User Manual

Controller

SIGMA CONTROL 2 SCREW FLUID ≥4.5.X

No.: 9_9450 11 USE

Manufacturer:

KAESER KOMPRESSOREN SE

96410 Coburg • PO Box 2143 • GERMANY • Tel. +49-(0)9561-6400 • Fax +49-(0)9561-640130

www.kaeser.com

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Contents

Contents

List of Illustrations

List of Illustrations

List of Tables

List of Tables

1 SIGMA CONTROL 2 Quick reference guide

1.1 Operating elements

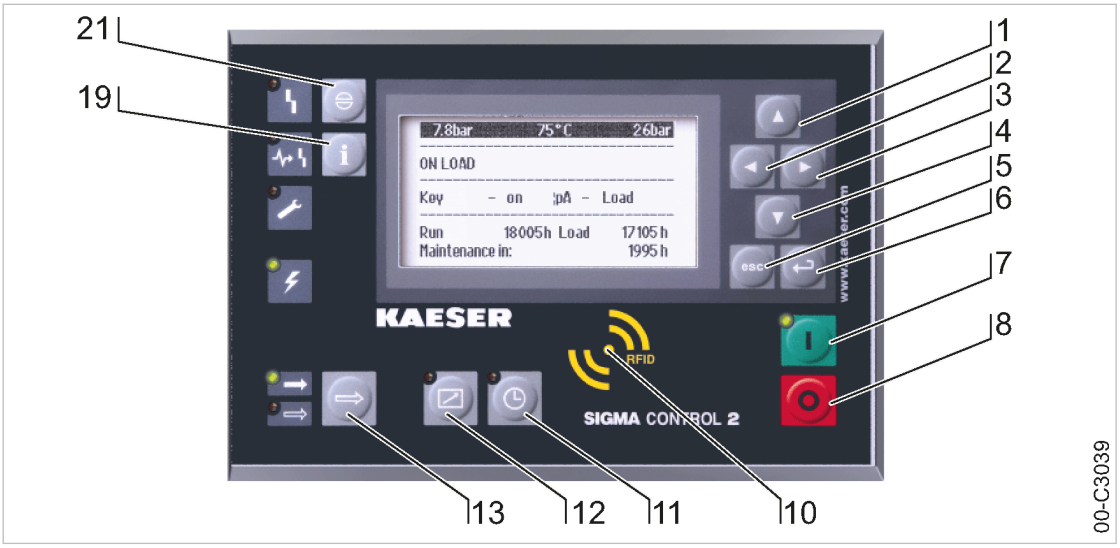


Fig. 1 Operating elements

Item	Description	Function
1	«Up»	Scrolls the menu up. Increases a parameter value.
2	«Left»	Jumps to the left. Moves the cursor position to the left.
3	«Right»	Jumps to the right. Moves the cursor position to the right.
4	«Down»	Scrolls the menu down. Reduces a parameter value.
5	«Escape»	Returns to the next menu level up. Exits editing mode without saving.
6	«Enter»	Opens the selected submenu option. Exits editing mode and saves.
7	«ON»	Switches the machine on.
8	«OFF»	Switches the machine off.
10	RFID	RFID reader for logging user in via RFID Equipment Card.
11	«Timer control»	Switches timer control on and off.
12	«Remote control»	Switches remote control on and off.
13	«LOAD/IDLE»	Switches between LOAD and IDLE operating modes [12)]
19	«Information»	Displays the message history.
21	«Acknowledge»	Confirms/acknowledges alarm and warning messages. When permissible: Resets the fault history (RESET).

[12)] Not on SXC

Tab. 1 Operating elements

1.2 Display elements

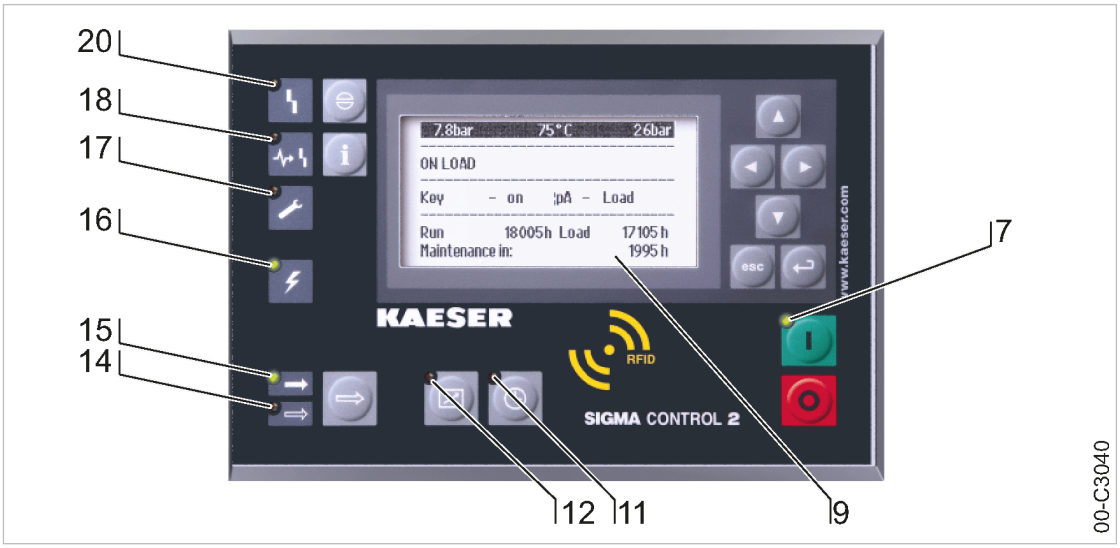


Fig. 2 Display elements

Item	Description	Function
7	*ON*	Display illuminates in green when the machine is switched on.
9	*Display*	Graphic display with 8 lines and 30 characters per line.
11	*Timer control*	Illuminates continuously in green when the machine is controlled by the timer.
12	*Remote control*	Illuminates continuously in green when the machine is controlled remotely.
14	*IDLE*	Illuminates continuously in green when the machine is running in IDLE. Flashes when the «LOAD/IDLE» [12] key is pressed.
15	*LOAD*	Illuminates continuously in green when the machine is running in LOAD.
16	*Controller voltage*	Illuminates continuously in green when voltage is supplied to the controller.
17	*Warning*	Flashes yellow in the following situations: ■ Maintenance required ■ Warning message
18	*Communication error*	Illuminates continuously in red to indicate a faulty communications connection, without shutting the machine down.
20	*Alarm*	Flashes red to indicate an alarm with the machine. Illuminates continuously in red after message has been acknowledged.

[12] Not on SXC

Tab. 2 Display elements

1.3 Main menu overview

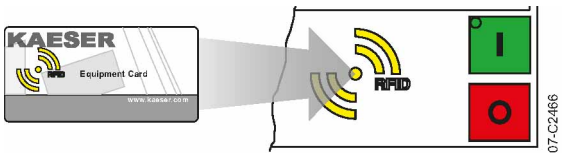
Press «Up» / «Down» / «Enter» to open the main menu.

Menu no.	Menu name	Function
1	Status	Displays messages, statistics and status information.
2	Performance data	Displays measured data from the machine and its components (e.g. motors).
3	Operating data	Displays operating hours, switching cycles and energy data.
4	Maintenance	Displays maintenance data from the machine and its components.
5	Configuration	Sets machine parameters, compressed air system and accessories.
6	Compressor clock	Sets the timer control.
7	User	Manual user log-in and password administration.
8	Communication	Sets the Ethernet interface, COM modules and control center connection.
9	Machine test	Checks the safety relief valve / temperature sensor for excessive temperature shutdown.
10	Components	Displays machine component settings, e.g. power switching.

Tab. 3 Main menu overview

See chapter 5.6.2 for the complete menu structure

1.4 Functions overview

Function	Menu no.	Steps	Chapter
Set the contrast	Main menu	Press and hold down «Information» – «Up» / «Down»	8.2.12
Set the brightness level	Main menu	Press and hold down «Information» – «Left» / «Right»	8.2.12
Set the language	Main menu	«Enter» – «Up» – «Enter» – «Up» / «Down»	8.2.2
Set the date, time and time zone	5.1	*<Configuration – General>*	8.2.8
User log-in with RFID Equipment Card	–		8.2.4
Set the pressure parameters	5.2.2	*<Configuration – Pressure control – Pressure settings – pA/pB>*	8.4
Set the «Timer control»	6	*<Compressor clock – Set timing program>*	8.5.1

Function	Menu no.	Steps	Chapter
Activate «Timer control» key	6	*<Compressor clock – Key clock – ☑>*	8.5.1.3
Activate the «Timer control»	–	Activate the «Timer control» key – Press the «Timer control» key	8.5.1.4
Activate the «Remote control» key	5.2.3 5.4.1 5.5	*<Configuration – Compressor start – Compressor on – Key remote – ☑>*	8.2.13
Activate the «Remote control»	–	Activate the «Remote control» key – Press the «Remote control» key	8.2.13
Set the control mode	5.3	Select *<Configuration – Control mode – Local mode – Control mode>*	8.6.1
Set the shut-down period	5.4.2	*<Configuration – Compressor start – Compressor off – Holidays – Start/End/☑>*	8.5.2
Display operating data	3	*<Operating data – Operating hours / Switching cycles>*	9.8
Set the maintenance interval	4	*<Maintenance – Select/set component>*	9.10
Reset the maintenance counter	4	*<Maintenance – Select component – Execute reset>*	9.11
Check the safety relief valve	9.1	For the test procedure, see chapter:	9.12
Check the excess temperature shutdown function	9.1	For the test procedure, see chapter:	9.13
Alarm messages	1.1.1	An alarm message shuts the machine down. The *Alarm* LED flashes red. Alarm messages are identified by the letter **A**. Example: <0002 S k 31.12.17 13:14:15 Motor temperature ↕>	10.2
Warning messages	1.1.1	If maintenance work needs to be carried out or if the warning is displayed before an alarm, the yellow *Warning* LED flashes. Warning messages are identified by the letter **W**.	10.3
Operating messages	1.1.1	Operating messages provide information about the current operating state of the machine. Operating messages are identified by the letter **O**.	10.4
Diagnostic messages	1.1.1	A diagnostic message shuts the machine down. Diagnostic messages provide information regarding the status of the controller and the connected input/output modules. They also assist KAESER SERVICE with troubleshooting. Diagnostic messages are identified by the letter **D**.	10.5
System messages	1.1.1	A system message shuts the machine down. System messages are identified by the letter **Y**.	10.6

Tab. 4 Functions overview

Settings can be entered following log-in with an RFID Equipment Card providing password access level 2.

2 Regarding this Document

2.1 Using this document

The user manual contains important information to the entire life cycle of SIGMA CONTROL 2.

The user manual is a component of the product.

- ➢ Keep the user manual in a safe place throughout the life of SIGMA CONTROL 2.
- ➢ Pass the user manual on to the next owner/user of the machine.
- ➢ Ensure that all amendments received are inserted into the user manual.

2.2 Copyright

This user manual is protected by copyright. Any queries regarding the use or duplication of this documentation should be referred to KAESER. Correct use of information will be fully supported.

2.2.1 Software

The software used in SIGMA CONTROL 2 contains copyright-protected software packages which are licensed as Open Source.
A copy of these licenses is contained in SIGMA CONTROL 2.
Display the licenses by pointing your browser to the "COPYING" file in the root directory of SIGMA CONTROL 2.
URL:
http:// <Hostname>/COPYING

The licenses can be also found under these addresses:
http://www.gnu.org/licenses
http://code.google.com/p/curve25519-donna/

Within three years from receipt of SIGMA CONTROL 2, you may obtain the complete source code of the copyright-protected software packages by sending a corresponding order to the following address:

Technical Office Electrical Design
KAESER KOMPRESSOREN SE
96450 Coburg, Postfach 2143
Germany

This offer is valid for anybody having this information.

2.3 Certification

This product has the following approvals:

- This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
  - Reorient or relocate the receiving antenna.
  - Increase the distance between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.
- This device complies with part 15 of the FCC rules. The operation is subject to the following two conditions:
  - this device may not cause harmful interference, and
  - this device must accept any interference received, including interference that may cause undesired operation.
- This device fulfils the provisions of the Industry Canada Licence, with the exception of the RSS rules. The operation is subject to the following two conditions:
  - this device may not cause harmful interference, and
  - this device must accept any interference received, including interference that may cause undesired operation.

In order to ensure permanent compliance with the FCC rules, unless explicitly approved by the authority responsible for compliance with the provisions, no changes must be carried out (for example: when connecting to computers or peripheral equipment use shielded cables only).

2.4 Updating the user manual

The page http://www.kaeser.com/int-en/manuals/response.aspx of our website provides frequently updated versions of this user manual.

➢ Download the user manual in your language.

2.5 Symbols and labels

➢ Please note the symbols and labels used in this document.

2.5.1 Warnings

Warnings indicate danger potentially resulting in personal injury, if the measures specified are not taken.

Warning notices indicate three levels of danger identified by the corresponding signal word:

Signal term	Meaning	Consequences of non-compliance
DANGER	Warns of imminent danger	Will very likely result in death or severe injury
WARNING	Warns of potentially imminent danger	May result in death or severe injury
CAUTION	Warns of a potentially dangerous situation	May result in moderate physical injury

Tab. 5 Danger levels and their definition (personal injury)

Warning notices preceding a chapter apply to the entire chapter, including all sub-sections.

Example:

⚠ DANGER

The type and source of the imminent danger is shown here!
The possible consequences of ignoring a warning are shown here.
The word "DANGER" indicates that death or severe injury can very likely result from ignoring the warning.

➢ *The measures required to protect yourself from danger are shown here.*

Warning notes referring to a sub-section or the subsequent step are integrated into the procedure and numbered as a step.

Example:

1. **⚠ WARNING** *The type and source of the imminent danger is shown here!*
   The possible consequences of ignoring a warning are shown here.
   The word "WARNING" indicates that death or severe injury may result from ignoring the warning.
   ➢ *The measures required to protect yourself from danger are shown here.*
2. Always read and comply with warning instructions.

2.5.2 Potential damage warnings

Contrary to the warnings shown above, damage warnings do not indicate a potential personal injury.

Warning notices for damages are identified by their signal term.

Signal term	Meaning	Consequences of non-compliance
NOTE	Warns of a potentially dangerous situation	Damage to property is possible

Tab. 6 Danger levels and their definition (damage to property)

Example:

NOTICE

The type and source of the imminent danger is shown here!
Potential effects when ignoring the warning are indicated here.

➢ *The protective measures against the damages are shown here.*

➢ Carefully read and fully comply with warnings against damages.

2.5.3 Other alert notes and their symbols

The meaning of names is emphasized by different formatting. Depending on the font, not all formatting options can be realized.

Designation	Formatting	Example
Operating state	UPPER CASE	LOAD
Item number	(...)	Open valve (4)
Indication	*italic*	*ON* LED
Key	« ... »	«ON» key
Menu option	*< ... >*	*<Configuration>*
Menu path	*<Menu 1 – Menu 2 – ...>*	*<Configuration – Pressure control>*
activated	...	The minutes display flashes. 00:00:00

Tab. 7 Formatting options

This symbol identifies particularly important information.

Material Here you will find details on special tools, operating materials or spare parts.

Precondition Here you will find conditional requirements necessary to carry out the task.

The conditions relevant to safety shown here will help you to avoid dangerous situations.

➢ This symbol denotes lists of actions comprising one stage of a task.
Operating instructions with several steps are numbered in the sequence of the operating steps.

Information referring to potential problems is identified by a question mark.

The cause is specified in the help text ...

➢ ... as is a solution.

This symbol identifies important information or measures regarding the protection of the environment.

Further information Further subjects are introduced here.

3 Technical Data

3.1 Controller SIGMA CONTROL 2

Industrial computer

- Internal temperature monitoring
- Internal low voltage monitoring
- Battery-buffered real-time clock
  - Battery service life: more than 10 years
  - Battery replaceable

3.1.1 Versions and options

SIGMA CONTROL 2 is offered in different designs.

Type	Prepared for connection to control center	Connection to control technology not provided [1]
Option	C3	C48
Components	Main Control System (MCS): Slot for an optional communication module (to connect to a control center)	Main Control System Input Output (MCSIO): Digital and analog inputs and outputs integrated
	Input-Output-Module (IOM): Modules with digital and analog inputs and outputs.	

[1] only SIGMA CONTROL 2 FLUID

Tab. 8 Versions and Options

3.1.2 User interface with display, CPU and interfaces

User interface

Feature	MCS	MCSIO
Material	Plastics	
Width [in.]	7.5	
Height [in.]	5.1	
Depth [in.]	1.8	1.9
Number of membrane keys	13	
Number of LEDs	9	
Degree of protection, control cabinet exterior	IP 54	
Degree of protection, control cabinet interior	IP 20	
Voltage [V]	24	
Current [A]	0.3	1.5
Voltage source	Input/output module	External

Tab. 9 User interface

Display

Feature	Value
Graphical display [px]	255 x 128
Width [in.]	3.2
Height [in.]	1.6
Maximum number of lines/characters	8/30
Colors	Black/white with grey scale
Lighting	LED backlit
px ≙ pixel	

Tab. 10 Display data

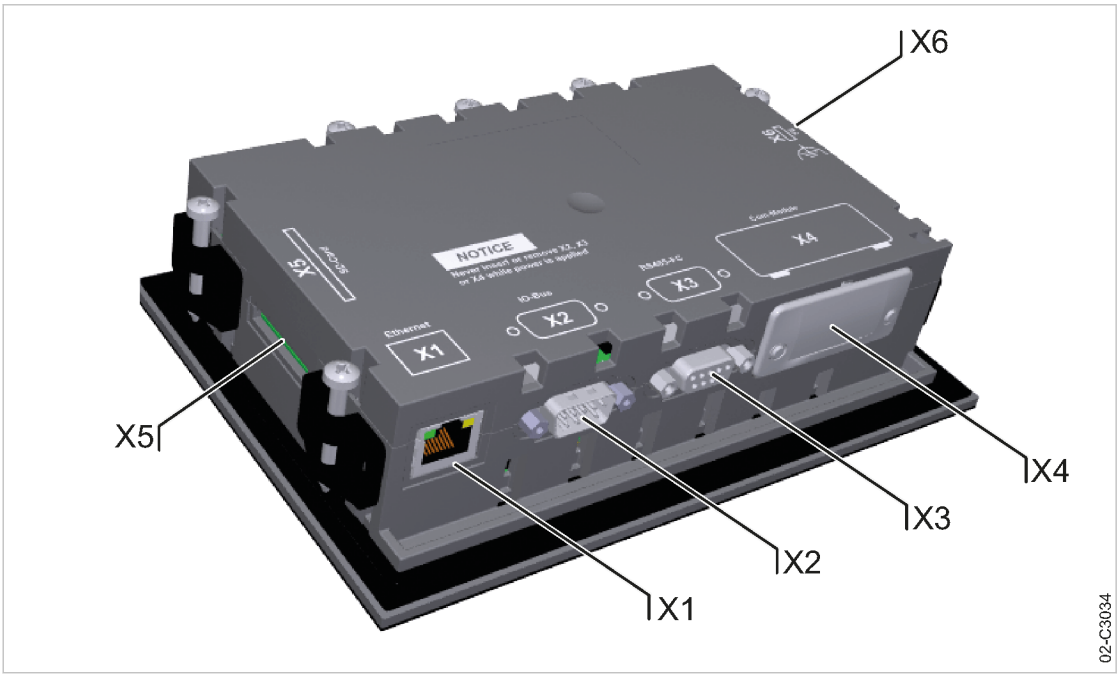


Fig. 3 MCS interfaces

Identification	Interface	Connection
X1	Ethernet 10/100 Base T	RJ 45 socket
X2	I/O bus	9-pole SUB-D pins
X3	RS485–FC (USS interface)	9-pole SUB-D socket
X4	Com modules, slot for communications module	Module optional for: PROFIBUS, PROFINET, Modbus RTU, Modbus TCP, DeviceNet, EtherNet/IP
X5	SD card, SD card slot	SD/SDHC card
X6	FG	Functional ground (FG)
The positions of the interfaces X1–X6 are marked on the rear of the controller.		

Tab. 11 MCS interfaces

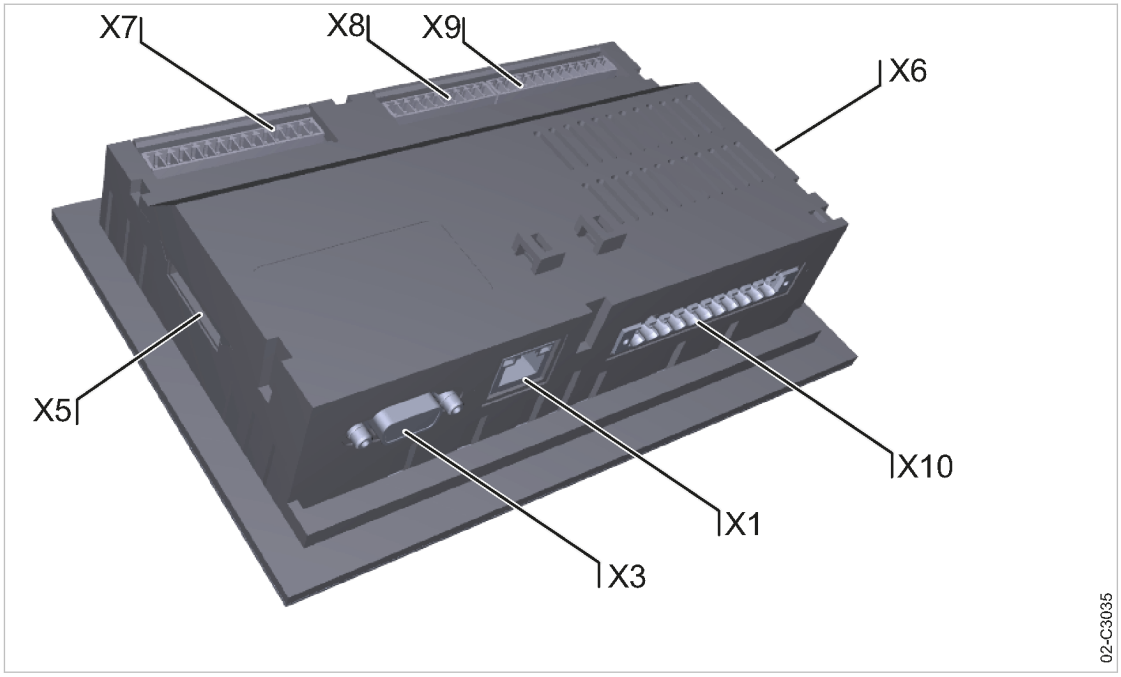


Fig. 4 MCSIO interfaces

Identification	Interface	Connection
X1	Ethernet 10/100 Base T	RJ 45 socket
X3	RS485–FC (USS interface)	9-pole SUB-D socket
X5	SD card, SD card slot	SD/SDHC card
X6	FG	Functional ground (FG)
X7	24 VDC, DII	Power supply 24 VDC Digital inputs DII1.00–DII1.05
X8	DII/DOT	Digital inputs DII1.06–DII1.07 Digital outputs DOT1.00–DOT1.01
X9	AII/AIR	Analog input current 0–20 mA, AII1.00–AII1.01 Analog input resistor AIR1.00–AIR1.01
X10	DOR	Digital output relay 250 VAC, 4 A DOR1.00–DOR1.04
The positions of the interfaces X1–X10 are marked on the rear of the controller.		

Tab. 12 MCSIO interfaces

Identification with RFID Equipment Card

Feature	Value
Hardware on the SIGMA CONTROL 2 controller	RFID write/read device
Hardware (external)	RFID Equipment Card
Recognition distance [in.]	Max. 2

Feature	Value
Frequency [MHz]	13.56
Emitted maximum transmitting power at 33 ft distance [dB(A)]	11

Tab. 13 RFID

3.1.3 Inputs and outputs with MCSIO

Integrated inputs and outputs with MCSIO type controller

Input/Output	Number
Digital input (DI), 24 VDC	8
Digital output transistor (DOT), 24 VDC, 0.5 A	2
Analog input current (AII), 0–20 mA	2
Analog input resistor (AIR), Pt100	2
Digital output relay (DOR), 250 VAC, 4 A	5

Tab. 14 Inputs and outputs with MCSIO

3.1.3.1 Maximum cable lengths

Input/Output	Cable length [ft]
Analog input current (AII), Analog input resistor (AIR) Analog output current (AOI)	< 100
Digital input (DI), Digital output relay (DOR)	< 330
Digital output transistor (DOT)	< 100

Tab. 15 Maximum cable lengths

3.1.4 Input/output modules

IOM modules only in combination with the MCS controller type

There are three different types of input/output modules with different numbers of inputs and outputs.
The number of input/output modules actually available depends on the machine type and the available options.
Refer to the machine's wiring diagram for the input/output modules installed in your equipment.

Every input/output module is equipped with:

- Internal temperature monitoring
- Internal low voltage monitoring
- LED indication of operational status

IOM 1

Input/Output	Input/output module 1		
	Internal, into the control cabinet	Available in parallel on both sides	External, into the compressor interior
Digital input (DI), 24 VDC	4	10	2
Analog input current (AII), 0–20 mA	–	1	2
Analog input resistor (AIR), Pt100	–	1	3
Digital output relay (DOR), 250 VAC, 8 A	8	–	–
Digital output transistor (DOT), 24 VDC, 0.5 A	–	2	1
Analog output current (AOI), 0–20 mA	–	–	–

Tab. 16 IOM-1

IOM 2

Input/Output	Input/output module 2		
	Internal, into the control cabinet	Available in parallel on both sides	External, into the compressor interior
Digital input (DI), 24 VDC	6	–	2
Analog input current (AII), 0–20 mA	–	1	2
Analog input resistor (AIR), Pt100	–	3	–
Digital output relay (DOR), 250 VAC, 8 A	4	–	–
Digital output transistor (DOT), 24 VDC, 0.5 A	–	2	2
Analog output current (AOI), 0–20 mA	–	1	–

Tab. 17 IOM-2

IOM 3

Input/Output	Input/output module 3		
	Internal, into the control cabinet	Available in parallel on both sides	External, into the compressor interior
Digital input (DI), 24 VDC	6	–	2
Analog input current (AII), 0–20 mA	–	1	3
Analog input resistor (AIR), Pt100	–	3	8
Digital output relay (DOR), 250 VAC, 8 A	8	–	–
Digital output transistor (DOT), 24 VDC, 0.5 A	–	1	1
Analog output current (AOI), 0–20 mA	–	1	–

Tab. 18 IOM-3

3.1.4.1 Electrical connection specifications IOM

Power is provided by the machine's power supply unit.

Feature	Value
Rated power supply (stabilized) [V DC]	24
Current consumption SIGMA CONTROL 2 with IOM 1 [A]	2.4
Current consumption IOM 2 [A]	2.5
Current consumption IOM 3 [A]	1.6
IOM ≙ Input/Output module	

Tab. 19 Power supply specifications

3.1.4.2 Maximum cable lengths

Input/Output	Cable length [ft]
Analog input current (AII), Analog input resistor (AIR) Analog output current (AOI)	< 100
Digital input (DI), Digital output relay (DOR)	< 330
Digital output transistor (DOT)	< 100

Tab. 20 Maximum cable lengths

3.1.4.3 Input/output modules – degree of protection

Feature	Value
Degree of protection within the machine	IP 54
Degree of protection within the control cabinet	IP 20

Tab. 21 Degree of protection, IOM

3.1.4.4 Input/output modules – dimensions

Feature	Value
Width [in.]	4.9
Height [in.]	9.8
Depth [in.]	1.7

Tab. 22 IOM dimensions

3.1.5 Sensors

Pressure transducer

Feature	Value
Output signal [mA]	0/4–20

Feature	Value
Connection	Twin cable

Tab. 23 Pressure transducer

Resistance thermometer

Feature	Value
Sensing resistance	Pt100
Connection	Twin cable

Tab. 24 Resistance thermometer

4 Safety and Responsibility

4.1 Basic instructions

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ➢ Close and lock the door of the equipment properly.
- ➢ Place the equipment as far as possible from the interfered radio or television receiver.

Changes or modifications not expressly approved by KAESER could void the user's authority to operate the equipment.

This device complies with Industry Canada licence-exempt RSS standard(s).
Operation is subject to the following two conditions:

- this device may not cause interference and
- this device must accept any interference, including interference that may cause undesired operation of the device

SIGMA CONTROL 2 is manufactured to the latest engineering standards and acknowledged safety regulations.

The safety regulations of the machine in which SIGMA CONTROL 2 is installed apply.

4.2 Specified use

SIGMA CONTROL 2 is solely intended for the control of machines in which SIGMA CONTROL 2 is factory-installed. Any other use is considered incorrect. The manufacturer is not liable for any damages that may result from incorrect use. The user alone is liable for any risks incurred.

- ➢ Adhere to the specifications given in this user manual and the machine's operator manual.
- ➢ Operate the machine only within its performance limits and under the permitted ambient conditions.

4.3 Improper use

Improper usage can cause damage to property and/or (severe) injuries.

- ➢ Use SIGMA CONTROL 2 only as intended.
- ➢ Do not use SIGMA CONTROL 2 to control other machines or products for which SIGMA CONTROL 2 is not intended.

5 Design and Function

5.1 Controller overview

SIGMA CONTROL 2 controls, regulates, monitors, and protects the machine.

All parameters needed to operate KAESER rotary screw compressors can be set and displayed using the controller. Various user-dependent password mechanisms protect the parameters.

Components

SIGMA CONTROL 2 has the following components:

- **M**ain **C**ontrol **S**ystem (MCS):
  - Industrial PC
  - Software for the control, regulation, and monitoring of the machine, for the display and modification of settings and for communication.
  - User interface with backlit display, touch keys, LEDs, and interfaces.
  - **R**adio **F**requency **I**denfication (RFID):
    Identification with RFID Equipment Card
  - Slot for customer interface; optional communications module.
  - SD card slot for SD/SDHC cards:
    Manual loading of updates with an SC card, reading or recording process data.
- **M**ain **C**ontrol **S**ystem **I**nput **O**utput (MCSIO) [only SIGMA CONTROL 2 FLUID]:
  - As with MCS, but with:
  - Integrated digital and analog inputs and outputs
  - Without slot for customer interface
- **I**nput-**O**utput-**M**odule (IOM):
  For SIGMA CONTROL 2 (Prepared for connection to control center): modules with digital and analog inputs and outputs with autonomous power supply.

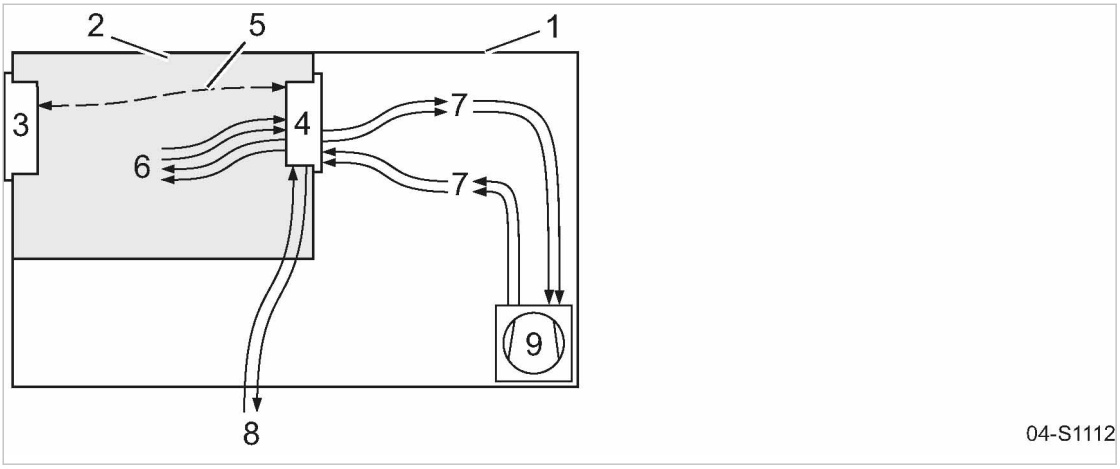


Fig. 5 MCS system design with IOM

1 Machine enclosure
2 Control cabinet
3 SIGMA CONTROL 2 (Prepared for connection to control center)
4 Input-Output-Module (IOM):
5 I/O bus
6 Inputs/outputs in the interior of the control cabinet
7 Inputs/outputs in the interior of the compressor
8 Inputs/outputs for external sensors
9 Compressor

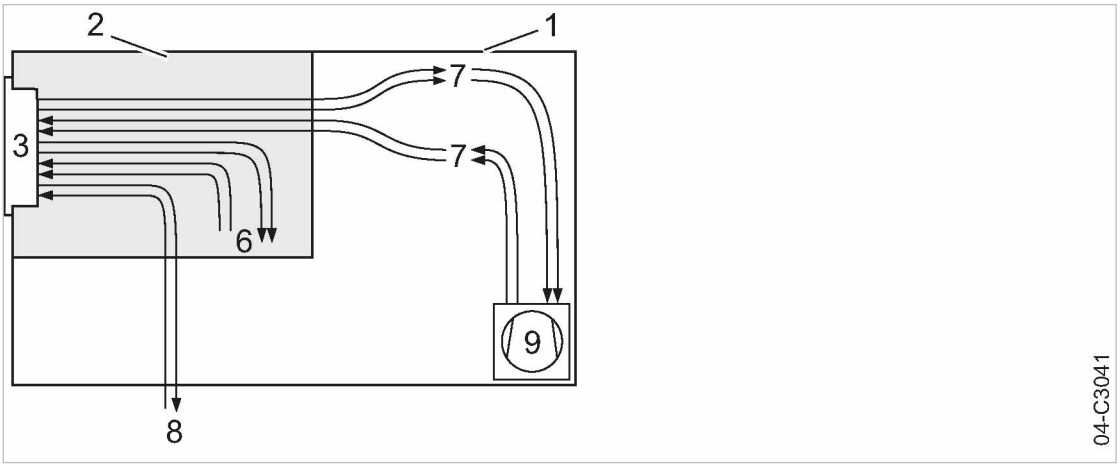


Fig. 6 MCSIO system design

1 Machine enclosure
2 Control cabinet
3 SIGMA CONTROL 2 (Connection to control technology not provided)
6 Inputs/outputs in the interior of the control cabinet
7 Inputs/outputs in the interior of the compressor
8 Inputs/outputs for external sensors
9 Compressor

Function

The **control and regulating function** allows:

- Automatic changeover of the machine from LOAD to IDLE (not for SXC) or READY.
- Optimum utilization of the motor adjusted to the actual compressed air demand.
- Automatic restart of the machine after a power failure (can be deactivated).

The **monitoring function** allows:

- Monitoring of all maintenance-relevant components via the maintenance interval counters.
- Display of warning and maintenance messages for due maintenance on the display of SIGMA CONTROL 2.

The **protective function** allows:

- Automatic machine shut-down on alarms that may lead to damage to the machine, e.g. high current, high pressure or high temperature.

5.2 Operating panel

5.2.1 Operating elements

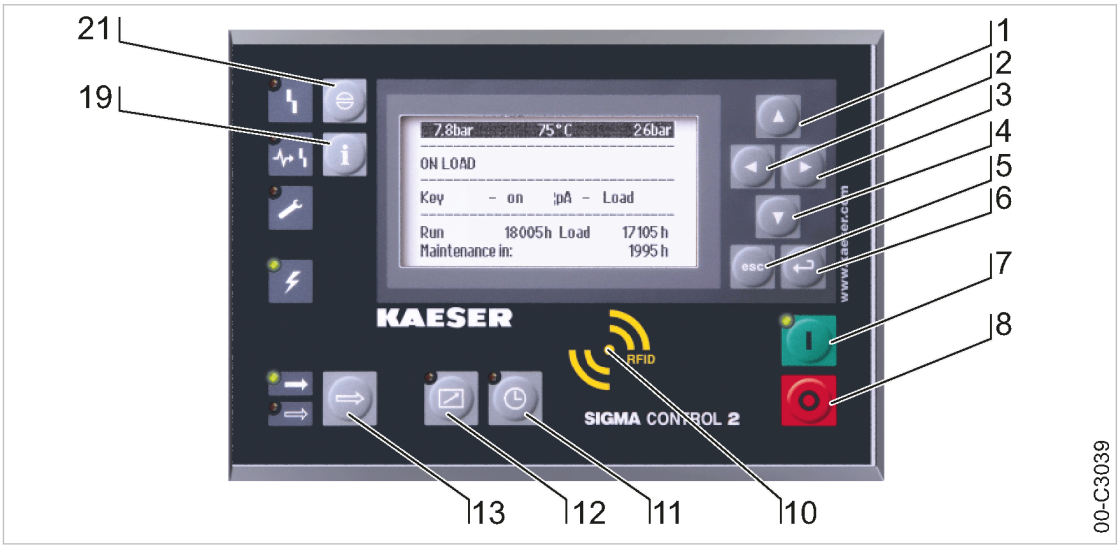


Fig. 7 Operating elements

Item	Description	Function
1	«Up»	Scrolls up the menu options. Increases a parameter value.
2	«Left»	Jumps to the left. Moves the cursor position to the left.
3	«Right»	Jumps to the right. Moves the cursor position to the right.
4	«Down»	Scrolls down the menu options. Reduces a parameter value.
5	«Escape»	Returns to the next higher menu option level. Exits the edit mode without saving.
6	«Enter»	Jumps to the selected submenu option. Exits the edit mode and saves.
7	«ON»	Switches the machine on.
8	«OFF»	Switches the machine off.
10	RFID	RFID reader for user log-in with RFID Equipment Card.

[12] not for SXC

Item	Description	Function
11	«Timer control»	Switches the timer control on and off.
12	«Remote control»	Switches the remote control on and off.
13	«LOAD/IDLE»	Toggles between the LOAD and IDLE [12] operating modes.
19	«Information»	Displays the event memory.
21	«Acknowledgement»	Confirms/acknowledges alarms and warning messages. If permissible: Resets the fault counter (RESET).

[12] not for SXC

Tab. 25 Operating elements

5.2.2 Display elements

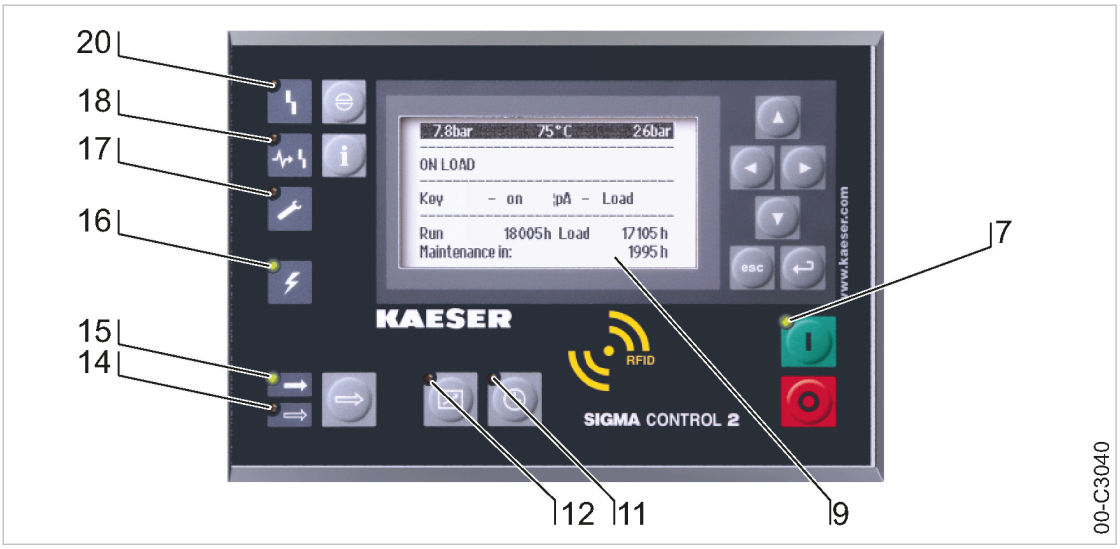


Fig. 8 Display elements

Item	Description	Function
7	*ON*	Display illuminates green when the machine is switched on.
9	*Display*	Graphic display with 8 lines and 30 characters per line.
11	*Timer control*	Continuous green light when the machine is controlled by the timer.
12	*Remote control*	Continuous green light when the machine is in remote control.
14	*IDLE*	Continuous green light when the machine is running in IDLE. Flashes when the «LOAD/IDLE» [12] toggle key is pressed.
15	*LOAD*	Continuous green light when the machine is running in LOAD.
16	*Controller voltage*	Continuous green light when voltage is applied to the controller.
17	*Warning*	Flashes in yellow in the following events: ■ Maintenance necessary ■ Warning message
18	*Communications error*	Continuous red light to indicate a defective communication connection without machine shutdown.

[12] not for SXC

Item	Description	Function
20	*Alarm*	Flashes red to indicate a machine alarm. Continuous red light after acknowledgement.

[12] not for SXC

Tab. 26 Display elements

5.2.3 RFID reader

RFID is the abbreviation for "**R**adio **F**requency **I**dentification" and makes possible to identify persons and objects.
Placing a suitable transponder in front of the RFID reader of the controller will automatically activate the communication between transponder and SIGMA CONTROL 2.

A suitable transponder is the KAESER RFID Equipment Card. Two of them have been provided with the machine.

Typical application:

- Operators log on at the machine.
  (Manual input of the password not required)

The RFID Equipment Cards are carefully packed in a plastic sleeve.
This plastic sleeve is attached to the rear of the controller in the control cabinet.

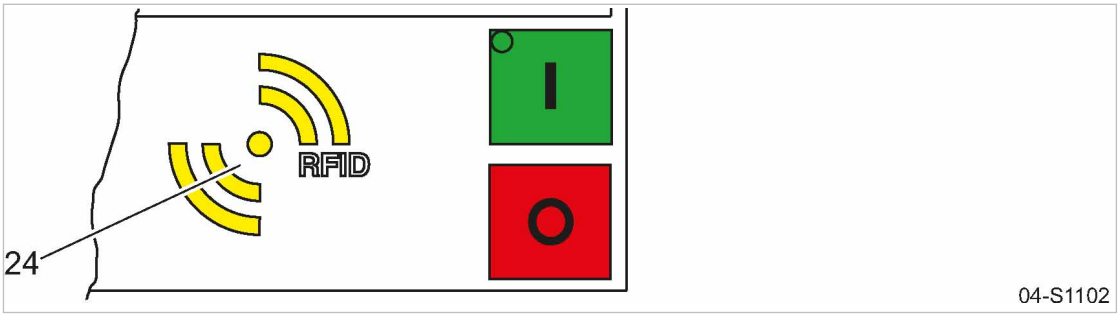


Fig. 9 RFID reader

Item	Description	Function
24	RFID	RFID reader for the communication with a RFID Equipment Card or RFID Key.

Tab. 27 RFID reader

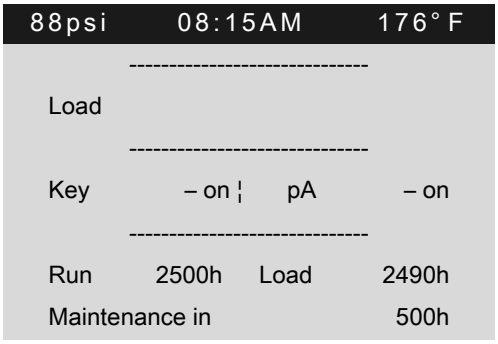
5.3 Display

Use the display to read information and to check entered data. The display comprises 8 lines, each of 30 characters.

During operation, the display will indicate the operating mode.

Press «Enter» or one of the arrow keys to open the main menu. Here, you can set the language to be used for the display of texts or open the various submenus.

5.3.1 Operating mode



Header

The header is the topmost line on the display. It is always shown as white text on a black background.

Important information and values are displayed in the header.

The displayed data varies depending on the machine type:

Type	Header, left	Header, center	Header, right
SIGMA CONTROL 2 FLUID	Working gauge pressure	Time	Airend discharge temperature
SIGMA CONTROL 2 DRY	Pressure display reading point	Pressure at the compressed air outlet p100	Current operating mode
SIGMA CONTROL 2 VAC	Working gauge pressure	Time	Airend discharge temperature
SIGMA CONTROL 2 BLOWER	p2 (final pressure)	Time	Discharge temperature T2
SIGMA CONTROL 2 BOOSTER	Pressure at the compressed air inlet p1	Temperature at the compressed air outlet T2	Pressure at the compressed air outlet p4
SIGMA CONTROL 2 PISTON	Working gauge pressure	–	Time

Tab. 28 Data in the header depending on the machine type

Lines 3 and 5: Operational state

Depending on the settings, either the current state of the machine or a menu text is shown in line 3. The following parameters with their current values are displayed in line 5:

- Remote control yes/no
- Timer control yes/no
- Pressure control

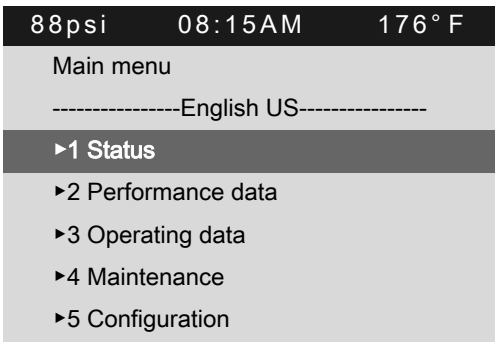
Lines 7 and 8: Machine state

The following parameters with their current values are displayed in lines 7 and 8:

- The hours during which the machine was activated.

- The hours during which the machine ran in operating mode LOAD.
- Remaining time of the machine until the next maintenance.

5.3.2 Main menu



Representation

The main menu is the top menu level. You open the individual submenus in the main menu.

A scrollbar appears at the right side of the display if you open a menu with more than 6 lines. It represents the currently visible portion of the menu. A short scrollbar thus indicates that the opened menu is very long as only a small portion can be displayed.

The image above provides an example for the appearance of the main menu (without scrollbar).

Numbering

Each menu is numbered.

Not all menus may be displayed because the access to certain menus is restricted by the password access level, and some menus are displayed or hidden due to specific settings or options.

For example, you can recognize subordinate menus in the menu structure by the number preceding their designation. The menu structure is explained in chapter 5.6.2.

Active line

The active line is always shown as white text on a dark background. In deviation of this, the header is also shown as white text on a dark background, but cannot be selected.

Press «Enter» to open a menu in the active line. This opens the selected menu.
You change parameters in Setting mode.

5.3.3 Setting parameters

In order to set a parameter in the active line of the selected menu, you must always switch to setting mode.

Setting parameters

Press «Enter». The value of the parameter will flash indicating that it can be changed.

The «Enter» key affects only the active line.

In some lines, you can change more than one parameter.
In this case, you must first select the specific parameter with the «Left» or «Right» keys.

Resetting current parameters

In order to reset current parameters to zero, activate the check box for *Reset* in the active line of the display.

First, press «Enter» to switch into setting mode. The check box *Reset* will flash.
You then press «Up». The check box is activated and flashes.
Press «Enter» to save the settings.
The display no longer flashes and the parameters are reset. The check box for *Reset* is again deactivated.

