32: List of Modbus registers, command 03h – bit registers for basic load cycle compressor 2 messages

Register	Address	Contents	Data/comments
41473	05C0h	Compressor 3 Maintenance messages	Bit mask depending on control system
41474 - 41477	05C1h - 05C4h	Compressor 3 Warning messages	Bit mask depending on control system
41478 - 41496	05C5h - 05D7h	Compressor 3 Fault messages	Bit mask depending on control system
41497 - 41504	05D8h - 05DFh	Compressor 3 reserved	

Table 33: List of Modbus registers, command 03h – bit registers for basic load cycle compressor 3 messages

Register	Address	Contents	Data/comments
41505	05E0h	Compressor 4 Maintenance messages	Bit mask depending on control system
41506 - 41509	05E1h - 05E4h	Compressor 4 Warning messages	Bit mask depending on control system
41510 - 41528	05E5h - 05F7h	Compressor 4 Fault messages	Bit mask depending on control system
41529 - 41536	05F8h - 05FFh	Compressor 4 reserved	

Table 34: List of Modbus registers, command 03h – bit registers for basic load cycle compressor 4 messages

Register	Address	Contents	Data/comments
41537	0600h	Compressor 5 Maintenance messages	Bit mask depending on control system
41538 - 41541	0601h - 0604h	Compressor 5 Warning messages	Bit mask depending on control system
41542 - 41560	0605h - 0617h	Compressor 5 Fault messages	Bit mask depending on control system
41561 - 41568	0618h - 061Fh	Compressor 5 reserved	

Table 35: List of Modbus registers, command 03h – bit registers for basic load cycle compressor 5 messages

Register	Address	Contents	Data/comments
41729 - 41920	06C0h - 077Fh	Reserved	

7.2.3 . Basic Load Cycle Compressors – Maintenance Intervals

Register	Address	Contents	Data/comments
41921	0780h	Compr. 1 maintenance int. for water filter	U Int16 [h] (0 = maintenance interval inactive)
41922	0781h	C. 1 maintenance int. for intake filter	U Int16 [h] (0 = maintenance interval inactive)
41923	0782h	C. 1 maintenance int. for oil filter	U Int16 [h] (0 = maintenance interval inactive)
41924	0783h	Compr. 1 maintenance int. for oil separator	U Int16 [h] (0 = maintenance interval inactive)
41925	0784h	C. 1 maintenance int. for motor	U Int16 [h] (0 = maintenance interval inactive)
41926	0785h	Compr. 1 maintenance int. for compressor	U Int16 [h] (0 = maintenance interval inactive)
41927	0786h	Compr. 1 reserved	
41928	0787h	Compr 1 maintenance int. for universal 1	U Int16 [h] (0 = maintenance interval inactive)
41929	0788h	C. 1 maintenance int. for univ. 2	U Int16 [h] (0 = maintenance interval inactive)
41930	0789h	C. 1 maintenance int. for univ. 3	U Int16 [h] (0 = maintenance interval inactive)
41931	078Ah	C. 1 maintenance int. for univ. 4	U Int16 [h] (0 = maintenance interval inactive)
41932	078Bh	C. 1 maintenance int. for annual	U Int16 [h] (0 = maintenance interval inactive)
41933 - 41936	078Ch - 078Fh	Compr. 1 reserve	
41937	0790h	Compr. 1 water filter maintenance time remaining	I nt16 [h]
41938	0791h	C. 1 intake filter maintenance time remaining	I nt16 [h]
41939	0792h	C. 1 oil filter maintenance time remaining	I nt16 [h]
41940	0793h	Compr. 1 oil separator maintenance time remaining	I nt16 [h]
41941	0794h	C. 1 motor maintenance time remaining	I nt16 [h]
41942	0795h	Compr. 1 compressor maintenance time remaining	I nt16 [h]

Register	Address	Contents	Data/comments
41943	0796h	Compr. 1 reserved	
41944	0797h	Compr. 1 universal 1 maintenance time remaining	Int16 [h]
41945	0798h	C. 1 univ. 2 maintenance time remaining	Int16 [h]
41946	0799h	C. 1 univ. 3 maintenance time remaining	Int16 [h]
41947	079Ah	C. 1 univ. 4 maintenance time remaining	Int16 [h]
41948	079Bh	C. 1 maintenance time remaining annual	Int16 [h]
41949 - 41952	079Ch - 079Fh	Compr. 1 reserve	

Table 36: List of Modbus registers, command 03h – maintenance intervals for basic load cycle compressor 1

Register	Address	Contents	Data/comments
41953	07A0h	Compr. 2 maintenance int. for water filter	UInt16 [h] (0 = maintenance interval inactive)
41954	07A1h	C. 2 maintenance int. for intake filter	UInt16 [h] (0 = maintenance interval inactive)
41955	07A2h	C. 2 maintenance int. for oil filter	UInt16 [h] (0 = maintenance interval inactive)
41956	07A3h	Compr. 2 maintenance int. for oil separator	UInt16 [h] (0 = maintenance interval inactive)
41957	07A4h	C. 2 maintenance int. for motor	UInt16 [h] (0 = maintenance interval inactive)
41958	07A5h	Compr. 2 maintenance int. for compressor	UInt16 [h] (0 = maintenance interval inactive)
41959	07A6h	Compr. 2 reserved	
41960	07A7h	Compr 2 maintenance int. for universal 1	UInt16 [h] (0 = maintenance interval inactive)
41961	07A8h	C. 2 maintenance int. for univ. 2	UInt16 [h] (0 = maintenance interval inactive)
41962	07A9h	C. 2 maintenance int. for univ. 3	UInt16 [h] (0 = maintenance interval inactive)
41963	07AAh	C. 2 maintenance int. for univ. 4	UInt16 [h] (0 = maintenance interval inactive)
41964	07ABh	C. 2 maintenance int. annual	UInt16 [h] (0 = maintenance interval inactive)