Check box *Reset*	Status
☒	Activated
☐	Deactivated

Tab. 29 Reset check box status

5.3.4 Activating keys with check boxes

Certain keys of the SIGMA CONTROL 2 are locked by default. Activate the corresponding check boxes in the active line of the display to unlock these keys.

First, press «Enter» to switch into setting mode. The check box will flash.
You then press «Up». The check box is activated and flashes.
Press «Enter» again to save the settings.
The display line no longer flashes and the key is activated.
Proceed correspondingly to deactivate a key.

Check box	Status
☑	Activated
☐	Deactivated

Tab. 30 Check box status

5.4 Access rights

Access to the controller is governed by the user name combined with a password.

Users log on using an RFID Equipment Card by default. Alternatively, you can manually enter the user name and the password.

When the controller is switched on, the lowest level of access (level 0) is activated.

You have access to a further level: Access level 2
Access level 2 allows you to display and adjust further parameters.

The access level will automatically return to level 0 after 10 minutes without any key being pressed.

Secure storage of the RFID Equipment Cards

You will receive 2 RFID Equipment Cards with each machine.
They are stored in a plastic sleeve.
This plastic sleeve is attached at the rear of the controller in the control cabinet.
If you lose both RFID Equipment Cards, you can register a new RFID Equipment Card only after having entered the user name and the password. A new RFID Equipment Card may be registered by KAESER service subject to a fee, if the user name and the password are lost.

5.5 KAESER CONNECT

Using an Internet-capable device with web browser, you can open a visualization of the controller. This enables remote checking of, for example, the operating and energy efficiency of your machine. For this purpose, you must generate a password (see Chapter 8.2.5). KAESER CONNECT does not require additional software to do so. The display language of KAESER CONNECT can be set independently to the language used with SIGMA CONTROL 2.

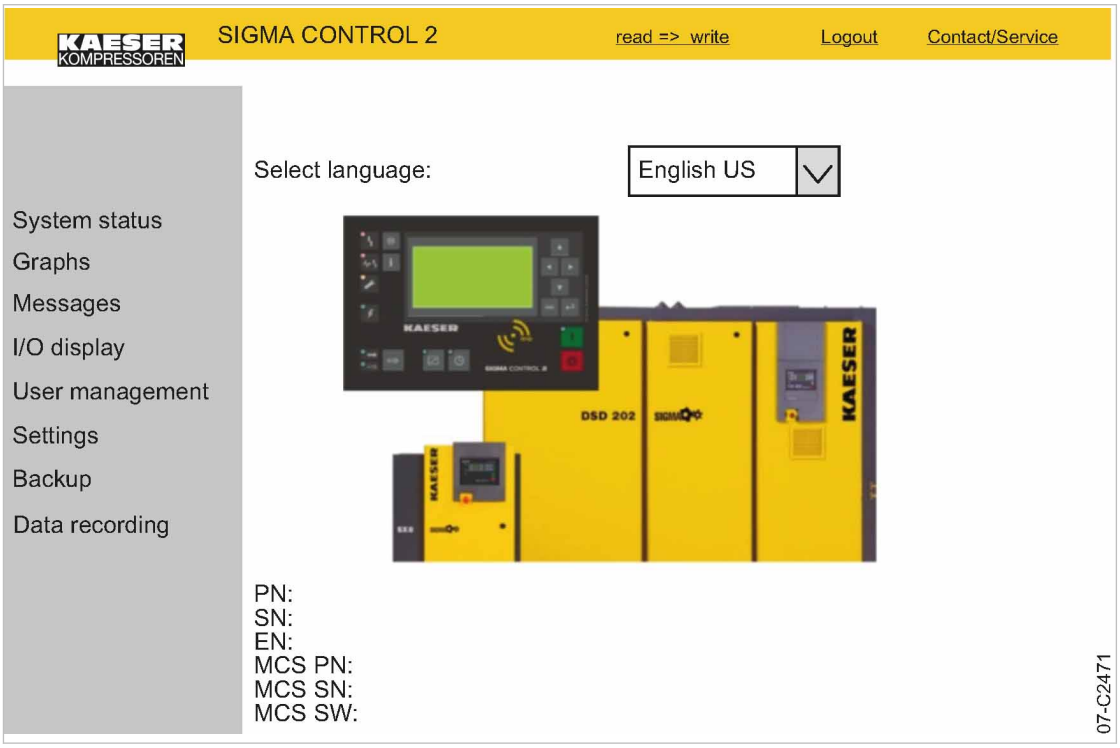


Fig. 10 KAESER CONNECT for SIGMA CONTROL 2

KAESER CONNECT functions:

Operating element	Meaning
read => write	Switching from read-only to read/write mode To create users and acknowledge messages
write => read	Switching from read/write to read-only mode
Logout	User log out
Contact/Service	Display the contact information for an authorized KAESER service representative
Select language:	Setting the display language for KAESER CONNECT
System status	Menu representation on local menu
Graphs	■ Pressures and temperatures are displayed in different graphs ■ Graphic representation of the machine status (STOP, IDLE, [12], LOAD) and RPM along the time axis
Messages	■ Current messages ■ Message history (event memory)

[12] not for SXC

Operating element	Meaning
I/O display	Assignment of the input/output modules
User management	■ Creating and activating new user accounts ■ Modifying or deactivating existing user accounts ■ Changing passwords
Settings	■ Unit display format ■ Date display format ■ Time display format
Backup	Saving data via KAESER CONNECT from SIGMA CONTROL 2 to a PC

[12] not for SXC

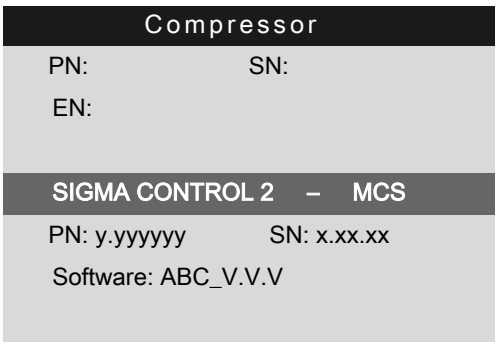
Tab. 31 KAESER CONNECT functions

Further information For opening KAESER CONNECT, login and other procedures, please see chapter 8.3.

5.6 Menu overview

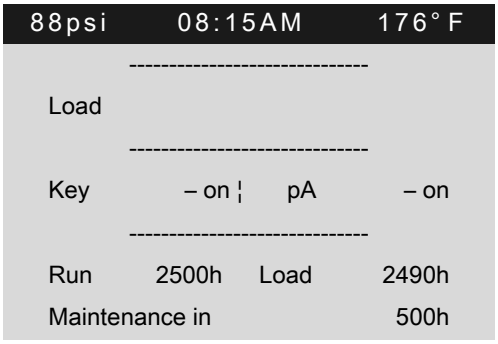
5.6.1 Operating mode

When the power supply is switched on, details of the software are displayed (for example):



Machine model
Part number and serial number of the machine
Equipment number of the machine
MCS: Main Control System
Part number and serial number of the controller
Software version

Subsequently, the software is loaded and the current operating mode is displayed (example):



Header
Current operating mode
Operating parameters
Operating parameters
Maintenance indicator

The following parameters are displayed:

- Current operational state of machine
- On the left-hand side of "¦" you can see where the compressor is switched on (in the illustrated example via the green «ON» key) and what the current status is (in the example "on").

- On the right-hand side of "¦", you can see the mode of the load control (in the illustrated example, the network nominal pressure pA is active) and the mode of the compressor (in the example it is switched on).
- Number of operating hours and hours of the machine being in LOAD mode.

5.6.2 Menu structure

Press «Enter» or one of the arrow keys to open the main menu.

In the main menu, you can:

- Retrieve displayed information
- Enter customer-specific settings

The menus shown require password access level 2.

Depending on the software version of SIGMA CONTROL 2, machine type and available options, only the menus that are available for this particular machine will be displayed.

Main menu

Navigation	Function / Submenu
1 Status	■ Messages ■ Statistics ■ Current pressure control ■ Current operating mode ■ DI/DO status ■ pN/ADT curve ■ pN/n curve [1) 4)] For details of the *Status* menu, please see table 33.

[1)] Power switching with frequency converter

[3)] SIGMA CONTROL 2 (Prepared for connection to control center)

[4)] SIGMA CONTROL 2 FLUID

Navigation	Function / Submenu
2 Performance data	■ Compressor – System pressure pNloc – Internal pressure pi – ADT – Oil separator – Start temperature – Inlet temperature – PD temperature – Air filter ■ Compressor motor – Motor temperature (if available) – Speed [1) 4)] – Current [1) 4)] – UzK [1) 4)] – Torque [1) 4)] – Reference value [1) 4)] ■ Fan motor(s) – Oil cooler fan – Speed [1) 4)] – Current [1) 4)] – UzK [1) 4)] – Torque [1) 4)] – Air cooler - Fan – Speed [1) 4)] – Current [1) 4)] – UzK [1) 4)] – Torque [1) 4)] ■ Analogue values ■ SIGMA CONTROL 2

[1)] Power switching with frequency converter

[3)] SIGMA CONTROL 2 (Prepared for connection to control center)

[4)] SIGMA CONTROL 2 FLUID

Navigation	Function / Submenu
3 Operating data	■ Operating hours – Compressor – On load – Motor – Compressor block – SIGMA CONTROL 2 – Partial load valves ■ Switching cycles – Load valve on – Mains contactor on ■ kWh counter
4 Maintenance	Oil filter Oil separator Oil change Air filter Prefilter changed: Valve inspection Belt/coupling inspection Compressor motor Bearing lube Bearing change Fan motor(s) Bearing lube Bearing change Electrical equipment Annual maintenance due
5 Configuration	For details of the *Configuration* menu, please see table 34.

[1] Power switching with frequency converter

[3] SIGMA CONTROL 2 (Prepared for connection to control center)

[4] SIGMA CONTROL 2 FLUID

Navigation	Function / Submenu
6 Compressor clock	Key clock Reset Switching point 01: Switching point 02 Switching point 03 Switching point 04 Switching point 05 Switching point 06 Switching point 07 Switching point 08 Switching point 09 Switching point 10
7 User	Name Password Current access level:
8 Communication	■ Ethernet/SIGMA NETWORK ■ Com-Module [3] Key remote For details of the *Communication* menu, please see table 37.
9 Machine test	■ TÜV inspection
10 Components	■ Compressor motor – Power switching For details of the *Components* menu, please see table 39.
[1] Power switching with frequency converter	
[3] SIGMA CONTROL 2 (Prepared for connection to control center)	
[4] SIGMA CONTROL 2 FLUID	

Tab. 32 Menu structure of main menu

5.6.2.1 *Status* menu

Navigation	Function / Submenu
1.1 Messages	■ Current messages ■ Message history – Compressor messages – Diagnostic messages – System messages ■ Address error – Incorrect parameterisation in [2] Status report current Alarms current Warnings
1.2 Statistics	Load (hours) since/Reset: Load (speed) [1] [4] since/Reset: Network actual pressure pNloc Internal pressure Motor starts total since/Reset: Motor starts per day Motor starts per hour Motor starts T↓ Last load run Last idle run [12] Last motor off
1.3 Current pressure control	SIGMA CONTROL 2 Cut-out pressure SP/SD Network actual pressure Frequency converter [1] [4] Setpoint pressure [1] [4] Actual pressure [1] [4] Speed nominal value [1] [4] Speed actual value [1] [4] Speed limits [1] [4]

[1] Power switching with frequency converter

[2] Only visible in the event of parameterization error

[3] SIGMA CONTROL 2 (Prepared for connection to control center)

[4] SIGMA CONTROL 2 FLUID

[12] Not for SXC

Navigation	Function / Submenu
1.4 Current operating mode	Compressor on Load control Control mode Idle period [12)] Idle warm-up [12)] Acknowledgement Frequency converter [1) 4)] Heat recovery HR valve (if available) [4)] Operating mode: Nominal value
1.5 DI/DO status	1st I/O module DI/DO display 2nd I/O module DI/DO display 3rd I/O module DI/DO display
1.6 pN/ADT curve	Diagram: Nominal pressure/airend discharge temperature
1.7 pN/n curve [1) 4)]	Diagram: Nominal pressure/Speed
[1)] Power switching with frequency converter	
[2)] Only visible in the event of parameterization error	
[3)] SIGMA CONTROL 2 (Prepared for connection to control center)	
[4)] SIGMA CONTROL 2 FLUID	
[12)] Not for SXC	

Tab. 33 *Status* menu

5.6.2.2 *Configuration* menu

Navigation	Function / Submenu
5.1 General	■ System information – SIGMA CONTROL 2 MCS – Software – KAESER:PN/SN – Controller manufacturer:PN/SN – MFGDT (Manufacturing date) – Compressor – EN (Equipment number) – PN (Part number) – SN (Serial number) – I/O modules – First IOM – Second IOM (if available) – FC information [1) 4)] – Compressor motor [1) 4)] – Oil-/air cooler fan [1) 4)] – Oil cooler fan [1) 4)] – Air cooler - Fan [1) 4)] Model: Date/time Time zone ■ Time server – active: – IP address Date format Time format Pressure unit Temperature unit Display lighting

[1)] Power switching with frequency converter

[3)] SIGMA CONTROL 2 (Prepared for connection to control center)

[4)] SIGMA CONTROL 2 FLUID

[12)] Not for SXC

[13)] Power switching aircooler fan with frequency converter

Navigation	Function / Submenu
5.2 Pressure control	■ Pressure sensors ■ Pressure settings ■ Load control ■ Network actual pressure For details of the *Pressure control* menu, please see table 35.
5.3 Control mode [12)]	Local mode: ■ Venting period [4)] ■ DUAL ■ QUADRO [4)] ■ Partial load valves [4)]
5.4 Compressor start	■ Compressor on ■ Compressor off Autostart: Start inhibit: Start temperature
5.5 Acknowledgement	Remote mode: RC Ack Key remote
5.6 ETM [4) 12)]	Heat recovery Local mode: Remote mode: current RC DI Key remote Heat recovery ADT controller Thermostat valve Oil cooler Thermostat valve ADT controller ■ Oil cooler ■ Heat recovery

[1)] Power switching with frequency converter

[3)] SIGMA CONTROL 2 (Prepared for connection to control center)

[4)] SIGMA CONTROL 2 FLUID

[12)] Not for SXC

[13)] Power switching aircooler fan with frequency converter

Navigation	Function / Submenu
5.7 I/O periphery	■ DO functions ■ Analogue values ■ External messages ■ Switch For details of the *I/O periphery* menu, please see table 36.
5.8 Timer	on off DOR current
5.9 Refrigeration dryer (if available)	Control mode Compressor ready: Compressor Clk/RC/RB off: Temperature ↑ DOR DOT Temperature ↡ DOR DOT Safe compressed air supply/Safe compressed air quality Error operation without RD active: Run time max.: Reset Alarm:
5.10 PD temperature controller	Nominal value [13)] Actual value [13)] Controller parameter [13)] KP/KI/KD Actual values [13)] P/I/D/Y

[1)] Power switching with frequency converter

[3)] SIGMA CONTROL 2 (Prepared for connection to control center)

[4)] SIGMA CONTROL 2 FLUID

[12)] Not for SXC

[13)] Power switching aircooler fan with frequency converter

Navigation	Function / Submenu
5.11 Save data	Language: Save data Eject SD card Status Format SD card
[1] Power switching with frequency converter	
[3] SIGMA CONTROL 2 (Prepared for connection to control center)	
[4] SIGMA CONTROL 2 FLUID	
[12] Not for SXC	
[13] Power switching aircooler fan with frequency converter	

Tab. 34 *Configuration* menu

Pressure control menu

Navigation	Function / Submenu
5.2.1 Pressure sensors	System pressure pNloc Internal pressure pi
5.2.2 Pressure settings	System pressure high [5] pRV (Safety relief valve actuating pressure) [4] Pressure rise [4] [12] pE SP/SD [4] [12] ΔpFC [1] [4] Nominal pressure [4] Setpoint pressure pA SP/SD pB SP/SD System pressure low Cut-in pressure min [4] Pressure fall [5]
[1] Power switching with frequency converter	
[4] SIGMA CONTROL 2 FLUID	
[5] SIGMA CONTROL 2 VAC	
[12] Not for SXC	

Navigation	Function / Submenu
5.2.3 Load control	Local mode Remote mode ■ pA/pB Clock (Menu see Remote mode) pA/pB Cycle pA/pB RC pA/pB DO Load RC [12)] loc.-load RC [12)] Key remote Key idle [12)]
5.2.4 Network actual pressure	pNloc (local network pressure)/FC USS [1) 4)]/AII AII For sensor error: Type of message: Warning Alarm
[1)] Power switching with frequency converter	
[4)] SIGMA CONTROL 2 FLUID	
[5)] SIGMA CONTROL 2 VAC	
[12)] Not for SXC	

Tab. 35 *Pressure control* menu

I/O periphery menu

Navigation	Function / Submenu
5.7.1 DO functions	Controller on DOR/DOT Compressor on DOR/DOT Compressor motor running DOR/DOT Fan motor running DOR/DOT Idle [12)] DOR/DOT On load DOR/DOT Group alarm DOR/DOT Group warning continuous DOR/DOT Group warning interrupted DOR/DOT Remote mode DOR/DOT Clock active DOR/DOT ■ Clock contact DOR/DOT EMERGENCY STOP DOR/DOT

[1)] Power switching with frequency converter

[4)] SIGMA CONTROL 2 FLUID

[12)] Not for SXC

Navigation	Function / Submenu
5.7.2 Analogue values	■ AnMod (Analog modules) – AnMod_p_1 – AnMod_p_2 – AnMod_p_3 – AnMod_p_4 – AnMod_T_1 – AnMod_T_2 – AnMod_T_3 – AnMod_T_4 – AnMod_I_1 – AnMod_I_2 ■ AI (Analog inputs) – AI_p_1 – AI_p_2 – AI_T_1 – AI_T_2 – AI_I_1 – AI_I_1 ■ AO (Analog outputs) [4)] – AO_p_1 – AO_p_2 – AO_T_1 – AO_T_2 – AO_I_1 – AO_I_2 – AO_n_1 [1)] ■ PD (Process data) – PD_p_1 – PD_p_2 – PD_T_1 – PD_T_2 – PD_I_1 – PD_I_2
5.7.3 External messages	■ External message 1 ■ External message 2 ■ External message 3 ■ External message 4 ■ External message 5 ■ External message 6

[1)] Power switching with frequency converter

[4)] SIGMA CONTROL 2 FLUID

[12)] Not for SXC

Navigation	Function / Submenu
5.7.4 Switch	■ System pressure pNloc ■ Internal pressure pi ■ ADT ■ Inlet temperature ■ PD temperature ■ n Compressor motor [1) 4)]
[1)] Power switching with frequency converter	
[4)] SIGMA CONTROL 2 FLUID	
[12)] Not for SXC	

Tab. 36 *I/O periphery* menu

5.6.2.3 *Communication* menu

Navigation	Function / Submenu
8.1 Ethernet/SIGMA NETWORK	■ IP configuration – IP address – Subnet mask – Gateway – DNS Server 1 – DNS Server 2 – Restart network
	■ Connections – SIGMA CONTROL 2 [4)] – SAM 4.0 Restart Timeout Cycle time For details of the *Connections* menu, please see table 38.
	■ E-mail – active: Compressor number: Language: Repeat cut-off time: Use SSL: – Sender address: Sender name: Contact telephone: Receiver address: – SMTP Server: User name: Password: – Port/Timeout Resend after: – Retry attempts:
	MAC: MAC address

[3)] SIGMA CONTROL 2 (Prepared for connection to control center)

[4)] SIGMA CONTROL 2 FLUID

Navigation	Function / Submenu
8.2 Com-Module [3]	The content of the menu depends on the type of the communication module identified. The following KAESER communications modules may be used: ■ PROFIBUS ■ Modbus ■ Modbus TCP ■ DeviceNet ■ PROFINET ■ EtherNet/IP
[3] SIGMA CONTROL 2 (Prepared for connection to control center)	
[4] SIGMA CONTROL 2 FLUID	

Tab. 37 *Communication* menu

5.6.2.4 *Connections* menu

Navigation	Function / Submenu
8.1.2 Connections	■ SIGMA CONTROL 2 [4] – Status – Mode – Port – Communication partner – IP address – Communication error Start td Timeout ■ SAM 4.0 – Status – SAM 4.0 active: Send/receive Send – IP address – Port – Communication error Start td Timeout Restart Timeout Cycle time
[4] SIGMA CONTROL 2 FLUID	

Tab. 38 *Connections* menu

5.6.2.5 *Components* menu

Navigation	Function / Submenu
10.1 Compressor motor	■ Power switching For details of the *Power switching* menu, please see table 40.
[1] Power switching with frequency converter	
[3] SIGMA CONTROL 2 (Prepared for connection to control center)	
[4] SIGMA CONTROL 2 FLUID	
[6] Power switching with frequency converter and speed sensor is being used	

Tab. 39 *Components* menu

5.6.2.6 *Power switching* menu

Navigation	Function / Submenu
10.1.1 Power switching	USS status: Run/Error [1] [4] ■ Star-delta start – Temp. warm start – Star time T↑ – Star time T↓ – Y/Δ switching time – Overload relay – Mains contactor – Star contactor – Delta contactor ■ DOL start – Run-up period: – Overload relay – Mains contactor – Delta contactor ■ High-voltage cell [4] – Run-up period: – ready – Mains contactor ■ SFC USS [4] USS status: Run/Error – Run-up period: [1] – Service operation [1] – Heavy load monitoring [1] – Mains contactor [1] – STO channel A [1] – STO channel B [1] ■ Softstart [4] – ready – Motor running – Start-up ended – Start – Reset – Mains contactor ■ Customer-provided [4] – Temp. warm start – Run-up period T↑ – Run-up period T↓ – ready – Mains contactor/Alarm td – Redundancy contactor/Alarm td

[1] Power switching with frequency converter [4] SIGMA CONTROL 2 FLUID

10.1.1 Power switching [4]	If a power switching unit with a frequency converter is available, the further content of the menu is determined by the type of frequency converter (with main contactor or STO) and the settings available for it.
10.1.1 Power switching [4]	Operating mode: Pressure control/Speed control [9] Manual/FC USS [8] Nominal value:/Actual value [8] Local mode: [7] Pressure control/Speed set point manual/Speed sensor All Remote mode: [7] Pressure control/Speed set point manual/Speed sensor All Key remote [7] ■ Speed sensor [10] – Configuration [7] All [7] For sensor error: [7] Operating mode: [7] – Scaling 4mA/20mA [1] Speed set point manual [11] nMin/nMax [11] Nominal value: [11] Actual values [7] Target/Actual [7]

[1] Power switching with frequency converter

[4] SIGMA CONTROL 2 FLUID

[7] Power switching with frequency converter with STO is being used

[8] Power switching with frequency converter and main contactor is being used in the *Speed control* operating mode

[9] Power switching with frequency converter and main contactor is being used

[10] Selection *FC USS* or *Speed sensor All* is activated

[11] Power switching with frequency converter and STO is being used in the *Speed set point manual* operating mode

Tab. 40 *Power switching* menu

5.7 Operating modes and control modes

5.7.1 Machine operating modes

STOP

The machine is connected to the power supply.
The *Controller voltage* LED is illuminated in green.
The machine is switched off. The *ON* LED is extinguished.

READY

The machine has been activated via the «ON» key:

- The *ON* LED is illuminated in green.
- The compressor drive motor has stopped.
- The inlet valve is closed.
- The minimum pressure/check valve isolates the oil separator tank from the air system
- The venting valve is open.

The compressor motor starts as soon as network pressure drops below the specified network pressure setpoint (cut-out pressure).

Timer and/or remote control can also influence when the compressor motor starts.

LOAD

The compressor motor runs under load:

- The inlet valve is open.
- The airend delivers compressed air to the air network.

IDLE

The compressor motor runs unloaded (not for SXC) and consumes less power:

- The inlet valve is closed.
- The minimum pressure/check valve isolates the oil separator tank from the air system.
- The venting valve is open.

A small volume of air circulates through the bypass bore in the inlet valve, through the airend and back to the inlet valve via the venting line.

5.7.2 Control modes

In type SXC compressors it is not possible to set the control modes since there is no IDLE operating mode. All menus connected to it are then not available.

In order to ensure that gauge working pressure remains between the specified cut-in and cut-out pressures irrespective of the consumers' air demand, the controller switches the machine back and forth between various operating points, depending on the control mode selected. The control mode also controls the degree of energy efficiency of the machine.

The machine-dependant venting phase between the LOAD and READY operating points ensures load changes at minimum material stresses.

The controller SIGMA CONTROL 2 can operate in the following control modes:

- DUAL
- QUADRO
- VARIO
- CONTINUOUS
- DYNAMIC

Option C1
- MODULATING control

DUAL

In the DUAL control mode, the machine is switched back and forth between LOAD and IDLE to maintain the machine working pressure between the preset minimum and maximum values. When maximum pressure is reached, the machine switches to IDLE. When the preset *idling time* has lapsed, the machine switches to READY.

The *idling time* is factory set according to the maximum starting frequency of the compressor motor. The shorter the *idling time* setting, the sooner (and more frequently) the motor is stopped.

QUADRO

In contrast to the DUAL control mode, the machine will switch from LOAD to READY in QUADRO mode after periods with low compressed air consumption.

After periods with a high compressed air consumption, the machine will switch from LOAD to READY after passing through IDLE.

In this control mode, the controller requires two times to be specified: The *minimum run-time* and the *off-time*.

The shorter these times are set, the sooner (and more frequently) the motor / engine is stopped.

VARIO

The VARIO mode is based on the DUAL control mode. The difference to DUAL is that the *idling time* is automatically lengthened or shortened to compensate for higher or lower machine starting frequencies.

CONTINUOUS

In the CONTINUOUS control mode, the machine is switched back and forth between LOAD and IDLE, in order to maintain the machine's working pressure between the preset minimum and maximum values. When maximum pressure is reached, the machine switches to IDLE. However, the machine does **not** switch to READY.

DYNAMIC

In contrast to the DUAL control mode, the machine will switch from LOAD to READY in DYNAMIC mode at a low compressor motor temperature.

And from LOAD via IDLE to READY at a high compressor motor temperature.

The lower the drive motor / engine temperature, the sooner (and, therefore, more often and longer) it is stopped.

Option C1 MODULATING control

The MODULATING control is an additional mechanical regulation. It continuously changes the flow rate within the machine's control range.

A control valve, the proportional controller, changes the degree of opening of the inlet valve when the machine transports compressed air into the air network (LOAD).

The load and power consumption of the drive motor / engine rises and falls with the air demand.

5.7.3 Variable speed drive with frequency converter (SFC)

If the machine runs in the LOAD mode, the ACTUAL value is compared with the TARGET value of the network pressure. Depending on the pressure differential, the system controls the speed of the drive motor and, thus, the airend.
The speed of the airend determines the rate of compressed air delivery and the working pressure.

If the compressed air demand rises, the motor speed increases and consequently the volume of air delivered.

If air demand drops, the SIGMA CONTROL 2 reduces the motor speed and, therefore, the volume of air delivered.

The network pressure remains constant – within the control range of the frequency converter – regardless of the fluctuating air demand.

If the network pressure exceeds the TARGET value:

Outside the frequency converter's range of control the machine reverts to the selected control mode.

DUAL:

The minimum controllable speed is reached and the machine switches to IDLE mode. The drive motor runs unloaded with low power consumption.
When the preset idling time has elapsed, the machine switches to READY.

VARIO/QUADRO/CONTINUOUS:

The minimum controllable speed is reached and, depending on the air demand at the time, the machine switches either to READY or to IDLE. The machine remains in IDLE at least for the duration of the *venting time*, before it switches to READY.

DYNAMIC:

The minimum controllable speed is reached and, depending on the air temperature of the drive motor / engine, the machine switches either to READY or to IDLE. The machine remains in IDLE at least for the duration of the *venting time*, before it switches to READY.

If the network pressure falls below the TARGET value:

SIGMA CONTROL 2 runs the motor up to a speed at which air delivery matches the air demand.

The above description is valid only when the *Pressure control* option is set to *Local mode:* in the menu:10.1.1 Power switching .

The inlet valve opens and the machine delivers compressed air.

The frequency converter varies the speed of the drive motor according to the air demand. The power consumption of the compressor motor rises and falls according to air demand.

5.7.4 MODULATING control

With the help of a mechanical control valve (the proportional controller), the opening and closing of the inlet valve is continuously varied in relation to the actual air demand. The airend delivers compressed air to the distribution network.
The load and power consumption of the drive motor rises and falls with the air demand.
To ensure optimal control on large compressors, the control air for the proportional controller is taken from an external air receiver.

6 Installation and Operating Conditions

6.1 Maintaining ambient conditions

➢ Follow the instructions in the machine's operator manual.

6.2 Installation conditions

The installation and operating conditions depend the machine into which the controller is installed.

NOTICE

UV radiation!
Direct sunlight (UV radiation) can destroy the display screen.

➢ *Do not allow the display screen to be subjected to direct sunlight.*

➢ See the machine's operator manual for required conditions.

7 Installation

7.1 Reporting Transport Damage

1. Check the machine for visible and hidden transport damage.
2. Inform the carrier and the manufacturer in writing of any damage without delay.

7.2 Machine identification

If the machine is run in sequenced operation its identification as detailed in the installation diagram is to be taken into account.

Identifying the machine for operation in remote mode.

➢ Attach the following notice to warn of remote machine operation (suggestion):

⚠ WARNING
Remote control: danger of unexpected starting!
➢ Make sure the power supply disconnecting device is switched off before commencing any work on the machine.

Tab. 41 Machine identification

➢ Label the starting device in the remote control center as follows (suggestions):

⚠ WARNING
Remote control: danger of unexpected starting!
➢ Before starting, make sure that no one is working on the machine and that it can be safely started.

Tab. 42 Remote control identification

Identifying the machine for clock control mode operation

➢ Attach the following notice to warn of remote machine operation (suggestion):

⚠ WARNING
Clock control: Risk of injury caused by unexpected starting!
➢ Make sure the power supply disconnecting device is switched off before commencing any work on the machine.

Tab. 43 Machine identification

8 Initial Start-up

8.1 Outline

SIGMA CONTROL 2 was designed and developed for a number of applications. Potential settings are correspondingly varied.

It is possible that only a few of these settings are needed for the initial start-up. This depends on the application .

The following sections explain the large number of practical applications, but only one configuration is relevant for a specific use.

8.2: Configuring the controller (display format, units, languages, etc.)

8.3: Using KAESER CONNECT

8.4: Pressure parameters of the machine

8.5: Machine start and stop

8.6: Control modes

8.7: Electronic Thermal Management

8.8: Refrigerated dryer

8.9: Configuring the machine for local mode

8.10: Configuring the machine for master control operation

8.11: Configuring input and output signals

8.13: Activating remote acknowledgement

8.14: Linking to an external pressure transducer

8.15: Commissioning the machine

8.2 Setting the controller

The following chapters describe in detail the basic settings for the SIGMA CONTROL 2. The quick installation guide at the beginning of this operating manual provides an overview of the essential displays and operating elements, the main menu and important functions.

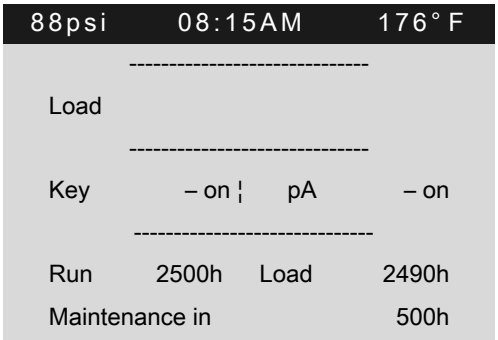
➢ Carry out settings as required:
- 8.2.1: Selecting menu options (introduction)
- 8.2.2: Setting the language
- 8.2.3: Noting the user name
- 8.2.4: User log-in with RFID Equipment Card
- 8.2.5: Generating a password
- 8.2.6: Manual user log-in
- 8.2.7: Create the master RFID Equipment Card
- 8.2.8: Checking/Setting time and date
- 8.2.9: Setting the time zone (daylight saving time/winter time)
- 8.2.10: Set display formats (date, time, units of pressure and temperature)
- 8.2.11: Setting the display illumination
- 8.2.12: Setting the contrast and the brightness
- 8.2.13: Activating the remote control
- 8.2.14: IP configuration
- 8.2.15: Setting the e-mail function
- 8.2.16: Setting the time server
- 8.3.6: Creating a user account

8.2.1 Selecting menu options

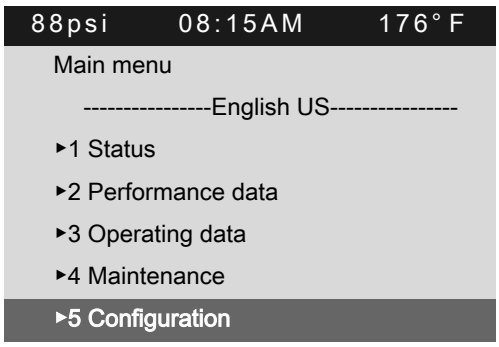
All menu options can be selected with the «Down», «Up» and «Enter» keys.

Example: Open the < Configuration – General > menu.

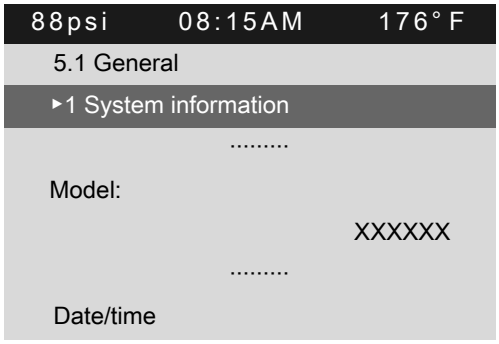
1. Switch on the machine and wait for SIGMA CONTROL 2 to start.
   The operating mode is displayed.



2. Press «Enter».
   The Main menu is displayed.



3. Use «Up» or «Down» to select the *Configuration* line.
4. Press «Enter».
   The *Configuration* menu is displayed
5. Use «Up» or «Down» to select the *General* line.
6. Press «Enter».
   The *General* menu is displayed.



7. Use the «Up» or «Down» key to select a menu item in the *General* menu such as *System information*.
8. Press «Escape» repeatedly to return to the main menu.

8.2.2 Setting the language

You can set the user interface to one of these languages:

Arabic	Estonian	Italian	Norwegian	Spanish
Bulgarian	Finnish	Japanese	Polish	Spanish (South America)
Chinese	French	Korean	Portuguese	Czech
Danish	French (Canada)	Croatian	Romanian	Turkish
German	Greek	Latvian	Russian	Hungarian
English	Hebrew	Lithuanian	Swedish	...
English (USA)	Indonesian	Dutch	Slovenian	...

Tab. 44 Supported languages

Depending on the selected language, the system automatically sets the units and the time and date formats. You can manually change these settings (see chapter 8.2.10).

Precondition The operating mode is displayed.

1. Press «Enter».
   The Main menu is displayed.

88psi 08:15AM 176°F	Header
Main menu	
----------English US----------	Current language
▸1 Status	Active line
▸2 Performance data	Sub-menu
▸3 Operating data	Sub-menu
▸4 Maintenance	Sub-menu
▸5 Configuration	Sub-menu

2. Press «Up» key.
   The currently set language is displayed.

88psi 08:15AM 176°F	Header
Main menu	
----------English US----------	Active line with current set language
▸1 Status	Sub-menu
▸2 Performance data	Sub-menu
▸3 Operating data	Sub-menu
▸4 Maintenance	Sub-menu
▸5 Configuration	Sub-menu

3. Press «Enter».
   The currently set language flashes.
4. Use «Up» or «Down» to select the desired language.
5. Press «Enter».

Result The user interface is displayed in the set language.

8.2.3 Noting the user name

The number of your RFID Equipment Card is identical with the *user name* displayed on SIGMA CONTROL 2 after you have successfully logged on using your RFID Equipment Card.

Fig. 11 Back of the RFID Equipment Card

[1] Back of the RFID Equipment Card
[2] Number of your RFID Equipment Card

1. Note the user name (= number of the RFID Equipment Card).
2. Keep the note at a secure location.

If your RFID Equipment Card gets damaged or can no longer be found?

➢ If you know your user name and password, you can manually log on to SIGMA CONTROL 2 (see chapter 8.2.5).

8.2.4 User log-on with RFID Equipment Card

The RFID Equipment Card enables an easy and quick log-on at SIGMA CONTROL 2. It authorizes you to access advanced functions of the controller.

Advanced access rights allow you to:

- Read additional data
- Change other settings

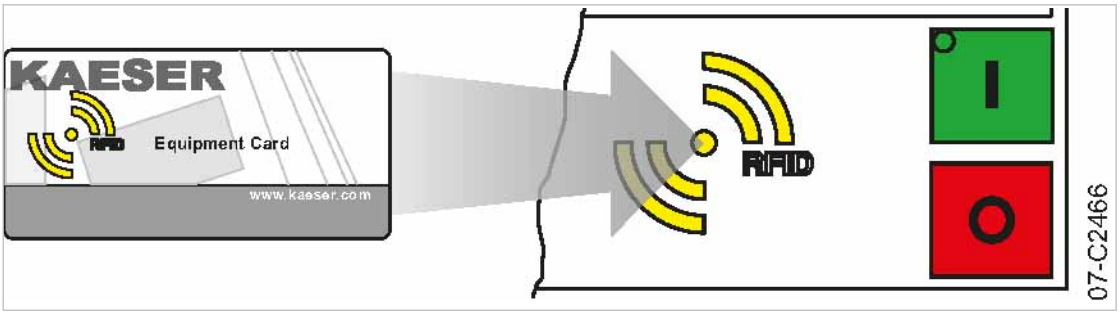
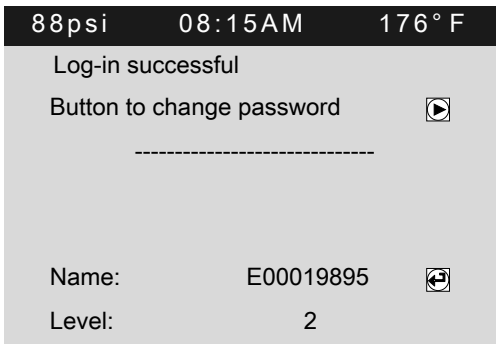


Fig. 12 User log-in with RFID Equipment Card

1. Hold the RFID Equipment Card in front of the RFID reader.
   Your user name and access level will be displayed.



Header
Menu
Prompt, whether the password is to be changed

2. Press «Enter».
   The access right is confirmed.

The RFID Equipment Card is damaged or lost?
➢ Manually enter the user name and password, see chapter 8.2.6.

8.2.5 Generating a password

In the event that your RFID Equipment Card is damaged or lost, you must manually log on to SIGMA CONTROL 2. A password is also required to use KAESER CONNECT to log on at SIGMA CONTROL 2 (see chapter 8.3).

Prerequisite for this is that you know your

- Name
- Password

You have noted your user name and stored it at a suitable location (see chapter 8.2.3). In the next step, generate a password on SIGMA CONTROL 2. Note this generated password as well, and store it a suitable location. If your RFID Equipment Card is damaged or lost, the card won't be necessary to manually log on to SIGMA CONTROL 2 when you have these two pieces of information.

Precondition Any menu is displayed

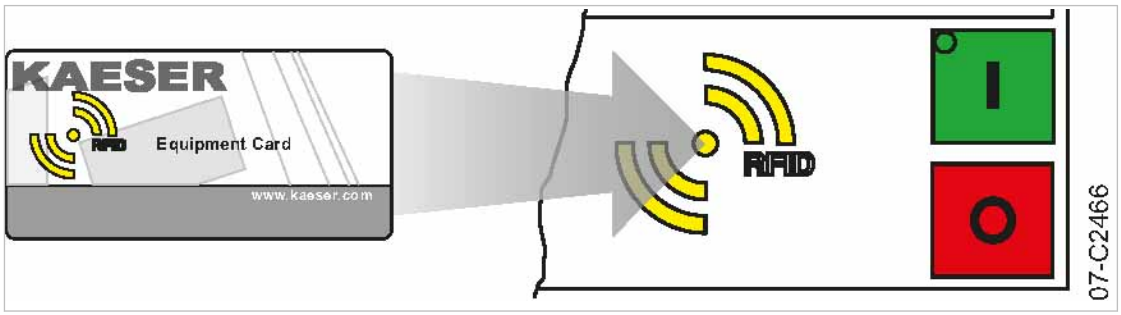
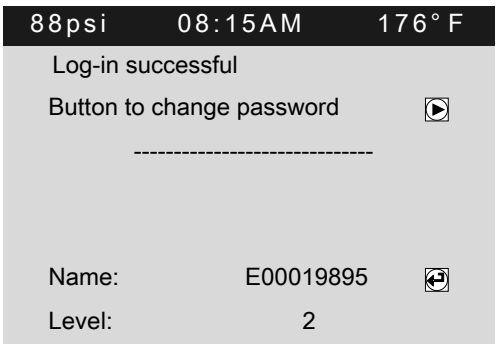


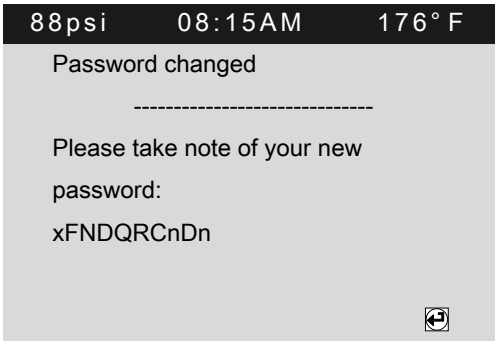
Fig. 13 User log-in with RFID Equipment Card

1. Hold the RFID Equipment Card in front of the RFID reader.
   Users are always logged on with access level 2.



Header
Menu
Prompt, whether the password is to be changed

2. Press the «Right» key within five seconds.
   The new *Password* is displayed.



Header
Menu
New password

3. Note the new password.
4. Store the password at a suitable location, if it should become necessary to manually log-on without RFID Equipment Card.
5. Press «Enter».
   The setting is applied.

8.2.6 Manual user log-in

In the event that your RFID Equipment Card is damaged or lost, you can manually log on to SIGMA CONTROL 2.

Precondition The user name (see chapter 8.2.3) and password (see chapter 8.2.5) are known.
The operating mode is displayed.

1. Open the 7 *User* menu.
2. Use «Up» or «Down» to select the *Name* line.
3. Press «Enter».
   The setting mode is active.
   A column with alphanumeric characters is displayed.
   The selected character flashes.

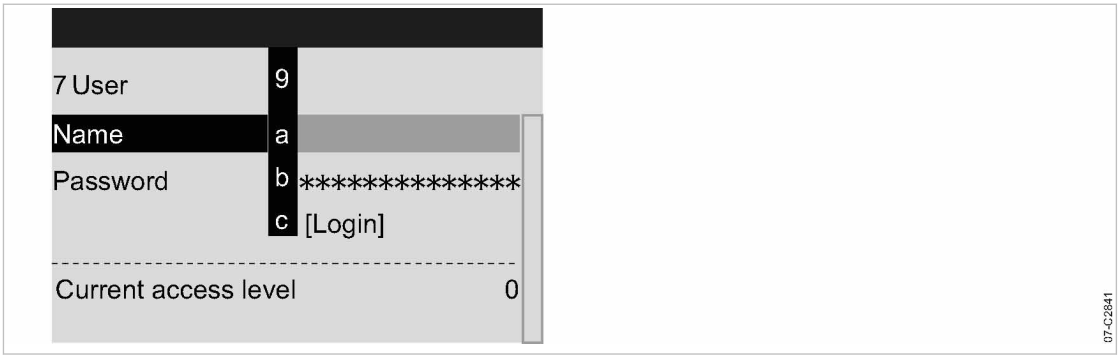


Fig. 14 Manual user log-on

4. Select the required character with the «Up» or «Down» keys.
5. Press the «Right» arrow.
   The cursor jumps to the next position of the user name.
6. Enter the remaining characters of the user name in the same manner.
7. Press «Enter».
   The user name is entered.
8. Use «Up» or «Down» to select the *Password* line.
9. Press «Enter».
   Enter the remaining letters and digits of the password in the same manner.
   The password is case sensitive!
10. Press «Enter».
    The password is entered.
11. Use «Up» or «Down» to select the *[Login]* line.
12. Press «Enter».
    Current access level: 2 is displayed.

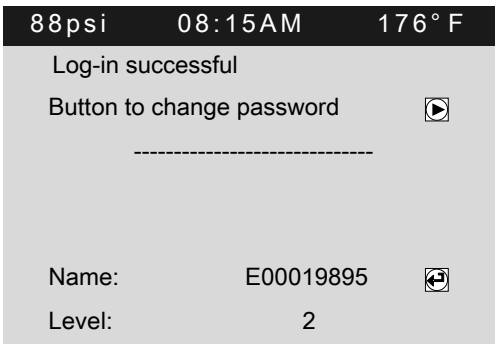
Result You are now logged on to SIGMA CONTROL 2 with access level 2, having manually input your user name and the password.

8.2.7 Create the master RFID Equipment Card

If you are running several KAESER machines with the SIGMA CONTROL 2 control it may make sense to create a master RFID Equipment Card with which you can log onto all machines.

Precondition The RFID Equipment Card delivered with the machine and at least one additional teachable RFID Equipment Card are available.
The operating mode is displayed.

1. Hold the RFID Equipment Card delivered with the machine in front of the RFID reader.
   Users are always logged on with access level 2.



Header
Menu
Prompt, whether the password is to be changed

2. Within 10 minutes, hold the master RFID Equipment Card to be taught in front of the RFID reader.
   The master RFID Equipment Card is not registered at the machine.

Header
The master RFID Equipment Card has been registered

3. Repeat the above steps at the next machine if the master RFID Equipment Card is to be registered at other machines.

Result You have registered a master RFID Equipment Cards at the machine.

8.2.8 Checking/setting time and date

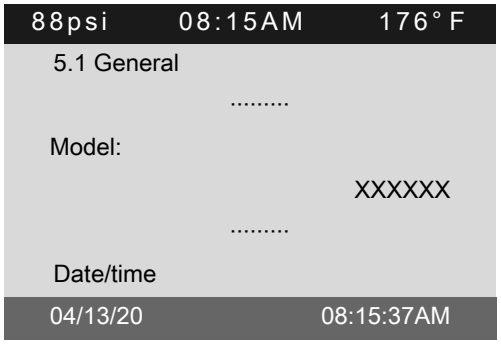
Precondition Password access level 2 is activated.

Check and set time

- ➢ When operating the machine with a timer program, check the time settings at least once a year.
- ➢ You can automatically synchronize date and time using a time server. Manual setting of the time is no longer required in this case. See chapter 8.2.16.