Register	Address	Contents	Data/comments
41965 - 41968	07ACh - 07AFh	Compr. 2 reserve	
41969	07B0h	Compr. 2 water filter maintenance time remaining	Int16 [h]
41970	07B1h	C. 2 intake filter maintenance time remaining	Int16 [h]
41971	07B2h	C. 2 oil filter maintenance time remaining	Int16 [h]
41972	07B3h	Compr. 2 oil separator maintenance time remaining	Int16 [h]
41973	07B4h	C. 2 motor maintenance time remaining	Int16 [h]
41974	07B5h	Compr. 2 compressor maintenance time remaining	Int16 [h]
41975	07B6h	Compr. 2 reserved	
41976	07B7h	Compr. 2 universal 1 maintenance time remaining	Int16 [h]
41977	07B8h	C. 2 univ. 2 maintenance time remaining	Int16 [h]
41978	07B9h	C. 2 univ. 3 maintenance time remaining	Int16 [h]
41979	07BAh	C. 2 univ. 4 maintenance time remaining	Int16 [h]
41980	07BBh	C. 2 maintenance time remaining annual	Int16 [h]
41981 - 41984	07BCh - 07BFh	Compr. 2 reserve	

Table 37: List of Modbus registers, command 03h – maintenance intervals for basic load cycle compressor 2

Register	Address	Contents	Data/comments
41985	07C0h	Compr. 3 maintenance int. for water filter	UInt16 [h] (0 = maintenance interval inactive)
41986	07C1h	C. 3 maintenance int. for intake filter	UInt16 [h] (0 = maintenance interval inactive)
41987	07C2h	C. 3 maintenance int. for oil filter	UInt16 [h] (0 = maintenance interval inactive)
41988	07C3h	Compr. 3 maintenance int. for oil	UInt16 [h] (0 = maintenance interval inactive)

Register	Address	Contents	Data/comments
41989	07C4h	C. 3 maintenance int. for motor	UInt16 [h] (0 = maintenance interval inactive)
41990	07C5h	Compr. 3 maintenance int. for compressor	UInt16 [h] (0 = maintenance interval inactive)
41991	07C6h	Compr. 3 reserved	
41992	07C7h	Compr 3 maintenance int. for universal 1	UInt16 [h] (0 = maintenance interval inactive)
41993	07C8h	C. 3 maintenance int. for univ. 2	UInt16 [h] (0 = maintenance interval inactive)
41994	07C9h	C. 3 maintenance int. for univ. 3	UInt16 [h] (0 = maintenance interval inactive)
41995	07CAh	C. 3 maintenance int. for univ. 4	UInt16 [h] (0 = maintenance interval inactive)
41996	07CBh	C. 3 maintenance int. annual	UInt16 [h] (0 = maintenance interval inactive)
41997 - 42000	07CCh - 07CFh	Compr. 3 reserve	
42001	07D0h	Compr. 3 water filter maintenance time remaining	Int16 [h]
42002	07D1h	C. 3 intake filter maintenance time remaining	Int16 [h]
42003	07D2h	C. 3 oil filter maintenance time remaining	Int16 [h]
42004	07D3h	Compr. 3 oil separator maintenance time remaining	Int16 [h]
42005	07D4h	C. 3 motor maintenance time remaining	Int16 [h]
42006	07D5h	Compr. 3 compressor maintenance time remaining	Int16 [h]
42007	07D6h	Compr. 3 reserved	
42008	07D7h	Compr. 3 universal 1 maintenance time remaining	Int16 [h]
42009	07D8h	C. 3 univ. 2 maintenance time remaining	Int16 [h]
42010	07D9h	C. 3 univ. 3 maintenance time remaining	Int16 [h]
42011	07DAh	C. 3 univ. 4 maintenance time remaining	Int16 [h]
42012	07DBh	C. 3 maintenance time remaining annual	Int16 [h]
42013 - 42016	07DCh - 07DFh	Compr. 3 reserve	

Table 38: List of Modbus registers, command 03h – maintenance intervals for basic load cycle compressor 3