1. Open the 5.1 *<Configuration – General>* menu.
2. Use «Up» or «Down» to select the *Date/time* line.

3. Press the «DOWN» key.



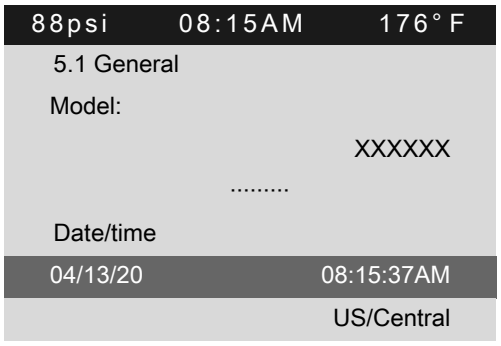
Header
Menu
Set machine type
Current date and time

4. Press the «Right» key.
5. Press «Enter».
   The display for hours *00:00:00* flashes.
6. Use «Up» or «Down» to set the hours.
7. Press the «Right» arrow.
   The display for minutes *00.00:00* flashes.
8. Use «Up» or «Down» to set the minutes.
9. Press the «Right» arrow.
   The display for seconds *00:00.00* flashes.
10. Use «Up» or «Down» to set the seconds.
11. Press «Enter».
    The setting is applied.
12. Press «Escape» repeatedly to return to the main menu.

Check and set date

Precondition Password access level 2 is activated.

1. Open the 5.1 *<Configuration – General>* menu.
2. Use «Up» or «Down» to select the *Date/time* line.
3. Press the «DOWN» key.



Header
Menu
Set machine type
Current date and time
Time zone

4. Press «Enter».
   The display for days *00.00.00* flashes.
5. Use «Up» or «Down» to set the day.
6. Press the «Right» arrow.
   The display for months *00.00.00* flashes.

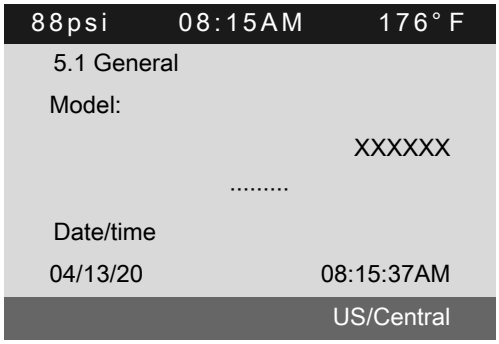
7. Use «Up» or «Down» to set the month.
8. Press the «Right» arrow.
   The display for years *00.00.00* flashes.
9. Use «Up» or «Down» to set the years.
10. Press «Enter».
    The setting is applied.
11. Press «Escape» repeatedly to return to the main menu.

8.2.9 Set the time zone

Set the time zone for the SIGMA CONTROL 2 to ensure the timely automatic conversion from winter time (standard time) to daylight savings time, for example.

Precondition Password access level 2 is activated.

1. Open the 5.1 *<Configuration – General>* menu.
2. Use «Up» or «Down» to select the *Date/time* line.
3. Press «Down» twice.



4. Press «Enter».
   The time zone display flashes.
5. Use «Up» or «Down» to set the time zone.
6. Press «Enter».
   The setting is applied.
7. Press «Escape» repeatedly to return to the main menu.

8.2.10 Set display formats

Depending on the selected language, the system automatically sets the units and the time and date formats. You can manually change these settings.

Set the date format

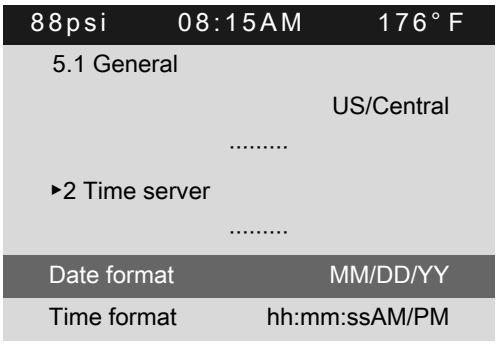
Set the display for the date format:

Format	Example
DD.MM.YY	30/07/2019
YY-MM-DD	19-07-30
MM/DD/YY	07/30/19

Tab. 45 Date formats

Precondition Password access level 2 is activated.

1. Open the 5.1 *<Configuration – General>* menu.
2. Use «Up» or «Down» to select the *Date format* line.



3. Press «Enter».
   The *MM/DD/YY* display flashes.
4. Use «Up» or «Down» to set the date format.
5. Press «Enter».
   The setting is applied.
6. Press «Escape» repeatedly to return to the main menu.

Set the time format

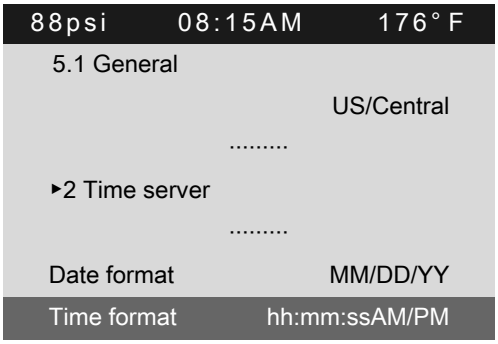
Set the display for the time format:

Format	Example
hh:mm:ss	13:33:45
hh:mm	13:33
hh:mm:ssAM/PM	01:33:45PM
hh:mmAM/PM	01:33PM

Tab. 46 Possible settings for the time format

Precondition Password access level 2 is activated.

1. Open the 5.1 *<Configuration – General>* menu.
2. Use «Up» or «Down» to select the *Time format* line.



3. Press «Enter».
   The *hh:mm:ssAM/PM* indication flashes.

4. Use «Up» or «Down» to set the time format.
5. Press «Enter».
   The setting is applied.
6. Press «Escape» repeatedly to return to the main menu.

Set the pressure display units

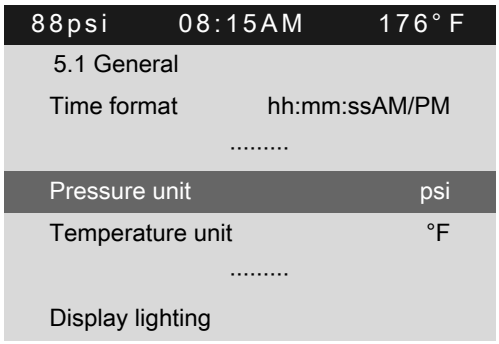
Set the pressure unit for display:

Format	Example
bar	5.5bar
hPa	5523hPa
MPa	0.55MPa
psi	80psi
at	5.6at
kPa	550 kPa [1]
"Hg	15 "Hg [2]
[1] SIGMA CONTROL 2 SCREW FLUID	
[2] SIGMA CONTROL 2 SCREW VAC	

Tab. 47 Possible settings for the pressure unit

Precondition Password access level 2 is activated.

1. Open the 5.1 *<Configuration – General>* menu.
2. Use «Up» or «Down» to select the *Pressure unit* line.



3. Press «Enter».
   The display for the set unit flashes.
4. Use «Up» or «Down» to set the unit.
5. Press «Enter».
   The setting is applied.
6. Press «Escape» repeatedly to return to the main menu.

Set the temperature display units

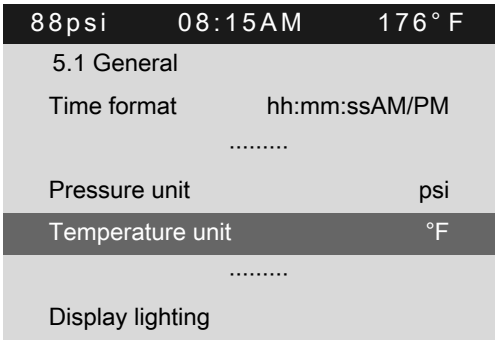
Set the temperature unit for display:

Format	Example
°C	46°C
K	319K
°F	114°F

Tab. 48 Possible settings for the temperature unit

Precondition Password access level 2 is activated.

1. Open the 5.1 *<Configuration – General>* menu.
2. Use «Up» or «Down» to select the *Temperature unit* line.



3. Press «Enter».
   The display for the set unit flashes.
4. Use «Up» or «Down» to set the unit.
5. Press «Enter».
   The setting is applied.
6. Press «Escape» repeatedly to return to the main menu.

8.2.11 Setting the display illumination

Set the display lighting mode:

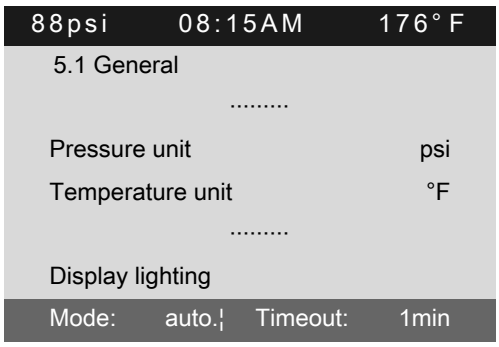
Mode	1	2	3
Indication	*automatic*	*on*	*off*
Function	The illumination extinguishes after the *time-out* has elapsed.	Permanent setting Illumination "on"	Permanent setting Illumination "off"

Tab. 49 Display illumination

Precondition Access level 2 is activated.

1. Open the 5.1 *<Configuration – General>* menu.
2. Use «Up» or «Down» to select the *Display lighting* line.

3. Press the «DOWN» key.
   The *Mode* line is displayed.



4. Press «Enter».
   The display for the set mode flashes.
5. Use the «Up» or «Down» keys to set the *auto.* mode.
6. Press «Enter».
   The setting is applied.
7. Press the «Right» arrow.
8. Set the value for the *Timeout* in the same manner: 1 min, for example.
9. Press «Enter».
10. Press «Escape» repeatedly to leave this menu.

Result The display illumination is set for automatic operation with deactivation after one minute without user intervention.

8.2.12 Setting the contrast and the brightness

The display settings for contrast and brightness are set to the highest possible values by default. Change the settings if adverse lighting conditions make it difficult to read the displayed information.

Precondition The operating mode is displayed.

1. Press and hold the «Information» key.
2. Use «Up» or «Down» to adjust the contrast.
3. Use «Left» or «Right» to adjust the brightness.

Result The settings for contrast and brightness have been adjusted.

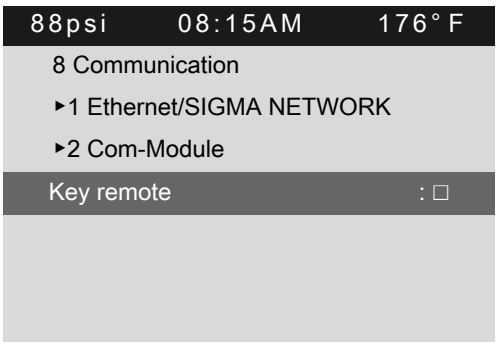
8.2.13 Activating the remote control

The «remote control» key on the operating panel of the SIGMA CONTROL 2 can be activated or deactivated. Various menus offer check boxes for this setting.

Precondition Access level 2 is activated.
The operating mode is displayed.

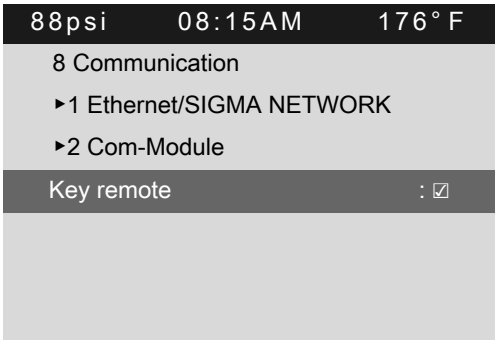
1. Open the menu, e.g. 8 *Communication* menu.
2. Use «Up» or «Down» to select the *Key remote* line.

3. Press «Enter».
   The check box *Key remote* will flash.



Header
Menu
Active line with deactivated check box

4. Press «Up» key.
   The check box *Key remote* is activated.



Header
Menu
Active line with activated check box

5. Press «Enter».
   The «Remote control» key is activated.
6. Press «Escape» repeatedly to leave this menu.

Proceed in the same manner to deactivate the «remote control» key.

7. Press «Remote control» key on the operating panel of SIGMA CONTROL 2.

Result SIGMA CONTROL 2 remote control is activated.

8.2.14 IP configuration

For the SIGMA CONTROL 2 to be connected to the network, you must set the IP configuration (for KAESER CONNECT for example).

If you use SIGMA CONTROL 2 as the master control of two machines, you set other network parameters in the *IP configuration* menu (see chapter 8.10.4).

The network parameters for the IP configuration must be specified manually. You **cannot** use DHCP for an automatic IP configuration.

Precondition Password access level 2 is activated.
The network parameters are known. Request the required information from your IT department.

1. Connect SIGMA CONTROL 2 to the network using an Ethernet cable.
2. Select the 8.1.1 *<Communication – Ethernet/SIGMA NETWORK – IP configuration>* menu.

3. Use «Up» or «Down» to select the *IP address* line.

88psi 08:15AM 176° F	
8.1.1 IP configuration	
IP address	169.254.100.101
Subnet mask	255.255.000.000
Gateway	169,254,100.97
DNS Server 1	169,254,100.97
DNS Server 2	169,254,100.97
Restart network	□

Header
Menu
Active line, factory setting

4. Press «Enter»to switch into setting mode.
   The first group of numbers of the *IP address* flashes *169.254.100.101*.
5. Use «Up» or «Down» to set the first group of numbers of the *IP address*.
6. Press the «Right» key.
   The second group of numbers of the *IP address* flashes *192.168.100.101*.
7. Use «Up» or «Down» to set the second, third and fourth group of numbers of the *IP address*.
   The *IP address* is correctly set.
8. Press «Enter»to accept the setting.
   The setting is applied.
9. Press «Down».
   The *Subnet mask* line is displayed.
10. Set the remaining network parameters as described above:

Parameters	Setting value	Meaning
IP address		IP address of the interface X1 Ethernet
Subnet mask		Subnet mask of the network
Gateway		Gateway address of the network
DNS Server 1		DNS server 1 address
DNS Server 2		DNS server 2 address
Restart network	–	Activate the changed network parameters

Tab. 50 Network parameters

11. Use «Up» or «Down» to select the *Restart network* line.

88psi 08:15AM 176° F	
8.1.1 IP configuration	
IP address	192.168.001.010
Subnet mask	255.255.255.000
Gateway	192.168.001.001
DNS Server 1	008.008.008.008
DNS Server 2	008.008.004.004
Restart network	□

Header
Menu
Example address
Example address
Example address
Example address
Example address
Active line

12. Press «Enter».
    The check box *Restart network* will flash.

13. Press the «Up» key.
    The check box is activated.
14. Press «Enter».

Result The network is restarted.
The set network parameters are active.

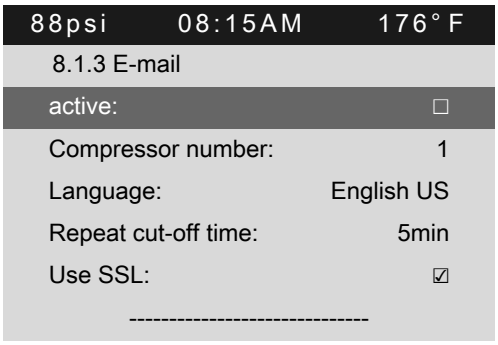
8.2.15 Setting the e-mail function

SIGMA CONTROL 2 uses e-mail to send information (messages) to an e-mail address.
For this purpose, an Ethernet connection with an SMTP server is required.

Setting e-mail parameters

Precondition Password access level 2 is activated.
IP configuration is set; see chapter 8.2.14.
An SMTP server is active in the network.
The e-mail parameters are known. Request the required information from the IT department.

1. Open the 8.1.3 *<Communication – Ethernet/SIGMA NETWORK – E-mail>* menu.
2. Use the «Up» or «Down» keys to select the *active:* line.



3. Press «Enter».
   The check box *active:* will flash.
4. Press «Up»key.
   The check box is deactivated.
5. Press «Enter».
   The e-mail function is deactivated.

6. Set the e-mail parameters as described above:

If SIGMA CONTROL 2 is connected via SIGMA NETWORK to SAM 4.0 and e-mails are to be forwarded via SAM 4.0, then enter the IP address of interface X6 of SAM 4.0 in the *SMTP Server:* field. **169.254.100.100** (see also chapter 8.10.2). Enter at port address of the SMTP server: **25**.
For SAM 4.0 the option *Data Forwarding* in the menu *<Configuration - E-mail - Basic Settings>* must be activated.

Parameter	Setting value	Meaning
Compressor number:		This field displays the machine number that appears as the sender of e-mails. The recipient is thus able to identify the different machines sending mails.
Language:		Use this field to define the language for the message texts. This setting is independent from the language setting in SIGMA CONTROL 2 (see chapter 8.2.2).
Repeat cut-off time:		In this field, enter the time in minutes (repeat block time) that the system must wait in order not to send multiple recurring messages in short time intervals.
Use SSL:		E-mail sending is encrypted if the check box is marked.
Sender address:		Enter the e-mail address of the sender in this field.
Sender name:		Enter the name of the sender in this field.
Contact telephone:		In this field, enter a telephone number under which the air station operator can be reached. This telephone number is sent with each e-mail.
Receiver address:		The e-mail address of the recipient.
SMTP Server:		IP address of the SMTP server receiving and forwarding the e-mails.
User name:		Log-in user name for logging on to the SMTP server.
Password		Log-in password for logging on to the SMTP server.
Port		Port address of the SMTP server.
Timeout		In this field, enter the seconds for SIGMA CONTROL 2 to wait for a reply by the SMTP server before e-mail sending is cancelled.
Resend after:		In this field, enter the time in seconds for the system to wait after a failed e-mail sending operation before it again attempts to send the mail.
Retry attempts:		Setting option for the number of attempts to resend after failed e-mail sending.

Tab. 51 E-mail parameters

7. Activating the e-mail function: Activate the *active:* check box as described above.
8. Press «Escape» repeatedly to leave this menu.

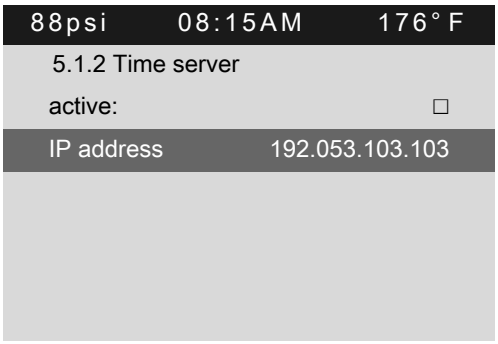
Result The e-mail parameters are set and the e-mail function is activated.

8.2.16 Configuring the time server

If SIGMA CONTROL 2 is connected to the network, you can set the access to an SNTP server available in the Internet or a local Intranet. SIGMA CONTROL 2 then automatically imports the date and time settings and ensures continuous synchronization of the internal clock with the external time server.

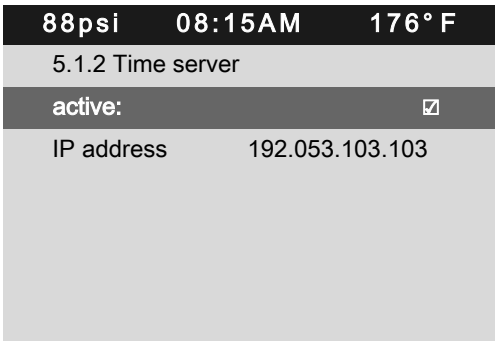
Precondition
Access level 2 is activated.
IP configuration is set; see chapter 8.2.14.
The time server's IP address is known. Request the required information from your IT department.

1. Open the 5.1.2 *<Configuration – General – Time server>* menu.
2. Use «Up» or «Down» to select the *IP address* line.



Header
Menu
Activating/deactivating the time server function
Example address, time server

3. Press «Enter».
   The first group of numbers of the *IP address* flashes *192.053.103.103*.
4. Use «Up» or «Down» to set the first group of numbers of the *IP address*.
5. Press the «Right» key.
   The second group of numbers of the *IP address* flashes *192.053.103.103*.
6. Use «Up» or «Down» to set the second, third, and fourth group of numbers of the *IP address*.
   The *IP address* is correctly set.
7. Press «Enter»to accept the setting.
   The setting is applied.
8. Use «Up» or «Down» to select the *active:* line.
9. Press «Enter».
   The check box *active:* will flash.
10. Press the «Up» key.
    The check box is activated.



Menu
The time server function is activated
Example address, time server

11. Press «Enter».
12. Press «Escape» repeatedly to return to the main menu.

Result Access to the selected time server is active.
The internal clock of SIGMA CONTROL 2 is permanently synchronized.

8.3 Using KAESER CONNECT

Using an Internet-capable device with web browser, you can use KAESER CONNECT to remotely display these SIGMA CONTROL 2 menus:

- System status
- Graphs
- Messages
- I/O display
- User management
- Settings
- Backup
- Data recording

Thus, KAESER CONNECT provides an excellent option for an easy and quick check of the economy and energy efficiency of your machines.

The following functions are **not** available with KAESER CONNECT:

- Remotely starting the machine
- Remotely setting parameters

For KAESER CONNECT to be able to use the Internet-capable device, it must be registered in the **same network** as SIGMA CONTROL 2.

To be able to use KAESER CONNECT, the browser installed on the Internet-capable device must be able to display HTML5 content. For security reasons, we strongly recommend to use only up-to-date browser versions.

8.3.1 Open KAESER CONNECT

Precondition The user name (see chapter 8.2.3) and password (see chapter 8.2.5) are known.
The IP address of your controller is known, see chapters 8.2.14 and 8.10.4.

1. Use an Ethernet cable to connect SIGMA CONTROL 2 to the Internet-capable device or network.
2. In the web browser, enter the controller's IP address.
   The Login window is displayed.

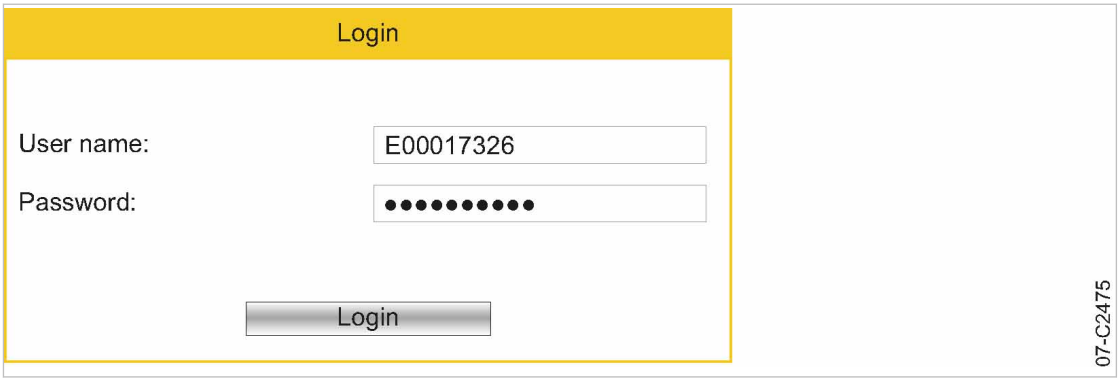


Fig. 15 Login window

3. Enter your user name in the *User name:* field.
4. Enter your password in the *Password:* field.
5. Click Login.
   KAESER CONNECT for SIGMA CONTROL 2 is displayed.

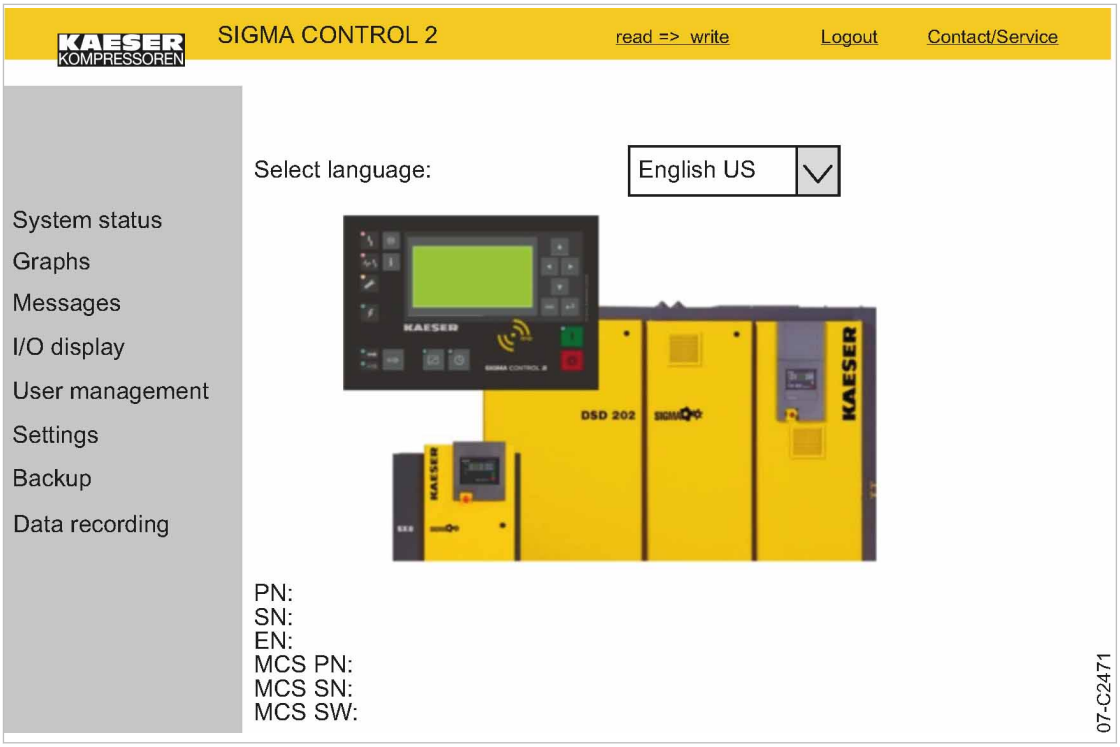


Fig. 16 KAESER CONNECT for SIGMA CONTROL 2

6. Click the arrow key (1) to open Select language:.
   The *Select language:* window is displayed.

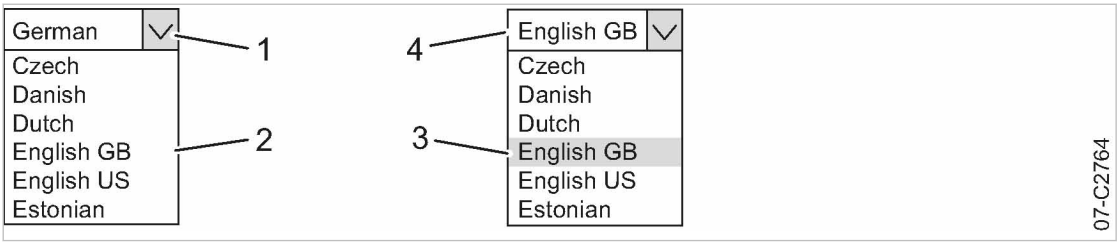


Fig. 17 Select language: window

1 «Arrow key» Select language:
2 Select language: window
3 Select a language
4 Selected language

7. Select the required language 3.

Result KAESER CONNECT is displayed in the selected language.

8.3.2 System status menu

Precondition KAESER CONNECT for SIGMA CONTROL 2 is displayed.

Fig. 18 *System status* menu

1. Click the *System status* menu element.
   The *System status* menu is displayed.

Fig. 19 Main menu

2. Click in the SIGMA CONTROL 2 display.
   The Main menu is displayed.
3. Click the numbered lines.
   The system displays the corresponding submenus.
4. Press ESC repeatedly to leave this menu.

8.3.3 Graphs menu

When starting the *Graphs* menu, the recorded data from the last 60 minutes are loaded. The last 20 minutes are displayed in a graph. The system updates the graph every ten seconds whilst the current time is displayed.

If an SD card is provided in the X5 SD card slot, you can retrieve and display the automatically-recorded machine data for any time in the past.

Moving the mouse pointer across the graph calls up a ruler. The time selected with the ruler and the associated values are displayed in the legend above the graph. When the ruler is hidden, the time and associated values are displayed at the right edge of the graph.

The graph content depends on the machine type.

The *Speed* display is implemented only for machines with frequency converter.

Precondition KAESER CONNECT for SIGMA CONTROL 2 is displayed.

1. Click the *Graphs* menu element.

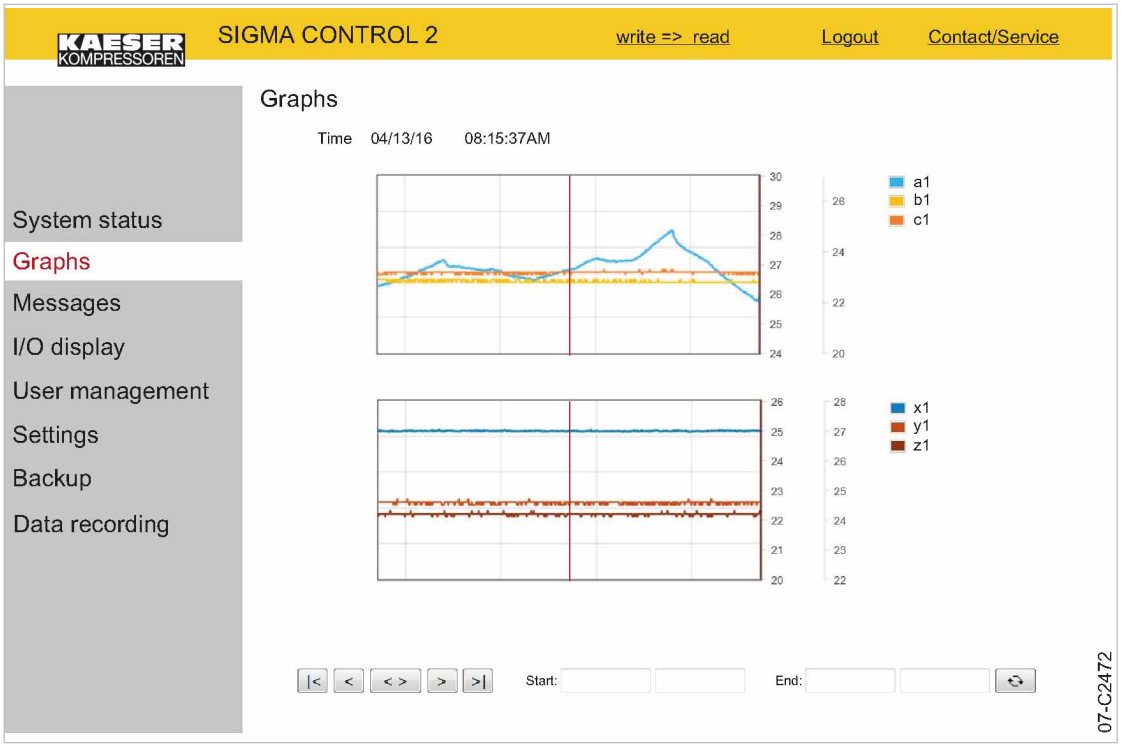


Fig. 20 *Graphs* (illustration similar)

2. Check the displayed data.

8.3.3.1 Zoom function

Use the Zoom function to enlarge significant curve developments:
Highlight a specific area within the graph by drawing a rectangle with the mouse pointer pressed.
The selected area will be enlarged as soon as the mouse pointer is released.

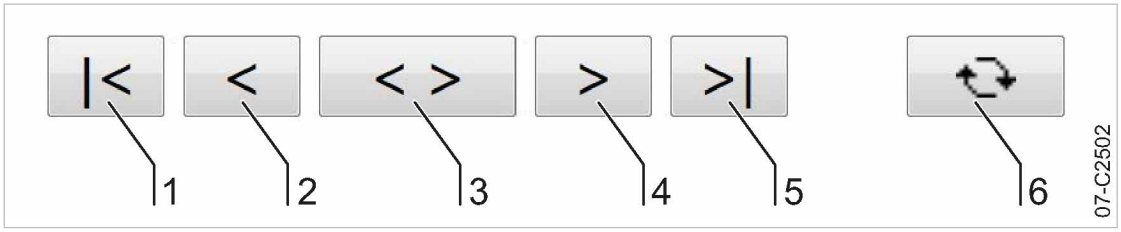


Fig. 21 Arrow keys

Item	Description	Function
1	«Start»	Display the oldest data in the cache memory or load the data from the previous 20 minutes from the SD card
2	«Scroll left»	Shift the display area by $^1/_3$ to the left
3	«Zoom-out»	Time range is enlarged
4	«Scroll right»	Shift the display area by $^1/_3$ to the right
5	«End»	Display of newest data
6	«Refresh»	Load and display the entered machine data from start time to end time

Tab. 52 Arrow key functions

1. Click the «Start» [1] arrow key.
   The oldest data in the cache memory or the data of the last 20 minutes are loaded form the SD card and displayed
2. Click the «Scroll right» [4] arrow key.
   The display area is shifted to the right by $^1/_3$.
3. With the mouse button pressed, draw a rectangle around the selected area.
4. Release the mouse button.
   The selected area is enlarged (zoom-in function).
5. Click the «Zoom-out» [3] arrow key.
   The time range is enlarged (zoom-out function).

8.3.3.2 Displaying past machine data

You can display the automatically-recorded machine data for any time in the past.

Precondition An SD card with sufficient free memory is inserted in the X5 SD card slot
The SD card was inserted for the entire operating time of the machine.
The SIGMA CONTROL 2 data recorder function is activated.

1. Enter the date and time for the start time in the required time period in *Start:*.
2. Enter the date and time for the end time in the required time period in *End:*.
3. Click [6].
   The machine data for the specified time interval are loaded and displayed.

8.3.4 Messages menu

The following messages are shown:

- Current messages
- Compressor messages
- System messages
- Diagnostic messages

Precondition KAESER CONNECT for SIGMA CONTROL 2 is displayed.

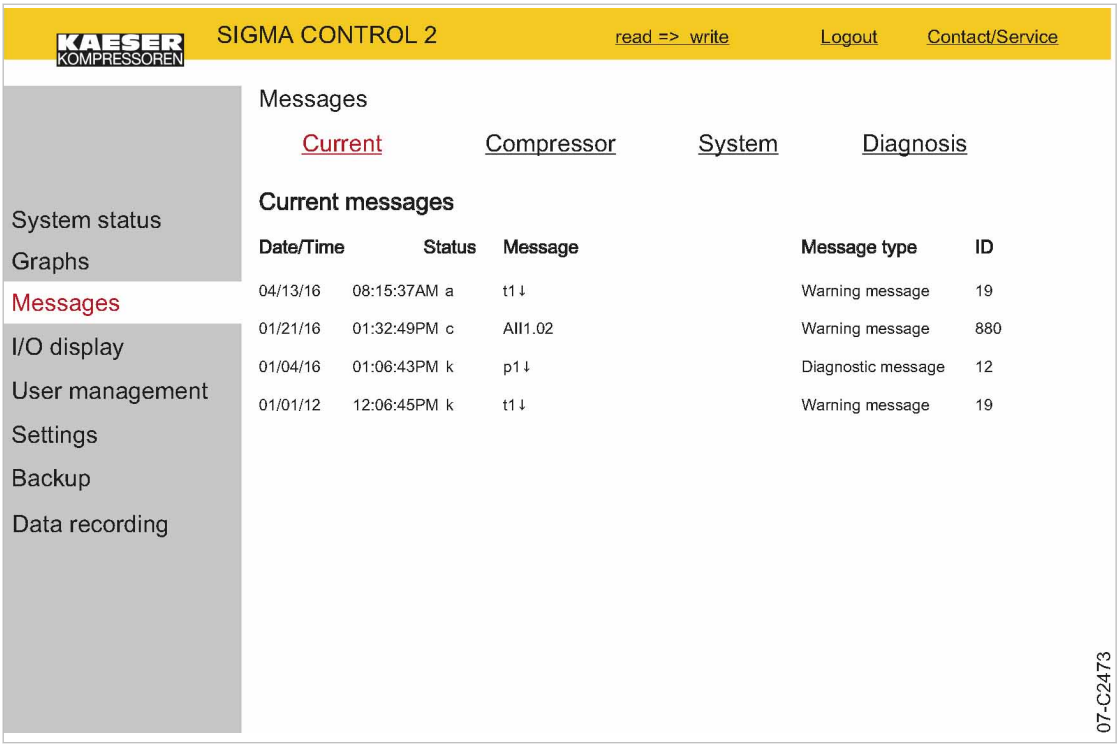


Fig. 22 *Messages*

1. Open the *Messages* menu.
   The *Messages* menu is displayed.
2. Click the required message type.
3. Check messages.

8.3.5 I/O display menu

The measured values of the analog inputs and the states of the digital inputs and outputs are displayed in the *I/O display* menu. Depending on the machine options, you may select from further IOM module tabs.

Precondition KAESER CONNECT for SIGMA CONTROL 2 is displayed.

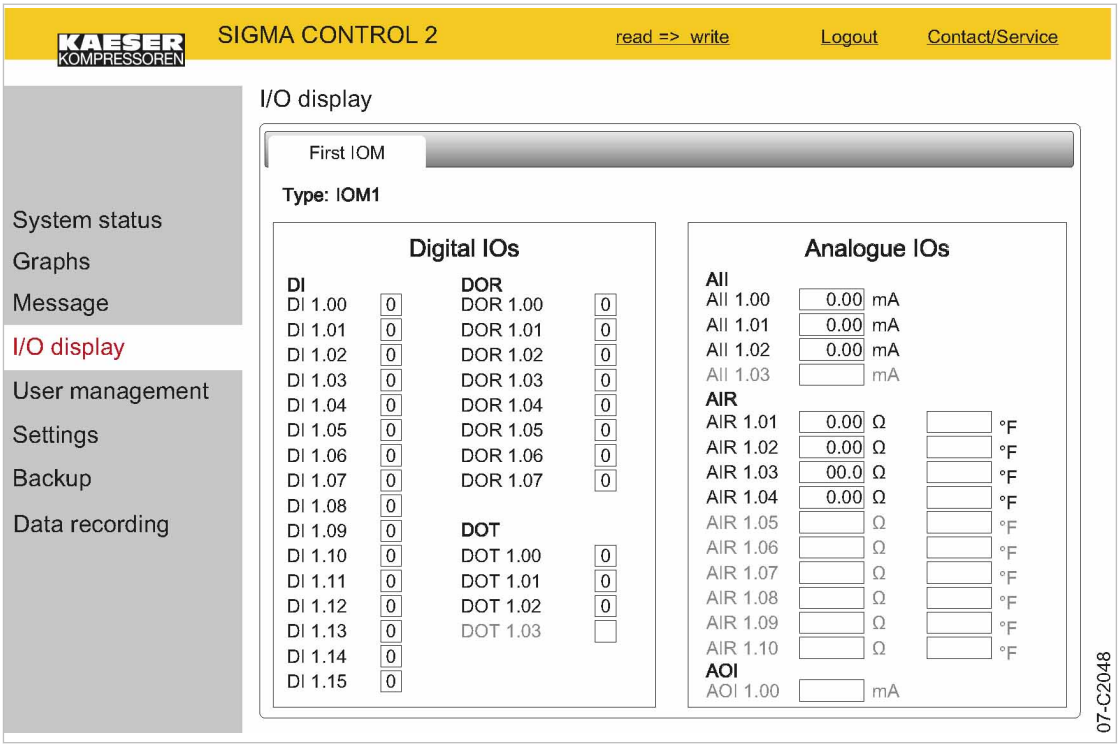


Fig. 23 *I/O display* (illustration similar)

➢ Click the *I/O display* menu element.
The current measured data and states of the input/output modules are displayed.

8.3.6 User management menu

Use the *User management* menu to create additional user accounts for other employees.

In order to be able to create user accounts, you must activate the write mode. The system will prompt you to enter and confirm your user name and your password. Subsequently, the write mode is activated (see Chapter 8.2.5).
The write mode is granted only to one person at a time.
If a second user attempts to log on in write mode, he will be refused by the system.
The system will return an error message.

String length for personally created user names and passwords:

- User name: 6 to 16 characters, the second character must not be a number
- Password: 6 to 16 characters

Precondition The generated password is available.
KAESER CONNECT for SIGMA CONTROL 2 is displayed.

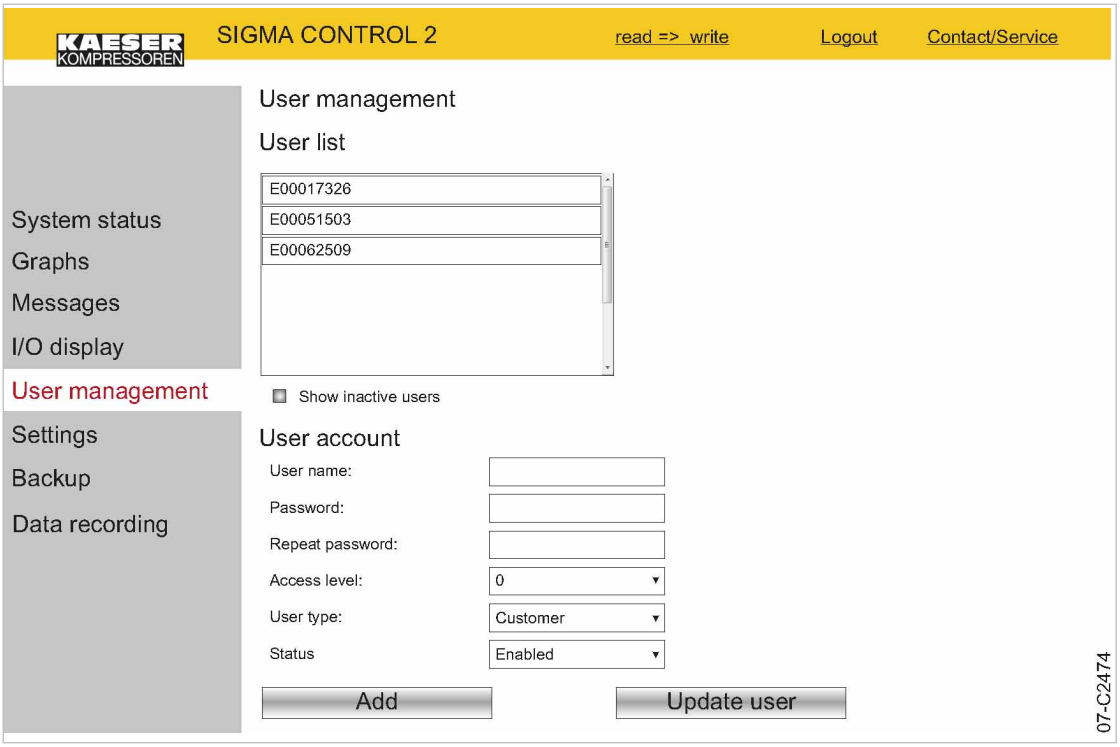


Fig. 24 *User management* menu

1. Select the *User management* menu element.
2. Click *read => write* to activate the read/write mode.
   The *Log on for write access:* window is displayed.

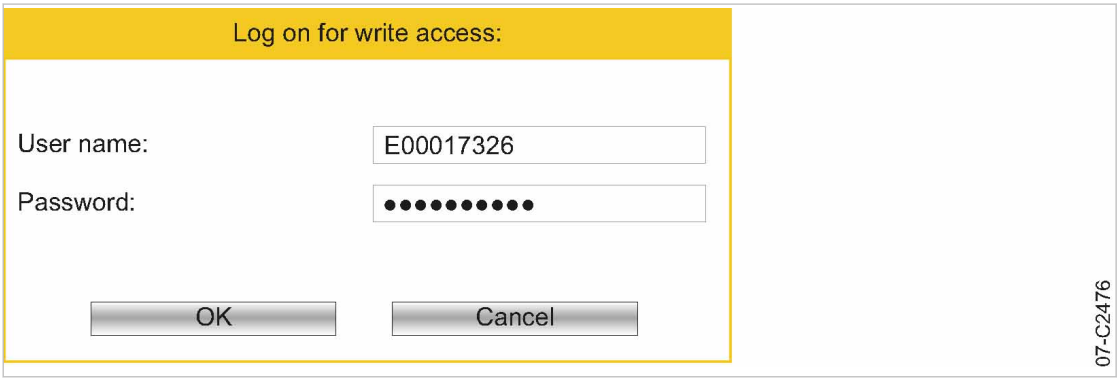


Fig. 25 *Log on for write access:* window

3. Enter your user name in the *User name:* field.
4. Enter your password in the *Password:* field.
5. Click OK.
   The *User management* menu is displayed.

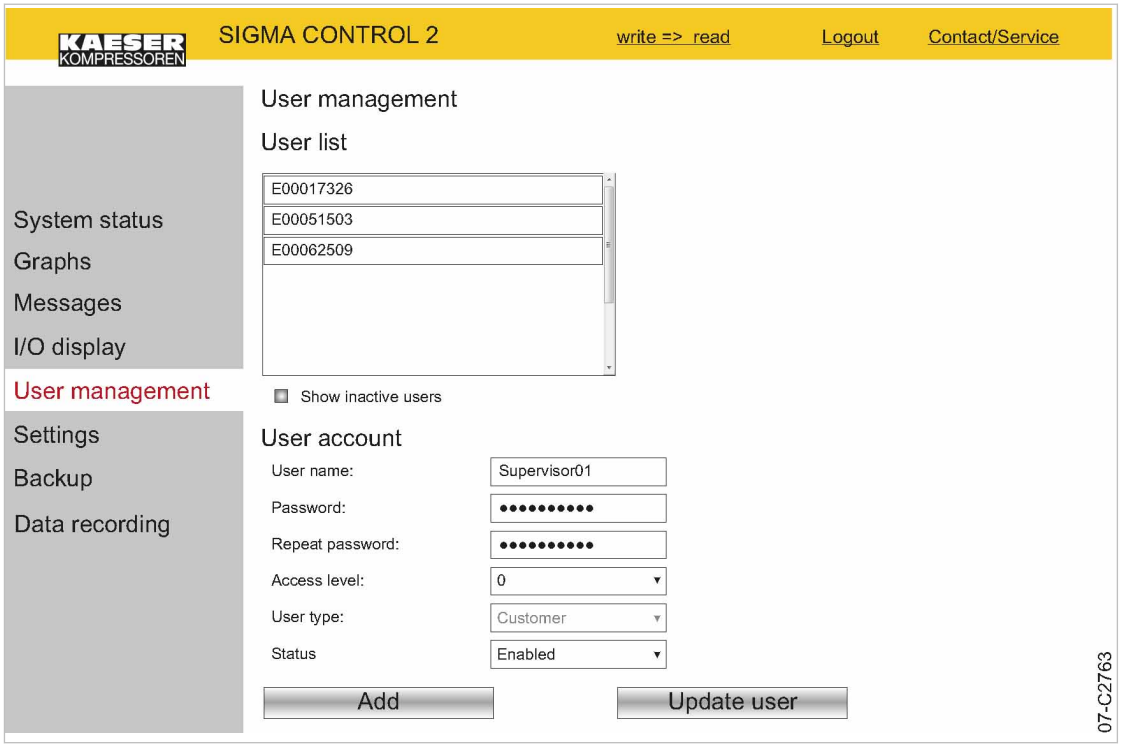


Fig. 26 *User management* menu

6. Enter a new user name in the *User name:* field.
7. Enter a new password in the *Password:* field.
8. Re-enter the same new password in the *Repeat password:* field.
9. Set Level 2 in the *Access level:* field.
10. Set the *State:* option in the Enabled field.
11. Click Add.
    The new user name has been added to the user list.

Result A new user account has been created and activated.

Editing a user account

You can edit existing user accounts:

- Changing the password
- Changing the access level
- Changing the status

Example: Change the password for an existing user account.

Precondition The *User management* menu is displayed.
Write mode is activated.

1. Click the required user account in the list.
2. Enter a new password in the *Password:* field.
3. Re-enter the same new password in the *Repeat password:* field.
4. Click Update user.

Result The password for the existing user account is changed.

8.3.7 Settings

Settings via KAESER CONNECT apply only to your PC and your Browser.

The following settings are available.

- Units
- Date format
- Time format

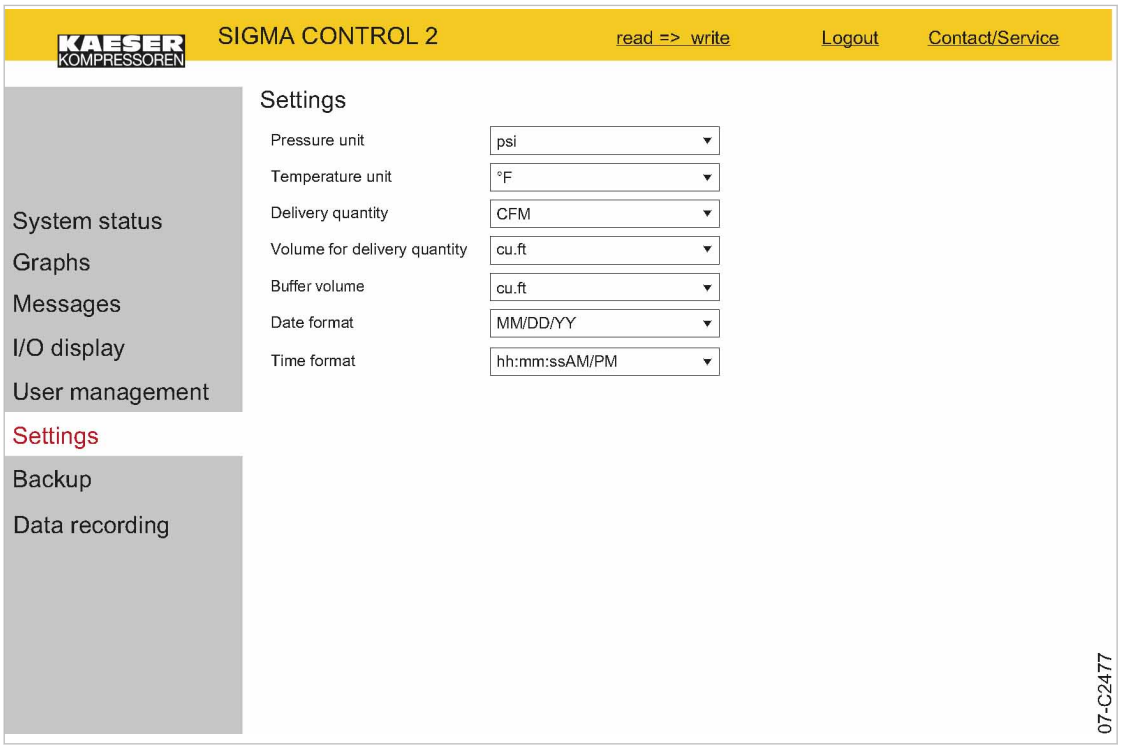


Fig. 27 *Settings*

Converting units to US values:

Precondition KAESER CONNECT for SIGMA CONTROL 2 is displayed.

1. Select the *Settings* menu.
2. Click the arrow key for the unit of pressure.
   A selection list of units of pressure is displayed.
3. Select the desired unit.
4. Click the arrow key for the unit of temperature.
   A selection list of units of temperature is displayed.
5. Select the desired unit.
6. Set additional units and date and time formats.

8.3.8 Backup menu

The *Backup* menu allows you to download data from SIGMA CONTROL 2 to the Internet-capable device.

The following backup types are available:

- Backup all
- Log files
- Settings
- User information

Precondition KAESER CONNECT for SIGMA CONTROL 2 is displayed.

1. Click the *Backup* menu element.

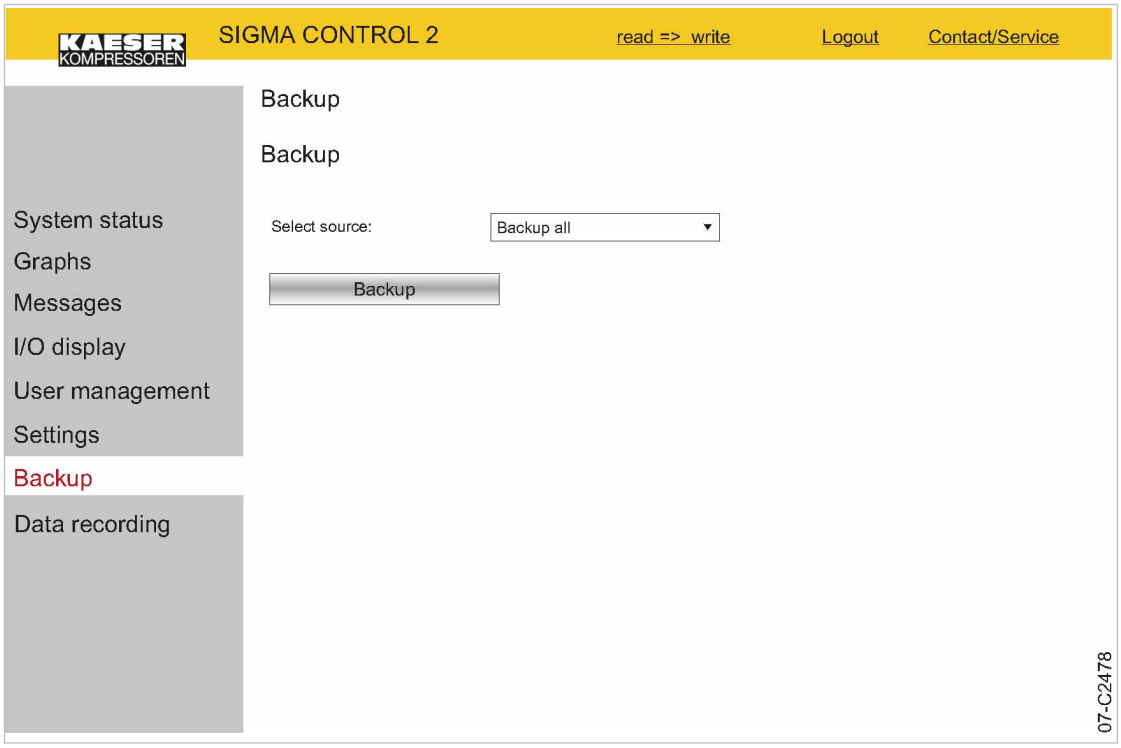


Fig. 28 *Backup* menu

2. Set the required backup type in the *Select source:* option.
3. Click Backup.

Result The data are downloaded to the Internet-capable device.

8.3.9 Data recording menu

The *Data recording* menu allows you to download machine data that has been recorded to the SD card from SIGMA CONTROL 2 to the Internet-capable device.

The following options are available:

- Hour file:
  Recorded machine data from the last 60 min
- Time period range:
  Recorded machine data between the time period of *Start time* and *End time*

Precondition KAESER CONNECT for SIGMA CONTROL 2 is displayed

An SD card with sufficient free memory has been inserted in the X5 SD card slot of SIGMA CONTROL 2 during the machine running time.

1. Click the *Data recording* menu element.

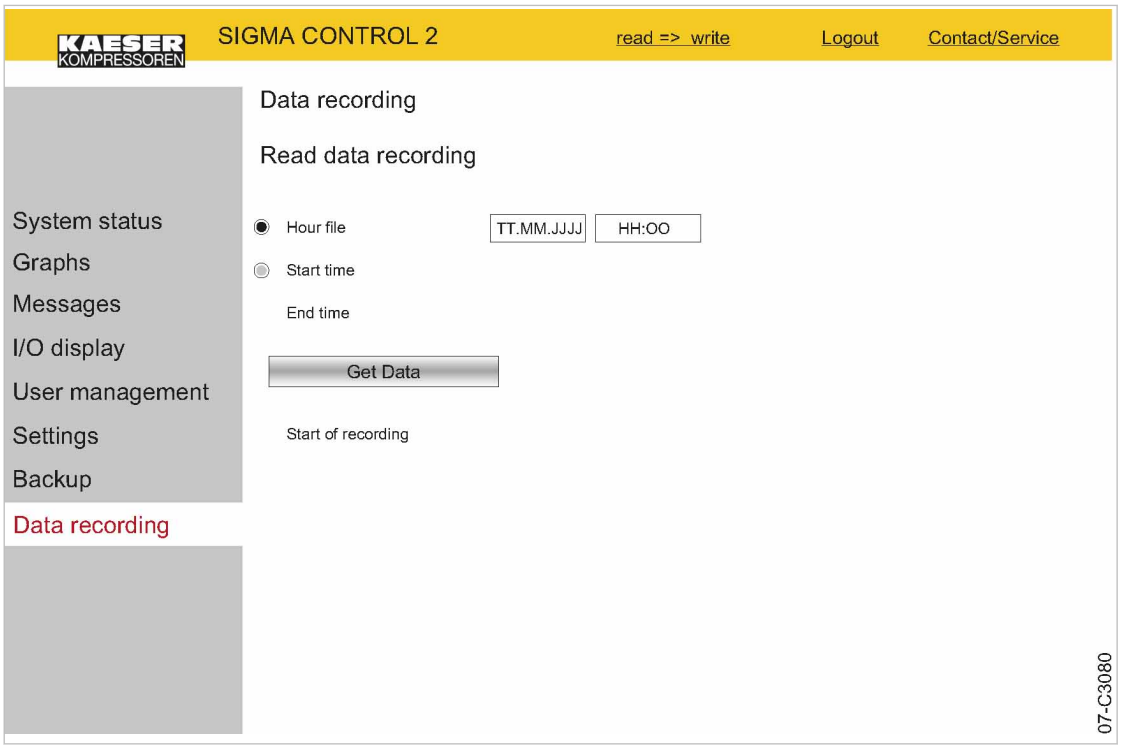


Fig. 29 *Data recording* menu

2. Select the *Hour file* or *Start time* option.
3. Set the requested time in the MM/DD/YY and HH:00 field.
4. Click Get Data.

Result The data is downloaded to the Internet-capable device.

The downloaded data can be sent to KAESER SERVICE for evaluation and service support.

8.3.10 Closing KAESER CONNECT

In order to close KAESER CONNECTfor SIGMA CONTROL 2, click Logout in the header.

➢ Click Logout.

The system displays a message confirming the successful logout.

8.4 Adjusting the pressure parameters of the machine

This chapter contains instructions on how to display and adjust the pressure parameters of the machine.

The chapter is divided into the following sections:

- 8.4.1: Displaying pressure parameters
- 8.4.2: Setting pressure parameters

"Display" means that the parameter will only be shown.

"Setting:" means that the parameter can also be changed.

Parameters	Explanation
pRV	Display: Actuating pressure of the safety relief valve on the oil separator tank.
pE [12)]	Pressure increase Setting: ■ pE SP: Switching point for pressure increase; upper safety limit for maximum machine pressure; in an external LOAD controller, this value is used to switch the machine from LOAD to IDLE [12)] in the event of a fault. ■ pE SD: Switching differential of pressure increase.
ΔpFC [12)]	Limiting value for machines with frequency-controlled drive (SFC). Setting: ■ ΔpFC: Limit of lowest flow rate. When the value [switching point system target pressure +*ΔpFC*] is exceeded, the compressor switches from LOAD to IDLE.
Nominal pressure	Display: The compressor is designed for this pressure (maximum network nominal pressure).
Setpoint pressure	Setpoint pressure can be regulated to 2 values: pA and pB. Setting: ■ Switching point *pA* or control pressure *pA* in machines with frequency converter (SFC). ■ Switching point *pB* or control pressure *pB* in machines with frequency converter (SFC).
System pressure low	A warning message is displayed when the limit value for the network pressure is reached. Setting: ■ SD: Switching difference for *System pressure low* ↓: Switching point for *System pressure low* ■ Option: Configure the output signal. Warning message displayed or an additional output signal is sent, e.g., to a control center.

[12)] not for SXC

Parameters	Explanation
Cut-in pressure min	Display: For design reasons, pressure can only be built up above this value.

[12)] not for SXC

Tab. 53 Compressor pressure parameters

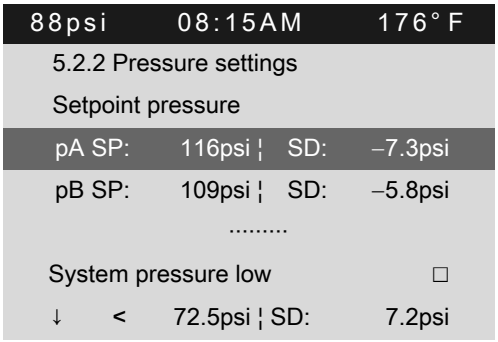
➢ Set the parameters according to the following specifications.

8.4.1 Displaying pressure parameters

Precondition Password access level 2 is activated.

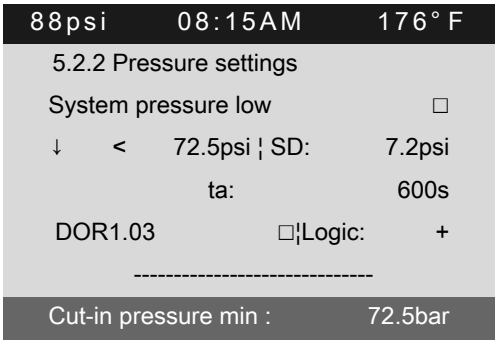
Open the menu for pressure parameters.

1. Open the 5.2.2 *<Configuration – Pressure control – Pressure settings>* menu.
2. Press «Enter».
   The *Pressure settings* menu is displayed.



Display further parameters

1. Use «Up» or «Down» to select the *Cut-in pressure min* line.



2. Select further parameters with the «Up» and «Down» keys.

8.4.2 Setting pressure parameters

8.4.2.1 Setting the system setpoint pressure: pA and pB

The pressure parameters can only be set within certain limits:

Rated machine pressure ≥ SP: pA /pB ≥ Min. cut-in pressure* + switching differential

Tab. 54 Setting limits for the network nominal pressure (* Cut-in pressure min)

The machine switches to LOAD under the following condition:

System pressure ≤ SP: pA /pB + switching differential

Tab. 55 Pressure condition for LOAD

The machine switches to IDLE under the following conditions [12]:

System pressure = System setpoint pressure [2]

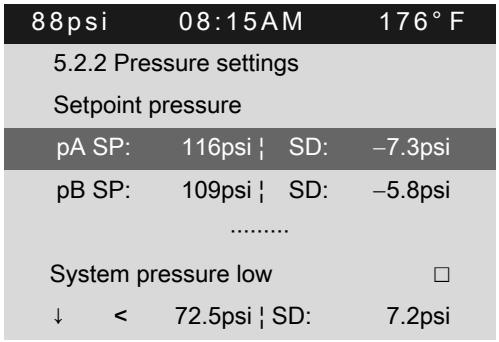
Tab. 56 Pressure conditions for IDLE [12]

[2] For machines with frequency converter (SFC): System pressure = System setpoint pressure + ΔpFC

[12] Not for SXC

Precondition Password access level 2 is activated.

1. Open the 5.2.2 *<Configuration – Pressure control – Pressure settings>* menu.
2. Use «Up» or «Down» to select the *pASP* line.



3. Press «Enter».
   The setting mode is active.
4. Use «Up» or «Down» to set the *pA SP* value.
5. Press «Enter».
   The setting is applied.
6. Set the *SD* switching differential in the same manner.
7. If necessary, adjust the value for the *pB SP* and the *SD* switching differential in the same way.
8. Press «Escape» repeatedly to return to the main menu.

Result The parameters for the system setpoint pressure *pA* and *pB* are set.

8.4.2.2 Setting the SD switching differential of the pressure increase

The pressure increase *pE SP* primarily serves as a safety limit value for when the machine is externally controlled. When the system setpoint pressure reaches the value *pE SP* (for example, when the external control does not function correctly) the machine switches to IDLE (not for SXC). The warning message *External load signal?* is displayed.

The parameter for *pE SP* pressure increase is preset and cannot be changed. You can, however, adjust the *SD* switching differential (not for SXC).

Displaying and adjusting the pressure increase parameters:

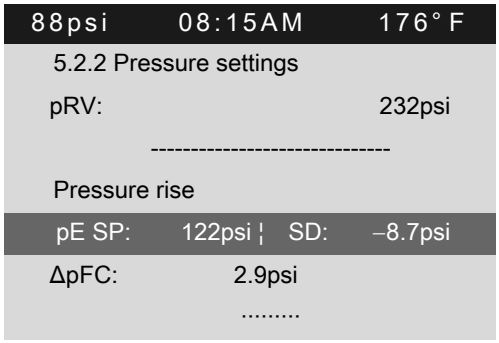
Pressure increase	Display parameters	Setting parameters
Switching point *pE SP*	x	–
Switching differential *SD*	x	x

x ≙ fitted, – ≙ not fitted

Tab. 57 Displaying and setting parameters

Precondition Password access level 2 is activated.

1. Open the 5.2.2 *<Configuration – Pressure control – Pressure settings>* menu.
2. Use «Up» or «Down» to select the *pE SP* line.



3. Press «Enter».
   The setting mode is active.
4. Use «UP» or «DOWN» to set the required value for *SD*.
5. Press «Enter».
   The setting is applied.
6. Press «Escape» repeatedly to return to the main menu.

8.4.2.3 Setting "System pressure low" parameters

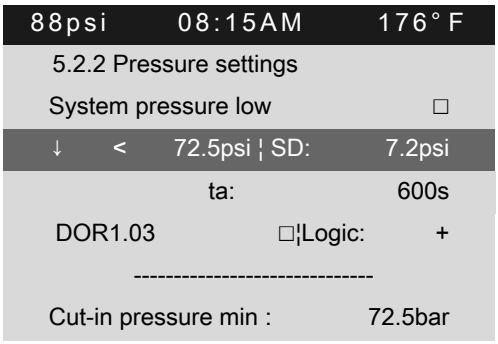
When the system pressure drops to the value *System pressure low*, SIGMA CONTROL 2 displays a warning message for insufficient system pressure.
The switching differential influences the pressure level at which the message can be acknowledged or the optionally activated output can switch again:

Message	Output
72.5 psi Message appears	Active
80.0 psi Message disappears	Inactive

Tab. 58 Example: activated output

Precondition Password access level 2 is activated.

1. Open the 5.2.2 *<Configuration – Pressure control – Pressure settings>* menu.
2. Use «Up» or «Down» to select the ↓ < line.



Header
Menu
Current system pressure low point

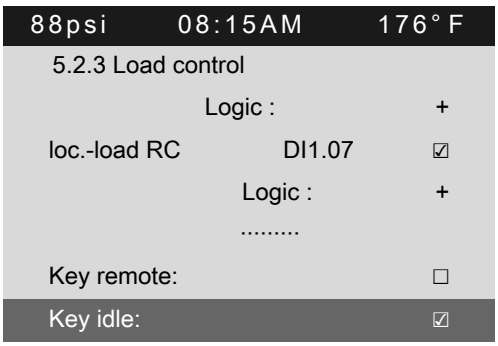
3. Press «Enter».
   The setting mode is active.
4. Use «Up» or «Down» to set the value for *System pressure low*.
5. Press «Enter».
   The setting is applied.
6. If necessary, adjust the value for the *SD* switching differential in the same way.
7. Press «Escape» repeatedly to return to the main menu.

8.4.3 Activating/deactivating the «LOAD/IDLE» key

In order to prevent unauthorized users from switching the machine to IDLE (not for SXC), you can deactivate the «LOAD/IDLE» key on the SIGMA CONTROL 2 control panel.

Precondition Password access level 2 is activated.

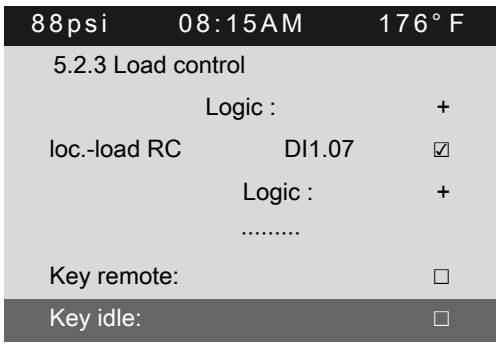
1. Open the 5.2.3 *<Configuration – Pressure control – Load control>* menu.
2. Use «Up» or «Down» to select the *Key idle* line.
3. Press «Enter».
   The check box *Key idle* will flash.



Header
Menu
Active line with activated check box

4. Press «Up» key.
   The check box is deactivated.

5. Press «Enter».
   The «IDLE» key is deactivated.



Header
Menu
Active line with deactivated check box

6. Press «Escape» repeatedly to return to the main menu.

Result It is ensured that unauthorized users can press the «IDLE» key without the machine switching to IDLE.

8.5 Configuring machine start and stop

➢ In addition to manually starting the machine locally, you have the following alternatives:

Function	State on delivery, setting	See
Automatic start/stop in timer mode	No clock (time) program set	8.5.1
Holidays	Not set	8.5.2
Remote start, e.g. from a control center	Deactivated	8.5.3
"Venting" function	Activated	8.5.5
"Autostart" function	Activated	8.5.6

Tab. 59 Configuring machine start and stop

8.5.1 Automatic start/stop in Timer mode

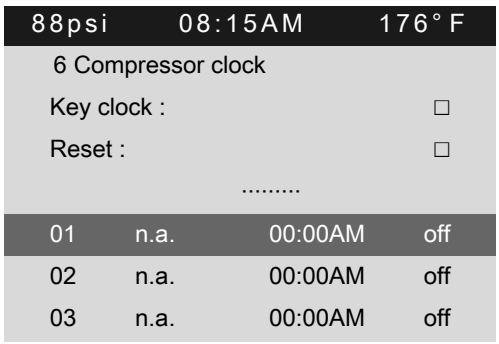
Overview

- Open the *Compressor clock* menu
- Setting/adjusting the time program
- Activating the «Timer» key
- Activating timer control

8.5.1.1 Compressor clock

Precondition Password access level 2 is activated.

1. Open the 6 *Compressor clock* menu.
   The *Compressor clock* menu is displayed.



User-defined clock program:

No.:	Day	Time	Function
01			
02			
03			
04			
05			
06			
07			
08			
09			
10			

Tab. 60 User-defined clock program machine ON/OFF

8.5.1.2 Setting/adjusting the clock program (example)

When setting a clock program for the first time, note first the switching times on the "User-defined clock program" table.

In addition to individual weekdays, the controller has the following cycles:

- Mon-Thu
- Mon-Fri
- Mon-Sat
- Mon-Sun
- Sat-Thu

You can also program an OFF time (plant vacation shut-down, for example) (see Section 8.5.2).

Example

- Machine ON: On weekdays 06:30AM – 05:00PM, Fridays 06:30AM – 03:00PM
- Machine OFF: Sat – Sun and during midday break 12:00PM – 01:00PM

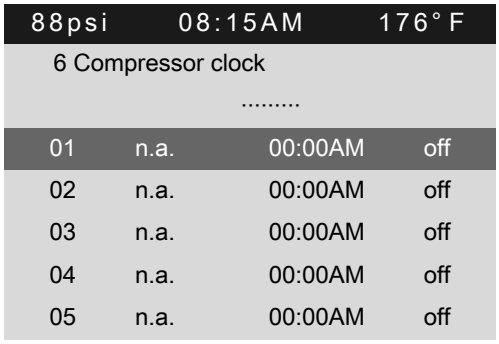
The following switching points result:

No.:	Day	Time	Function
01	Mon-Fri	06:30AM	on
02	Mon-Fri	12:00PM	off
03	Mon-Fri	01:00PM	on
04	Mon-Thu	05:00PM	off
05	Fri	03:00PM	off

Tab. 61 Example of a machine ON/OFF clock program

Precondition Password access level 2 is activated.

1. Open the 6*Compressor clock* menu.
2. Use «Up» or «Down» to select the *01* line.



3. Press «Enter».
   The *n.a.* column flashes in the active line.
4. Use «Up» or «Down» to specify the settings for the weekdays.
5. Press «Enter» to accept the setting.
   The setting is applied.
6. Press the «Right» key.
7. Press «Enter».
   The display for hours, *00*:*00* flashes in the active line.
8. Use «Up» or «Down» to specify the settings for the hours.
9. Press the «Right»key.
10. The display for minutes, 00:*00* flashes.
11. Use «Up» or «Down» to specify the settings for the minutes.

12. Press the «Enter» key.
    The setting is applied.

88psi	08:15AM	176° F	
6 Compressor clock			
	.....		
01	Mon-Fri	06:30AM	on
02	Mon-Fri	12:00PM	off
03	Mon-Fri	01:00PM	on
04	Mon-Thu	05:00PM	off
05	Fri	03:00PM	off

Header
Menu
Switching point 01 is set
Switching point 02 is set
Switching point 03 is set
Switching point 04 is set
Switching point 05 is set

13. Press the «Right» arrow.
14. Press «Enter».
    The *on/off* indicator flashes.
15. Use «Up» or «Down» to set the Compressor On action.
16. Press «Enter».
    The setting is applied.
    The Compressor ON action is set for the first switching point.
17. Specify further switching points in the same manner.

Result Weekdays, time and the Compressor ON/Compressor OFF actions are set for all switching points of the user-defined clock program.

8.5.1.3 Activating the «Timer control» key

1. Use «Up» or «Down» to select the *Key clock* line.
2. Press «Enter».
   The check box *Key clock* flashes in the active line.

88psi	08:15AM	176° F	
6 Compressor clock			
Key clock			: ☑
Reset			: ☐
01	Mon-Fri	06:30AM	on
02	Mon-Fri	12:00PM	off
03	Mon-Fri	01:00PM	on

Header
Menu
Active line with activated check box
Switching point 01:
Switching point 02
Switching point 03

3. Press the «Up» key.
   The check box is activated.
4. Press «Enter».
   The setting is applied.
5. Press «Escape» repeatedly to return to the main menu.

Result The «Time control» key is activated.

8.5.1.4 Activating Timer control

Precondition The «Timer control» key is activated; see chapter 8.5.1.3.

➢ Press the «Timer control» key on the SIGMA CONTROL 2 operating panel to activate the timer control.

Result The *Timer control* LED on the operating panel of the SIGMA CONTROL 2 signalizes with *green continuous light* that the machine is operated with activated timer control.

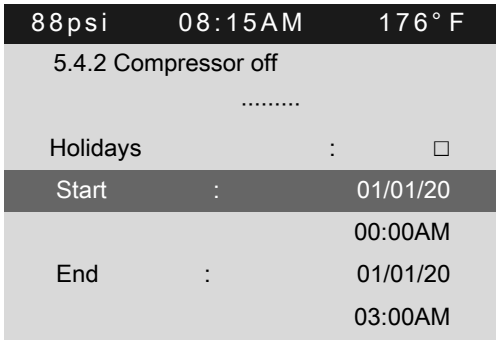
The Timer control of SIGMA CONTROL 2 switches the machine according to the defined switching points of the timer program.

8.5.2 Setting up the company shut-down

In addition to the fixed cycles of a timing program or timer, you can also specify a longer lasting standstill time. For example, you may specify a standstill period for vacation shutdown by defining the following:

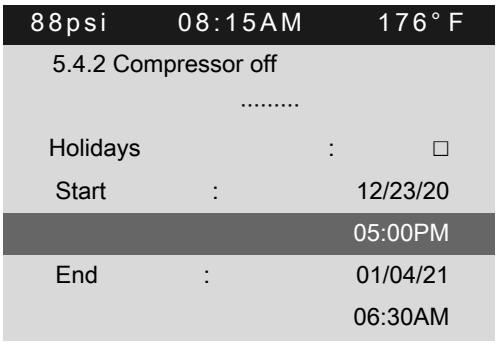
Precondition Password access level 2 is activated.

1. Select the 5.4.2 *<Configuration – Compressor start – Compressor off>* menu.
2. Use «Up» or «Down» to select the *Start* line.

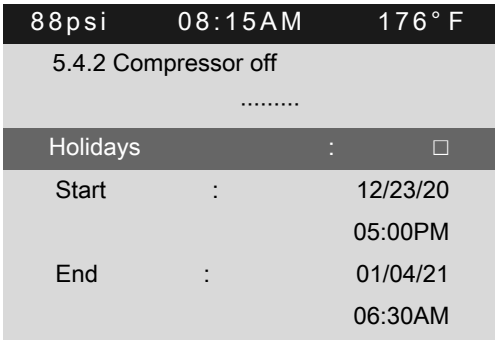


3. Press «Enter».
   The display for days *00.00.00* flashes.
4. Use «Up» or «Down» to set the day.
5. Press the «Right» key.
   The display for months *00.00.00* flashes.
6. Use «Up» or «Down» to set the month.
7. Press the «Right» key.
   The display for years *00.00.00* flashes.
8. Use «Up» or «Down» to set the years.
9. Press «Enter».
   The setting is applied.
10. Press «Down».
11. Press «Enter».
    The display for hours *00:00:00* flashes.
12. Use «Up» or «Down» to set the hours.
13. Press the «Right» key.
    The display for minutes *00.00.00* flashes.

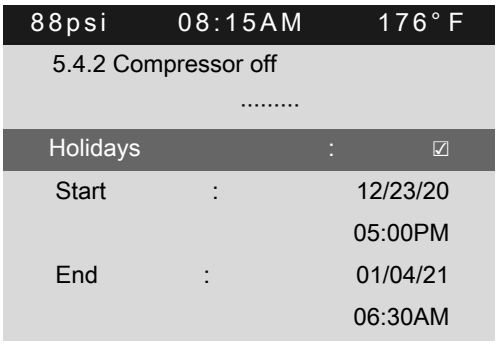
14. Use «Up» or «Down» to set the minutes.
15. Press «Enter».
    The date and time for the start of the company shut-down are set.
16. Adjust the date and time for the end of the company shut-down in the same manner.



17. Use «Up» or «Down» to select the *Holidays* line.



18. Press «Enter».
    The check box *Holidays* will flash.
19. Press «UP».
    The check box is activated.



20. Press «Enter».

Result In this example, a company shutdown (standstill time) for the time between 12/23/20 / 05:00PM until 01/04/21 / 06:30AM has been set for the machine.

8.5.3 Controlling the machine remotely (Remote ON/OFF)

If the machine is to be started and stopped from a remotely, the following steps have to be set:

Overview

- Making the electrical connection (a spare input for the remote contact is to be found in the electrical wiring diagram for the machine, DI 1.07 being preferred).
- Switching machine start to remote mode.
- Activating the «remote control» key.
- Activating the «Time control» key and configure the clock program (see chapter 8.5.1.2), if necessary.
- Assigning a different input for the remote contact *RC*, if required.
- Pressing the «Remote control» key.

8.5.3.1 Switching machine start to Remote mode

Two methods are available to start the machine remotely from a control center:

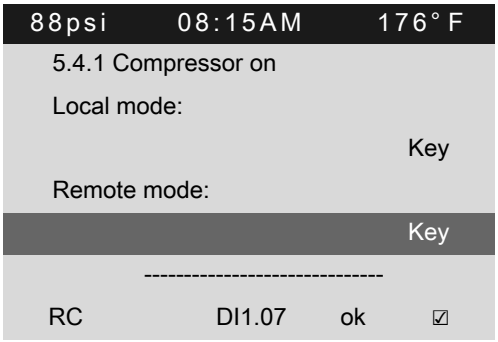
- Variant **A**: Starting the machine with the input signal from the remote control center.
- Variant **B**: Starting the machine from the remote control center in addition to a configured ON/OFF clock program.
  The machine can be started from the remote control center even though the timer control is activated and the ON/OFF program has selected OFF at this point in time.

Precondition The electrical connection has been made.

Password access level 2 is activated.

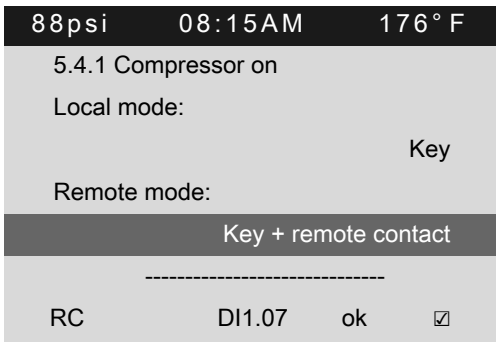
The operating mode is displayed.

1. Open the 5.4.1 *<Configuration – Compressor start – Compressor on>* menu.
2. Use «Up» or «Down» to select the *Remote mode* line.
3. Press the «DOWN» key.
4. Press «Enter».
   The currently active operating mode flashes.



5. Use «Up» or «Down» to set the *Key + remote contact* input.

6. Press «Enter».
   The setting is applied.



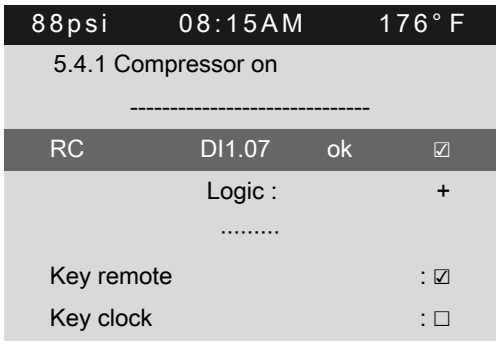
Header
Menu
Active line

Result The machine start is set to *Remote mode Key + remote contact*.

8.5.3.2 Assigning another input

Inputs already assigned cannot be further assigned.

1. Use «Up» or «Down» to select the *RC* line.



Header
Menu
Remote contact DI 1.07 (default)

2. Press «Enter».
   The display for the currently set input flashes.
3. Select another input with the «Up» or «Down» keys.
4. Press «Enter».
   The input has now been assigned.
5. Press the «Remote control» key to enable the machine to be started from the remote control center.

If an input is rejected it means it is already assigned.
➢ Select a different input.

8.5.4 Activating the remote control

➢ Activating remote control, see chapter 8.2.13.

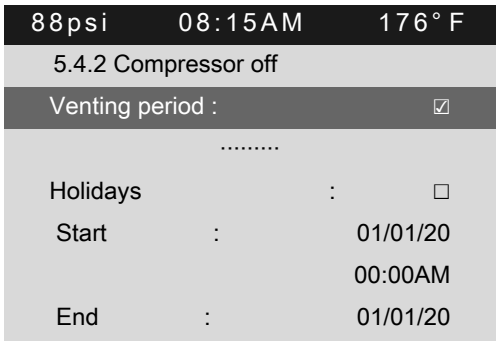
Result SIGMA CONTROL 2 remote control is activated.

8.5.5 Activating/deactivating the idle period “Venting period" function

Prior to the machine's transition from the operating points LOAD to READY you can also activate an IDLE phase (not with SXC) ("Venting period" function). The duration of the IDLING phase can be timed and/or regulated by internal pressure. The machine-dependent venting period between the LOAD and READY operating modes ensures load changes at minimum material stresses and is therefore activated at the factory (default setting). If this function is not required, you can deactivate it.

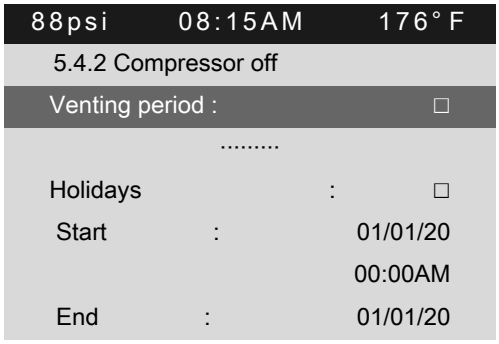
Precondition Password access level 2 is activated.

1. Select the 5.4.2 *<Configuration – Compressor start – Compressor off>* menu.
2. Use «Up» or «Down» to select the *Start* line.



Header
Menu
Factory setting: "Venting period" function activated

3. Press «Enter».
   The check box *Venting period* will flash.
4. Press «UP».
   The check box is deactivated.



Header
Menu
Active line with deactivated check box

5. Press «Enter».
   The setting is applied.

Apart from the discontinuation of the pressure or load requirement, venting of the machine is also executed when the «OFF» key is pressed.

Press the «OFF» key twice to immediately shut the machine off.

➢ Press the «OFF» key twice.

Result The machine is switched off without venting (IDLE time).

8.5.6 Activating/deactivating and adjusting the "Autostart" function

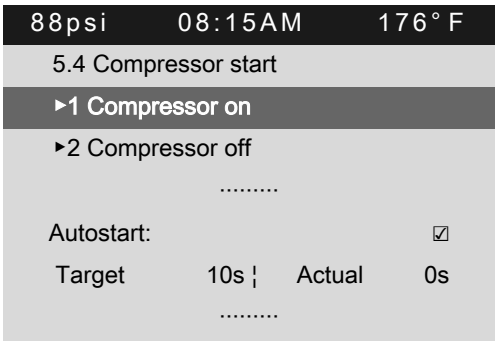
To avoid overloading the main power supply through several machines starting simultaneously a delay period determining the Autostart of each machine can be entered.

The *Autostart:* function is activated (default setting).

In machines with the existing option for electronic thermal management (ETM), a duration of 60 s for auto start is defined by default.
If a value for parameter *Autostart:* has been additionally set, it is added to the 60 s.

Precondition Password access level 2 is activated.

1. Select the 5.4 *<Configuration – Compressor start>* menu.
2. Press «Enter».
   The *Compressor start* menu is displayed.



Header
Menu
Active line
Autostart activated
Set/expiring delay time

Setting up the Autostart delay time

If you operate several machines, it is better to start them in sequence.

Use the "Delay time for Autostart" table to plan the time-delayed machine start. In the "Start period" column, enter for each individual machine the real time required for the first possible LOAD. Cumulatively add these values in the "Delay time" column. Enter the value of the delay time of each machine in the corresponding controller.

The first machine may start immediately and does not require a delay time.

Machine number	Start time [sec]	Delay time [sec]
1	—	—
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Machine number	Start time [sec]	Delay time [sec]
16		

Tab. 62 Autostart delay time

Precondition Password access level 2 is activated.

1. Select the 5.4 *Compressor start* menu.
2. Use «Up» or «Down» to select the *Target* line.

Header
Menu
Active line
Autostart activated
Set/expiring delay time

3. Press «Enter».
   The *Target* display flashes.
4. Use «Up» or «Down» to set the time delay in seconds.

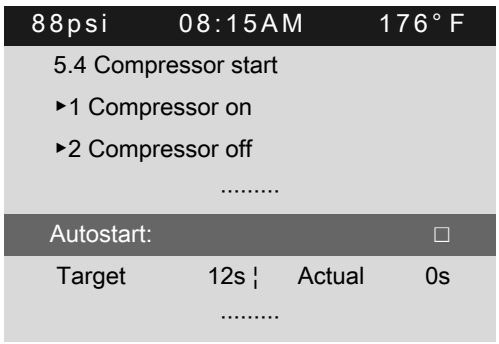
Header
Menu
Active line
Autostart activated

5. Press «Enter».
   The setting is applied.
6. Press «Escape» repeatedly to return to the main menu.

Result The delay time for an Autostart after a power failure has been adjusted from 10 s to 12 s.

Deactivate/activate the Autostart function

1. Use «Up» or «Down» to select the *Autostart:* line.



Header
Menu
Active line
Autostart deactivated
Set/expiring delay time

2. Press «Enter».
   The check box *Autostart:* will flash.
3. Press «Up» key.
   The check box *Autostart:* is deactivated.
4. Press «Enter».

The *Autostart:* function can be activated in the same manner.

   The setting is applied.
5. Press «Escape» repeatedly to return to the main menu.

Result Autostart after a power failure is deactivated.

8.6 Activating and adjusting the control modes

In type SXC compressors it is not possible to set the control modes since there is no IDLE operating point. All menus connected to it are then not available.

The controller is provided with various control modes that can bring about varying capacity utilization depending on machine application. Chapter 5.7 provides a comprehensive description of all control modes.

8.6.1 Setting a control mode

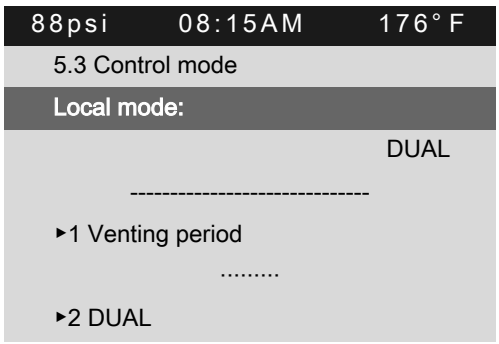
These control modes are possible:

- DUAL
- QUADRO
- VARIO
- DYNAMIC
- Continuous

- The standard setting of the control mode depends on the machine type.
- The machine-dependant venting phase between the LOAD and READY operating modes ensures load changes at minimum material stresses.

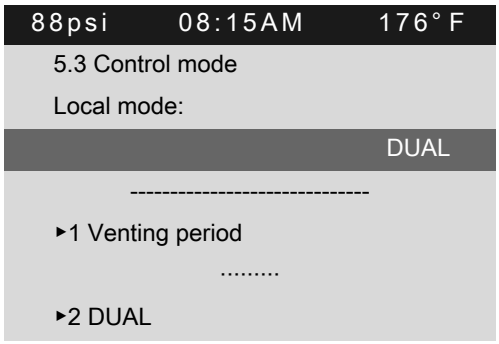
Precondition Password access level 2 is activated.

1. Select the 5.3 *<Configuration – Control mode>* menu.
2. Use «Up» or «Down» to select the *Local mode* line.



Header
Menu
Active line
Venting period menu

3. Press «Down».
   The currently set control mode is displayed.
4. Press «Enter».
   The currently active control mode flashes.



Header
Menu
Active line
Venting period menu

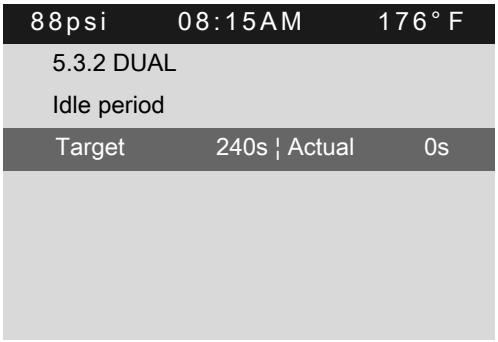
5. Use «Up» or «Down» to set the control mode.
6. Press «Enter».
   The setting is applied.
7. Press «Escape» repeatedly to return to the main menu.

8.6.2 Adjusting the idle time of DUAL control mode

The machine switches to the READY operating mode when the specified idle time has elapsed. The shorter the period, the more often the machine will switch from IDLE to READY.
SIGMA CONTROL 2 will take into account the maximum motor switching capacity.
Depending on the machine type, the compressor motor may not fall below a minimum idling or standstill time.

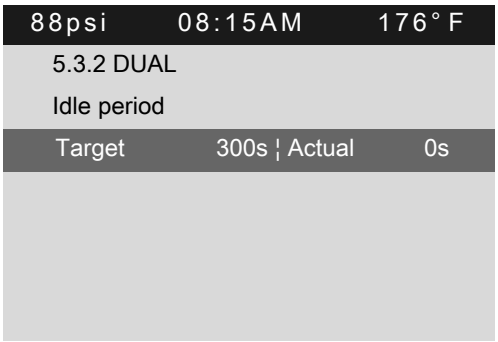
Precondition
Password access level 2 is activated.
The DUAL control mode is set.
The operating mode is displayed.

1. Select the 5.3.2 *<Configuration – Control mode – DUAL>* menu.



Header
Menu
Active line

2. Use «Up» or «Down» to select the *Target* line.



Header
Menu
Increased idle time (e.g. 300 s)

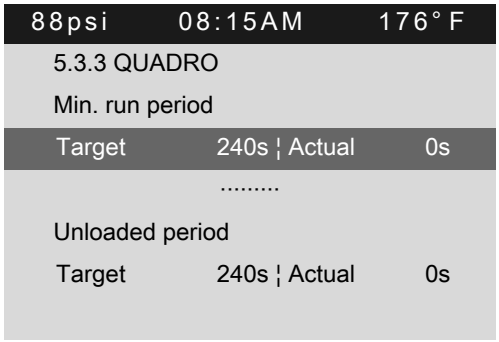
3. Press «Enter».
   The seconds display flashes.
4. Use «Up» or «Down» to set the seconds.
5. Press «Enter».
   The setting is applied.
6. Press «Escape» repeatedly to return to the main menu.

8.6.3 Adjusting the minimum running and unloaded period in the QUADRO control mode

When the minimum running period has elapsed, the machine switches from IDLE to READY. Depending on the setting of the unloaded period, the machine switches from IDLE to READY only after expiry of the set unloaded period or after expiry of the venting period.

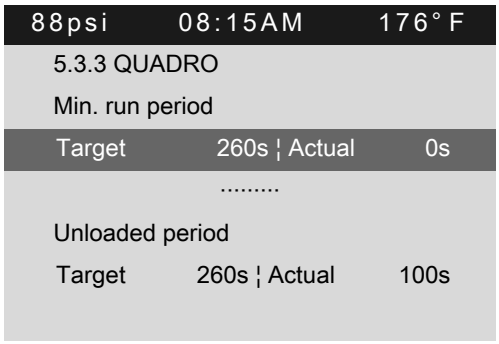
Precondition
Password access level 2 is activated.
The QUADRO control mode is set.

1. Select the 5.3.3 *<Configuration – Control mode – QUADRO>* menu.



Header
Menu
Set value for minimum run-time
Set value for unloaded period

2. Use the «Up» or «Down» keys to select the *Min. run period* line.
3. Press the «DOWN» key.
4. Press «Enter».
   The seconds display flashes.
5. Use «Up» or «Down» to set the seconds.



Header
Menu
Changed setpoint for minimum run-time
Changed setpoint for unloaded period

6. Press «Enter».
   The setting is applied.
7. If necessary, adjust the target value for the *Unloaded period* switching differential in the same way.
8. Press «Escape» repeatedly to return to the main menu.

Further information See chapter 5.7 for an overview of the control modes.

8.7 Electronic Thermal Management

The Electronic Thermal Management option is only available for specific machine models.

The design of the electronic thermal management (ETM) is determined by your machine's options.

Type	Electronic thermal management (ETM)
Machine type 1	Without heat recovery
Machine type 2	Heat recovery without electrically controlled valve
Machine type 3	Heat recovery with adjustable airend discharge temperature for the regulator of the electrically controlled heat recovery valve

Tab. 63 Machine type and ETM design

Note:

- The machine runs with increased airend discharge temperature when heat recover is set to active.
- An increased airend discharge temperature causes poorer efficiency of the compressed air generation.

1. Check whether your machine is fitted with electronic thermal management.
2. Check whether the setpoint value of the discharge temperature for the regulator of the electrically controlled heat recovery valve can be adjusted.
3. Activate the heat recovery only if you can use the machine's exhaust heat.
4. Deactivate the heat recovery if you cannot use the machine's exhaust heat.