Register	Address	Contents	Data/comments
42017	07E0h	Compr. 4 maintenance int. for water filter	U Int16 [h] (0 = maintenance interval inactive)
42018	07E1h	C. 4 maintenance int. for intake filter	U Int16 [h] (0 = maintenance interval inactive)
42019	07E2h	C. 4 maintenance int. for oil filter	U Int16 [h] (0 = maintenance interval inactive)
42020	07E3h	Compr. 4 maintenance int. for oil separator	U Int16 [h] (0 = maintenance interval inactive)
42021	07E4h	C. 4 maintenance int. for motor	U Int16 [h] (0 = maintenance interval inactive)
42022	07E5h	Compr. 4 maintenance int. for compressor	U Int16 [h] (0 = maintenance interval inactive)
42023	07E6h	Compr. 4 reserved	
42024	07E7h	Compr 4 maintenance int. for universal 1	U Int16 [h] (0 = maintenance interval inactive)
42025	07E8h	C. 4 maintenance int. for univ. 2	U Int16 [h] (0 = maintenance interval inactive)
42026	07E9h	C. 4 maintenance int. for univ. 3	U Int16 [h] (0 = maintenance interval inactive)
42027	07EAh	C. 4 maintenance int. for univ. 4	U Int16 [h] (0 = maintenance interval inactive)
42028	07EBh	C. 4 maintenance int. annual	U Int16 [h] (0 = maintenance interval inactive)
42029 - 42032	07ECh - 07EFh	Compr. 4 reserve	
42033	07F0h	Compr. 4 water filter maintenance time remaining	I nt16 [h]
42034	07F1h	C. 4 intake filter maintenance time remaining	I nt16 [h]
42035	07F2h	C. 4 oil filter maintenance time remaining	I nt16 [h]
42036	07F3h	Compr. 4 oil separator maintenance time remaining	I nt16 [h]
42037	07F4h	C. 4 motor maintenance time remaining	I nt16 [h]
42038	07F5h	Compr. 4 compressor maintenance time remaining	I nt16 [h]
42039	07F6h	Compr. 4 reserved	
42040	07F7h	Compr. 4 universal 1 maintenance time remaining	I nt16 [h]

Register	Address	Contents	Data/comments
42041	07F8h	C. 4 univ. 2 maintenance time remaining	Int16 [h]
42042	07F9h	C. 4 univ. 3 maintenance time remaining	Int16 [h]
42043	07FAh	C. 4 univ. 4 maintenance time remaining	Int16 [h]
42044	07FBh	C. 4 maintenance time remaining annual	Int16 [h]
42045 - 42048	07FCh - 07FFh	Compr. 4 reserve	

Table 39: List of Modbus registers, command 03h – maintenance intervals for basic load cycle compressor 4

Register	Address	Contents	Data/comments
42049	0800h	Compr. 5 maintenance int. for water filter	UInt16 [h] (0 = maintenance interval inactive)
42050	0801h	C. 5 maintenance int. for intake filter	UInt16 [h] (0 = maintenance interval inactive)
42051	0802h	C. 5 maintenance int. for oil filter	UInt16 [h] (0 = maintenance interval inactive)
42052	0803h	Compr. 5 maintenance int. for oil separator	UInt16 [h] (0 = maintenance interval inactive)
42053	0804h	C. 5 maintenance int. for motor	UInt16 [h] (0 = maintenance interval inactive)
42054	0805h	Compr. 5 maintenance int. for compressor	UInt16 [h] (0 = maintenance interval inactive)
42055	0806h	Compr. 5 reserved	
42056	0807h	Compr 5 maintenance int. for universal 1	UInt16 [h] (0 = maintenance interval inactive)
42057	0808h	C. 5 maintenance int. for univ. 2	UInt16 [h] (0 = maintenance interval inactive)
42058	0809h	C. 5 maintenance int. for univ. 3	UInt16 [h] (0 = maintenance interval inactive)
42059	080Ah	C. 5 maintenance int. for univ. 4	UInt16 [h] (0 = maintenance interval inactive)
42060	080Bh	C. 5 maintenance int. annual	UInt16 [h] (0 = maintenance interval inactive)
42061 - 42064	080Ch - 080Fh	Compr. 5 reserve	
42065	0810h	Compr. 5 water filter maintenance time remaining	Int16 [h]

Register	Address	Contents	Data/comments
42066	0811h	C. 5 intake filter maintenance time remaining	Int16 [h]
42067	0812h	C. 5 oil filter maintenance time remaining	Int16 [h]
42068	0813h	Compr. 5 oil separator maintenance time remaining	Int16 [h]
42069	0814h	C. 5 motor maintenance time remaining	Int16 [h]
42070	0815h	Compr. 5 compressor maintenance time remaining	Int16 [h]
42071	0816h	Compr. 5 reserved	
42072	0817h	Compr. 5 universal 1 maintenance time remaining	Int16 [h]
42073	0818h	C. 5 univ. 2 maintenance time remaining	Int16 [h]
42074	0819h	C. 5 univ. 3 maintenance time remaining	Int16 [h]
42075	081Ah	C. 5 univ. 4 maintenance time remaining	Int16 [h]
42076	081Bh	C. 5 maintenance time remaining annual	Int16 [h]
42077 - 42080	081Ch - 081Fh	Compr. 5 reserve	

Table 40: List of Modbus registers, command 03h – maintenance intervals for basic load cycle compressor 5

Register	Address	Contents	Data/comments
42081 - 42240	0820h - 08BFh	Reserve	

7.2.4 . Basic Load Cycle Compressors - Operating Hours / Hours Under Load and Stationary Hours

Register	Address	Contents	Data/comments
42433 - 42434	0980h - 0981h	Compressor 1 operating hours	UInt32 [h]
42435 - 42436	0982h - 0983h	Compressor 1 hours under load	UInt32 [h]
42437 - 42438	0984h - 0985h	Compressor 1 stationary time	UInt32 [h]
42439 - 42440	0986h - 0987h	Compressor 1 reserve	UInt32 [h]

Table 41: List of Modbus registers, command 03h – basic load cycle compressor 1 hours