8.7.1 Activating the heat recovery for machine type 2

The heat recovery can be set for local operation, as well as for remote operation. In remote operation, the heat recovery can be controlled by means of a load remote contact.

Example: Heat recovery for machines in "remote operation".

Precondition Password access level 2 is activated.

1. Select the 5.6 *<Configuration – ETM>* menu.
2. Use «Up» or «Down» to select the *Remote mode:* line.

88psi 08:15AM 176° F	
5.6 ETM	
Heat recovery	
Local mode:	
	inactive
Remote mode:	
	inactive
current	inactive

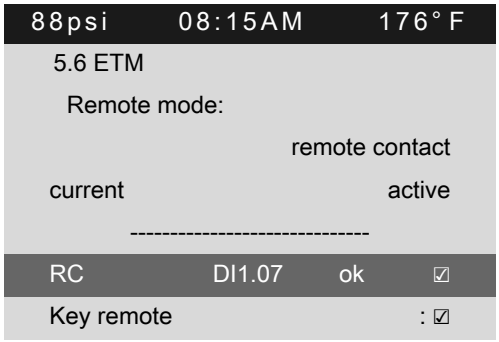
Header
Menu
Active line
Status of heat recovery

3. Press the «DOWN» key.
4. Press «Enter».
   The currently active operating mode flashes.
5. Use «Up» or «Down» key to set the *active* option.
6. Press «Enter».
   The setting is applied.

88psi 08:15AM 176° F	
5.6 ETM	
Heat recovery	
Local mode:	
	inactive
Remote mode:	
	active
current	active

Header
Menu
Active line
Status of heat recovery

7. If a load remote contact controls the remote control, set the *remote contact* option.



8. Subsequently, set the requested digital input *DI* in line *RC* and activate the corresponding check box.
9. Activate the «Remote control» key (see chapter 8.2.13).

Result The heat recovery system in "remote operation" has been activated.

The «Remote control» key is activated.

No other settings are required.

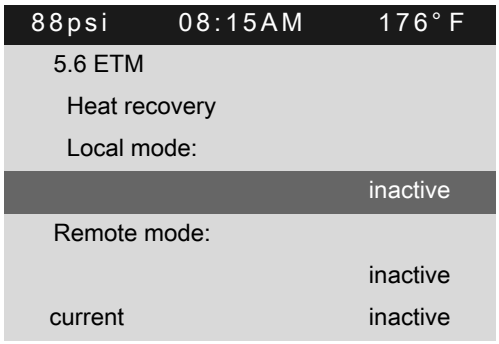
The current status for the heat recovery is displayed in the *current* line.

8.7.2 Activating the heat recovery for machine type 3

Example: Heat recovery with adjustable setpoint for the airend discharge temperature for the regulator of the electrically controlled heat recovery valve for machines in "local operation".

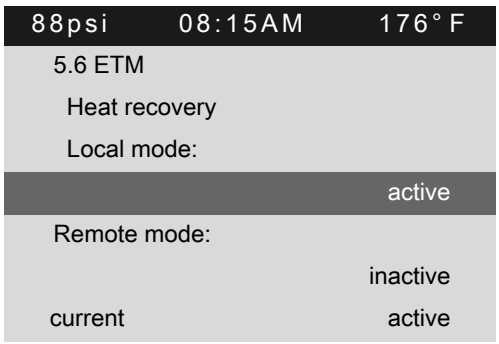
Precondition Password access level 2 is activated.

1. Select the 5.6 *<Configuration – ETM>* menu.
2. Use «Up» or «Down» to select the *Local mode:* line.



3. Press the «DOWN» key.
4. Press «Enter».
   The currently active operating mode flashes.
5. Use «Up» or «Down» key to set the *active* option.

6. Press «Enter».
   The setting is applied.



Header
Menu
Active line
Status of heat recovery

Result The heat recovery system has been activated.

Further information The setpoint value for the airend discharge temperature for the regulator of the electrically controlled heat recovery valve can be set manually; see chapter 8.7.2.1.

8.7.2.1 Setting the setpoint value for the airend discharge temperature

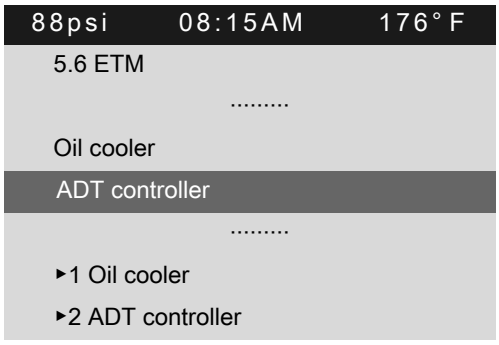
The airend discharge temperature and the water outlet temperature are related. To increase the value for the water outlet temperature, you must increase the setpoint value for the airend discharge temperature.

Maximum setting = 198 °F.

The specific value of the discharge temperature depends on the respective application for the heat recovery at the customer's site.

Precondition Password access level 2 is activated.

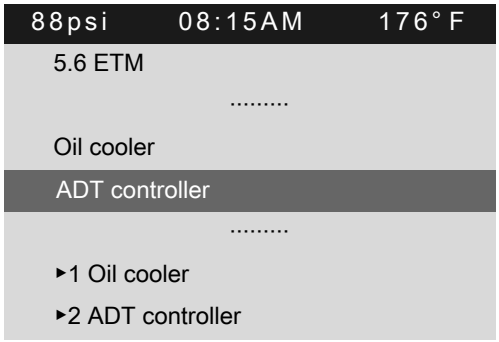
1. Select the 5.6 *<Configuration – ETM>* menu.
2. Use «Up» or «Down» to select the *ADT controller* line.



Header
Menu
Active line
Indication
Indication

3. Press «Enter».
   The setting mode is active.

4. Use «Up» or «Down» to set the setpoint for the *ADT controller*.



5. Press «Enter».
   The setting is applied.

Result The setpoint value of the airend discharge temperature for the regulator of the electrically controlled heat recovery valve is set.

8.7.3 Deactivating heat recovery

If the heat recovery is set to inactive, you have improved efficiency in compressed air generation.

➢ Set the heat recovery to "inactive" if you cannot use the machine's exhaust heat.

8.8 Refrigerated dryer

Overview:

- Setting the operating mode
- Output messages
- Procedure following a fault of the refrigerated dryer:
  - If the compressed air quality has priority:
    Contact an authorized KAESER service representative immediately
- Procedure following a fault of the refrigerated dryer:
  - If the compressed air supply has priority:
    Activate fault mode without refrigerated dryer

➢ It is mandatory to follow the procedures indicated according to the priorities established for the compressed air quality or compressed air supply!

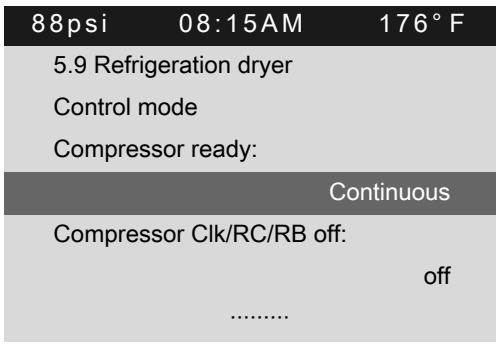
8.8.1 Setting the operating mode

For the refrigerated dryer, the operating modes CONTINUOUS or TIMER can be selected.
When TIMER mode is selected, the refrigerated dryer will be shut down via a timer if compressed air is not required.
With this control mode activated, the operating temperature in the refrigerated dryer will be kept within narrow limits via a cycling of the refrigeration circuit.

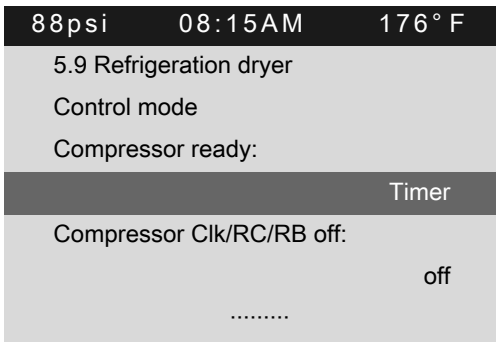
Precondition Password access level 2 is activated.

1. Open the menu 5.9 *<Configuration – Refrigeration dryer>*.

2. Using the «Up» or «Down» keys, select the line *Compressor ready:*.
3. Press the «Down» key.



4. Press the «Enter» key.
   The indicator flashes for the operating mode currently selected.
5. Using the «Up» or «Down» keys, set the operating mode *Timer*.



6. Press the «Enter» key.
   The setting is applied accordingly.
7. Press the «Escape» key repeatedly to exit the menu.

Result The operating mode CONTINUOUS has been switched to TIMER.

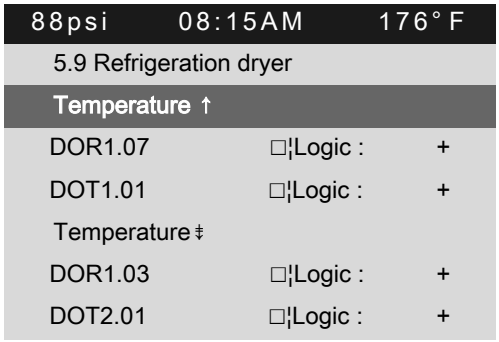
8.8.2 Output messages

If required, you can activate messages regarding the operating temperature of the refrigerated dryer as a binary signal.
You can assign to *DOR* or *DOT*.
If you have parametrized correctly, *ok* will be displayed.

Precondition Password access level 2 is activated.

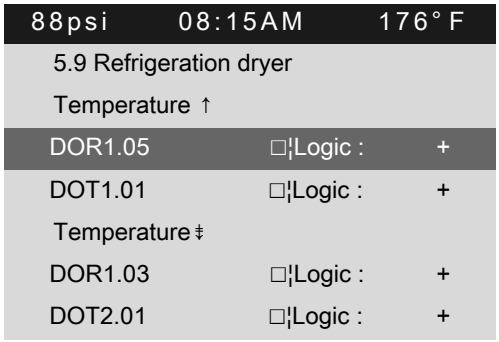
1. Open the menu 5.9 *<Configuration – Refrigeration dryer>*.

2. Using the «Up» or «Down» keys, select the line *Temperature*.



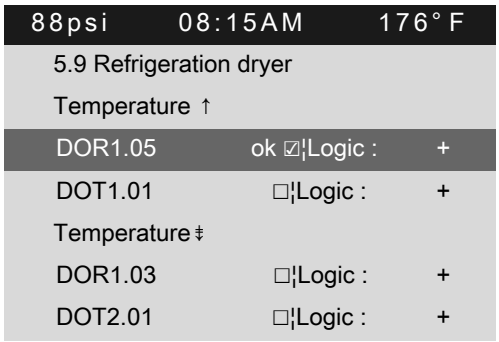
Header
Menu
Active line, temperature high

3. Press the «Down» key.
4. Press the «Enter» key.
   Setting mode is active.
5. Using the« Up» or «Down» keys, select a free input DOR.



Header
Menu
Temperature high
Active line, example: DOR selected
Temperature low

6. Press the «Enter» key.
   The setting is applied accordingly.
7. Press the «Right» key.
8. Press the «Enter» key.
   Setting mode is active.
9. Press the «UP» key.



Header
Menu
Temperature high
Active line
Temperature low

10. Press the «Enter» key.
    ok is displayed in the active line.
11. If required, set the *Temperature ≠* message in the same way.

Upon activation of the check box, *err* is displayed.

➢ The parametrization is incorrect.

➢ Deactivate the check box.

➢ Assign a different/free output.

8.8.3 Fault in the refrigerated – Compressed air quality has priority

In the event of a refrigeration dryer fault, the SIGMA CONTROL 2 shuts the machine down.
No compressed air will be delivered.
As compressed air quality (i.e. dried compressed air) is crucial, an authorized KAESER service representative must be contacted immediately.

The KAESER service representative resolves the fault and executes a reset.

Precondition The operator decides: Compressed air quality has priority over compressed air supply.

1. The machine remains shut down because the required compressed air quality can no longer be met.
2. Contact an authorized KAESER service representative immediately.

8.8.3.1 Fault mode without refrigerated dryer

NOTICE

Higher residual moisture in the compressed air!
Corrosion due to higher residual moisture in the compressed air.

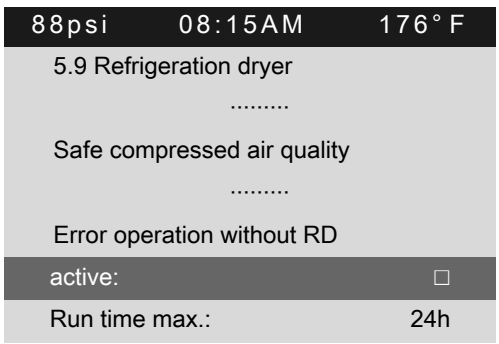
➢ *Carefully assess a "Fault mode without refrigerated dryer" in respect to the further use of the compressed air.*

In order to ensure continued compressed air supply for a defined period of time, the operator can activate the *Error operation without RD* function. In this case, the compressed air quality (dried compressed air) is compromised. The warning message *0069 Error operation without RD → Call service!* will be displayed. The warning message *0069* will remain active for the duration of operation in fault mode.

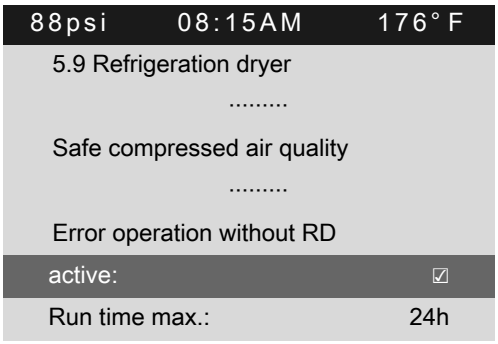
Precondition The operator decides that, for a limited period of time, the compressed air supply has priority over compressed air quality.

Password access level 2 is activated.

1. Open the menu 5.9 *<Configuration – Refrigeration dryer>*.
2. Using the «Up» or «Down» keys, select the line *Error operation without RD*.
3. Press the «Down» key.



4. Press the «Enter» key.
   The setting mode is active.
5. Press the «Up» key.
   The check box is activated.



6. Press the «Enter» key.
   The setting is applied accordingly.

Result The function “Fault mode without refrigerated dryer” is activated.
The machine supplies compressed air to connected consumers.
Due to the fault with the refrigerated dryer, the compressed air delivered in this mode contains a higher level of residual moisture.
Resolve the fault with the refrigerated dryer as soon as possible.

8.8.4 Refrigerated dryer fault – Compressed air supply has priority

NOTICE

Higher residual moisture in the compressed air!
Corrosion due to higher residual moisture in the compressed air.

➢ *Carefully assess a “Fault mode without refrigerated dryer” in respect to the further use of the compressed air.*

1. Contact an authorized KAESER service representative immediately.
2. The KAESER service representative resolves the fault and executes a reset.
   The machine is again ready to deliver high-quality, dried compressed air.

8.9 Setting the machine for local mode

In local mode, the machine is controlled with the nominal pressure *pA* or *pB*. The controller offers the following modes of operation:

Operating mode	Description	See chapter
pA	The machine is controlled by the nominal pressure *pA*	8.9.3.3
pB	The machine is controlled by the nominal pressure *pB*	
pA/pB Clock	The changeover between the nominal pressures *pA* and *pB* is regulated by a timer program	8.9.2

Operating mode	Description	See chapter
pA/pB Cycle	The changeover between the nominal pressures *pA* and *pB* is regulated by a programmed time pulse	8.9.3

Tab. 64 Operating modes in local operating mode (local mode)

➢ Set the nominal pressure as described in chapter 8.4.

Overview

- Open the *Configuration* menu
- Set the timing program (see chapter 8.9.2)
  or set the timer (see chapter 8.9.3)
- Setting local operating mode

8.9.1 Menu Load control

Precondition Access level 2 is activated.

1. Open the 5.2.3 *<Configuration – Pressure control – Load control>* menu.
   The *Load control* menu is displayed.

8.9.2 Setting the nominal pressure change via timing program

Note the setting sequence:

➢ First, set the timing program.

➢ Then select the operating mode.

Overview

- Deleting an existing timing program
- Entering the weekday for the first switching point
- Enter the time of the first switching point.
- Set the nominal pressure for the first switching point *pA* or *pB*
- Set up any further switching points.
- Select the operating mode *pA/pB Clock* : see chapter 8.9.3.3.

User-defined timer program

No.:	Day	Time	Nominal pressure
01			
02			
03			
04			
05			
06			
07			
08			
09			

No.:	Day	Time	Nominal pressure
10			

Tab. 65 User-defined timing program for nominal pressure change

When setting a clock programme for the first time, note first the switching times on the "User-defined clock program" table for example.

In addition to individual weekdays, the controller has the following cycles:

- Mon-Thu
- Mon-Fri
- Mon-Sat
- Mon-Sun
- Sat-Thu

Example

- Base load period: Weekdays from 06:30AM–05:00PM, Fridays 06:30AM–03:00PM
- Low load period: Midday from 12:00PM–01:00PM and remaining time

The timing program is established with the following switching points (maximum 10 switching points available):

No.:	Weekday	Time	Nominal pressure
01	Mon-Fri	06:30AM	*pA on*
02	Mon-Fri	12:00PM	*pB on*
03	Mon-Fri	01:00PM	*pA on*
04	Mon-Thu	05:00PM	*pB on*
05	Fri	03:00PM	*pB on*

Tab. 66 Example: Switching points, nominal pressure change

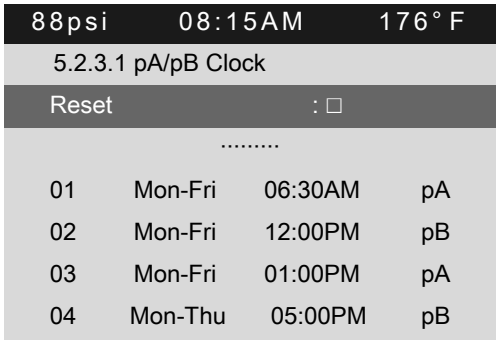
Deleting an existing timing program

Delete an existing timing program as follows:

Precondition Access level 2 is activated.

1. Open the 5.2.3 *<Configuration – Pressure control – Load control>* menu.
2. Use the «Up» or «Down» keys to select the *pA/pB Clock* line.
3. Press the «Enter» key.
   The *Timing program* menu is displayed.

4. Use the «Up» or «Down» keys to select the *Reset* line.

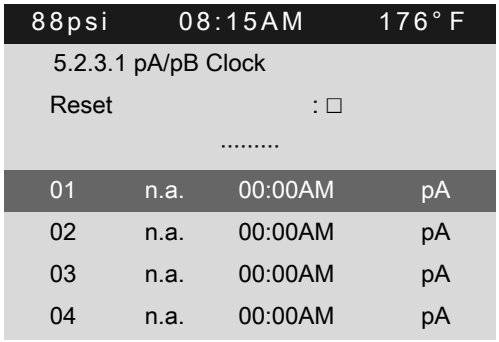


5. Press the «Enter» key.
   The check box *Reset:* will flash.
6. Press the «UP» key.
   The check box is activated.
7. Press the «Enter» key.
   The timing program is now deleted.

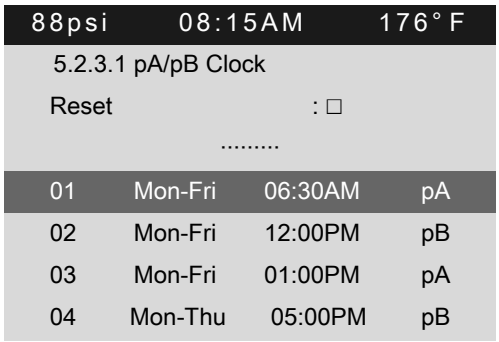
Setting the switching point

Precondition Access level 2 is activated.

1. Open the 5.2.3.1 *<Configuration – Pressure control – Load control – pA/pB Clock>* menu.
   The *Timing program* menu is displayed.



2. Press the «Enter» key.
   The display for the set operating mode flashes.



3. Use «Up» or «Down» to set the weekdays.

4. Press the «Enter» key.
   The setting is applied.
5. Press the «Right» key.
6. Press the «Enter» key.
   The display for hours, *00: 00* flashes.
7. Use «Up» or «Down» to set the hours.
8. Press the «Right» key.
9. The minutes display *00:* flashes.
10. Use «Up» or «Down» keys to set the minutes.
11. Press the «Enter» key.
    The setting is applied.
12. Press the «Right » key.
13. Press the «Enter» key.
    The *pApB* indicator flashes.
14. Adjust the setting with the «Up», «Down» *pA or pB* keys.
15. Press «Enter».
    The setting is applied.
16. Set the other switching points in the same manner.
    The timing program is now set.
17. Select the operating mode *pA/pB Clock*: see chapter 8.9.3.3.

8.9.3 Setting the nominal pressure change via timer

Overview

- Delete the old timer configuration, if necessary
- Set timer period *pA* and *pB*
- Set starting point for *pA* or *pB*
- Select the operating mode *pA/pB Cycle*: see chapter 8.9.3.3.

8.9.3.1 Set timer period pA and pB

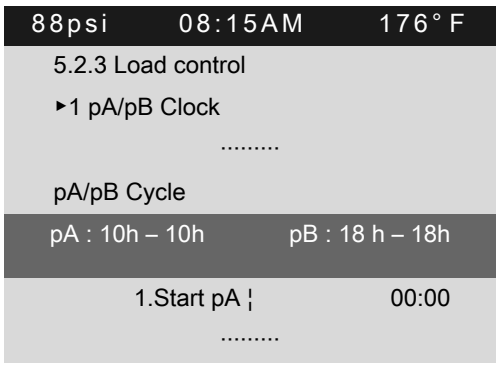
Observe and keep to the configuration sequence. The *pA/pB Cycle* operating mode must not be activated when configuring the timer period.

➢ First set the timer and then the operating mode, or set another operating mode beforehand.

Precondition Access level 2 is activated.

1. Open the 5.2.3 *<Configuration – Pressure control – Load control>* menu.
2. Use the «Up» or «Down» keys to select the *pA/pB Cycle* line.
3. Press the «Down» key.
   The *pA* line is displayed.
4. Press «Enter».
   The display for the cycle duration in hours, *00* flashes.
5. Use «Up» or «Down» to set the hours.

6. Press the «Enter» key.
   The setting is applied.

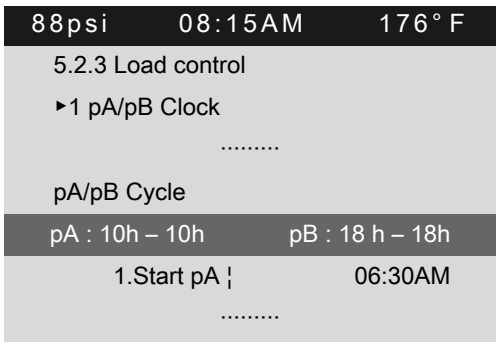


Header
Menu
Active line, manually set setpoint value – automatically elapsing value (example)

7. Press the «Right» key.
8. Set the cycle duration for *pB* in the same way.
9. Press «Enter».
   The cycle duration for the nominal pressure *pA* and *pB* is set.

8.9.3.2 Set starting time for pA or pB

1. Use the «Up» or «Down» keys to select the *1.Start pA* line.
2. Press the «Right» key.
3. Press the «Enter» key.
   The display for hours, *00: 00* flashes.



Header
Menu
Active line, starting time

4. Use «Up» or «Down» to set the hours.
5. Press the «Right» key.
   The minutes display, *00 :* flashes.
6. Use «Up» or «Down» keys to set the minutes.
7. Press the «Enter» key.

Result The starting time for *pA* is set.

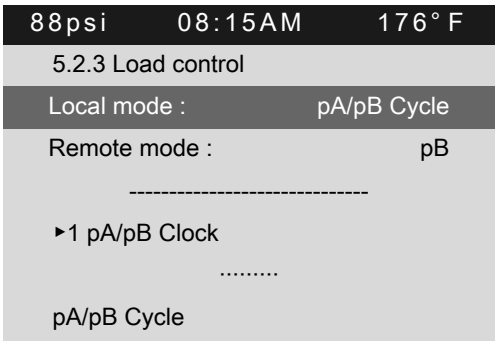
The cycle is set to start with *pB*.

➢ Press the «Enter» key and adjust with «Up» *1.Start pB* key.

8.9.3.3 Setting local mode

Precondition Access level 2 is activated.
The timing program or timer is set up.

1. Open the 5.2.3 *<Configuration – Pressure control – Load control>* menu.
2. Use the «Up» or «Down» keys to select the *Local mode* line.
3. Press the «Enter» key.
   The display for the set operating mode flashes.



4. Press the «Up» or «Down» keys to set the desired operating mode (*pA*, *pB*, *pA/pB Clock*, *pA/pB Cycle*).
5. Press «Enter».
   The setting is applied.
6. Press «Escape» repeatedly to leave this menu.

Result The timer setting is completed.

8.10 Configuring the machine for master control

8.10.1 Overview of the different master operating modes

The controller offers several possibilities to work together with other controllers:

Method	Description	Section
Interconnected operation with SAM 4.0.	The operating mode settings on the SIGMA CONTROL 2 must be changed via a SIGMA NETWORK to enable control by a SIGMA AIR MANAGER 4.0.	8.10.2
Interconnected operation via PROFIBUS (only available with SIGMA CONTROL 2 - prepared for connection to control technology with optional communications module).	The controller (and therefore the machine) receives the instruction LOAD or IDLE [12)] via the PROFIBUS master (e.g. SIGMA AIR MANAGER). The system setpoint pressures pA and pB are irrelevant for activated LOAD/IDLE signals.	8.10.3
Interconnected operation of two compressors with SIGMA CONTROL 2 via Ethernet interface.	The two SIGMA CONTROL 2 controllers operate as master and slave. The slave receives the command to switch between the two system setpoint pressures pA and pB from the master.	8.10.4

[12)] not for SXC

Method	Description	Section
Interconnected operation via LOAD remote contact. Master control via a LOAD remote contact is another method of controlling the machine externally.	LOAD remote contact [12]: An input signal from a master controller switches the machine to LOAD or IDLE. The system setpoint pressure settings pA and pB have no relevance.	8.10.5
	Local/LOAD remote contact [12]: Using two inputs, a master controller (e.g. MVS 8000) switches the machine between LOAD/IDLE and local operation.	8.10.6
Setpoint pressure preselection.	pA/pB remote contact: An input contact provides the signal to switch from the system setpoint pressure pA to pB.	8.10.7
Master control of machines regulated by pressure switch.	On machines with the same FAD, SIGMA CONTROL 2 controls the pressure switch via a floating relay output.	8.10.8.1
	On machines supplying an unequal FAD, the pressure ranges are matched to each other.	8.10.8.2

[12] not for SXC

Tab. 67 Master control (interconnected operation) – overview

Further information Examples of timing programs for equal machine loading are given in section 8.10.9.

8.10.2 SAM 4.0 mode

You must modify the settings in SIGMA CONTROL 2 for the operation via SIGMA NETWORK using, for example, the KAESER SIGMA AIR MANAGER 4.0 (SAM 4.0).

Precondition SIGMA CONTROL 2 is connected to SAM 4.0 via SIGMA NETWORK and ready for operation (see the SAM 4.0 operating manual in the chapter “Installation”).

System pressure pB is set as the pressure for the “SAM 4.0 manual mode".

Password access level 2 is activated.

The remote control is activated (see chapter 8.2.13).

Setting the IP configuration

1. Open the 8.1.1 *<Communication – Ethernet/SIGMA NETWORK – IP configuration>* menu.

2. Use «Up» or «Down» to select the *IP address* line.

88psi 08:15AM 176° F	Header
8.1.1 IP configuration	Menu
IP address 169.254.100.103	Active line
Subnet mask 255.255.000.000	
Gateway 169.254.100.97	
DNS Server 1 169.254.100.97	
DNS Server 2 169.254.100.97	
Restart network ☐	

3. Set the IP address for SIGMA CONTROL 2 using the following pattern:
   169.254.100.(SAM 4.0 machine number +102)
   (for the setting see chapter 8.2.14).

Setting the SAM 4.0 mode

The IP address for SAM 4.0 has been set on SIGMA CONTROL 2 at the factory: 169.254.100.100 and **must not** be changed. The same applies to Port 2000.

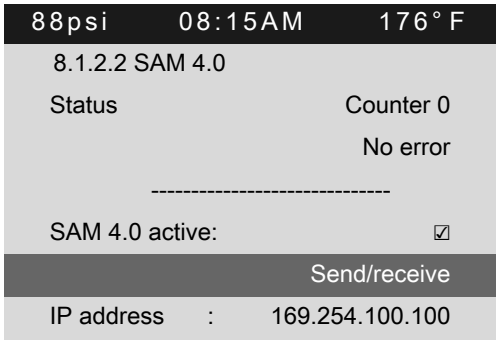
1. Open the 8.1.2.2 *<Communication – Ethernet/SIGMA NETWORK – Connections – SAM 4.0>* menu.
2. Use «Up» or «Down» to select the *SAM 4.0 active:* line.

88psi 08:15AM 176° F	Header
8.1.2.2 SAM 4.0	Menu
Status Counter 0	
No error	

SAM 4.0 active: ☑	Active line
Send	
IP address : 169.254.100.100	

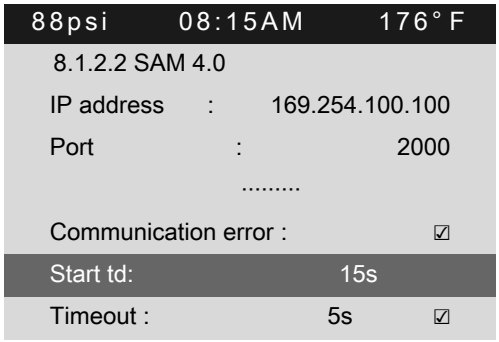
3. Press «Enter»to switch into setting mode.
   The *SAM 4.0 active:* check box flashes.
4. Press the «UP»key.
   The check box is activated.
5. Press «Enter»to accept the setting.
   The setting is applied.
6. Press the «DOWN» key.
7. Press «Enter»to switch into setting mode.
   The currently active operating mode flashes.

8. Use «Up» or «Down» to set the *Send/receive* value.



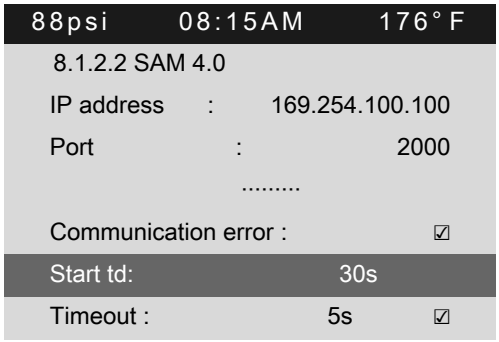
Header
Menu
Active line

9. Press «Enter» to accept the setting.
   The setting is applied.
10. Use «Up» or «Down» to select the *Starttd* line.



Header
Menu
Active line

11. Press «Enter»to switch into setting mode.
    The setting mode is active.
12. Use «Up» or «Down» to set the *Start td* value to 30 s.



Header
Menu
Active line

13. Press «Enter» to accept the setting.
    The setting is applied.

Result SIGMA CONTROL 2 communicates with SAM 4.0 via SIGMA NETWORK.

The communication is working smoothly when neither SIGMA CONTROL 2 nor SAM 4.0 report any communication fault.

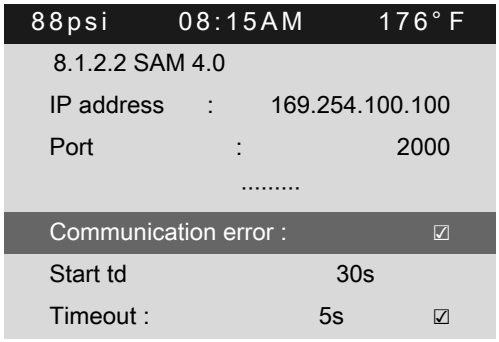
8.10.2.1 Reaction in the event of a communication malfunction

After switching on the power supply, monitoring for communication malfunctions is suppressed for a period of time which can be defined by means of the *Start td* parameter. The setting depends on the time passing at the bus master between return of power and start of communication via the bus.

For the communication with SAM 4.0, the value of Start td must be set to 30 s.

SIGMA CONTROL 2 can monitor the bus communication at user level. For this purpose, the bus master reads a value ("toggle bit") that changes with every bus cycle and returns it without change. SIGMA CONTROL 2 returns a communication malfunction if the value does not change for a time longer than set (*Timeout*).

Monitoring for communication malfunction can be **activated** if needed. For this purpose, the *Send/receive* option must be set for the data exchange. Activate the *Communication error* check box to enable monitoring for communication malfunctions.



Settings for connection to SAM 4.0.

Parameters	Factory setting	Set value
Check box Communication error	Check box ☑ activated [1)]	
Start td	30 s	
Timeout	5 s	
Check box Timeout	Check box ☑ activated	

[1)] Prerequisite: The *Send/receive* option has been set.

Tab. 68 Parameters for monitoring for communication malfunction

8.10.3 Configuring PROFIBUS mode (SIGMA AIR MANAGER)

Only possible with SIGMA CONTROL 2 (prepared for connection to control center)

Overview:

- PROFIBUS DP-V0 Retrofit Kit required
- Establishing the electrical connection
- Setting the remote operating mode *pB*.
- Setting the PROFIBUS interface
- Activating the «Remote control» key

Precondition Retrofit kit PROFIBUS required

Establishing the electrical connection

Pin	Assignment
1	Spare
2	Spare
3	PROFIBUS connection B
4	TTL signal RTS
5	Ground
6	+5 V for bus terminal
7	Spare
8	PROFIBUS connection A
9	Spare

Tab. 69 Pin assignment of SUB-D 9-pole interface on the PROFIBUS module

Interface plug wiring

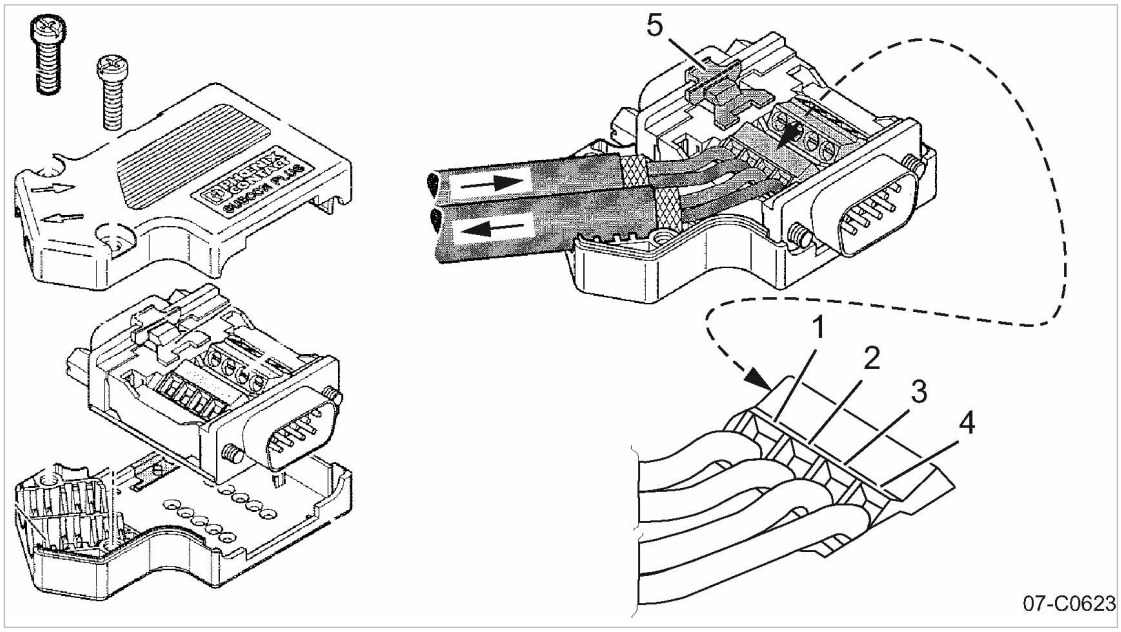


Fig. 30 PROFIBUS plug wiring

[1] Terminal 1A
[2] Terminal 1B
[3] Terminal 2A
[4] Terminal 2B
[5] Slide switch, terminating resistor

Electrical diagram example with SIGMA AIR MANAGER (extract)

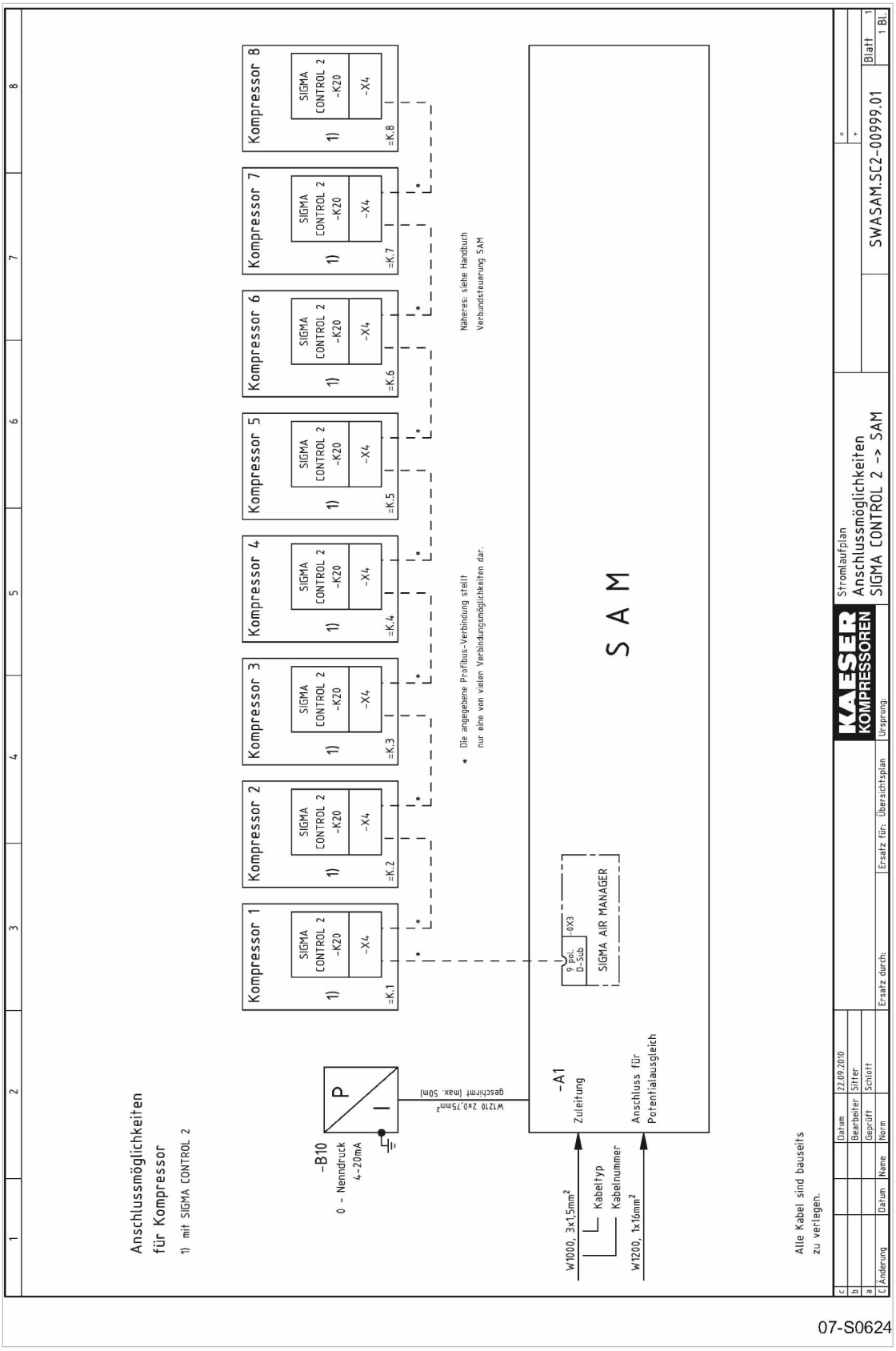


Fig. 31 Electrical diagram example with SIGMA AIR MANAGER

1. Connect the bus devices one after the other according to the pin assignment below.
2. Place the shield onto the plug housings at both ends.
3. Set the terminating resistor in the connector to ON for the first and last devices of the PROFIBUS connection.

Result The terminals for the remaining bus conduit (2A/2B) are switched off.

8.10.3.1 Inserting the communication module

The SIGMA CONTROL 2 communication interface is sealed with a plastic cover when shipped from the factory. Before you can insert the communication module in the X4 interface, you must remove the plastic cover from the SIGMA CONTROL 2 . The designation of the interfaces is provided on the rear of the SIGMA CONTROL 2.

Material Small screwdriver

Torx screwdriver, size 9

Precondition The machine is disconnected from the power supply.

The absence of voltage has been verified.

➢ Work with caution.

Removing the plastic cover.

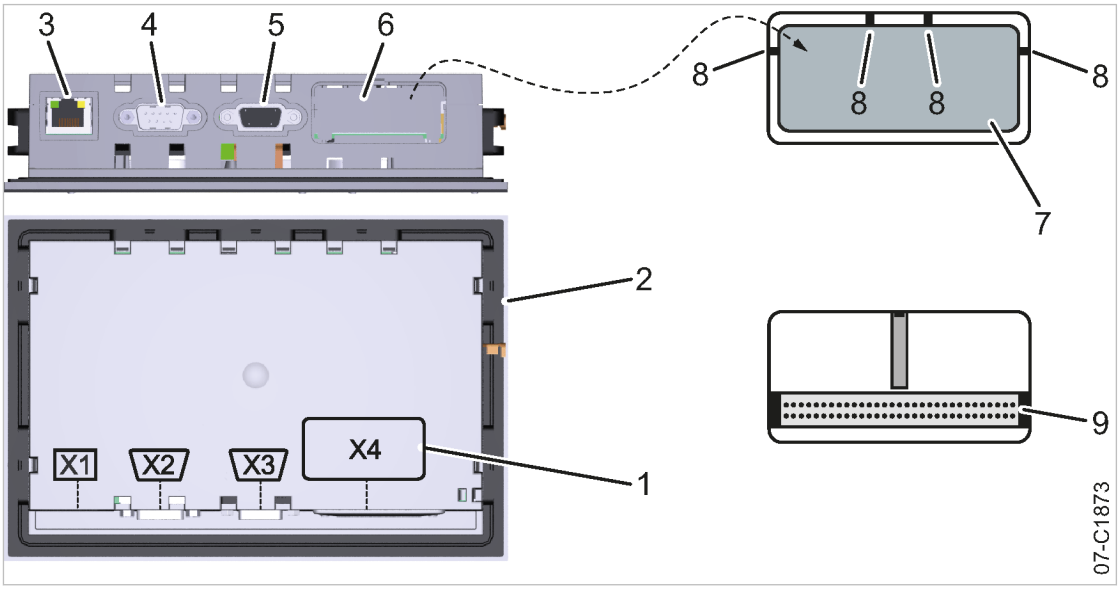


Fig. 32 Communication interface

1	Designation of the interfaces	6	Communication interface X4 (customer interface)
2	Rear side of the SIGMA CONTROL 2 controller	7	Plastic cover
3	Ethernet interface X1	8	Fin
4	IO BUS X2	9	Communication interface X4 without plastic cover
5	RS485–FC (USS interface) X3		

1. Place the screwdriver next to the fin.
2. Insert the tip into the slot between the plastic cover and the enclosure of the SIGMA CONTROL 2.
3. Press the screwdriver down until the fin breaks.

4. Break the other fins in the same manner.
5. Remove the plastic cover [7].

Inserting and fixing the communication module

Align the communications module as shown in Figure 33.

Precondition The plastic cover is removed.

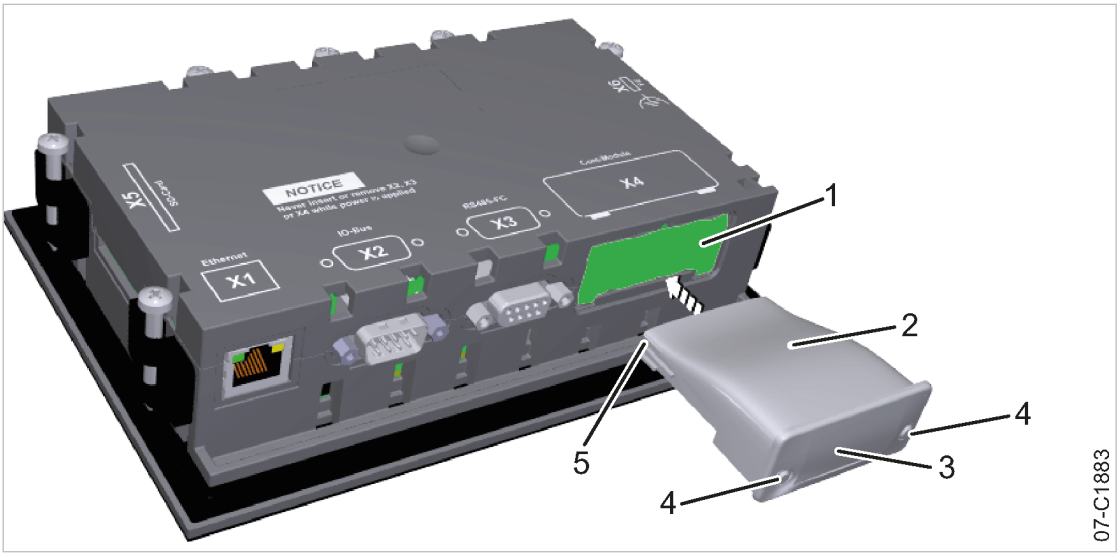


Fig. 33 Insert the communication module.

[1] Bay, interface X4
[2] Communications module
[3] Front plate
[4] Fastening screws
[5] Cable connector, communication module

1. Align the communication module [2].
2. Insert the communication module into the bay of interface X4 [1] until it latches (see Fig. 33).
   The module is correctly installed when its front plate [3] sits tightly in the recess of shaft interface X4 [1].
3. Use the Torx T9 screwdriver to screw in the fastening screws [4] to hand tightness.

8.10.3.2 Activating operation via PROFIBUS

Overview:

- Set the slave number
- Set reaction for a communication malfunction.
- Activate the communications module
- Activate the remote mode

Precondition The communication module is plugged and screwed into the X4 interface.
The bus is wired to the bus master.
The machine's voltage supply is activated.
The machine is parametrised as a slave in the bus master.
The bus master is operational.