Register	Address	Contents	Data/comments
42441 - 42442	0988h - 0989h	Compressor 2 operating hours	UInt32 [h]
42443 - 42444	098Ah - 098Bh	Compressor 2 hours under load	UInt32 [h]
42445 - 42456	098Ch - 098Dh	Compressor 2 stationary time	UInt32 [h]
42447 - 42448	098Eh - 098Fh	Compressor 2 reserve	UInt32 [h]

Table 42: List of Modbus registers, command 03h – basic load cycle compressor 2 hours

Register	Address	Contents	Data/comments
42449 - 42450	0990h - 0991h	Compressor 3 operating hours	UInt32 [h]
42451 - 42452	0992h - 0993h	Compressor 3 hours under load	UInt32 [h]
42453 - 42454	0994h - 0995h	Compressor 3 stationary time	UInt32 [h]
42455 - 42456	0996h - 0997h	Compressor 3 reserve	UInt32 [h]

Table 43: List of Modbus registers, command 03h – basic load cycle compressor 3 hours

Register	Address	Contents	Data/comments
42457 - 42458	0998h - 0999h	Compressor 4 operating hours	UInt32 [h]
42459 - 42460	099Ah - 099Bh	Compressor 4 hours under load	UInt32 [h]
42461 - 42462	099Ch - 099Dh	Compressor 4 stationary time	UInt32 [h]
42463 - 42464	099Eh - 099Fh	Compressor 4 reserve	UInt32 [h]

Table 44: List of Modbus registers, command 03h – basic load cycle compressor 4 hours

Register	Address	Contents	Data/comments
42465 - 42466	09A0h - 09A1h	Compressor 5 operating hours	UInt32 [h]
42467 - 42468	09A2h - 09A3h	Compressor 5 hours under load	UInt32 [h]
42469 - 42470	09A4h - 09A5h	Compressor 5 stationary time	UInt32 [h]
42471 - 42472	09A6h - 09A7h	Compressor 5 reserve	UInt32 [h]

Table 45: List of Modbus registers, command 03h – basic load cycle compressor 5 hours

7.3 Register Addresses for Command 10h – Write Data Register

Register	Address	Contents	Data/comments
40001	0000h	Acknowledge messages	Writing 005a hex resets pending and acknowledgeable messages. No other values are permitted
40002	0001h	Switch system On / Off	0080 hex value: Switch system Off 0081 hex value: Switch system On No other values are permitted To be able to switch the system, these values must be keyed in locally and be enabled appropriately in the menu for remote access.
40003	0002h	Remote loaded / idling	0080 hex value: No control via interface 0081 hex value: No control via interface 0082 hex value: No load request (idling / Off) 0083 hex value: Load request No other values are permitted The system must be enabled appropriately in the menu for external pressure control. In addition, this command must be repeated at least every 20 seconds.
40004	0003h	External target speed value	Range of values 4000 – 20000 corresponds to 0 – 100 % This command must be repeated at least every 20 seconds.

Table 46: List of Modbus registers, command 10h – write data register

8 Standard Protocol / Profibus DP

To activate this operating mode, the interface at 36 Communication must be selected as "Standard" protocol. This protocol is used both for basic load cycle networking and to integrate a Profibus II (Profibus DP) module.

8.1 Standard Protocol

A detailed technical description of the standard protocol including an exact structure of the send/receive telegram is available in a separate document.

8.2 Profibus II (Profibus DP)

A technical description of the Profibus module including the terminal assignment is available in a separate document.

Data set structure

A max. of 104 bytes each can be transferred via the Profibus II module (Profibus DP - secondary) to one or more connected control systems or called up from there.

The Profibus module generates the corresponding command telegrams for the control system (=> "Standard protocol") from the output data received by the Profibus primary.

The reply telegrams from the control system are then re-converted accordingly and stored in the input data area for the Profibus primary.

In a special status byte, the Profibus primary is informed when the reply data are available and/or whether the secondary acknowledged the command (if no reply data available).

The byte sequence is "Big Endian", i.e. with values that require 2 or more bytes, the more significant byte always comes first (Hi, Lo).

Abbreviations used:

UInt8: 8 bit unsigned

UInt16: 16 bit unsigned

UInt32: 32 bit unsigned

Int8: 8 bit signed

Int16: 16 bit signed

Int32: 32 bit signed

Data allocation for Profibus output data (send data from the Profibus primary)

Byte	Contents	Data/comments
1	RS-485 address of the control system to be addressed	This corresponds to the respective RS485 address set at 36Communication
2	Command number A new command is only accepted if this byte had previously been "0"!	A list and description of the individual command numbers can be found at 109 Overview of commands
3	Number of send bytes (0 - 101)	With commands purely for calling up data "0", otherwise number of the data bytes to be sent to the control system. This value can be found in the description of the individual commands (109 Overview of commands) (number of data bytes under command telegram)
4 – 104	Send data	The data described at 109 Overview of commands (command telegram) (D0 – D100), if available, are transferred here. Only the first data bytes, stated under "Number of send bytes", are taken into consideration.