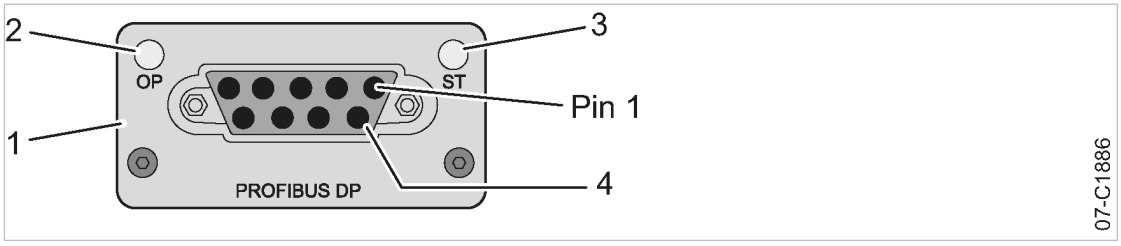


Fig. 34 Front plate communication module PROFIBUS

[1] Communication module PROFIBUS
[2] Operation *LED*
[3] Status *LED*
[4] PROFIBUS-Interface

➢ Proceed as shown.

Activate the communications module

1. Open the 8.2 *<Communication – Com-Module>* menu.
   The *Com-Module* menu is displayed
2. Use «Up» or «Down» to select the *Com-Moduleactive* line.
3. Press «Enter».
   The *Com-Module active* check box flashes.

88psi 08:15AM 176° F		Header
8.2 Com-Module		Menu
Status	Counter 1	
Com-Module deactivated		

Type	None	
	Send/receive	
Com-Module active	: ☐	Active line

4. Press the «Up» key.
   The check box is activated.
5. Press «Enter».
   The communication module is activated.

88psi 08:15AM 176° F		Header
8.2 Com-Module		Menu
Status	Counter 1	
Com-Module deactivated		

Type	PROFIBUS	
	Send/receive	
Com-Module active	: ☑	Active line

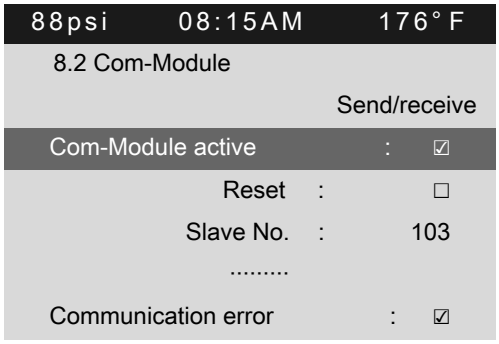
6. Press «Escape» repeatedly to leave this menu.

Set the slave number

You must set the slave address for the communication with the SIGMA AIR MANAGER.
When connected to a SIGMA AIR MANAGER, the slave address is determined as follows:
Compressor number used at SIGMA AIR MANAGER +102.

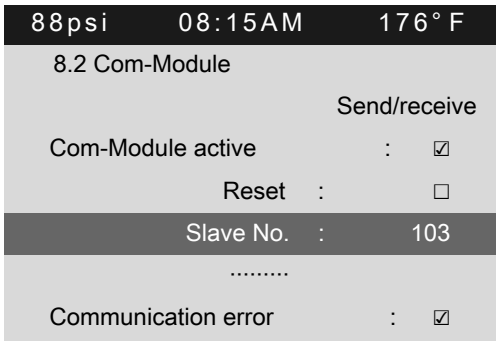
Precondition Access level 2 is activated.

1. Open the 8.2 *<Communication – Com-Module>* menu.
   The *Com-Module* menu is displayed



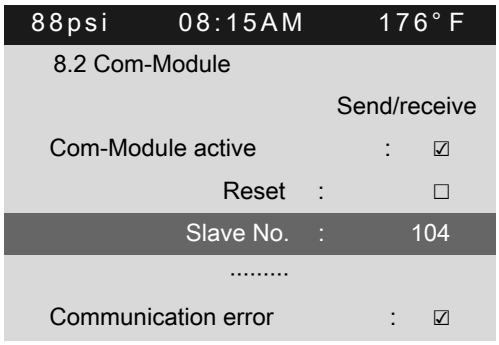
Header
Menu
Active line

2. Use «Up» or «Down» to select the *SlaveNo.* line.



Header
Menu
Active line

3. Press «Enter».
   The display for the slave address flashes.
4. Use «Up» or «Down» to set the slave address 104.
5. Press «Enter».
   The setting is applied.



Header
Menu
Active line
Monitoring for communication malfunction is active.

Result Slave address *104* is set.

Reaction in a PROFIBUS communication malfunction

Exchange of data with a PROFIBUS connection takes place in fixed cycles. The PROFIBUS connection can be monitored with the help of the cycle time:
The bus connection is considered to be interrupted if no data is exchanged between the bus master and the controller (as bus subscriber) after expiry of a set time period (time-out).
Time-out monitoring is activated. You may neither adjust nor deactivate time-out for SIGMA AIR MANAGER.

After switching on the power supply, the communication malfunction can be suppressed temporarily.

Monitoring for communication malfunction can be deactivated if needed. For this purpose, the *Send* option must be selected for the data exchange.

- Settings for SIGMA AIR MANAGER **without** SIGMA AIR CONTROL PLUS
  - Start: 30 seconds
- Settings for SIGMA AIR MANAGER **with** SIGMA AIR CONTROL PLUS
  - Start: 40 seconds

1. Use «Up» or «Down» to select the *Communication error* line.

88psi 08:15AM 176° F	
8.2 Com-Module	Menu
Reset : ☐	
Slave No. : 103	
.....	
Communication error : ☐	active line
Start td 30s	
Timeout : 5s ☑	

2. Press «Enter».
   The check box *Communication error* will flash.
3. Press «Up».
   The check box is activated.
   The monitoring for communication malfunctions is active.
4. Use «Up» or «Down» to select the *Starttd* line.

88psi 08:15AM 176° F	
8.2 Com-Module	Menu
Reset : ☐	
Slave No. : 103	
.....	
Communication error : ☑	Communication monitoring is activated
Start td 30s	active line
Timeout : 5s ☑	

5. Press «Enter».
   The *00* seconds display flashes.
6. Use «Up» or «Down» to set the seconds.

7. Press «Enter».
   The setting is applied.

Activating the remote control

➢ Activate remote control see chapter 8.2.13.

Result SIGMA CONTROL 2 remote control is activated.
The bus master can remotely control the SIGMA CONTROL 2.

8.10.4 Interconnection of two machines in master/slave operation

Example 1 Two machines with different flow rates

A timer program can be configured on the master switches between the *pA* and *pB* set-point pressures. The machine with the high flow rate is the master and the machine with the lower flow rate is the slave.

- **Operating mode of load control on master**: *Local mode pA/pB Clock*.
  - During periods of peak demand of compressed air, the master is regulated (in accordance with the time program) to the set-point pressure *pA* and the signal for using the set-point pressure *pB* is transmitted to the slave.
  - During periods of low air demand, the master is regulated (in accordance with the time program) to set-point pressure *pB* (e.g. at weekends). The slave receives the information, to use set-point pressure *pA* now.
- **Operating mode of load control on slave**: Remote mode pA/pB SC2.
  - At peak air demand times, pressure is regulated to the *pB* set-point pressure and at times with low air demand to set-point pressure *pA*.
  - At times with lower compressed air demand, the machine is correspondingly used more frequently.

Example 2: Two machines with equal flow rates

A timer can be set on the master switches between the *pA* and *pB* set-point pressures. The set-point pressures *pA* and *pB* are set the same for both machines.

- **Operating mode of load control on master**: *Local mode pA/pB Cycle*.
  - The timer ensures even loading of both machines.
  - E.g. if the first start *pA* is selected as the start time, the master regulates for cycle time 1 at set-point pressure *pA* and sends the slave the signal to use set-point pressure *pB*. During cycle time 2, the master regulates to set-point pressure *pB* and signals to the slave to regulate to set-point pressure *pA*. .
- **Operating mode of load control on slave**: *Remote mode pA/pB SC2*.
  - Depending on the specification by the master, the slave regulates to set-point pressure *pA* or pB. See example for the master:
    Cycle time 1 = set-point pressure *pB*
    Cycle pressure 2 = set-point pressure *pA*

Example 3 Two machines with equal flow rates

Base load sequencing is particularly well suited for machine installations that require most of the time just one of the two machines for covering the air demand. The set-point pressures *pA* and *pB* are set the same for both machines. Both machines use QUADRO, VARIO or DYNAMIC as the control mode. Automatic base load sequencing ensures that unnecessary idle times are minimized on both machines and that the energy-efficiency of the compressed air generation is increased.

- **Operating mode of load control on master**: *Local mode pA/pB SC2*.
  - When both machines are at standstill, the master switches its set-point pressure and sends a signal to the slave to use the other set-point pressure. E.g. if the set-point pressure on the master has been set to *pB*, the slave receives the signal to use the set-point pressure *pA* now. .
- **Operating mode of load control on slave**: *Remote mode pA/pB SC2*.
  - Depending on the specification by the master, the slave regulates to set-point pressure *pA* or *pB*. See example for the master: The master regulates to set-point pressure *pB* and consequently, the slave to *pA*.

To run two machines with SIGMA CONTROL 2 in interconnected operation, both controllers must be equipped with the same software version.

➢ Follow the configuration steps as described in table 70:

Controller	Procedure	Chapter
Both	Establishing the electrical connection	8.10.4.1
Both	Set the set-point pressures for both, *pA* and *pB*. The pressure for the *pA* and *pB* switching points is measured directly at the compressor. Pressure losses in the network do not need to be taken into account.	8.10.4.2 and 8.10.4.3
Master	Either set up switching times for the time program	8.10.4.2
	or set switching times for the timer	8.10.4.2
Master	Set the type of LOAD control (time program or timer) in on-site operation.	8.10.4.2
Slave	Set remote mode *pA/pB SC2*	8.10.4.3
Slave	Activating the remote control	8.10.4.3
Both	Set IP addresses for Ethernet	8.10.4.2 and 8.10.4.3
Both	Setting the controller as master or slave	8.10.4.2 and 8.10.4.3

Tab. 70 Master-slave settings

8.10.4.1 Establishing the electrical connection

You need the following accessories to create the network connection with SIGMA NETWORK or Ethernet:

- SIGMA NETWORK cable (7.9679.0) or Ethernet cable with a maximum connection length of 100 m each

- For each machine with SIGMA CONTROL 2:
  - Retrofit kit LAN RJ45 (7.5250.01870)
- For connecting the machines to a network (LAN) or switch:
  - 2x RJ45 plug (7.7628.1)

➢ Create the electrical connection according to the local condition. For more information, see the installation manual for the retrofit kit LAN RJ45 (7.5250.01870)

Install the Ethernet cable

Use a cross-linked Ethernet cable for the direct connection of two machines.

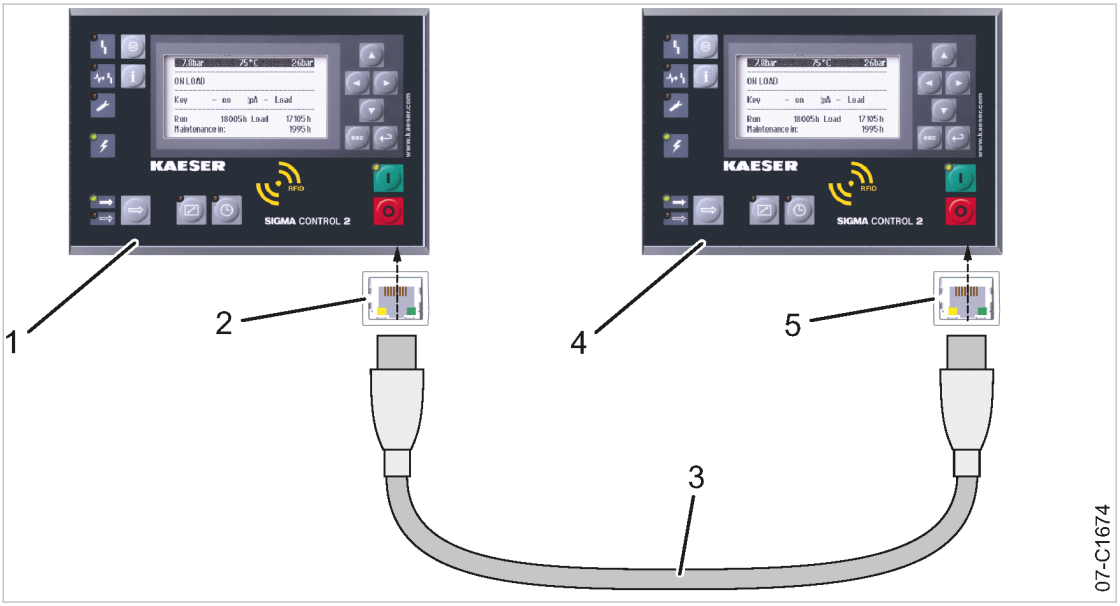


Fig. 35 Direct connection of two SIGMA CONTROL 2

1 Controller machine 1 (master)
2 Ethernet interface X1
3 Ethernet cable, cross-linked
4 Controller machine 2 (slave)
5 Ethernet interface X1

➢ Install the Ethernet cable between the two machines.

When you connect the machines to a network (LAN) or switch (when using KAESER CONNECT for example).

➢ Install the Ethernet cable from each machine to the LAN connection or switch.

Connect the Ethernet cable with the machine

For each machine:

1. Insert the Ethernet cable into the machine and the machine's control cabinet, using an EMC connection.
2. Lead the Ethernet cable through the cable ducts to SIGMA CONTROL 2. Use the wiring path in the 24V range (blue wiring) of the ducts.
3. Attach the RJ45-plug to the cable end.
4. Plug the RJ45 plug into the Ethernet interface X1 of the SIGMA CONTROL 2 until it latches.

For connecting the machines to a network (LAN) or switch:

Connect the Ethernet cable for each machine to the LAN connection or switch.

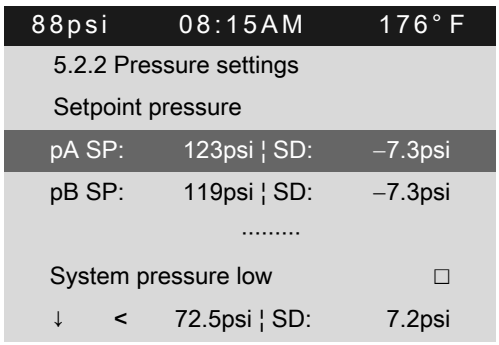
1. Attach the RJ45-plug to the cable end.
2. Plug the RJ45plug into the network socket until it latches.

8.10.4.2 Setting the controller of machine 1 as master

Precondition The electrical connection is made.
Access level 2 is activated.

Setting the switching points pA and pB

1. Open the 5.2.2 *<Configuration – Pressure control – Pressure settings>* menu.
   The *pA* line is displayed.
2. Press «Enter».
   The value for *pA* flashes.



3. Use «Up» or «Down» to set the *pA* value.
4. Press «Enter».
   The setting is applied.
5. Press «Down».
   The *pB* line is displayed.
6. If necessary, adjust the value for the *pB* switching differential in the same manner.

Setting the times

The following options for load control are are provided by SIGMA CONTROL 2 for selecting times:

- 1: Time program
- 2: Timer

1. Select either one of the time settings (time program **or** timer) **or** base load sequencing.
2. Follow the instructions below for the settings required.

Alternative 1: Set time program

Precondition The electrical connection is made.
Access level 2 is activated.

➢ Setting the set-point pressure change with a time program; see chapter 8.9.2.

Alternative 2: Setting the timer

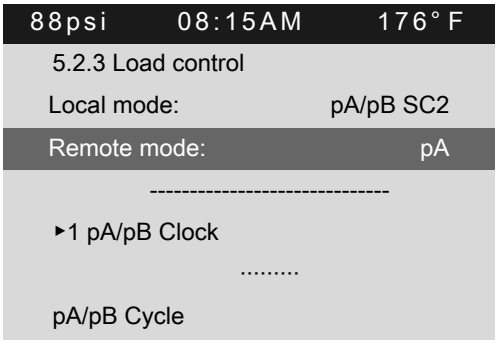
Precondition The electrical connection is made.
Access level 2 is activated.

1. Setting the timer for *pA* and *pB*; see chapter 8.9.3.1.
2. Setting the starting time for *pA* or *pB*; see chapter 8.9.3.2.

Alternative 3: Setting the base load change switching

Precondition The electrical connection is made.
Access level 2 is activated.

➢ Setting local operating mode to *pA/pB SC2*.



Header
Menu
Active line, current operating mode

Master IP configuration

The controllers of both machines must be set to different IP addresses.

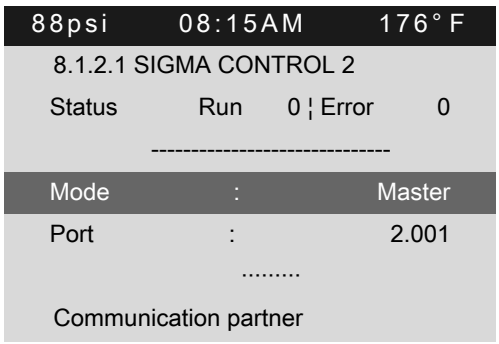
Example:

- IP addressController machine 1 (Master mode): 169.254.100.101
- IP address Controller machine 2 (Slave): 169.254.100.102

Precondition The electrical connection is made.
Access level 2 is activated.

1. Set IP address for the master: For instructions, see chapter 8.2.14, IP address for the above example.
   The IP address of machine 1 (master) is set correctly.
2. Open the 8.1.2.1 *<Communication – Ethernet/SIGMA NETWORK – Connections – SIGMA CONTROL 2>* menu.
3. Use «Up» or «Down» to select the *Mode* line.

4. Press «Enter».
   The setting mode is active.



5. Use the «Up» or «Down» key to set machine 1 to *Master*.
6. Press «Enter».
   The setting is applied.
7. Use «Up» or «Down» to select the *IP address* line.
8. Press «Enter».
   The setting mode is active.
9. Set the IP address of the communication partner (slave, see above example).
10. Press «Enter».
    The IP address of machine 2 (slave) is set correctly.
    The setting is applied.

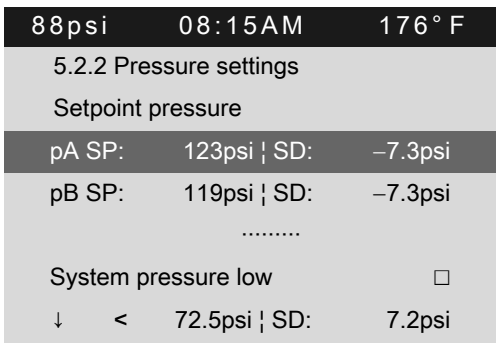
Result The controller of machine 1 is set as master.

8.10.4.3 Setting the machine 2 controller as slave

Precondition The electrical connection is made.
Access level 2 is activated.

Setting the switching points pA and pB

1. Open the 5.2.2 *<Configuration – Pressure control – Pressure settings>* menu.
   The *pA* line is displayed.
2. Press «Enter».
   The value for *pA* flashes.



3. Use «Up» or «Down» to set the *pA* value.

4. Press «Enter».
   The setting is applied.
5. Press «Down».
   The *pB* line is displayed.
6. If necessary, adjust the value for the *pB* switching differential in the same manner.

Activating the remote control

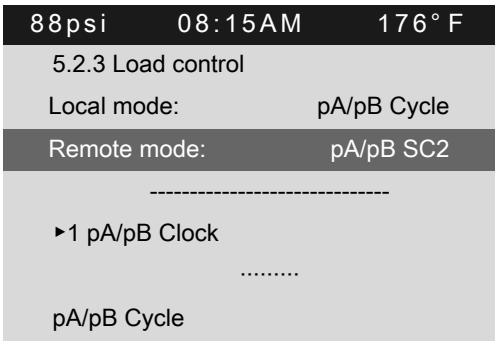
➢ Activate remote control see chapter 8.2.13.

Result SIGMA CONTROL 2 remote control is activated.

Set the remote operating mode

Precondition The electrical connection is made.
Access level 2 is activated.

1. Open the 5.2.3 *<Configuration – Pressure control – Load control>* menu.
2. Use «Up» or «Down» to select the *Remote mode* line.
3. Press «Enter».
   The setting mode is active.



Header
Menu
Active line, current operating mode

4. Use «Up» or «Down» to set the *pA/pB SC2* input.
5. Press «Enter».
   The setting is applied.

Slave IP configuration

The controllers of both machines must be set to different IP addresses.

Example:

- IP addressController machine 1 (Master mode): 169.254.100.101
- IP address Controller machine 2 (Slave): 169.254.100.102

Precondition The electrical connection is made.
Access level 2 is activated.

1. Set IP address for the slave: For instructions, see chapter 8.2.14, IP address for the above example.
   The IP address of machine 2 (slave) is set correctly.

2. Open the 8.1.2.1 *<Communication – Ethernet/SIGMA NETWORK – Connections – SIGMA CONTROL 2>* menu.
3. Use «Up» or «Down» to select the *Mode* line.
4. Press «Enter».
   The setting mode is active.
5. Use the «Up» or «Down» key to set machine 2 to *Slave*.
6. Press «Enter».
   The setting is applied.
7. Use «Up» or «Down» to select the *IP address* line.
8. Press «Enter».
   The setting mode is active.
9. Set the IP address of the communication partner (master, see above example).
10. Press «Enter».
    The setting is applied.

Result The controller of machine 2 is set as slave.

8.10.5 Configuring master control using the LOAD remote contact (e.g. SIGMA AIR MANAGER BASIC) [3)]

Overview

- Establish the electrical connection for LOAD remote contact
- Set the LOAD remote contact operating mode and assign the input
- If required, set temporary pressure increase *pE*.
- Activating the «remote control» key

[3)] PISTON: Applies only to Airbox

➢ Set master control as described below:

8.10.5.1 Establish the electrical connection for remote LOAD contact (excerpt)

Machine (example)

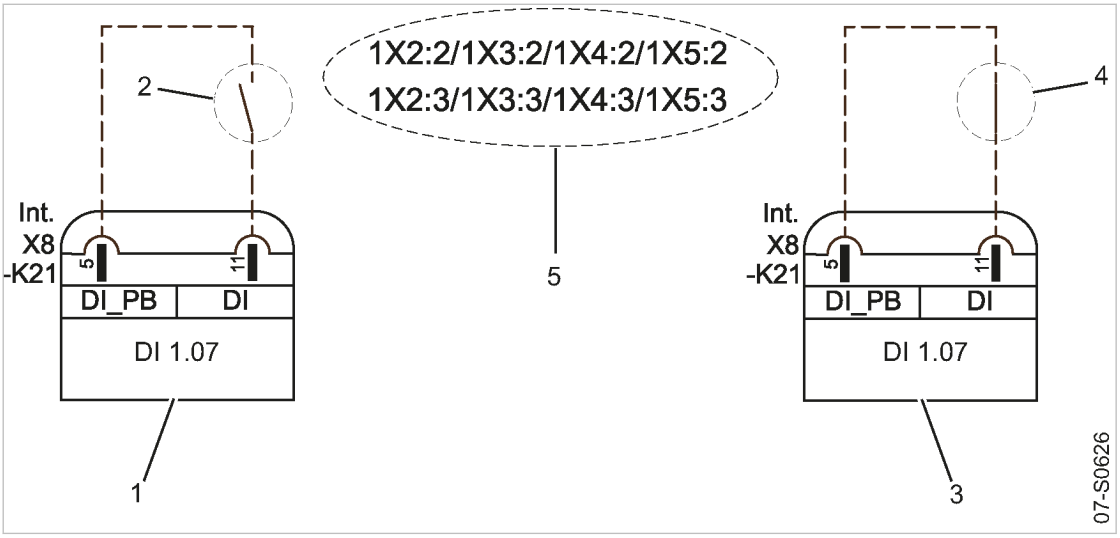


Fig. 36 LOAD remote contact

1. Electrical connection DI 1.07
2. LOAD remote contact open (IDLE)
3. Electrical connection DI 1.07
4. LOAD remote contact closed (LOAD)
5. SIGMA AIR MANAGER BASIC contacts

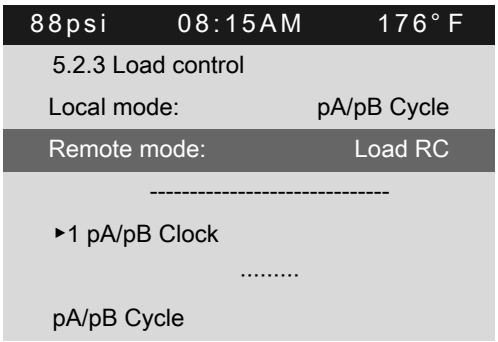
➢ Establish the electrical connection for DI 1.07 according to the wiring diagram.

8.10.5.2 Setting the remote LOAD contact operating mode and assigning the input for LOAD remote contact

Precondition Password access level 2 is activated.

Set the LOAD remote contact operating mode

1. Open the 5.2.3 *<Configuration – Pressure control – Load control>* menu.
2. Use «Up» or «Down» to select the *Remote mode* line.
3. Press «Enter».
   The currently active operating mode *Remote mode* flashes.



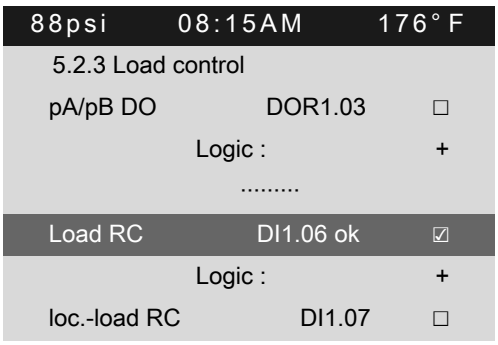
4. Use «Up» or «Down» to set the *Load RC* input.
5. Press «Enter».
   The LOAD remote contact operating mode is set.

Assign the input for LOAD remote contact

The input for the LOAD remote contact is pre-assigned.

Setting is only necessary if you deliberately want to use a different input.

1. Use «Up» or «Down» to select the *Load RC* line.
2. Press «Enter».
   The *DI* display flashes.



Header
Menu
Active line; standard DI 1.13

3. Use «Up» or «Down» to select the input for the LOAD remote contact.
4. Press «Enter».
   The setting is applied.
5. Press the «Right» key.
6. Press «Enter».
   The check box *Load RC* will flash.
7. Press «Up».
   The check box is activated.
8. Press «Enter».
   ok is displayed to the left of the check box.
   The operating mode is set.

8.10.5.3 Setting the SD switching differential of the pressure increase

➢ Set the SD switching differential of the pressure increase as described in chapter 8.4.2.2.

Further information Detailed information on the pressure parameters is provided in chapter 8.4.2.

8.10.5.4 Activating the remote control

➢ Activate remote control see chapter 8.2.13.

Result SIGMA CONTROL 2 remote control is activated.

8.10.6 Setting the master control with local/LOAD remote contact [3)]

Overview

- Establishing the electrical connection
- Set the local/LOAD remote contact operating mode and assign the input.

- Set local operating mode, if necessary.
- Activating the «remote control» key

[3] PISTON: Applies only to Airbox

➢ Set master control as described below.

8.10.6.1 Establishing the electrical connection

- Contact A open: SIGMA CONTROL 2controls with *pB* nominal pressure.
- Contact A closed: SIGMA CONTROL 2 controls via external LOAD mode contact.
- DI 1.07: LOAD/IDLE external
- DI 1.06: LOAD control – switch to local/LOAD remote contact.

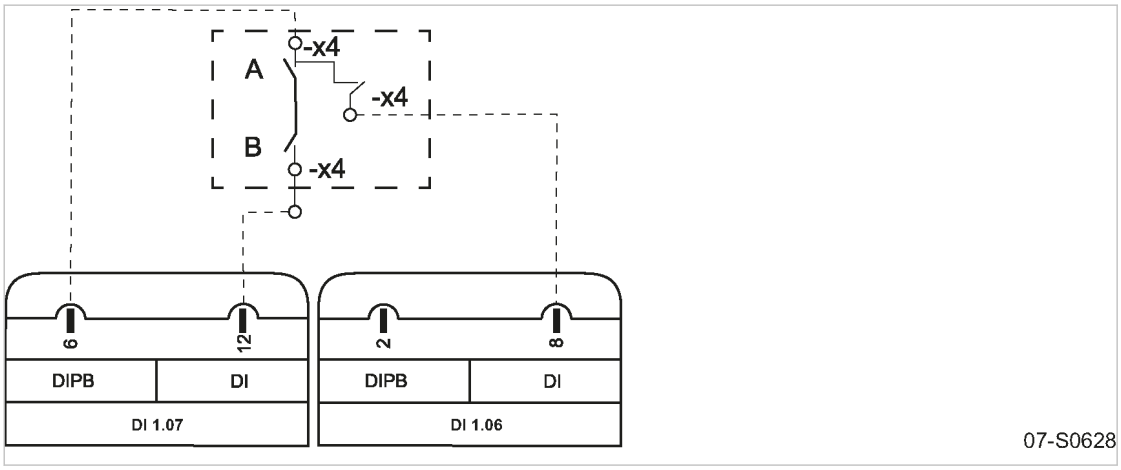


Fig. 37 Wiring diagram for local/LOAD remote contact:

Ⓐ Changeover between automatic and manual modes
Ⓑ LOAD/IDLE contact

➢ Make the electrical connection according to the diagram.

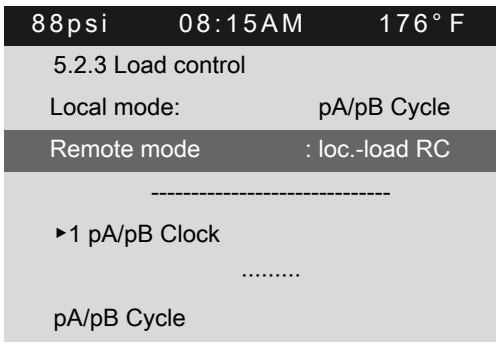
8.10.6.2 Set the local/LOAD remote contact operating mode and assign the input.

Precondition Password access level 2 is activated.

Set local/LOAD remote contact operating mode:

1. Open the 5.2.3 *<Configuration – Pressure control – Load control>* menu.
2. Use «Up» or «Down» to select the *Remote mode* line.

3. Press «Enter».
   The currently active operating mode *Remote mode* flashes.

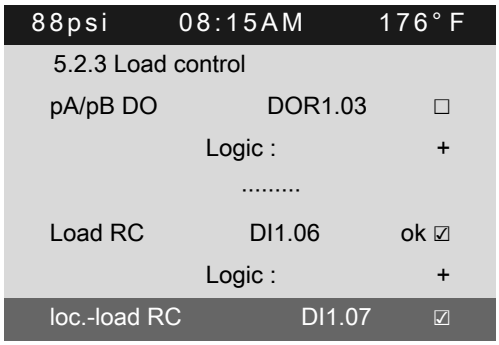


Header
Menu
Active line

4. Use «Up» or «Down» to set the *loc.-load RC* input.
5. Press «Enter».
   The local/LOAD remote contact operating mode is set.

Assign an input for the local/LOAD remote contact for switching the pressure control

1. Use «Up» or «Down» to select the *loc.-load RC* line.
2. Press «Enter».
   The *DI* display flashes.



Header
Menu
No input assigned
Active line

3. Use «Up» or «Down» to select a new input for local/LOAD remote contact.
4. Press «Enter».
   The input for local/LOAD remote contact is assigned.

8.10.6.3 Setting local operating mode pB

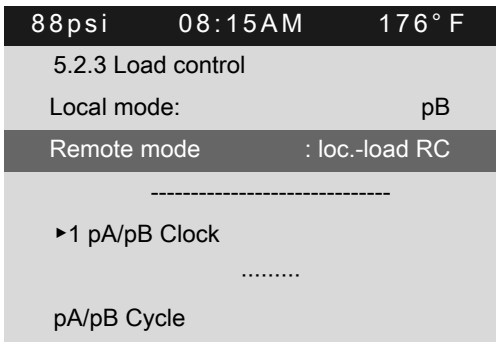
The *pB* nominal pressure is normally set for local operation.

➢ When setting the *pB* nominal pressure, bear in mind that, under certain circumstances, more than one compressor may be operating in local mode (see section 8.4 for adjusting the nominal pressure).

Precondition Password access level 2 is activated.

1. Open the 5.2.3 *<Configuration – Pressure control – Load control>* menu.
2. Use «Up» or «Down» to select the *Local mode* line.

3. Press «Enter».
   The operating mode display flashes.



4. Use «Up» or «Down» to set the *pB* input.
5. Press «Enter».
   The setting is applied.
6. Adjust the *pB* nominal pressure, if necessary (see section 8.4).
   The local operating mode *pB* is set.

8.10.6.4 Activating the remote control

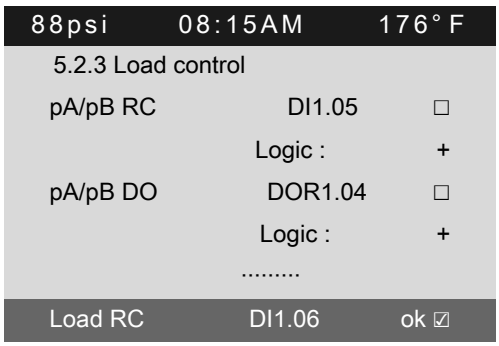
➢ Activate remote control see chapter 8.2.13.

Result SIGMA CONTROL 2 remote control is activated.

8.10.6.5 Assign an input for the LOAD remote contact for switching the pressure control

Precondition Password access level 2 is activated.

1. Open the 5.2.3 *<Configuration – Pressure control – Load control>* menu.
2. Use «Up» or «Down» to select the *Load RC* line.
3. Press «Enter».
   The *DI* display flashes.



4. Use «Up» or «Down» to select the input for the LOAD remote contact.
5. Press «Enter».
   The input for LOAD remote contact is assigned.

8.10.7 Setting the setpoint pressure pre-selection via remote contact

The signal to changeover from setpoint pressure *pA* to setpoint pressure *pB* comes from an input contact. If there is a signal at the input then system pressure is regulated on setpoint pressure*pB*.

Overview

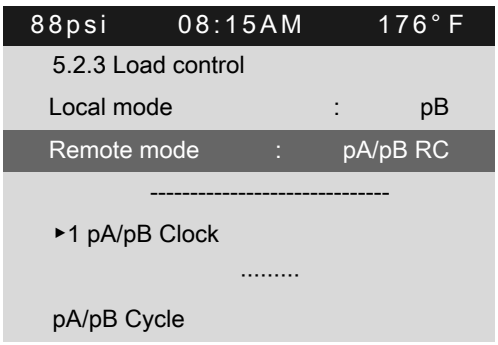
- Setting up remote contact mode pA/pB
- Assigning the remote contact input
- Activating the remote control

➢ Configuring the setpoint pressure pre-selection as described.

8.10.7.1 Setting up remote contact mode pA/pB

Precondition The electrical connection is made.
Password access level 2 is activated.

1. Select the 5.2.3 *<Configuration – Pressure control – Load control>* menu.
2. Use «Up» or «Down» to select the *Remote mode* line.
3. Press «Enter».
   The currently active operating mode flashes.



Header
Menu
Active line

4. Use «Up» or «Down» to set the *pA/pB RC* input.
5. Press «Enter».

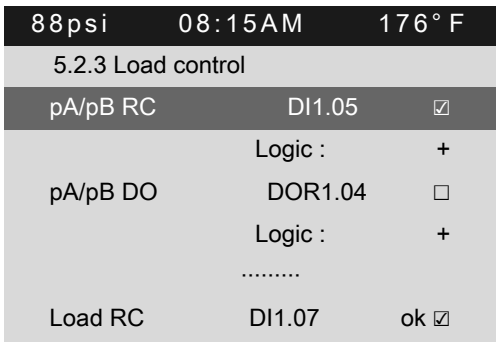
Result The *pA/pB RC* operating mode is set.

8.10.7.2 Assigning the remote contact input

A spare input can be found in the machine circuit diagram.

1. Use «Up» or «Down» to select the *pA/pB RC* line.

2. Press «Enter».
   The *DI* display flashes.



3. Use «Up »or «Down» to set the *DI* input.
4. Press «Enter».

Result The input for remote contact has now been assigned.

8.10.7.3 Activating the remote control

➢ Activating the remote control see chapter 8.2.13.

Result SIGMA CONTROL 2 remote control is activated.

8.10.8 Master control for machines regulated by pressure switch

➢ Set the master control as described below.

8.10.8.1 Master control via floating relay contact

Requirement:
A machine with SIGMA CONTROL 2 (e.g. series BSD) and a conventional machine **without** SIGMA CONTROL 2 with the same flow rate are to run in sequence as base load or peak load machines.

Suggestion:

- Set / adjust the clock program or clock on SIGMA CONTROL 2.
- Select local mode with timer control pA/pB Clock or clock pA/pB Cycle.
- Select the network setpoint pressures pA and pB analogous to the required values. They must be identical to the pressure switch settings on the machine without SIGMA CONTROL 2.
- To make the system setpoint pressure changeover between the two machines possible, a floating relay contact must be assigned to the selected local operating mode. An auxiliary contactor can be energized via this contact to activate the pressure switches for pA and pB on the compressor without SIGMA CONTROL 2. See the example wiring diagram below.

Overview

- Establishing the electrical connection
- Set the system setpoint pressure pA and pB.
- Set operating mode in local operating mode
- Assigning the floating relay contact
- Set local operating mode

Establishing the electrical connection

- Contact A **open**: SIGMA CONTROL 2 controls with system setpoint pressure pB
- Contact A **closed**: SIGMA CONTROL 2 controls with system setpoint pressure pA
- B 1.1: Pressure switch for system setpoint pressure pB
- B 1.2: Pressure switch for system setpoint pressure pA

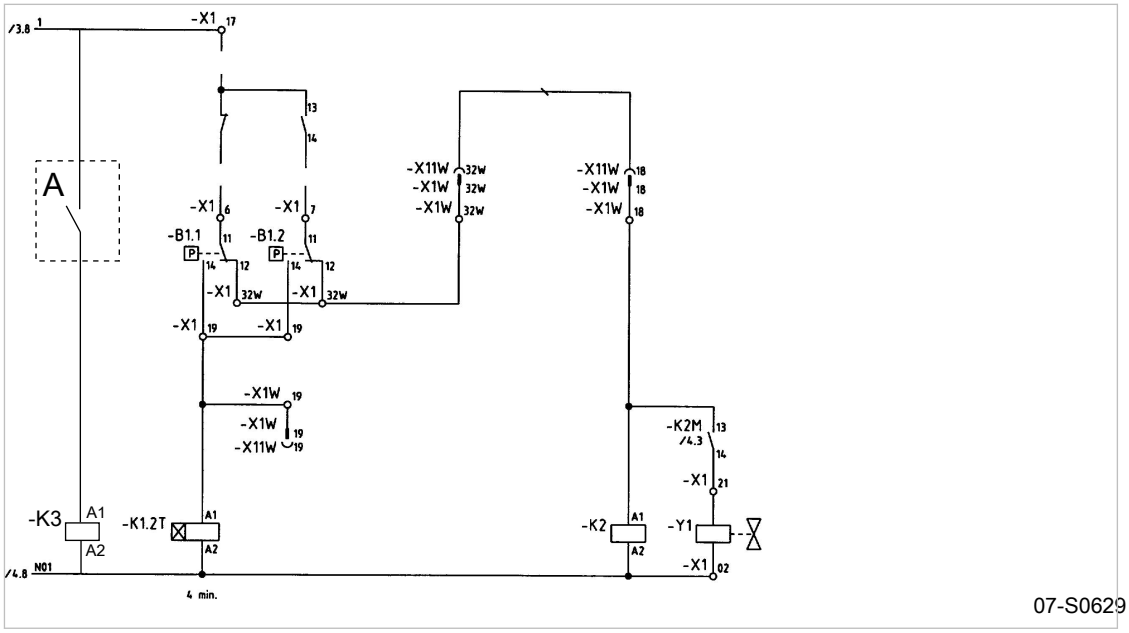


Fig. 38 Machine with pressure switch regulation

Ⓐ Floating relay contact SIGMA CONTROL 2

➢ Make the electrical connection according to the diagram.

Set the system setpoint pressure pA and pB.

Precondition Password access level 2 is activated.
The electrical connection is made.

1. Select the *<5.2.2 – Pressure control – Pressure settings>* menu (see chapter 8.4.1).
2. Use «Up» or «Down» to select the *pASP* line.
3. Press «Enter».
   The setting mode is active.
   The *Setpoint pressure pA* display flashes.

88psi	08:15AM	176°F	Header
5.2.2 Pressure settings			Menu
Setpoint pressure			
pA SP:	123psi ¦ SD:	–7.3psi	Active line
pB SP:	119psi ¦ SD:	–7.3psi	
	.....		
System pressure low		□	
↓	< 72.5psi ¦ SD:	7.2psi	

4. Use «Up» or «Down» to set the value for *pA*.
5. Press «Enter».
   The setting is applied.
6. If necessary, adjust the value for *SD* in the same manner.
7. If necessary, adjust the value for *pB/SD* in the same manner.
8. Press «Escape» repeatedly to return to the main menu.

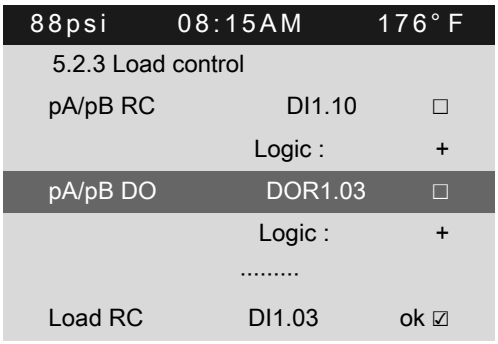
Setting operating mode in local operating mode

➢ Set the clock program or clock as described in section 8.9.

Assigning the floating relay contact (activate)

Precondition Password access level 2 is activated.
The electrical connection made (select spare contact from the machine's electrical diagram).

1. Select the 5.2.3 *<Configuration – Pressure control – Load control>* menu.
2. Use «Up» or «Down» to select the *pA/pB DO* line.



Header
Menu
Active line, no output assigned

3. Press «Enter».
   The setting mode is active.
4. Use «Up» or «Down» to set the required output.
5. Press «Enter».
   The setting is applied.

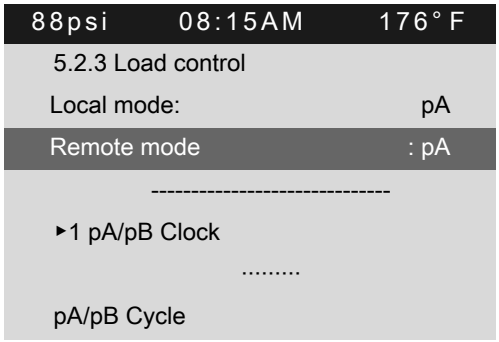
Result This output can now be used for the changeover between the two pressure switches.

Setting local operating mode

Precondition Password access level 2 is activated.

1. Select the 5.2.3 *<Configuration – Pressure control – Load control>* menu.

2. Use «Up» or «Down» to select the *Local mode* line.



Header
Menu
Active line, current operating mode

3. Press «Enter».
   The setting mode is active.
4. Use «Up» or «Down» to set the *pA/pB Clock or pA/pB Cycle* operating mode.
5. Press «Enter».
   The setting is applied.

8.10.8.2 Configuring the master control without an electrical connection

Requirement:
A machine with SIGMA CONTROL 2 (e. g. type BSD) and high flow rate is to work as a base load machine. A second machine (e.g., SK) **without** SIGMA CONTROL 2 is to supply air in times of low demand.

Suggestion:

- Select the system setpoint pressures pA and pB of the BSD machine for the switching point of the SK machine's pressure switch to be in between. When pB is activated for the periods of low demand, the SK machine automatically functions as the base load machine.
- Set the required values for a clock program on SIGMA CONTROL 2.
- Select local mode pA/pB Clock.
- Activate the compressor timer.

Function diagram:

Period t1–t7: high air demand	Period t8–t14: low air demand
t1 Air demand rises. System pressure pNloc drops.	t8: Air demand rises. System pressure pNloc drops.
t2 BSD switches to LOAD.	t9: SK switches to LOAD.
t3: System setpoint pressure pA reached. BSD switches to IDLE.	t10: System setpoint pressure pB reached. SK switches to IDLE.
t4: BSD switches to LOAD. Air demand not covered.	t11: BSD switches to LOAD. Air demand not covered.

Period t1–t7: high air demand	Period t8–t14: low air demand
t5: SK also switches to LOAD. System pressure pNloc begins to rise.	t12: SK switches to LOAD. System pressure pNloc begins to rise.
t6: SK switches to IDLE.	t13: SK switches to IDLE.
t7: BSD switches to IDLE.	t14: BSD switches to IDLE.

Tab. 71 Function diagram

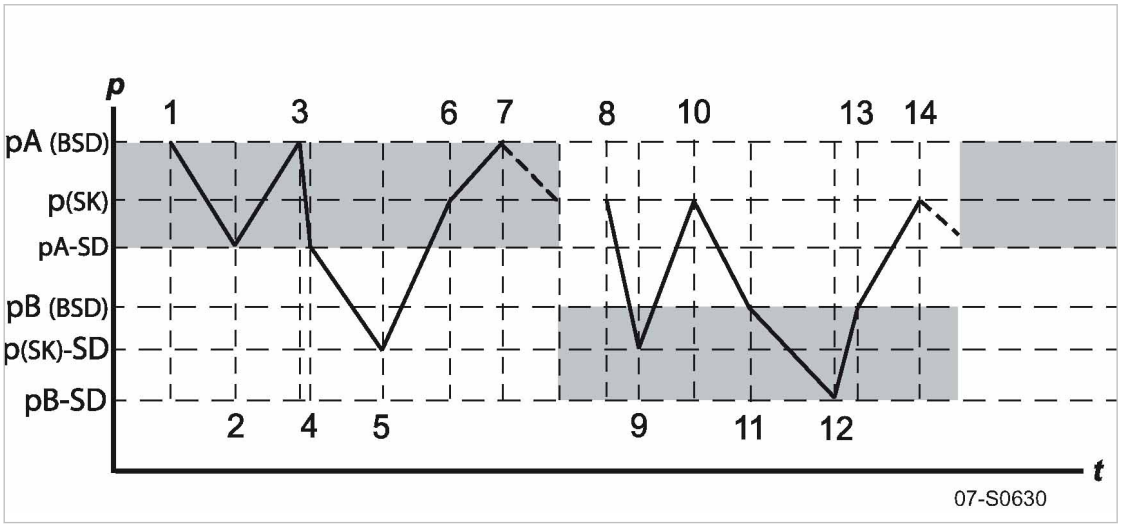


Fig. 39 Function diagram

SD Switching differential
p Pressure
t Time

Set the system setpoint pressure pA and pB.

Precondition Password access level 2 is activated.

1. Select the *<5.2.2 – Pressure control – Pressure settings>* menu (see chapter 8.4.1).
2. Use «Up» or «Down» to select the *pASP* line.

88psi 08:15AM 176° F	Header
5.2.2 Pressure settings	Menu
Setpoint pressure	
pA SP: 123psi ¦ SD: –7.3psi	Active line
pB SP: 119psi ¦ SD: –7.3psi	
.....	
System pressure low □	
↓ < 72.5psi ¦ SD: 7.2psi	

3. Press «Enter».
   The *pA* display flashes.

4. Use «Up» or «Down» to set the *pA* value.
5. Press «Enter».
   The setting is applied.
6. If necessary, adjust the value for *SD* in the same manner.
7. If necessary, adjust the value for *pB/SD* in the same manner.
8. Press «Escape» repeatedly to return to the main menu.