Table 47: Data allocation of Profibus output data

Data allocation of Profibus input data (receive data relating to the Profibus primary)

Byte	Contents	Data/comments
1	RS-485 address of the control system replying	Normally the address from the output data
2	Command number or error identifier	Normally command number from the output data. In the case of error 7F HEX. In this case, the error code is in byte 4
3	Status byte	00 HEX [0]: Module is waiting for a command from the Profibus primary F0 HEX [240]: Command was sent to the corresponding control system FF HEX [255]: Module has received the reply data from the control system and/or the control system has acknowledged the command.
4 – 104	Receive data	The data described at 109 Overview of commands (reply telegram) (D0 – D100), if available, are transferred here. In case of error (byte 2 = 7F HEX), the error code appears in byte 4: 1 = Forbidden data 2 = Unknown command 3 = Check total incorrect 4 = Profibus module / telegram length incorrect 5 = (currently not used) 6 = Control system / number of send bytes incorrect 7 = Timeout / control system is not responding

Table 48: Data allocation of Profibus input data

Example:

The example used here is a status query from the ICT (command 1).

In this example, the ICT is set to the RS485 address "2".

a) Profibus output data (send data from the Profibus primary)

First byte	RS-485 address of the desired control system	2
Second byte	Command (e.g. status query)	1
	* A new command is only recognised if this byte has previously been "0"!	
Third byte	Number of send bytes	0
----- from this point, the send data would arrive at the control system unless third byte is "0"-----		

a) Profibus input data (receive data for the Profibus primary)

First byte	RS-485 address of the replying control system	2
Second byte	Command or error message [127 with control system error message!]	1
Third byte	Status byte / Profibus module:	255
----- from this point onwards, the reply data from the control system is received -----		
Fourth byte	D0 (status 1 more significant byte)	0
Fifth byte	D1 (status 1 less significant byte)	0
...	...	
Forty-second byte	D38 \ reserved	32768
Forty-third byte	D39	

8.3 Overview of Commands

The individual control system commands for the standard protocol are listed and explained below.

For each telegram, the transmitted data bytes (useful data) and their significance are explained.

The interface description only applies to the standard software of the iCommand-Touch and not to special versions.

Overview of commands:

Command 1	Status query
Command 2	Fault query
Command 3	Read operating data
Command 10	Switch off
Command 11	Switch on
Command 12 –	Idling/loaded and speed specification
Command 18 –	Acknowledge messages
Command 30	Status query basic load cycle
Command 31	Status query compressor X from basic load cycle
Command 32	Fault query compressor X from basic load cycle
Command 33	Query operating data compressor X from basic load cycle
Command 34	Query texts compressor X from basic load cycle

8.3.1 . Command 1 – Status Query

Command telegram:

0 data bytes

Reply telegram

40 data bytes

Byte	Contents	Data/comments
D0 D1	Status 1	Bit mask 0x0001: Operation / keyed in 0x0002: Motor running 0x0004: Loaded / load valve open 0x0008: Idling (motor running, load valve closed but no ramp-up) 0x0010: Not assigned 0x0020: Maintenance message active 0x0040: Warning message active 0x0080: Fault message active
D2 D3	Status 2	Not assigned
D4	Frequency converter percent display	UInt8 [%]
D5	Reserved	
D6 D7	Delivery volume	UInt16 [3.53 ft ³ /h]
D8 D9	Mains pressure	UInt16 [.0145 psi] (8000 _h = invalid)
D10 D11	Compressor temperature	Int16 [32.18°F] (8000 _h = invalid)
D12 D13	Oil temperature	Int16 [32.18°F] (8000 _h = invalid)
D14 D15	Ambient temperature	Int16 [32.18°F] (8000 _h = invalid)
D16 D17	Dew point temperature	Int16 [32.18°F] (8000 _h = invalid)

Byte	Contents	Data/comments
D18 D19	Power consumption of compressor	UInt16 [0.01 kW] (8000 _h = invalid)
D20 D21	A-side bearing temperature	Int16 [32.18°F] (8000 _h = invalid)
D22 D23	B-side bearing temperature	Int16 [32.18°F] (8000 _h = invalid)
D24 D25	Winding temperature U	Int16 [32.18°F] (8000 _h = invalid)
D26 D27	Winding temperature V	Int16 [32.18°F] (8000 _h = invalid)
D28 D29	Winding temperature W	Int16 [32.18°F] (8000 _h = invalid)
D30 D31	Reserved	8000 _h = invalid
D32 D33	Reserved	8000 _h = invalid
D34 D35	Reserved	8000 _h = invalid
D36 D37	Reserved	8000 _h = invalid
D38 D39	Reserved	8000 _h = invalid

Table 49: List of standard protocol receive data for command 1

8.3.2 . Command 2 – Fault Query

Command telegram:

0 data bytes

Reply telegram

40 data bytes

Byte	Contents	Data/comments
D0 D1	Maintenance messages	Bit 0: M001 Intake filter 1: M002 Oil filter 2: M003 Oil separator 3: M004 Motor lubrication 4: M005 Compressor 6: M007 Water filter 7: M008 Annual maintenance 8: M009 Universal 1 9: M010 Universal 2 10: M011 Universal 3 11: M012 Universal 4 12: M016 Battery
D2 D3	Warning 1 messages	Bit 0: W021 Compressor temp. increased 1: W022 Mains pressure increased 2: W023 Temperature low 3: W024 Lower pressure threshold reached 4: W025 Check oil level / heater 5: W026 Calibration incorrect 8: W029 Water filter 9: W030 Diff. press. water filter 10: W031 Condensate drain 11: W032 Air filter 12: W033 Speed limitation 13: W034 Dryer 14: W035 Dew point temperature 15: W036 Oil filter