Configuring clock program

➢ Set the clock program as described in chapter 8.9.2.

8.10.9 Examples of time settings for equal overall load

Requirement:
Two machines of the same capacity are to be equally loaded. Versions A, B and C describe the different possibilities of achieving this requirement.

A detailed description for configuring a clock or timing program can be found in Chapter 8.9.

Variant A: Daily switch between system setpoint pressure pA and system setpoint pressure pB after 24 hours

The compressors start with a system setpoint pressure *pB* at 0:00 hours. A timer triggers the switch between system setpoint pressure *pA* and system setpoint pressure *pB* (local operating mode: *pA/pB Cycle* local mode).

Precondition The setpoint pressure *pA*/*pB* is configured the same for both machines.

➢ Establish a cycle with the following switching points:
- Cycle time *pA*: 24 h
- Cycle time *pB*: 24 h
- Start *pB*: 00:00AM

Variant B: Equal duty cycle during the day

A timer triggers the switch between system setpoint pressure *pA* and system setpoint pressure *pB* (local operating mode *pA/pB Clock*.

Precondition The system setpoint pressure *pA*/*pB* is configured the same for both machines.

➢ The clock program is set up using the following switching points:

No.:	Weekday	Time	Network nominal pressure
01	Mon-Sun	00:00AM	*pA* On
02	Mon-Sun	06:30AM	*pB* On
03	Mon-Sun	12:00PM	*pA* On
04	Mon-Sun	05:00PM	*pB* On

Tab. 72 Example for a clock program for equal duty cycling during the day

Variant C: Equal duty cycle during the week

A timer triggers the switch between system setpoint pressure *pA* and system setpoint pressure *pB* (local operating mode: *pA/pB SC2Clk*).

Precondition The system setpoint pressure *pA*/*pB* is configured the same for both machines.

➢ The clock program is set up using the following switching points:

No.:	Weekday	Time	Network nominal pressure
01	Mon	00:00AM	*pA* On
02	Mon	09:00PM	*pB* On
03	Tue	05:00PM	*pA* On
04	Wed	03:00PM	*pB* On
05	Thu	12:00PM	*pA* On
06	Fri	09:00AM	*pB* On
07	Sat	06:30AM	*pA* On
08	Sun	03:00AM	*pB* On

Tab. 73 Example for a clock program for equal duty cycling during the week

8.11 Setting input and output signals

The controller's analog and digital inputs and outputs can be used for customized messages and/or other functions.

The various options are explained in the following chapters:

- 8.11.1: Output operational states of machine on digital outputs
- 8.11.2: Output input signals on the display
- 8.11.3: Output measured values on the display
- 8.11.4: Switching and/or triggering messages with thresholds

The controller only allows assignment of spare inputs and outputs.
Any assignment of a pre-assigned input or output is discarded by the controller.
When delivered from the factory, the outputs DO0.3 to DO0.5 are available for assignment.
Further spare outputs can be found in the machine circuit diagram.

➢ Set the inputs and outputs as described below.

8.11.1 Output important operational states of machine on digital outputs

Important operational machine states can be made available as digital signals via floating contacts. Each output can be assigned only once.

The following messages can be output:

Message	Explanation	Output
Controller on	Controller is powered up	
Compressor on	The machine is switched on	

[12] Not for SXC

Message	Explanation	Output
Motor running	Compressor motor running	
IDLE	The machine is running in IDLE mode	
ON LOAD	The machine is running in LOAD mode	
Group alarm	Fault has occurred	
Group warning continuous	At least one warning message has appeared. No new warnings can be seen.	
Group warning interrupted	At least one warning message has appeared. Each new warning is indicated by a short signal interruption.	
Remote mode	Informs you whether the «Remote control» key is active	
Clock active	Informs you whether the timer control for the compressor («Timer control» key lights up in green) is active	
Clock contact	Timer with which a relay/transistor output can be switched	
EMERGENCY STOP	Signals whether the EMERGENCY STOP push button has been pressed	

[12] Not for SXC

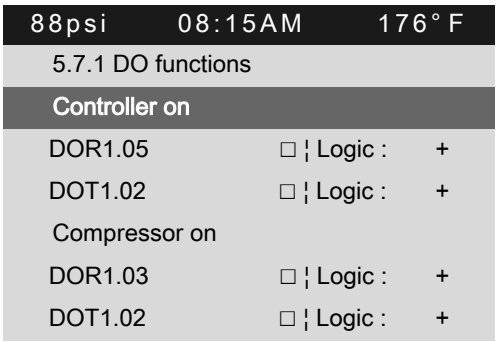
Tab. 74 Assigned output signals

8.11.1.1 DO functions menu

The requested message can be assigned to a free digital output (DOR orDOT).

Precondition Password access level 2 is activated.

1. Select the 5.7.1 *<Configuration – I/O periphery – DO functions>* menu.
   A menu containing a list of available messages and their assigned outputs is displayed.

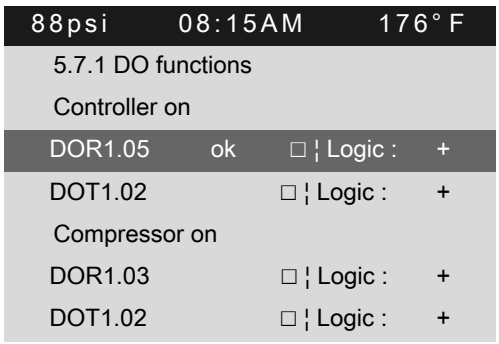


Header
Menu
Active line

8.11.1.2 Assigning a message to an output

1. Select the required message with the «Up» or «Down» keys.
2. Press the «Down» key once.
   Output DOR has been selected.
3. Press «Down» twice.
   Output DOT has been selected.

4. Press «Enter».
   The output of the selected message flashes.



5. Select a free output with the «Up» or «Down» key.
6. Press «Enter».
   The setting is applied.
7. Press the «Right» key.
8. Press «Enter».
   The check box will flash.
9. Press «Up» key.
   The check box associated to the output is activated.
10. Press «Enter».
    If the message is correctly assigned to the output and activated, *ok* is displayed.
11. If necessary, set the *Logic* option.

Result A message about the operational state is now sent via the assigned digital output.

You are missing an organized display of assigned output signals?
➢ Enter the selected output in table 74.

8.11.2 Output input signals on the display

In addition to the defined alarm and warning messages there are six additional freely selectable input signals that can be used to display messages. A list of the alarm and warning messages is provided in chapters 10.2 and 10.3. Please see the machine's wiring diagram for information on free inputs.

An input signal can be classified as either a fault, a warning or an operational message. To suppress any possible contact bounce or similar problems, the input signal can be delayed by an adjustable period. This ensures that the signal must be apparent for a minimum period before it can be processed as a message.

If an input signal is classified as fault, the controller goes into the alarm state and shuts down the machine.

Overview

Use the *External messages* menu for specifying the settings.

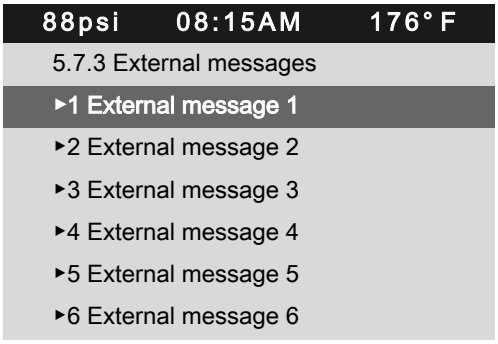
- Entering the message text
- Assigning and activating the input
- Setting the time delay
- Setting the logic

- Assigning and activating the output
- Selecting the message type
- Activating the message

8.11.2.1 External messages menu

Precondition The electrical connection has been made.
Password access level 2 is activated.

1. Select the 5.7.3 *<Configuration – I/O periphery – External messages>* menu.
   The *External messages* menu is displayed.

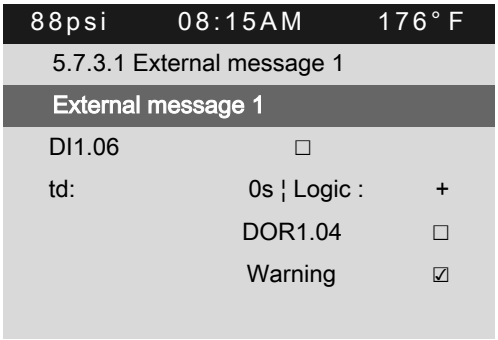


Menu
Active line with external message No. 1

8.11.2.2 Entering the message text

In the below example we select *External message 1*.

1. Use «Up» or «Down» to select the *External message 1* line.
2. Press «Enter».
   The *External message 1* menu is displayed.



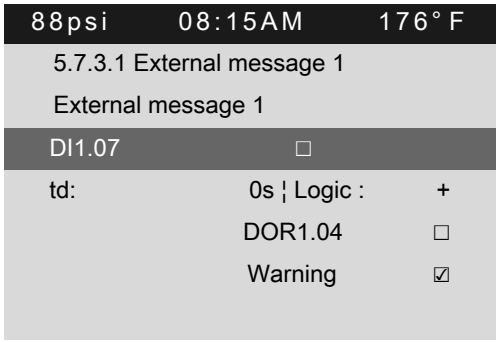
Header
Menu
Message text
No input assigned
Logic
Message type (operational, alarm, warning)

3. Press «Enter».
   The cursor is located at the first character of the message text.
   A column with alphanumeric characters is displayed.
   The selected character flashes.
4. Select the required character with the «Up» or «Down» keys.
5. Press the «Right» arrow.
   The cursor jumps to the next position of the message text.
6. Enter the remaining characters of the message text in the same manner.
7. Press «Enter».
   The message text has been entered.

8. Press «Enter».
   The setting is applied.

8.11.2.3 Assigning and activating the input

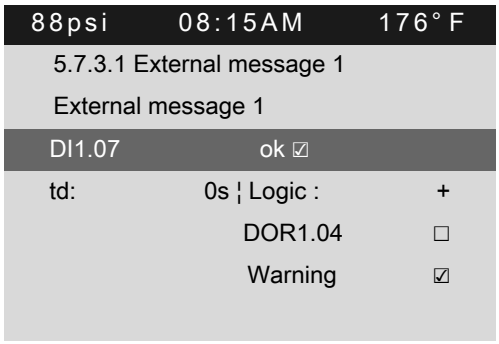
1. Use «Up» or «Down» to select the *DI* line.
2. Press «Enter».
   The display for the currently set input flashes.
3. Use «Up» or «Down» to select the input.
4. Press «Enter».
   The setting is applied.



Header
Menu
Message text
The output has been selected.
Logic

Example: Warning message type

5. Press the «Right» arrow.
6. Press «Enter».
   The check box assigned to the input flashes.
7. Press the «Up» key.
   The check box is activated.



Header
Menu
Message text
Input selected
Logic

Example: Warning message type

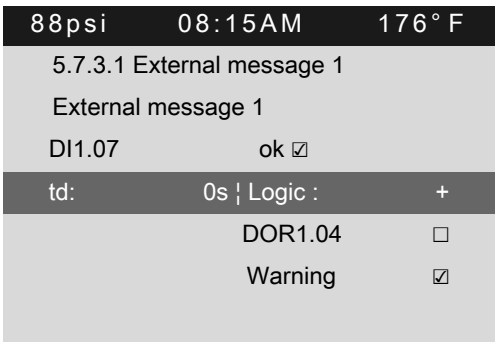
8. Press «Enter».
   ok is displayed.
   The input is assigned and activated.

8.11.2.4 Setting the time delay

The delay can be set between 0 and 600 seconds. The delay is counted down from 600 in 1 second increments with the «DOWN» key and counted upwards from 0 (zero) in 1 second increments with the «UP» key.

1. Use «Up» or «Down» to select the *td* line.

2. Press «Enter».
   The *td* delay time flashes.



Header
Menu
Message text
Input selected
Set time delay td

Example: Warning message type

3. Use «Up» or «Down» to set the time delay in seconds.
4. Press «Enter».

Result The *td* delay time has been set.

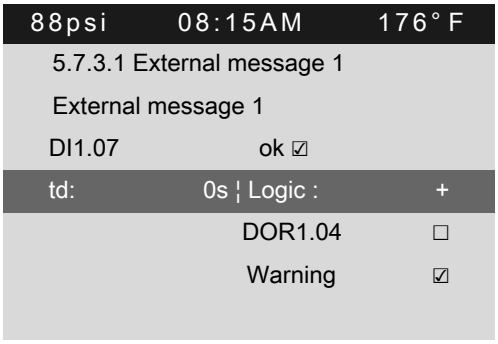
8.11.2.5 Setting the logic

Possible logic settings

Message at	Sign
24 V	+
0 V	-

Tab. 75 Logic settings

1. Use «Up» or «Down» to select the *td* line.
2. Press the «Right» arrow.
3. Press «Enter».
   The control field *Logic* flashes.
4. Use «UP» or «Down» to set the desired behavior, see table 75.



Header
Menu
Message text
Input selected
Active line, set logic control field

Example: Warning message type

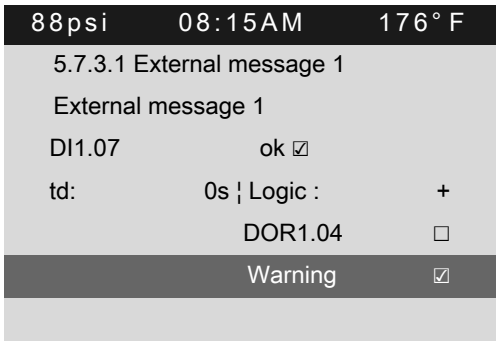
5. Press «Enter».

Result For messages at 24 V, the logic is set with the **+** symbol.

8.11.2.6 Setting the message type

1. Select the message type line with the «Up» and «Down» keys.

2. Press «Enter».
   The display for the message type flashes.
3. Use «Up» or «Down» to set the message type.

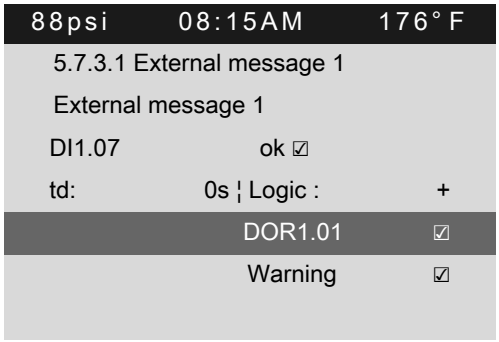


Header
Menu
Message text
Input selected
Active line, set logic control field
Example: Warning message type

4. Press «Enter».
   The message type is set.

8.11.2.7 Assigning and activating the output

1. Use «Up» or «Down» to select the *DOR* line.
2. Press «Enter».
   The *DOR* output display flashes.
3. Select the output with the «Up» and «Down» keys.
4. Press «Enter».
   The setting is applied.



Header
Menu
Message text
Input selected
Active line, set logic control field
Output is selected and activated
Example: Warning message type

5. Press the «Right» arrow.
6. Press «Enter».
   The check box assigned to the output flashes.
7. Press the «Up» key.
   The check box is activated.
8. Press «Enter».
   The output is assigned and activated.

Result The signal at the DI digital input is available as *External message 1* and as output signal at the selected DOR output.

8.11.3 Output measured values on the display

For analog measured values you can define customized messages.

The message can be classified as either a fault, a warning or an operational message.

If exceeding the switching point is classified as a fault, the controller goes into the fault state when the signal continues and shuts down the machine.

The following messages can be output:

Message	Explanation	Measured value	Output
AnMod_p_1	Customized monitoring of the pressure value p1		
AnMod_p_2	Customized monitoring of the pressure value p2		
AnMod_p_3	Customized monitoring of the pressure value p3		
AnMod_p_4	Customized monitoring of the pressure value p4		
AnMod_T_1	Customized monitoring of the temperature value T1		
AnMod_T_2	Customized monitoring of the temperature value T2		
AnMod_T_3	Customized monitoring of the temperature value T3		
AnMod_T_4	Customized monitoring of the temperature value T4		
AnMod_I_1	Customized monitoring of the current value I1		
AnMod_I_2	Customized monitoring of the current value I2		
T-Switch inlet temperature	Customized monitoring of the intake temperature		
p-Switch pi	Customized monitoring of internal pressure pi in the oil separator tank		
T-Switch ADT	Customized monitoring of the airend discharge temperature ADT		
p-Switch pN	Customized monitoring of local network pressure pNloc at compressor output		
T-Switch PDT	Customized monitoring of the compressed air discharge temperature		

Tab. 76 Assigned analog measured values

Overview

Use the *Analogue values* or *Switch* menus for specifying the settings.

- Entering the message text
- Selecting and activating measured value
- Setting the time delay
- Setting the logic
- Selecting the message type
- Assigning and activating the output

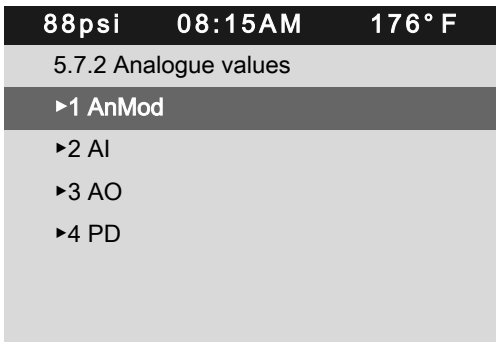
Below, the settings are displayed based on an example in the *Analogue values* menu. Use the *Switch* menu analogously for specifying the settings.

8.11.3.1 Analogue values menu

Precondition The electrical connection has been made.

Password access level 2 is activated.

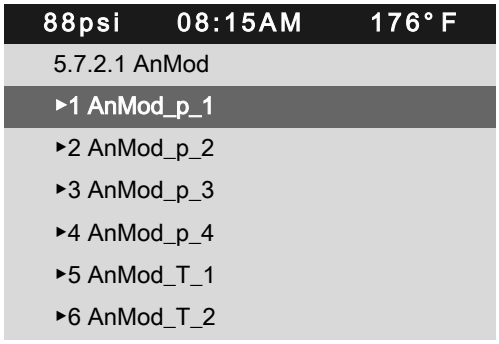
1. Select the 5.7.2 *<Configuration – I/O periphery – Analogue values>* menu.
   The *Analogue values* menu is displayed.



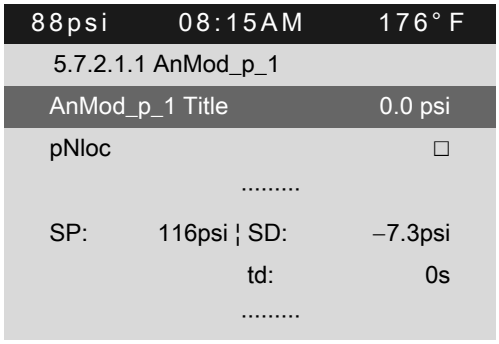
8.11.3.2 Entering the message text

In the following example, a message from the analog module is defined by pressure value p1.

1. Use «Up» or «Down» to select the *AnMod* line.
2. Press «Enter».
   The 5.7.2.1 *AnMod* menu is displayed.



3. Use «Up» or «Down» to select the *AnMod_p_1* line.
4. Press «Enter».
   The 5.7.2.1.1 AnMod_p_1 menu is displayed.

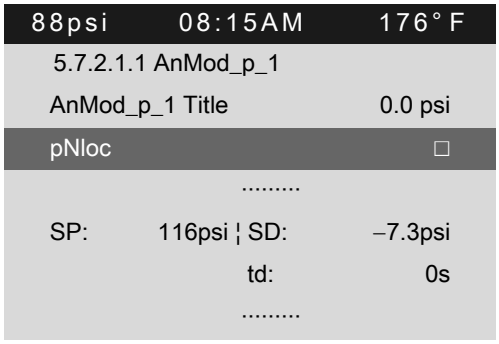


5. Press «Enter».
   The cursor is located at the first character of the message text.
   A column with alphanumeric characters is displayed.
   The selected character flashes.
6. Select the required character with the «Up» or «Down» keys.

7. Press the «Right» arrow.
   The cursor jumps to the next position of the message text.
8. Enter the remaining characters of the message text in the same manner.
9. Press «Enter».
   The message text has been entered.
10. Press «Enter».
    The setting is applied.

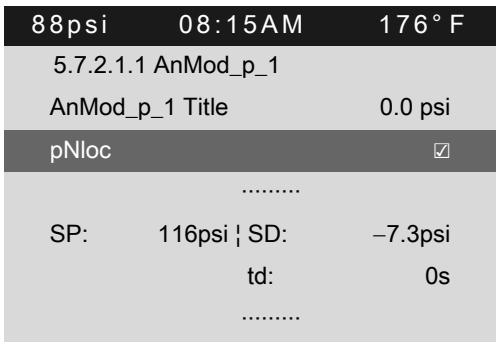
8.11.3.3 Selecting and activating measured value

1. Press the «DOWN» key.
2. Press «Enter».
   The display for the currently set measured value flashes.
3. Use «Up» or «Down» to select the measured value.
4. Press «Enter».



Header
Menu
Message text
Selected analog measured value
Switching point (SP) and switching differential (SD)
Time delay (td)

5. Press the «Right» arrow.
6. Press «Enter».
   The check box assigned to the input flashes.
7. Press the «Up» key.
   The check box is activated.

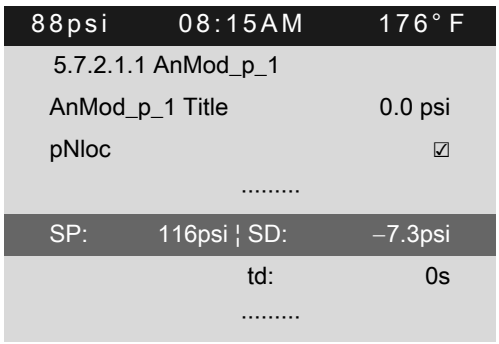


Header
Menu
Message text
Selected analog measured value, activated
Switching point (SP) and switching differential (SD)
Time delay (td)

8. Press «Enter».
   The measured value is assigned and activated.

8.11.3.4 Setting the switching point and switching differential

1. Use «Up» or «Down» to select the *SP* line.



Header
Menu
Message text
Selected analog measured value, activated
Switching point (SP) and switching differential (SD)
Time delay (td)

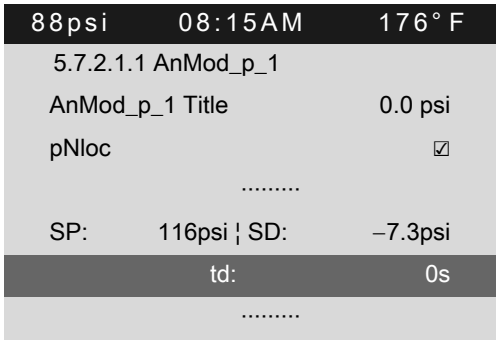
2. Press «Enter».
   The display for the current value of the switching point flashes.
3. Use «Up» or «Down» to set the *SP* value.
4. Press «Enter».
   The setting is applied.
5. If necessary, adjust the value for SD in the same manner.

Result The threshold value for the SP switching point and the SD switching differential are set.

8.11.3.5 Setting the time delay

The delay can be set between 0 and 600 seconds. The delay is counted down from 600 in 1 second increments with the «DOWN» key and counted upwards from 0 (zero) in 1 second increments with the «UP» key.

1. Use «Up» or «Down» to select the *td* line.
2. Press «Enter».
   The *td* delay time flashes.



Header
Menu
Message text
Selected analog measured value, activated
Switching point (SP) and switching differential (SD)
Time delay (td)

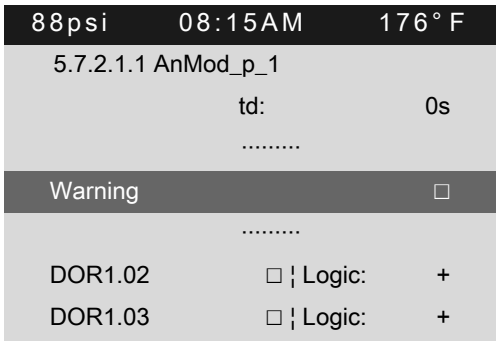
3. Use «Up» or «Down» to set the time delay in seconds.
4. Press «Enter».

Result The *td* delay time has been set.

8.11.3.6 Setting the message type

1. Select the message type line with the «Up» and «Down» keys.

2. Press «Enter».
   The display for the message type flashes.
3. Use «Up» or «Down» to set the message type.



Header
Menu
Time delay (td)
Set message type, in the example: Warning

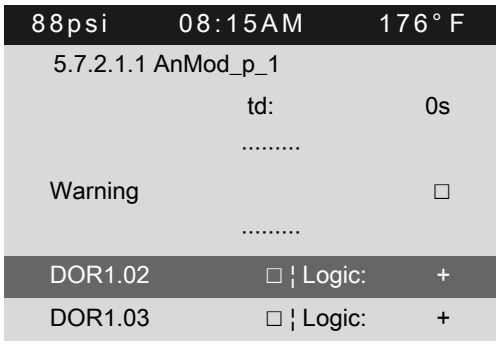
4. Press «Enter».
5. Press the «Right» arrow.
6. Press «Enter».
   The check box assigned to the message type flashes.
7. Press the «Up» key.
   The check box is activated.
8. Press «Enter».

Result The message type is set and activated.

8.11.3.7 Assigning and activating the output

By triggering the message one or two digital DOR outputs can be switched.

1. Use «Up» or «Down» to select the *DOR* line.
2. Press «Enter».
   The *DOR* output display flashes.
3. Select the output with the «Up» and «Down» keys.
4. Press «Enter».
   The setting is applied.



Header
Menu
Time delay (td)
Set message type, in the example: Warning
Active line (DOR output)

5. Press the «Right» arrow.
6. Press «Enter».
   The check box assigned to the output flashes.
7. Press the «Up» key.
   The check box is activated.

8. Press «Enter».
   The output is assigned and activated.
9. Press the «Right» arrow.
10. Press «Enter».
    The control field *Logic* flashes.
11. Use «UP» or «Down» to set the desired behavior, see table 75.
12. Press «Enter».

Result For messages at 24 V, the logic is set with the **+** symbol.

Result The pNloc measured value at the analog AnMod_p_1 input is available as a message and as output signal at the selected DOR output.

8.11.4 Switching and/or triggering messages with thresholds

Some measured values of the controller can be used for customized messages and/or other switching functions.

The following measured values are available:

Measured value	Explanation	Message #	Output
System pressure pNloc	Threshold for pressure *System pressure pNloc* (local system pressure at compressor output)	0095 O/W/A	
Internal pressure pi	Threshold for pressure *Internal pressure pi* (internal pressure pi in the oil separator tank)	0093 O/W/A	
ADT	Threshold for temperature *ADT* (discharge temperature)	0094 O/W/A	
Inlet temperature	Threshold for temperature *Inlet temperature* (inlet temperature)	0092 O/W/A	
PD temperature	Threshold for temperature *PD temperature* (compressed air discharge temperature)	0096 O/W/A	
n Compressor motor [1)]	Threshold for the compressor motor speed	0098 O/W/A	

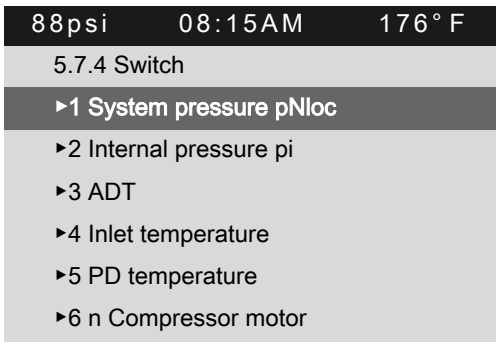
[1)] Power switching with frequency converter

Tab. 77 Available measured values

Example: Setting for the local network pressure at compressor output *System pressure pNloc*.

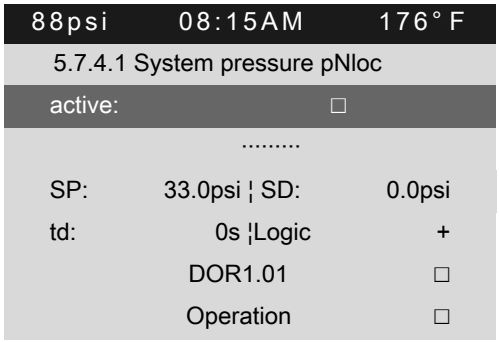
Precondition Password access level 2 is activated.

1. Open the 5.7.4 *<Configuration – I/O periphery – Switch>* menu.
   A menu containing a list of available measured values is displayed.



Header
Menu
Active line

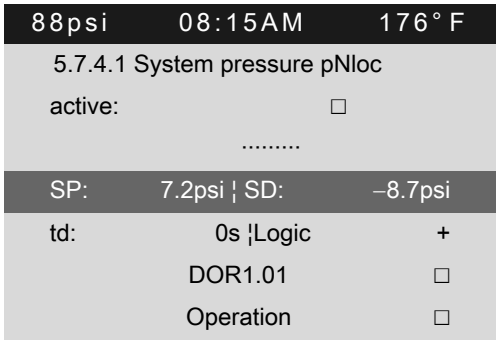
2. Use «Up» or «Down» to select the measured value.
3. Press «Enter».
   The menu for the selected measured value (in the example *System pressure pNloc*) is displayed.



Header
Menu
Active line with check box
Switching point (SP) and switching differential (SD)
Delay (td) and logic
Output DOR
Type of message

8.11.4.1 Setting the switching point and switching differential

1. Use «Up» or «Down» to select the *SP* line.



Header
Menu
Switching point (SP) and switching differential (SD)
Delay (td) and logic
Output DOR
Type of message

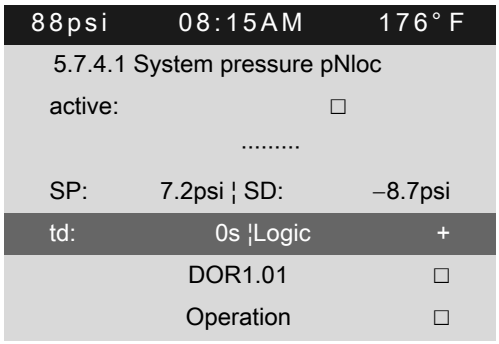
2. Press «Enter».
   The display for the current threshold of the switching point flashes.
3. Use the «Up» or «Down» keys to set the *SP* threshold.
4. Press «Enter».
   The setting is applied.
5. If necessary, adjust the value for the *SD* switching differential in the same way.

Result The threshold for the *SP* switching point and the *SD* switching differential are set.

8.11.4.2 Set the time delay

The delay can be set between 0 and 600 seconds. The delay is counted down from 600 in 1 second increments with the «DOWN» key and counted upwards from 0 (zero) in 1 second increments with the «UP» key.

1. Use «Up» or «Down» to select the *td* line.
2. Press «Enter».
   The *td* delay time flashes.



Header
Menu
Switching point (SP) and switching differential (SD)
Delay (td) and logic
Output DOR
Type of message

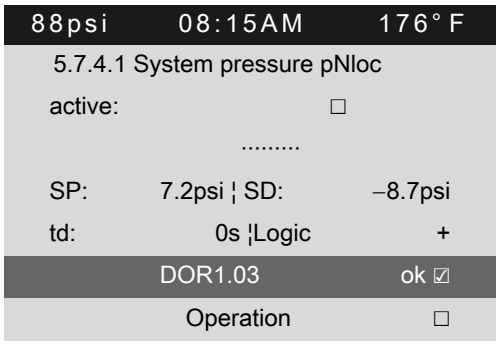
3. Use «Up» or «Down» to set the time delay in seconds.
4. Press «Enter».

Result The *td* delay time has been set.

8.11.4.3 Assign and activate the output

Once the threshold has been reached, you can switch a digital output *DOR*.

1. Use «Up» or «Down» to select the *DOR* line.
2. Press «Enter».
   The *DOR* display flashes.
3. Select the output with the «Up» and «Down» keys.
4. Press «Enter».
   The setting is applied.



Header
Menu
Switching point (SP) and switching differential (SD)
Delay (td) and logic
Output DOR
Type of message

5. Press the «Right» key.
6. Press «Enter».
   The check box assigned to the output flashes.
7. Press the «Up» key.
   The check box is activated.

8. Press «Enter».
   The output is assigned and activated.
   ok is displayed.

8.11.4.4 Setting the message type

1. Select the message type line with the «Up» and «Down» keys.
2. Press «Enter».
   The display for the message type flashes.
3. Use «Up» or «Down» to set the message type.

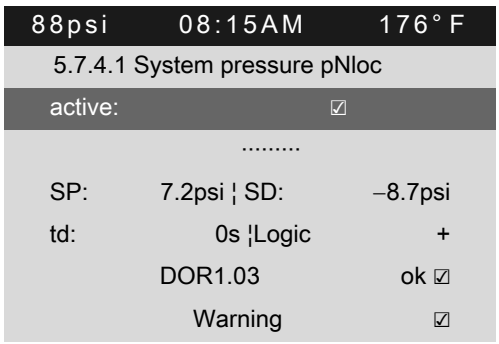
Header
Menu
Switching point (SP) and switching differential (SD)
Delay (td) and logic
Output DOR
Type of message

4. Press «Enter».
5. Press the «Right» arrow.
6. Press «Enter».
   The check box assigned to the message type flashes.
7. Press «Up» key.
   The message is activated.
8. Press «Enter».

Result The message type is set and activated.

8.11.4.5 Activating the threshold

1. Use «Up» or «Down» to select the *active:* line.
2. Press «Enter».
   The check box will flash.



Header
Menu
Active line with check box
Switching point (SP) and switching differential (SD)
Delay (td) and logic
Output DOR
Type of message

3. Press the «Up» key.
   The check box is activated.

4. Press the «Enter» key.
   The threshold is selected and activated.

Result In the above example the switching point for *System pressure pNloc* has been set and is active. If the pressure is reached or exceeded and remains longer than the set time delay *td*, the message is triggered with the set message type and the set output *DOR* is switched. If the pressure falls below the threshold *SP* + switching differential *SD*, the message and output are reset. The switching behavior is inverted by setting "-" of *Logic* parameter.

The settings for the other measured values are carried out in the same manner.

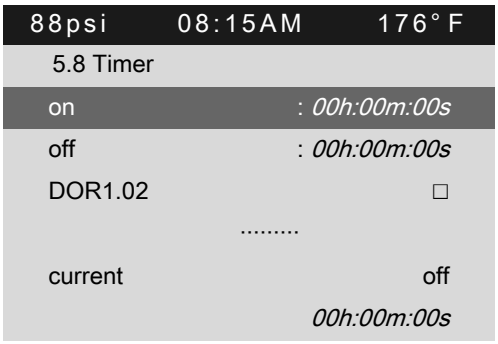
8.12 Timer

SIGMA CONTROL 2 is equipped with an integrated timer that can control an adjustable DOR output for customer-specific applications. Valid setting values for the cutting in and out duration are between 10 h ≥ t ≥ 1 s.

Precondition Access level 2 is activated

The electrical connection has been established (for information about a spare *DOR* output please see the machine's wiring diagram)

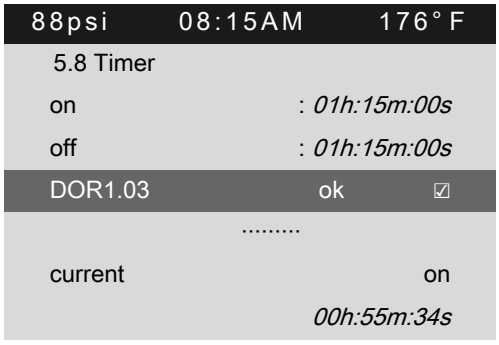
1. Open the 5.8 *<Configuration – Timer>* menu.



Header
Menu
Cut-in period
Cut-out period
set output
Current status DOR
Remaining time until status change

2. Using the «Up» or «Down» key, select the line *on*.
3. Press the «Enter» key.
   Setting mode is active.
   The display for hours *00h*:00m:00s flashes.
4. Use «Up» or «Down» to set the hours.
5. Press the «Right» key.
   The display for minutes *01h*:00m:00s flashes.
6. Use «Up» or «Down» to set the minutes.
7. Press the «Right» key.
   The display for seconds *01h:15m:*00s flashes.
8. Use «Up» or «Down» to set the seconds.
9. Press the «Enter» key.
   The setting is applied accordingly.
10. Use the «Up» or «Down» keys to select the *off* line.
11. Proceed in the same manner to set the cut-out period.
12. Use the «Up» or «Down» keys to select the *DOR* line.

13. Press the «Enter» key.
    Setting mode is active.
14. Use «Up» or «Down» to set the required output *DOR*.
15. Press the «Enter» key.
    The setting is applied accordingly.
16. Press the «Right» key.
17. Press «Enter».
    The check box flashes.
18. Press the «Up» key.
    The check box associated to output *DOR* is activated.
19. Press «Enter».
    If output *DOR* is correctly assigned and activated, *ok* is displayed.



Header
Menu
Cut-in period
Cut-out period
Set output DOR
Current status DOR
Remaining time until status change

Result The set output *DOR* is controlled by the timer.
The current status of output *DOR* is displayed in the *current* line. The remaining time until the next status change is displayed in the line underneath.

8.13 Activating remote acknowledgement

When fault or alarm messages are routed to a remote control center via an output it makes sense to have these messages acknowledged by the control center.

Acknowledging the message without correcting the cause, however, can lead to machine damage.
Safety-relevant "EMERGENCY STOP push button" and "Maintenance door limit switch" messages cannot be acknowledged remotely.

The following conditions must be fulfilled:

- The remote control of the compressor is set (see chapter 8.5.3 Controlling machine from a remote location)
- Remote control is activated (see chapter 8.2.13 Activating remote control)
- A controller input has been assigned for the acknowledgement signal

Overview

- Selecting the *<Configuration – Acknowledgement>* menu.
- Setting the "Remote acknowledgement" function
- Activating the remote control

- Assigning an input
- Press the «Remote control» key

⚠ CAUTION

Machine damage can result from acknowledging a fault message without remedying its cause!

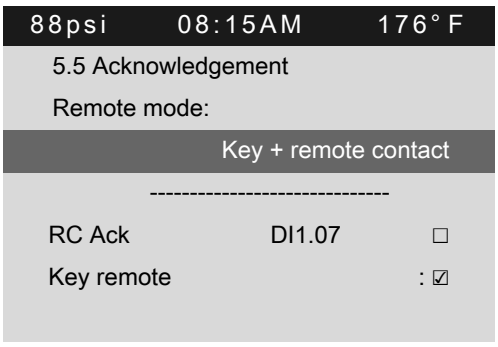
➢ *Find the failure cause.*

➢ Decide to acknowledge or not.

8.13.1 Setting the remote acknowledgement function

Precondition Password access level 2 is activated.

1. Select the 5.5 *< Configuration – Acknowledgement >* menu.
2. Use «Up» or «Down» to select the *Remote mode* line.
3. Press the «DOWN» key.
4. Press «Enter».
   The currently active operating mode flashes.
5. Use «Up» or «Down» to set the *Key + remote contact* input.



Header
Menu
Active line with "Key + remote contact" setting

6. Press «Enter».
   The setting is applied.

Result The Remote acknowledgement function is set.

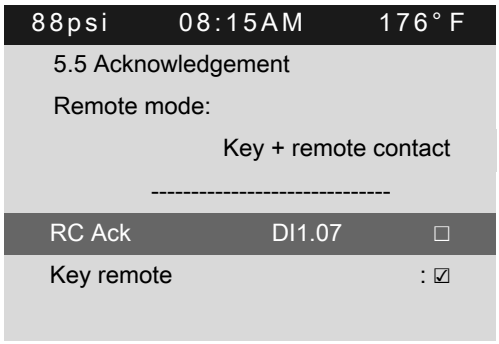
8.13.2 Activating the remote control

➢ Activating the remote control see chapter 8.2.13.

Result SIGMA CONTROL 2 remote control is activated.

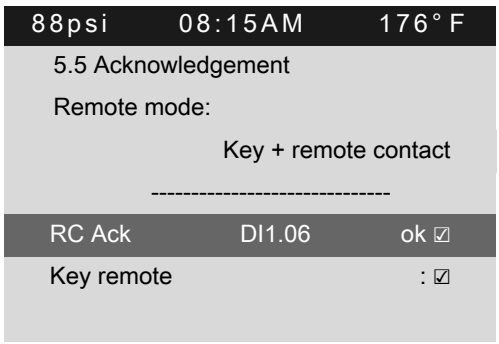
8.13.3 Assigning an input

1. Use «Up» or «Down» to select the *RCAck* line.



Header
Menu
Active line

2. Press «Enter».
   The *DI* display flashes.
3. Use «Up» or «Down» to set the input.
4. Press «Enter».
   The input has now been assigned.
5. Press the «Right» key.
6. Press «Enter».
   The check box assigned to the input flashes.
7. Press the «Up» key.
   The check box is activated.
8. Press «Enter».
   The input is assigned and activated.



Header
Menu
Input for remote contact assigned and activated

9. Press the «Remote control» key to enable remote acknowledgement.

Result Should a message occur, it can now be acknowledged from a control center.

8.14 Linking to an external pressure transducer

If the air system is operated with an air receiver, the pressure in the receiver can be regulated by an external pressure transducer.

Transmitting a pressure transducer value	Assignment to an input
The external pressure transducer is connected to SIGMA CONTROL 2.	*All* assign
Pressure transducer characteristics: ■ 4–20 mA ■ 0–232 psi	

Tab. 78 Transmitting a pressure transducer value

The controller processes the options in the following sequence:

- Pressure according to the assigned external transducer
- The local system pressure transducer (pNloc) remains active

Overview

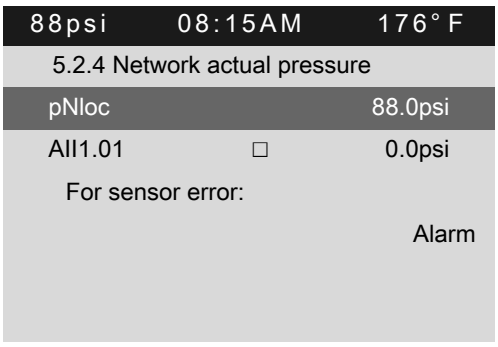
Example: The external pressure transducer is connected to SIGMA CONTROL 2.

- Select the *<Configuration – Pressure control>* menu.
- Assign an input.

8.14.1 Pressure control menu

Precondition Password access level 2 is activated.

1. Select the 5.2.4 *< Configuration – Pressure control – Network actual pressure>* menu.
   The *Network actual pressure* menu is displayed.

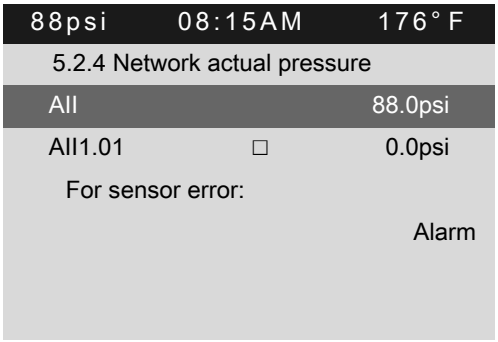


Header
Menu
Active line (local pressure transducer)

8.14.2 Assigning an input to an external pressure transducer

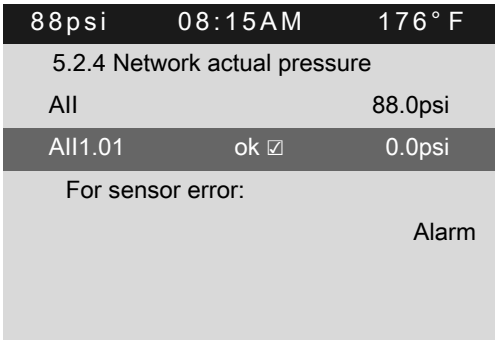
1. Press «Enter».
   The *pNloc* indication flashes.

2. Use «Up »or «Down» to set the *AI/* input.



Header
Menu
Active line (external pressure transducer)

3. Press «Enter».
   The *AI/* input is set.
4. Press «Down».
   The line for activating the input is displayed.
5. Press the «Right» key.
6. Press «Enter».
   The check box assigned to the input flashes.



Header
Menu
Active line

7. Press «UP».
   The check box is activated.
   ok is displayed.
8. Press «Enter».
   The setting is applied.

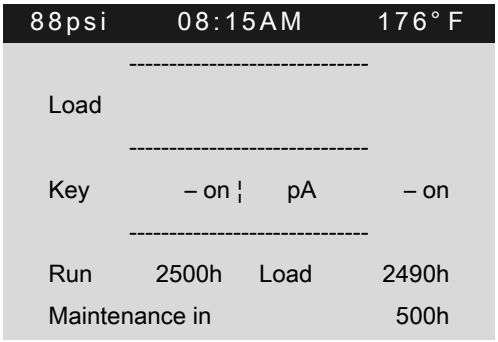
Result The input for the external transducer is now activated.

8.15 Commissioning the machine

Checking the controller settings	Section	Confirmed?
➢ Language correctly set?	8.2.2	
➢ Date and time correct?	8.2.8	
➢ Display format correctly set?	8.2.10	
➢ System pressure setpoint correctly set?	8.4	

Tab. 79 Check list for commissioning the machine

1. Check and confirm all the items in the check list before commissioning the machine.
   When power is applied to the machine the controller boots and carries out a self test. The display and the *Controller on* LED illuminate.



Header
Current operating mode
Operating parameters
Operating parameters
Maintenance indicator

2. Continue the commissioning process as described in chapter "Commissioning" of the machine's operating manual.

9 Operation

9.1 Switching on and off

Always switch the machine on with the «ON» key and off with the «OFF» key.

Precondition A power supply disconnecting device has been installed by the user.

Fig. 40 Switching the compressed air station on and off

7	«ON» key and LED	14	*IDLE* LED
8	«OFF» key	15	*LOAD* LED
13	«Load/Idle» toggle key	16	*Controller voltage* LED

9.1.1 Switching on

Precondition No personnel are working on the machine.
All access doors and panels are in place and secured.
The ambient conditions as described in Chapter "Installation and Operating Conditions" are met.

1. Switch on the user's power supply disconnecting device.
2. Switch on the machine and wait for SIGMA CONTROL 2 to start.
   The *Controller voltage* LED 16 lights green.
3. Press the «On» 7 key.
   The *On* LED lights green.

If a power failure occurs, the machine is **not** prevented from restarting automatically when power is resumed.
The compressor motor may automatically restart as soon as power is restored (see chapter 8.5).

Result The compressor motor starts as soon as system pressure is lower than the setpoint pressure (cut-off pressure).

9.1.2 Switching off

1. Press the «OFF» key.

   The machine switches to IDLE (not for SXC) and the *ON* LED flashes. The SIGMA CONTROL 2 display shows *Stopping*. The *ON* LED extinguishes as soon as the automatic shut-off action is completed.
2. Switch off and lock out/tag out the power supply disconnecting device.

Result The *Controller voltage* LED extinguishes. The machine is switched off and disconnected from the power supply.