Byte	Contents	Data/comments
D4 D5	Warning 2 messages	Bit 0: W037 Oil separator 1: W038 Dew point temperature too low 2: W038 Dew point temperature too high 7: W044: DUART module 8: W045 I/O module (addr.1) 9: W046 I/O module (addr.2) 13: W050 Profibus module (addr.31) 14: W051 Overc. fan 1 15: W052 Overc. fan 2
D6 D7	Warning 3 messages	Bit 2: W055 SD card access 3: W056 Ext. war. 1 4: W057 Ext. war. 2 5: W058 Ext. war. 3 6: W059 Ext. war. 4 8: W201: <user defined> 9: W202: <user defined> 10: W203: <user defined> 11: W204: <user defined> 12: W205: <user defined> 13: W206: <user defined> 14: W207: <user defined> 15: W208: <user defined>
D8 D9	Warning 4 messages	Not assigned
D10 D11	Fault 1 messages	Bit 0: E061 EEPROM 2: E063 Parameter incorrect 4: E065 Power outage 5: E066 C. temp cable def. 6: E067 Oil temp. cable def. 7: E068 Pressure cable def. 9: E070 Dew point cable def. 10: E071 EMERGENCY STOP confirmed 11: E072 Direction of rotation incorrect 12: E073 Motor temperature 13: E074 Overcurrent 14: E075 Overpressure 15: E076 Switching cycles exceeded

Byte	Contents	Data/comments
D12 D13	Fault 2 messages	Bit 0: E077 C temp too high 1: E078 Mains pressure too high 2: E079 System pressure build-up 4: E081 Converter fault 5: E082 Diff. pressure oil separator 6: E083: Ambient temp. cable def. 7: E084: Min ambient temp. 8: E085: Max ambient temp. 12: E089: DUART module 13: E090 Dew point temperature too low 14: E091 Dew point temperature too high
D14 D15	Fault 3 messages	Bit 2: E095 I/O module (addr. 4) E096 3: I/O module (addr. 5) 4: E097 I/O module (addr.6) 5: E098 I/O module (addr.7) 6: E099 Min. water level 7: E100 Max. water level 8: E101 Diff. press. water filter 10: E103 Fan overcurrent 13: E106 Press. build-up bearing flush
D16 D17	Fault 4 messages	Bit 0: E109: Dryer fault 1: E110 Ext. fault 1 2: E111 Ext. fault 2 3: E112 Ext. fault 3 4: E113 Ext. fault 4 6: E115: I/O module (addr.8) 7: E116: I/O module (addr.9) 11: E120: Bearing temp. cable def. A side 12: E121: Bearing temp. cable def. B side 13: E122: Bearing temp. A side too high 14: E123: Bearing temp. B side too high 15: E124: Cable def. winding temp. U
D18 D19	Fault 5 messages	Bit 0: E125: Cable def. winding temp. V E126: 1: Cable def. winding temp. W 2: E127: Winding temp. U too high 3: E128: Winding temp. V too high 4: E129: Winding temp. W too high 6: E131: <user defined> 7: E132: <user defined> 8: E133: <user defined> 9: E134: <user defined> 10: E135: <user defined> 11: E136: <user defined> 12: E137: <user defined> 13: E138: <user defined>

Byte	Contents	Data/comments
D20 D21	Fault 6 messages	Bit Not assigned
D22 D23	Fault 7 messages	Bit 13: E170: Communication FC addr. 1 14: E171: Communication FC addr. 2
D24 D25	Fault 8 messages FC faults YASKAWA	Bit 0: E301 FC overcurrent (OC, GF) 1: E302 FC overvoltage (OV) 2: E303 FC overload (OL2) 3: E304 FC overheating (OH1/2) 4: E305 FC motor brake (RR, RH) 5: E306 FC overcurrent (OC, GF) 6: E307 FC feedback(Fbl, FbH) 7: E308 FC external (EF0-6) 8: E309 FC hardware (OFx) 9: E310 FC motor overload (OL1) 10: E311 FC connection (PGO) 11: E312 FC interm. undervoltage (UV) 12: E313 FC undervoltage (UV1) 13: E314 FC phase (LF, PF) 14: E315 FC communication (CE) 15: E316 FC operating unit (OPR)
D26 D27	Fault 9 messages FC faults Bosch Rexroth	Bit 0: E317: FC undervoltage 1: E318: FC overcurrent (const) 2: E319: FC overcurrent (accel.) 3: E320: FC overcurrent (delay) 4: E321: FC overvoltage K 5: E322: FC overvoltage B 6: E323: FC overvoltage V 7: E324: FC motor overload 8: E325: FC overtemperature 9: E326: FC protection active 10: E327: FC EMC CPU - 11: E328: FC input phase missing 12: E329: FC output phase missing 13: E330: FC external fault 14: E331: FC reserved 15: E332: FC reserved

Byte	Contents	Data/comments
D28 D29	Fault 10 messages FC faults Emotron 1	Bit 0: E333 FC motor I ² t 1: E334 FC PTC 2: E335 FC motor off 3: E336 FC rotor blocked 4: E337 FC ext. error 5: E338 FC mon max alarm 6: E339 FC mon min alarm 7: E340 FC com error 8: E341 FC PT100 9: E342 FC free 10: E343 FC pump 11: E344 FC ext mot temp. 12: E345 FC LC level 13: E346 FC brake 14: E347 FC option 15: E348 FC overtemperature
D30 D31	Fault 11 messages FC faults Emotron 2	Bit 0: E349 FC overcurrent F 1: E350 FC overvoltage Vz 2: E351 FC overvoltage G 3: E352 FC overvoltage M 4: E353 FC overvoltage 5: E354 FC undervoltage 6: E355 FC power error 7: E356 FC desat 8: E357 FC interim circuit error 9: E358 FC int. error 10: E359 FC overvolt MMay 11: E360 FC overv
D32 D33	Free (messages)	Bit Not assigned
D34 D35	Free (messages)	Bit Not assigned
D36 D37	Free (messages)	Bit Not assigned
D38 D39	Free (messages)	Bit Not assigned

Table 50: List of standard protocol receive data for command 2

8.3.3 . Command 3 – Read Operating Data

Command telegram:

0 data bytes

Reply telegram

52 data bytes

Byte	Contents	Data/comments
D0 - D3	Operating hours	UInt32 [h]
D4 - D7	Hours under load	UInt32 [h]
D8 - D11	Stationary hours	UInt32 [h]
D12 D13	Intake filter maintenance interval	UInt16 [h]
D14 D15	Intake filter maintenance time remaining	Int16 [h]
D16 D17	Standard: Oil filter maintenance interval	UInt16 [h]
D18 D19	Standard: Oil filter maintenance time remaining	Int16 [h]
D20 D21	Standard: Fine separator maintenance interval	UInt16 [h]
D22 D23	Standard: Fine separator maintenance time remaining	Int16 [h]
D24 D25	Motor maintenance interval	UInt16 [h]
D26 D27	Motor maintenance time remaining	Int16 [h]
D28 D29	Compressor maintenance interval	UInt16 [h]
D30 D31	Compressor maintenance time remaining	Int16 [h]

Byte	Contents	Data/comments
D32 D33	Universal 1 maintenance interval	UInt16 [h]
D34 D35	Universal 1 maintenance time remaining	Int16 [h]
D36 D37	Universal 2 maintenance interval	UInt16 [h]
D38 D39	Universal 2 maintenance time remaining	Int16 [h]
D40 D41	Universal 3 maintenance interval	UInt16 [h]
D42 D43	Universal 3 maintenance time remaining	Int16 [h]
D44 D45	Universal 4 maintenance interval	UInt16 [h]
D46 D47	Universal 4 maintenance time remaining	Int16 [h]
D48 D49	Annual maintenance interval	UInt16 [h]
D50 D51	Annual maintenance time remaining	Int16 [h]

Table 51: List of standard protocol receive data for command 3

8.3.4 . Command 10 – Switch Off

This command works in a similar way to the "Remote On/Off" digital input. It is only active if the control system is configured accordingly under 24 Operating parameters menu.

Command telegram:

0 data bytes

The compressor is switched off!

Reply telegram

0 data bytes

8.3.5 . Command 11 – Switch On

This command works in a similar way to the "Remote On/Off" digital input. It is only active if the control system is configured accordingly under 24 Operating parameters menu. In addition, the control system must have been keyed in through the keyboard beforehand.

Command telegram:

0 data bytes

The compressor is switched on!

Reply telegram

0 data bytes

8.3.6 . Command 12 – Idling/Loaded and Speed Specification

This command must be repeated at least every 20 seconds as the compressor will otherwise switch back to the internal pressure control. In addition, the external pressure control must be activated under 24 Operating parameters menu.

Command telegram:

4 data bytes

Byte	Contents	Data/comments
D0	Reserved (0)	UInt8 (0)
D1	Idling / loaded	0: Idling / loaded control deactivated 1: Reserved 2: No load request 3: Load request
D2 D3	Target value for speed	UInt16 4000 – 20000 correspond to min. – max. 0: Speed specification deactivated

Table 52: List of standard protocol send data for command 12

Reply telegram

20 data bytes

Byte	Contents	Data/comments
D0 - D19	Reserved	Not relevant for loaded/idling and speed specification

Table 53: List of standard protocol receive data for command 1

8.3.7 . Command 18 – Acknowledge Messages

Command telegram:

0 data bytes

Resettable faults, warnings and maintenance prompts are acknowledged!

Reply telegram

0 data bytes

8.3.8 . Command 30 – Status Query Basic Load Cycle

Command telegram:

0 data bytes

Reply telegram

42 data bytes

Byte	Contents	Data/comments
D0 - D23	Reserved (0)	UInt8 (0)
D24	Status	Bit 0: Control system On / network Off 1: Automatic network
D25	Reserved (0)	UInt8 (0)
D26 D27	Station utilisation	UInt16 [0.1 %]
D28 D29 D30 D31	Station's current delivery volume	UInt32 [ft ³ /h]
D32 D33 D34 D35	Reserved (0)	UInt32 (0)
D38 D39	Mains pressure	UInt16 [.0145 psi] (8000 _h = invalid)
D38 - D41	Reserved (0)	UInt8 (0)

Table 54: List of standard protocol receive data for command 1

8.3.9 . Command 31 - Status Query Compressor X from Basic Load Cycle

Command telegram:

1 data byte

Byte	Contents	Data/comments
D0	Address of the compressor to be queried	UInt8 Value range 1 - 5

Table 55: List of standard protocol send data for command 31

Reply telegram

40 data bytes

Byte	Contents	Data/comments
D0 - D1	Status 1	Bit 0: Operation / keyed in 1: Motorrunning 2: Loaded / load valve open 3: Automatic restart or local 4: Free 5: Maintenance message active 6: Warning message active 7: Fault message active 8: Ramp-up phase 15: Communications error
D2 D3	Status 2	Bit Not assigned
D4	Variable	UInt8 [%]
D5	Reserved (0)	UInt8 (0)
D6 D7	Delivery volume	UInt16 [ft³/h]
D8 D9	Mains pressure	UInt16 [.0145 psi] (8000h = invalid)
D10 D11	Final temperature	Int16 [°F] (8000h = invalid)

Byte	Contents	Data/comments
D12 - D13	Oil temperature	Int16 [°F] (8000 _h = invalid)
D14 D15	Ambient temperature	Int16 [°F] (8000 _h = invalid)
D16 D17	Dew point temperature	Int16 [°F] (8000 _h = invalid)
D18 D19	Power output	UInt16 [0.01 kW] (8000 _h = invalid)
D20 D21	Reserved (0)	UInt16 (0)
D22 D23	Standard: Reserved Duplexx: Temperature after first stage	Int16 [°F] (8000 _h = invalid)
D24 D25	Standard: Reserved Duplexx: Temperature before second stage	Int16 [°F] (8000 _h = invalid)
D26 D27	Standard: Reserved Duplexx: Temperature after second stage	Int16 [°F] (8000 _h = invalid)
D28 D29	Standard: Reserved Duplexx: Pressure before first stage	UInt16 [psi] (8000 _h = invalid)
D30 D31	Standard: Reserved Duplexx: Pressure after first stage	UInt16 [.0145 psi] (8000 _h = invalid)
D32 D33	Standard: Reserved Duplexx: Pressure before second stage	UInt16 [.0145 psi] (8000 _h = invalid)
D34 D35	Standard: Reserved Duplexx: Pressure after second stage	UInt16 [.0145 psi] (8000 _h = invalid)
D36 D37	Standard: Reserved Duplexx: Output first stage	UInt16 [0.01 kW] (8000 _h = invalid)
D39	Standard: Reserved Duplexx: Output second stage	UInt16 [0.01 kW] (8000 _h = invalid)

Table 56: List of standard protocol receive data for command 31.

8.3.10 . Command 32 - Message Query Compressor X from Basic Load Cycle

Command telegram:

1 data byte

Byte	Contents	Data/comments
D0	Address of the compressor to be queried	UInt8 Value range 1 - 5

Table 57: List of standard protocol send data for command 32.

Reply telegram

40 data bytes

Byte	Contents	Data/comments
D0 D39	Messages (maintenance, warning and fault prompts)	The messages are dependent on the respective connected control system and how this system is configured. The assignment of this data area corresponds to that of command 2 for the respective compressor

Table 58: List of standard protocol receive data for command 32.

8.3.11 . Command 33 – Query Operating Data Compressor X from Basic Load Cycle

Command telegram:

1 data byte

Byte	Contents	Data/comments
D0	Address of the compressor to be queried	UInt8 Value range 1 - 5

Table 59: List of standard protocol send data for command 33.

Reply telegram

48 data bytes

Byte	Contents	Data/comments
D0 D1 D2 D3	Operating hours	UInt32 [h]
D4 D5 D6 D7	Hours under load	UInt32 [h]
D8 D9 D10 D11	Stationary hours	UInt32 [h]
D12 D13 D14 D15	Reserve	UInt32 (0)
D16 D17	Reserve	Int16 [h]
D18 D19	Intake filter maintenance time remaining	Int16 [h]
D20 D21	Oil filter maintenance time remaining	Int16 [h]
D22 D23	Fine separator maintenance time remaining	Int16 [h]

Byte	Contents	Data/comments
D24 D25	Motor maintenance time remaining	Int16 [h]
D26 D27	Compressor maintenance time remaining	Int16 [h]
D28 D29	Reserved	Int16 [h]
D30 D31	Universal 1 maintenance time remaining	Int16 [h]
D32 D33	Universal 2 maintenance time remaining	Int16 [h]
D34 D35	Universal 3 maintenance time remaining	Int16 [h]
D36 D37	Universal 4 maintenance time remaining	Int16 [h]
D38 D39	Annual maintenance time remaining	Int16 [h]
D40 - D47	Reserve	

Table 60: List of standard protocol receive data for command 33.

8.3.12 . Command 34 – Query Texts Compressor X from Basic Load Cycle

Command telegram:

1 data byte

Byte	Contents	Data/comments
D0	Address of the compressor to be queried	UInt8 Value range 1 - 5

Table 61: List of standard protocol send data for command 34.

Reply telegram

101 data bytes

Byte	Contents	Data/comments
D0 - D12	Compressor name	Character string scheduled '0' Characters following the first '0' should be ignored
D13 - D28	Model	Character string scheduled '0' Characters following the first '0' should be ignored
D29 D40	Factory no.	Character string scheduled '0' Characters following the first '0' should be ignored
D41 D56	DP no.	Character string scheduled '0' Characters following the first '0' should be ignored
D57 D72	Commission no.	Character string scheduled '0' Characters following the first '0' should be ignored
D73 D96	Circuit diagram no.	Character string scheduled '0' Characters following the first '0' should be ignored
D97	Installation date day	UInt8
D98	Installation date month	UInt8
D99 D100	Installation date year (4 digits)	UInt16

Table 62: List of standard protocol receive data for command 34.



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