In rare cases, you may want to shut down the machine immediately and cannot wait until the automatic shut-down process is finished.

➢ Press «OFF» once again.

9.2 Switching off in an emergency

The EMERGENCY STOP push button is located below the controller [2)].

[2)] Does **not** apply to i.Comp

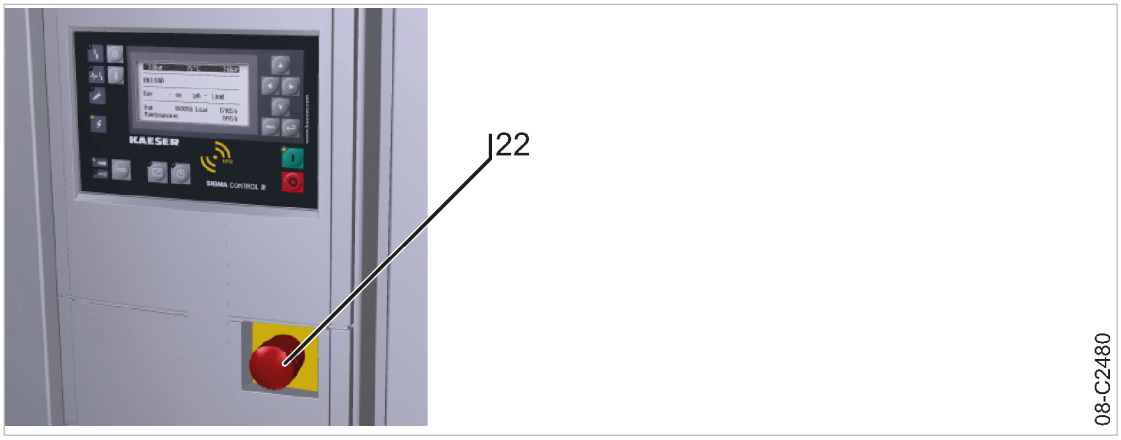


Fig. 41 Switching off in an emergency

22 EMERGENCY STOP push button

Switching off

➢ Press the EMERGENCY STOP push button.

After actuating the EMERGENCY STOP push button, the machine is shut down. However, the machine is still connected to the electrical power supply.

Result The EMERGENCY STOP push button remains latched after actuation.

The compressor's pressure system is vented and the machine is prevented from automatically re-starting.

Switching on

Precondition The fault has been rectified

1. Turn the EMERGENCY STOP push button in the direction of the arrow to unlatch it.
2. Acknowledge any existing fault messages.

Result The machine can now be started again.

9.3 Acknowledging alarm and warning messages

Messages are displayed on the "new value" principle: You can acknowledge warning or fault messages immediately after *Message coming* or *Message going*. However, warning and fault messages can be acknowledged only following a successful elimination of the corresponding fault.

Message sequence 1	Indication
Message coming	LED flashes
Message acknowledged	LED illuminates
Message going	LED off

Tab. 80 Message sequence 1

Message sequence 2	Indication
Message coming	LED flashes
Message going	LED flashes
Message acknowledged	LED off

Tab. 81 Message sequence 2

Fig. 42 Acknowledging messages

[17] *Warning* LED (yellow)
[20] *Alarm* LED (red)
[21] Key «Acknowledge»

Alarm message

An alarm message shuts the machine down automatically.
The red *Alarm* LED flashes.

Precondition The fault has been rectified

➢ Press «Ack» to acknowledge the fault message.
Alarm LED extinguishes. The machine is again ready for operation.

If the machine has been stopped with the EMERGENCY STOP push button.

➢ First turn the EMERGENCY STOP push button in the direction of the arrow to unlatch it.

➢ Then acknowledge the alarm message.

Further information A list of possible alarm messages occurring during operation are shown in chapter 10.2.

Warning message

If maintenance work is to be carried out or if the warning is displayed before an alarm, the yellow *warning* LED flashes.

Precondition The danger of an alarm is eliminated.
Maintenance has been carried out

➢ Press «Ack» to acknowledge the warning message.
The *Maintenance* LED extinguishes. The machine is again ready for operation.

Further information A list of possible warning messages occurring during operation are shown in chapter 10.3.

9.4 Displaying messages

The following information can be accessed in the 1.1 *<Status – Messages>* menu:

- Current messages
  - Last alarm
  - Last warning
  - Number of currently registered alarms and/or warnings
- Message history: The last 1000 events, these include alarm and warning messages
  - Compressor messages
  - Diagnostic messages
  - System messages
- Address error: Display of incorrect parameterization in menu X

The information (message) is shown in three lines of the display.

Line	Submenu/Segment/Text
1	Selected submenu: ■ Compressor messages ■ Diagnostic messages ■ System messages
2	Segment: ■ Message number ■ Message type ■ Message status ■ Message date ■ Message time

Line	Submenu/Segment/Text
3	Text: ■ Message text ■ –

Tab. 82 Information of a message

Message type and status are shown abbreviated.

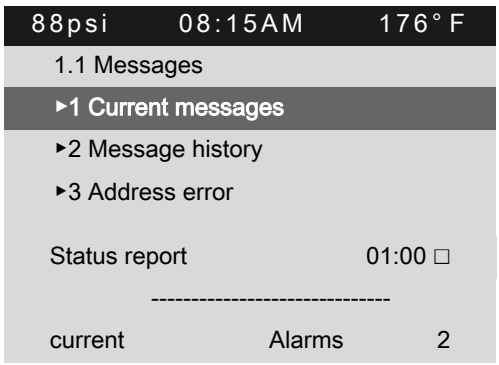
Segment	Indication	Meaning
Message number	*0059* (example)	Message 0059
Message type	*W*	Warning and maintenance message
	A	Alarm
Message status	*c*	Message has come
	g	Message gone
	a	Message acknowledged
Date	*04/13/20* (Example)	Date
Time	*08:15:37AM* (Example)	Time

Tab. 83 Message abbreviations

9.4.1 Selecting the status menu

1. Select the 1.1 *<Status – Messages >* menu.

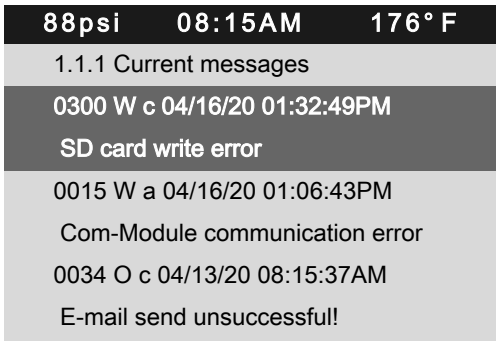
   The *Messages* menu is displayed
   The number of current alarms and warnings is displayed in the two bottom lines.



Header
Menu
Active line
Only displayed in the event of I/O parametrization error
Number of currently registered faults

Displaying the last alarm or warning

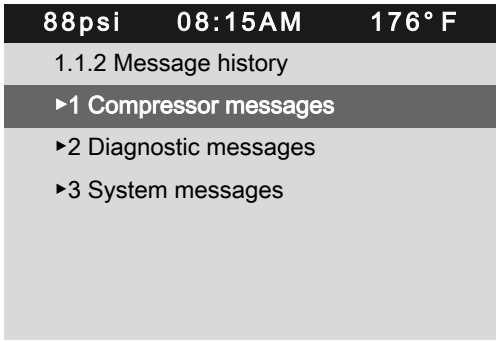
1. Select the 1.1.1 *<Status – Messages – Current messages>* menu.
   The third line displays the last fault or warning message.



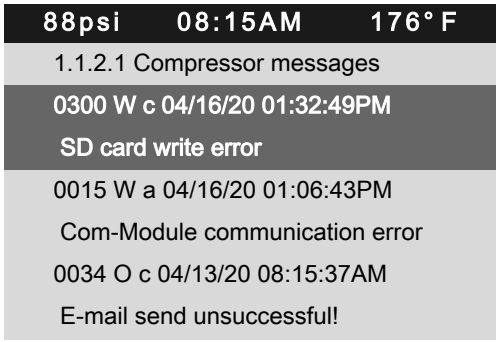
2. Press «Escape» repeatedly to return to the main menu.

Displaying the message history

1. Select the 1.1.2 *<Status – Messages – Message history>* menu.
   The *Message history* menu is displayed.



2. Press «Enter».
   The 1.1.2.1 *Compressor messages* menu is displayed.
   The third line displays the last fault or warning message.



3. Press «Escape» repeatedly to return to the main menu.

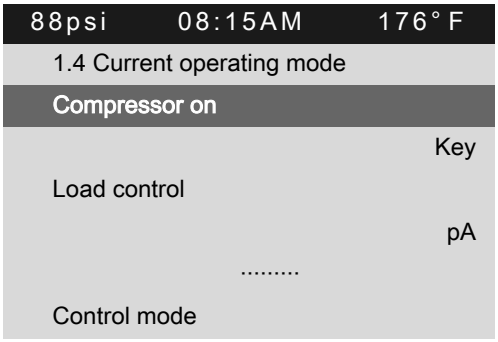
9.5 Displaying the current operating mode

The operating mode is displayed in 2 segments (example):

On/off switching via	Load control via
Key	*pA*

Tab. 84 Operating mode display

1. Open the 1.4 *<Status – Current operating mode>* menu.
   The *Current operating mode* menu is displayed.



Header
Menu
Active line

Abbreviation of operating modes

Segment	Display	Meaning
On/off switching via	Key	«ON» key on the operating panel of SIGMA CONTROL 2
	Key + clock	Cycle Control
	Key + remote contact	Remote contact (FK): external LOAD signal
	Key + remote bus	Remote bus (FB): external bus signal
LOAD control via	pA	*pA* set-point pressure
	pB	*pB* set-point pressure
	pA/pB Clock	Set-point pressure via time control
	pA/pB Cycle	Set-point pressure via timer
	pA/pB SC2	Nominal pressure via 2 machines working in master-slave mode [4]
	pA/pB RC	Set-point pressure via remote contact
	pA/pB RB	Set-point pressure via remote bus
	Load RC [3]	LOAD remote contact (external LOAD signal)
	Load RB [3]	Remote bus (external bus signal)
	loc.-load RC [3]	Local/LOAD remote contact

[3] PISTON: Applies only to Airbox

[4] FLUID

Tab. 85 Abbreviation of operating modes

9.6 Adjusting the working pressure

➢ Adjust the pressure parameter to suit the compressor and application.

Further information A detailed explanation of all pressure parameter settings is given in chapter 8.4.

9.7 Displaying analogue data

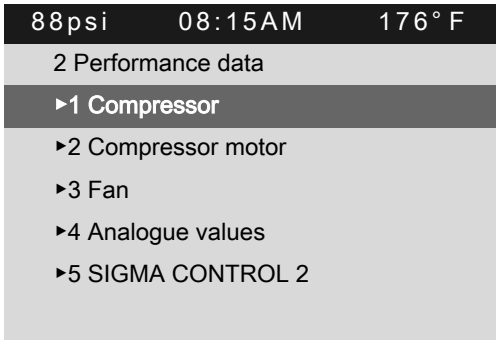
The *Performance data* menu provides the following information:

- Compressor
- Compressor motor
- Fan
- Analogue values
- SIGMA CONTROL 2

Displaying analogue data

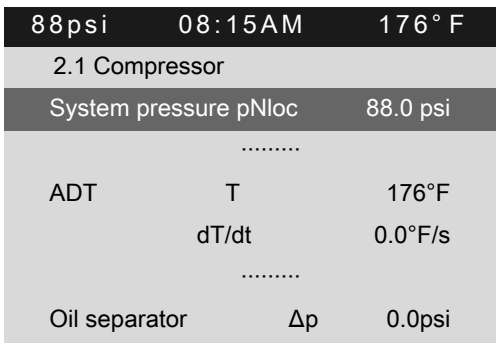
Precondition Password access level 2 is activated.
The operating mode is displayed.

1. Select the 2 *Performance data* menu.
   A list of the components is displayed.



Header
Menu
Active line

2. If necessary, repeatedly press «Up» or «Down» to select the required component.
3. Press «Enter».
   The system displays the measurement data for the compressor.



Header
Menu
Local System pressure pNloc
Airend discharge temperature
Rise of airend discharge temperature
Differential pressure, oil separator cartridge

9.8 Displaying operating data

The following information can be called up in the *Operating data* menu:

- Operating hours
  - Compressor: Total machine running time
  - On load: Machine running time in LOAD mode
  - Motor: Motor running timer (adjustable)
  - Compressor block: Airend running time (adjustable)
  - SIGMA CONTROL 2: Controller running time
- Switching cycles
  - Load valve on
  - Mains contactor on (adjustable)
- kWh counter

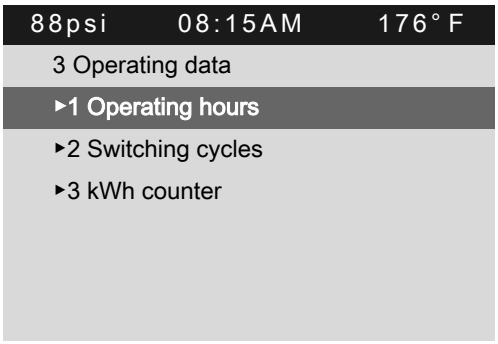
➢ Reset the run times after replacing the compressor block or the compressor motor.
➢ Reset the main contactor switching cycle counter after replacing the main contactor.

9.8.1 Checking the operating hours

Display the operating hours

Precondition Password access level 2 is activated.

1. Select the 3 *Operating data* menu.



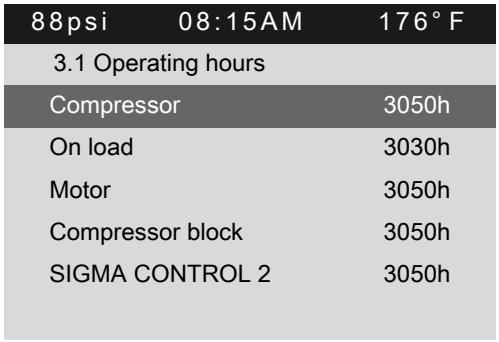
Header
Menu
Active line

Changing the operating hours

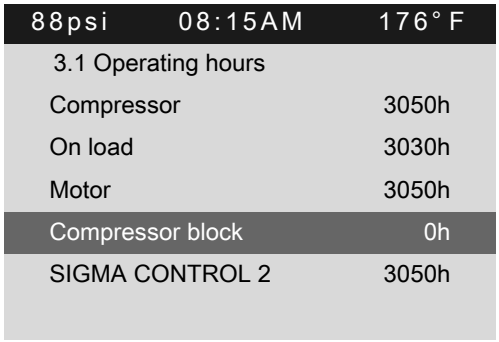
The running times of the compressor motor and airend can be adjusted. This may be required after a replacement, for example.

Precondition Password access level 2 is activated.

1. Select the 3.1 *<Operating data – Operating hours>* menu.



2. Use «Up» or «Down» to select the *Compressor block* line.
3. Press «Enter».
   The display of the running time flashes.



4. Use «Down» or «Up» key to set the value for operating hours to zero.
5. Press «Enter».
   The setting is applied.
6. Press «Escape» repeatedly to return to the main menu.

Result The operating hours for the new airend are set to *0 h*.

9.8.2 Checking the switching cycles

The system monitors the usage times of safety-relevant components to ensure the proper condition of all safety-relevant functions. Depending on the component, the usage time may be defined by run time or switching cycles. For the main contactor, the usage time is defined by the maximum permissible number of switching cycles.
The main contactor switching cycle counter in SIGMA CONTROL 2 records the number of switching cycles and generates a warning message when the maximum permissible number of switching cycles is exceeded.
When this warning message is generated, the safety-relevant function is no longer ensured. The main contactor must be replaced!

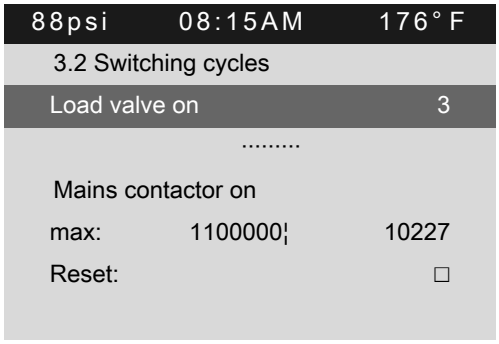
➢ Comply with all instructions.

Displaying the switching cycles

Precondition Password access level 2 is activated.

1. Select the 3.2 *<Operating data – Switching cycles>* menu.

2. Compare the maximum permissible number of switching cycles with the value displayed by the switching cycle counter.



Header
Menu
Active line
Maximum value/switching cycle timer

Result The safety-relevant function is ensured.
The maximum permissible number of switching cycles have not exceeded.
The main contactor can still be used.

The safety-relevant function is not ensured.
The maximum permissible number of switching cycles have exceeded.
➢ Have the main contactor replaced.

Replacing the main contactor

If the displayed value of the main contactor exceeds the maximum permissible number of switching cycles, SIGMA CONTROL 2 generates the warning message *0024 Mains contactor operations ≠*.
The main contactor must be replaced.

➢ Have the main contactor replaced by an authorized KAESER service representative.

Resetting the main contactor

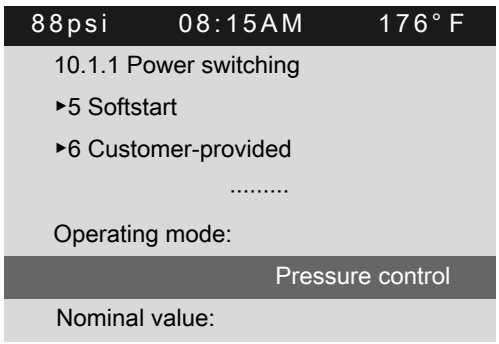
➢ Have the main contactor replaced by an authorized KAESER service representative.

9.9 Displaying the frequency converter settings

Precondition Machine with optional frequency converter
The operating mode is displayed

1. Open the menu 10.1.1 *<Components – Compressor motor – Power switching>*.

2. Using the «Up» or «Down» keys, select the line *Operating mode:*.
   The source for the speed setting will be displayed in the line *Operating mode:*.



Header

Source for speed setting

3. Press the «Escape» key repeatedly to exit the menu.

9.10 Setting the maintenance interval

Maintenance comprises a set of tasks that must be completed in order to ensure the functionality of a machine or system.

A maintenance interval is a period of time specified by the manufacturer, at the end of which a maintenance task falls due.

Example: Changing the oil change service interval.

Precondition Password access level 2 is activated.
The operating mode is displayed.

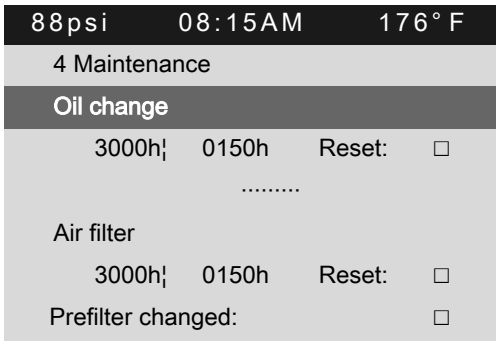
NOTICE

Unauthorized extended maintenance intervals
Progressive damage to the machine leading to inoperability

➢ *Observe the maintenance intervals specified by the manufacturer*

Maintenance menu

1. Open the menu 4 *Maintenance*.
2. Using the «Up» or «Down» keys, select the line *Oil change*.

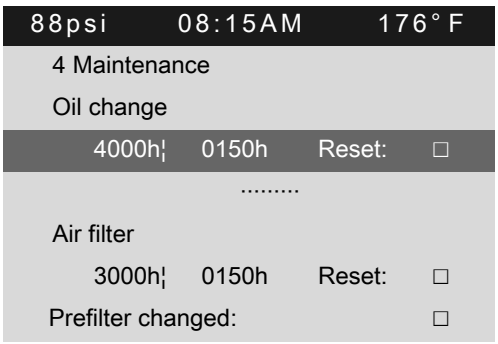


Header

Active line, Description maintenance interval

Preset interval 3000 h

3. Press the «DOWN» key.
   The maintenance interval for oil change is displayed as active line.



Header

Maintenance interval description

Active line, factory-defined interval

4. Press the «Enter» key.
   The setting mode is active.
5. Use the «Up» or «Down» keys to set the new value for the maintenance interval.

Hold down the «Up» key to change the maintenance interval in increments of 10, 100 or 1000.

6. Press the «Enter» key.
   The setting is applied.
7. Press the «Escape» key repeatedly to return to the main menu.

9.11 Resetting the maintenance interval counter

Whenever maintenance has been carried out, the associated maintenance counter must then be reset so that the countdown towards the next maintenance task can begin accordingly.

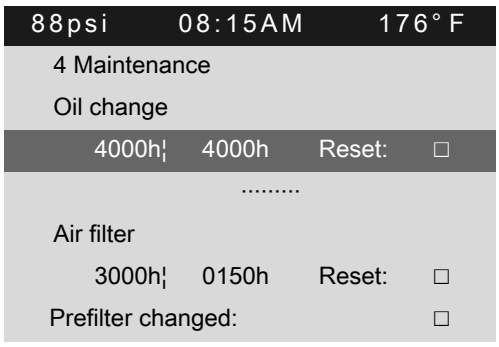
Example: Resetting the oil change maintenance counter.

Precondition
Password access level 2 is activated
The operating mode is displayed
The applicable maintenance task has been carried out in accordance with the stipulations of the manufacturer

Maintenance menu

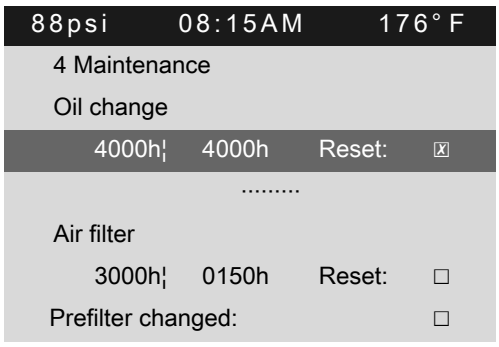
1. Open the menu 4 *Maintenance*.
2. Using the «Up» or «Down» keys, select the line *Oil change*.

3. Press the «Down» key.
   The maintenance interval for oil change is displayed as the active line.



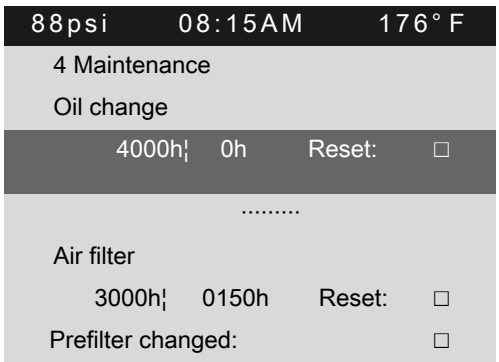
Header
Maintenance interval designation
Active line

4. Press the «Enter» key.
   The setting mode is active.
5. Press the «Right» key repeatedly until the check box *Reset:* is indicated.
6. Press the «Enter» key.
   The setting mode is active.
   The check box *Reset:* will flash.
7. Press the «Up» key.
   The check box is activated.



Header
Maintenance interval designation
Active line with activated check box

8. Press the «Enter» key.
   The display stops flashing and the maintenance counter *Oil change* is reset.
   The check box *Reset:* is deactivated again.



Header
Maintenance interval designation
Active line, the maintenance counter has been reset, the Reset check box has been deactivated

9. Press the «Escape» key repeatedly to return to the main menu.

9.12 Checking the safety relief valve

Overview

- Preparing the inspection
- Performing the inspection
- Correct conclusion of the test
- Resetting

When the check mode is activated, the threshold value for the blow-off protection is raised and regulation of the network pressure is deactivated.

The parameter *pi* is used for the test described below and for machines without internal pressure transducer, the parameter *pN* is used.

Check box	Status
☑	Activated
☐	Deactivated

Tab. 86 Check box status

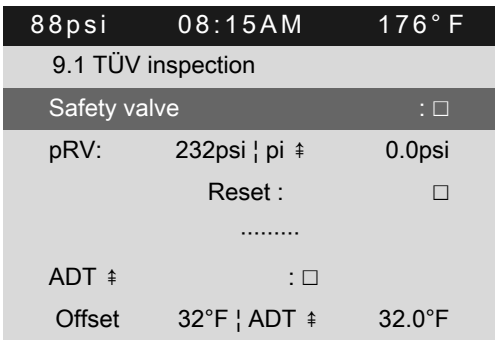
⚠ WARNING

Danger of injury from pressurized components!

➢ *Perform the following actions in the sequence provided.*

Preparing the inspection

1. Determine and record the safety relief valve's actuating pressure (see indicated value *pRV* in the controller display or in the machine's Operating Manual in chapter "Technical Data").
2. Calculate and record a value that is 11% higher than the actuating pressure of the safety relief valve.
3. Press the «Off» key to shut down the machine.
4. Close the user's shut-off valve between the machine and the air distribution network.
5. Log on with password access level 2.
6. Select the 9.1 *<Machine test – TÜV inspection>* menu.



Header

Menu

Active line with check box

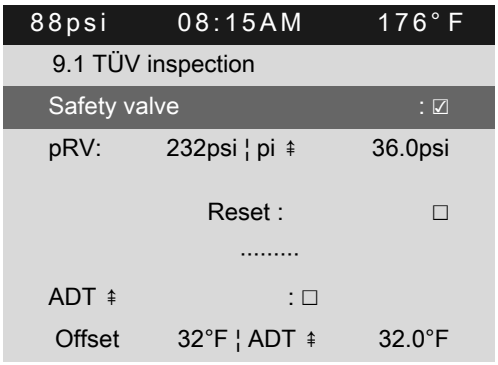
Safety relief valve actuating pressure (example)

Performing the inspection

1. Use «Up» or «Down» to select the *Safety valve* line.
2. Press «Enter».

   The check box *Safety valve* will flash.

3. Press «Up».
   The check box is activated.
4. Press «Enter».
   The test mode is now activated.



Header

Menu

Active line with check box

Safety relief valve actuating pressure, internal pressure

5. **⚠ WARNING** *Risk of hearing damage when safety relief valve blows off!*
   - ➢ *Close all access doors, replace and secure all removable panels.*
   - ➢ *Always wear ear protection.*
6. **⚠ WARNING** *Risk of burns due to released cooling oil and compressed air when blowing off the safety relief valve!*
   - ➢ *Close all access doors, replace and secure all removable panels.*
   - ➢ *Wear eye protection.*
7. Depending on the machine model, perform inspection as follows.

Rotary screw compressors with internal pressure transducer (*pi*)	Rotary screw compressors without internal pressure transducer (*pN*)
1. Press the «ON» key. After the motor start is completed, keep the «LOAD/IDLE» key pressed. Otherwise, the machine remains in IDLE and is stopped after two minutes. The machine switches to LOAD and the machine's *pi* pressure rises. 2. Monitor on the display the pressure rise *pi* during the TÜV check. 3. Release the «LOAD/IDLE» key immediately as soon as the safety valve actuates, in order to prevent unnecessary oil mist. 4. If the measured pressure value *pi* increases to 11 % above the actuating pressure of the safety relief valve, immediately release the «LOAD/IDLE» key. The safety relief valve is defective. Shut down the machine with the «OFF» key and immediately replace the safety relief valve. 5. If the measured pressure value *pi* exceeds the actuating pressure of the safety relief valve by 29.0psi, the display shows the fault message *pRV ≠*. The safety relief valve is defective. Decommission the machine. Have the safety relief valve replaced immediately.	1. Press and hold the « ON » key. The machine switches to LOAD and the machine's *pN* pressure rises. 2. Monitor on the display the pressure rise *pN* during the TÜV check. 3. Release the «ON» key immediately when the safety relief valve responds, in order to prevent unnecessary oil mist. 4. If the measured pressure value *pN* increases to 11 % above the actuating pressure of the safety relief valve, immediately release the «ON» key. The safety relief valve is defective. Shut down the machine with the «OFF» key and immediately replace the safety relief valve. 5. If the measured pressure value *pN* exceeds the actuating pressure of the safety relief valve by 29.0psi, the display shows the fault message *pRV ≠*. The safety relief valve is defective. Decommission the machine. Have the safety relief valve replaced immediately.

Correct conclusion of the test

1. Press «Enter».
   The check box *Safety valve* will flash.
2. Press the «DOWN» key.
   The check box is deactivated.
3. Press «Enter».
   The test mode is deactivated and the test is completed.
4. Press «Escape» repeatedly to return to the main menu.
5. Open the user's shut-off valve between the machine and the air distribution network.

Result The machine is ready for operation.

Resetting

If the test is cancelled when opening the safety relief valve, SIGMA CONTROL 2 will indicate the highest measured value as reached pressure.
To reset the saved value, activate the *Reset* check box.

➢ Activate the *Reset* check box.

9.13 Excessive temperature shut-down test

The machine should shut down if the airend discharge temperature (ADT) reaches a maximum of 230°F.
SIGMA CONTROL 2 will simulate a higher temperature for checking this function.

For this purpose, SIGMA CONTROL 2 automatically determines an offset value to be displayed. During the test mode, this offset is added to the actual airend discharge temperature to cause the machine to shut down prematurely.

No warning message is generated. However, the corresponding fault message "0015Airend discharge temperature ADT ⇞" switches off the machine once the maximum discharge temperature has been reached.

Overview

- Allow the machine to warm up, then shut it down and allow it to cool down slightly
- Performing the test
- Correct conclusion of the test
- Resetting

Performing the test

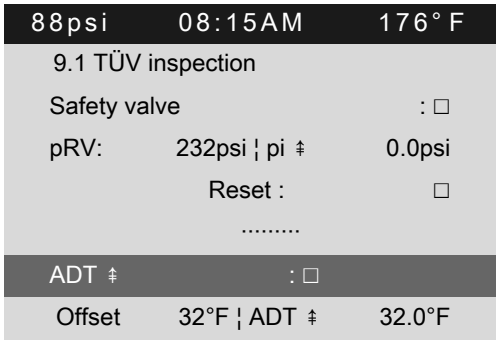
The offset value of *95°F* displayed in activated test mode refers to the discharge temperature of *163°F* as shown in the example.

Precondition Allow the machine to warm up. Shut down the machine as soon as the discharge temperature (VET) has stabilized.

Machine has cooled down by approx. 41°F (from discharge temperature of warmed up machine)

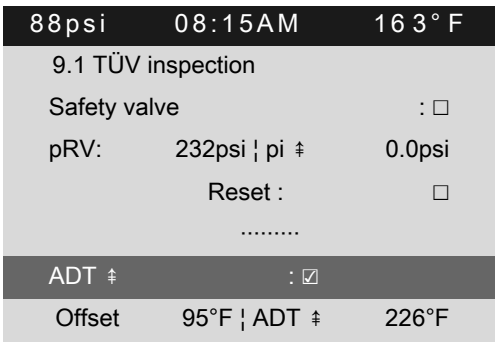
Password access level 2 is activated.

1. Select the 9.1 *<Machine test – TÜV inspection>* menu.
2. Use «Up» or «Down» to select the *ADT* line.



3. Press «Enter».
   The *ADT ⇞* check box flashes.
4. Press the «Up» key.
   The check box is activated.

5. Press the «Enter» key.
   The display *Offset* switches to *95°F*.
   The display *ADT ≠* switches to *226°F*.
   The test mode is now activated.



Header
Menu
Safety relief valve activating pressure (FLUID)
Active line with check box

6. Press the «ON» key.
   The machine is running in LOAD.
   The discharge temperature increases again.
   The machine will switch off as soon as the discharge temperature attains a value of *230°F*.

The machine does not shut down?

➢ Abort the test and contact an authorized KAESER service representative as soon as possible.

Correct conclusion of the test

1. Press «Enter».
   The setting mode is active.
   The check box flashes in line *ADT ≠*.
2. Press the «DOWN» key.
   The check box is deactivated.
3. Press «Enter».
   The offset is reset to *32°F*.

Result The test mode is deactivated and the test is completed.

Resetting

SIGMA CONTROL 2 will display the highest measured value if the test for switching off at excessive temperature is aborted.

Activate the *Reset* check box in order to reset the stored value.

➢ Activate the *Reset* check box.

9.14 Save data

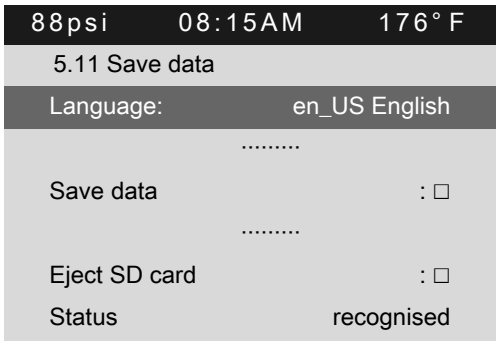
SIGMA CONTROL 2 settings can be backed up to an SD card.

Precondition An SD card with compatible file system (FAT32) and minimum 50 MB free memory is plugged into the SD card slot X5 of SIGMA CONTROL 2

The write protection of the SD card has been deactivated.

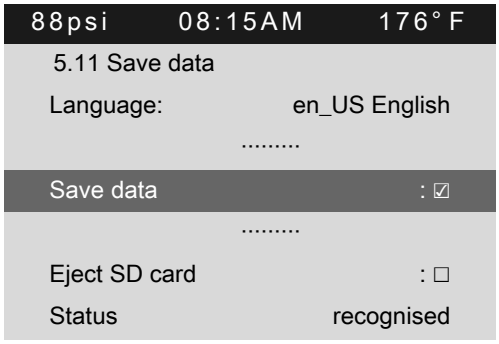
Password access level 2 is activated.

1. Select the 5.11 *<Configuration – Save data>* menu.
2. Use «Up» or «Down» to select the *Language:* line.



Header
Menu
Active line

3. Press «Enter».
   The display for the set language flashes.
4. Use «Up» or «Down» to select the desired language.
5. Press «Enter».
   The setting is applied.
6. Use «Up» or «Down» to select the *Save data* line.



Header
Menu
Active line

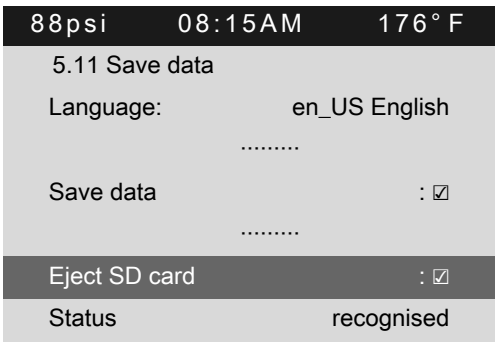
7. Press «Enter».
   The check box *Save data* will flash.
8. Press «Up».
   The check box is activated.
9. Press «Enter».
   A security query is displayed.
10. Press «Enter».

Result The settings are saved on the SD card.

Safely remove the SD card.

1. Use «Up» or «Down» to select the *Eject SD card* line.
2. Press «Enter».
   The check box *Eject SD card* will flash.

3. Press «Up».
   The check box is activated.



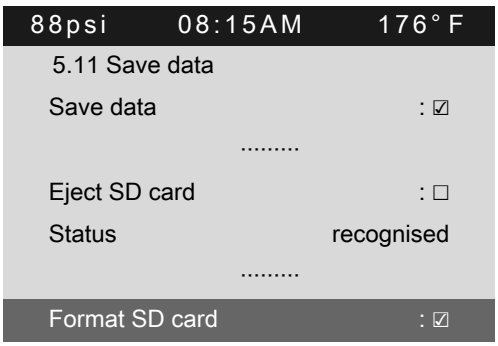
4. Press the «Enter» key.
   A security query is displayed.
5. Press «Enter».

Result The SD card is securely logged off from the electronic control and can be removed without the risk of data loss.

9.14.1 Format SD card

Precondition The operating mode is displayed.
The machine has been switched off with the «OFF» key.
The EMERGENCY STOP push button has been actuated.

1. Open the 5.11 *<Configuration – Save data>* menu.
2. Use «Up» or «Down» to select the *Format SD card* line.
3. Press «Enter».
   The check box *Format SD card* will flash.
4. Press «Up».
   The check box is activated.



5. Press the «Enter» key.
   A security query is displayed.
6. Press «Enter».
   SD card being formatted.

10 Fault Recognition and Rectification

10.1 Basic instructions

The following tables are intended to assist in locating faults.

SIGMA CONTROL 2 will indicate three types of faults:

- Fault on the machine:
  The *red LED* flashes, the machine is shut down, see chapters 10.2 and 10.5.
- Fault on the controller:
  The machine is shut down, see chapter 10.6.
- Warning:
  The *yellow LED* illuminates, the machine is **not** shut down, see chapter 10.3.

The messages valid for your machine are dependent on the controller and individual equipment.

1. Do not attempt fault rectification measures other than those given in this manual!
2. In all other cases:
   Have the fault rectified by an authorized KAESER service representative.

10.2 Interpreting fault messages

If an input signal is classified as a fault, the controller will display the fault upon receiving the signal.

Consequences:

- The *red LED* flashes:
- The controller shuts the machine down.

Fault messages are indicated with the letter A.

Messages are not numbered consecutively.

In this table, "**%d**" represents a variable value, e.g. a number, period of time or I/O address.

[1] Messages 0073-0078 and 0081-0098 are customer-specific.
Add in the meaning for the message text you have defined (see chapter 8.11).

Message	Possible cause	Remedy
0001 A Direction of rotation	Compressor motor turning in wrong direction.	Reverse supply lines L1 and L2.
0002 A Motor temperature ↟	Compressor motor too hot.	Keep ambient conditions within specified limits. Check the cooling air supply. Clean the motor.
0003 A pRV ↟	Safety relief valve actuating pressure on oil separator tank exceeded.	Replace the safety relief valve.
0004 A EMERGENCY STOP	EMERGENCY STOP push button.	Unlock the push button.

Message	Possible cause	Remedy
0005 A Oil separator Temperature ‡	Maximum air temperature at oil separator tank outlet exceeded.	Check line path to the trip relay. Check the oil separator cartridge for damage.
0006 A Surge arrester	High voltage in the power supply (Canadian version only).	Check the power supply. Contact an authorized KAESER service representative.
0007 A Power supply monitor	High voltage and low voltage in the power supply.	Check voltage alarm setting and power supply. Contact an authorized KAESER service representative.
0008 A Diagnostics group alarm	A diagnostic message has occurred.	For more details, see diagnostic message text.
0010 A Blow-off protection ‡	Safety relief valve actuating pressure on oil separator tank exceeded.	Check the safety relief valve.
0011 A Oil-/air cooler fan overcurrent	Overload shutdown of fan motor.	Determine cause of shutdown. Reset the overload relay.
0012 A Access doors	Maintenance door opened / cover panel removed while machine is running.	Close all maintenance doors/cover panels.
0013 A Compressor motor overcurrent	Overload shutdown of compressor motor.	Determine cause of shutdown.
0014 A Oil cooler fan overcurrent	Overload shutdown of oil cooler fan motor.	Determine cause of shutdown. Reset the overload relay.
0015 A Airend discharge temperature ADT ‡	Maximum permissible airend discharge temperature (ADT) exceeded.	Keep ambient conditions within specified limits. Clean the cooler. Check the cooling oil level.
0016 A Air cooler - Fan overcurrent	Overload shutdown of the air cooler fan motor.	Determine cause of shutdown. Reset the overload relay.
0017 A Safety shutdown ADT	Maximum permissible airend discharge temperature (ADT) exceeded.	Keep ambient conditions within specified limits. Clean the cooler. Check the cooling oil level.
0018 A Interior fan overcurrent	Overload shutdown of the air cooler fan motor.	Determine cause of shutdown. Reset the overload relay.
0019 A Internal pressure pi in idle ‡	Inlet valve defective.	Contact an authorized KAESER service representative.

Message	Possible cause	Remedy
0021 A Refrigeration dryer T ↡	Refrigerated dryer: Compressed air temperature too low.	Contact an authorized KAESER service representative.
0022 A Oil separator Δp ↡	Oil separator cartridge clogged.	Replace the oil separator cartridge.
0032 A Oil pressure ↡	Cooling oil temperature too low, resulting in highly viscous cooling oil. Residue within the cooling oil lines.	Keep ambient conditions within specified limits. Contact an authorized KAESER service representative.
0033 A Oil pressure ↡	Oil level too low. Defective oil pump (vacuum machines only).	Check the cooling oil level. If necessary, arrange for a KAESER service representative to replace the oil pump.
0034 A Mains contactor on?	Compressor motor main contactor not switching on.	Check main contactor and wiring.
0035 A Cabinet fan I ↡	Overload shutdown of control cabinet fan motor.	Contact an authorized KAESER service representative.
0038 A PD temperature ↡	Compressed air discharge temperature too low.	Contact an authorized KAESER service representative.
0039 A PD temperature ↡	Compressed air discharge temperature too high.	Check the cooling oil level. Clean the cooler. Check the fan motor.
0040 A Mains contactor off?	Compressor motor main contactor not switching off.	Check main contactor and wiring.
0041 A Mains voltage ↡	Second power failure.	Check the power supply voltage. Check the door interlock switch.
0042 A Back pressure stop	Back pressure in oil separator tank due to defective venting.	Check the venting line.
0043 A Airend discharge temperature ADT rise dT/dt ↡	Permissible rate of rise for airend discharge temperature (ADT) exceeded.	Check the cooling oil level.
0044 A No pressure buildup	Machine does not produce compressed air. Gauge working pressure does not rise above 50 psig within a specified time period. Machine does not go into LOAD. Minimum pressure/check valve defective.	Check the machine for leaks. Check coupling and V-belt. Contact an authorized KAESER service representative.
0048 A High-voltage cell	High-voltage cell alarm.	Contact an authorized KAESER service representative.

Message	Possible cause	Remedy
0050 A Customer-provided power element	Power switching not ready or faulty.	Check the power switching.
0051 A Aggregate A	Unit A failed.	Contact an authorized KAESER service representative.
0052 A Aggregate B	Unit B failed.	Contact an authorized KAESER service representative.
0053 A Condensate drain 2	Condensate drain 2 faulty / not ready. Too much condensate. Line interrupted. Condensate cannot be drained.	Check condensate drain and condensate lines. Check the inlet conditions. Check the lines. Check the ECO-DRAIN.
0056 A RD condensate drain	Refrigerated dryer: Condensate drain faulty.	Refrigerated dryer: Check condensate drain and condensate lines.
0057 A Model?	Compressor model uncertain.	Contact an authorized KAESER service representative.
0058 A Condensate drain 1	Condensate drain 1 faulty / not ready. Too much condensate. Line interrupted. Condensate cannot be drained.	Check condensate drain and condensate lines. Check the inlet conditions. Check the lines. Check the ECO-DRAIN.
0059 A Back pressure run	Drive belt or coupling broken.	Drive belt: Replace the drive belt. Coupling: Contact an authorized KAESER service representative.
0060 A Softstart	Soft start device alarm.	Contact an authorized KAESER service representative.
0062 A Refrigeration dryer p ⇟	Refrigerated dryer: Pressure in refrigerant circuit high. Pressure monitor triggered.	Clean the refrigerant condenser. Check the fan motor. Keep operating conditions within specified limits.
0063 A Refrigeration dryer p ⇟	Refrigerated dryer: Refrigerant loss; pressure in refrigerant circuit too low. Pressure monitor triggered.	Contact an authorized KAESER service representative.

Message	Possible cause	Remedy
0064 A Refrigeration dryer compressor motor temperature ‡	Permissible ambient temperatures exceeded. Condenser cooling insufficient. Compressed air inlet temperature too high. Low refrigerant level.	Check and reduce ambient temperatures. Clean the condenser. Check the fan. Check compressed air cooling at the compressor. Clean the compressor cooler. Contact an authorized KAESER service representative.
0067 A SC2 <=> SC2 communication error	Electrical connection interrupted. IP configuration incorrect.	Check the electrical connection. Check the IP configuration.
0073 A External message 1	1)	
0074 A External message 2	1)	
0075 A External message 3	1)	
0076 A External message 4	1)	
0077 A External message 5	1)	
0078 A External message 6	1)	
0081 A AnMod_p_1	1)	
0082 A AnMod_p_2	1)	
0083 A AnMod_T_1	1)	
0084 A AnMod_T_2	1)	
0085 A AnMod_I_1	1)	
0086 A AnMod_I_2	1)	
0087 A AnMod_p_3	1)	
0088A AnMod_p_4	1)	
0089A AnMod_T_3	1)	
0090 A AnMod_T_4	1)	

Message	Possible cause	Remedy
0092 A T-Switch inlet temperature	1)	
0093 A p-Switch pi	1)	
0094 A T-Switch ADT	1)	
0095 A p-Switch pN	1)	
0096 A T-Switch PDT	1)	
0098 A n-Switch Compressor motor	1)	
0100 A Star contactor on?	Compressor motor star contactor not switching on.	Check star contactor and wiring.
0101 A Star contactor off?	Compressor motor star contactor not switching off.	Check star contactor and wiring.
0102 A Delta contactor on?	Compressor motor delta contactor not switching on.	Check delta contactor and wiring.
0103 A Delta contactor off?	Compressor motor delta contactor not switching off.	Check delta contactor and wiring.
0104 A High-voltage cell on?	High-voltage cell not switching on.	Contact an authorized KAESER service representative.
0105 A High-voltage cell off?	High-voltage cell not switching off.	Contact an authorized KAESER service representative.
0106 A Softstarter DI%.2d closed?	Soft start device not switching on.	Contact an authorized KAESER service representative.
0107 A Softstarter DI%.2d open?	Soft start device not switching off.	Contact an authorized KAESER service representative.
0108 A Softstarter DI%.2d closed?	Soft start device run-up not completed.	Contact an authorized KAESER service representative.
0109 A Softstarter DI%.2d open?	Soft start device run-down not completed.	Contact an authorized KAESER service representative.
0150 A Redundancy contactor on?	Redundancy contactor not switching on.	Check redundancy contactor and wiring.
0151 A Redundancy contactor off?	Redundancy contactor not switching off.	Check redundancy contactor and wiring.

Message	Possible cause	Remedy
0200 A Compressor motor USS alarm	Frequency converter fault.	Contact an authorized KAESER service representative.
0201 A Compressor motor USS alarm	Frequency converter fault.	Contact an authorized KAESER service representative.
0202 A Compressor motor USS alarm	Frequency converter fault.	Contact an authorized KAESER service representative.
0203 A Compressor motor FC PKW error P%d.E%d	Frequency converter fault.	Contact an authorized KAESER service representative.
0204 A Compressor motor FC PKW error P%d.E%d	Frequency converter fault.	Contact an authorized KAESER service representative.
0205 A Compressor motor FC PKW error P%d.E%d	Frequency converter fault.	Contact an authorized KAESER service representative.
0206 A Compressor motor USS error %d	Alarm triggered by software driver.	Contact an authorized KAESER service representative.
0207 A Compressor motor USS error %d	Alarm triggered by software driver.	Contact an authorized KAESER service representative.
0208 A Compressor motor USS error %d	Alarm triggered by software driver.	Contact an authorized KAESER service representative.
0210 A Compressor motor FC Over temperature alarm	Temperature of compressor motor frequency converter too high.	Keep ambient conditions within specified limits. Check filter mats and fan in frequency converter control cabinet Contact an authorized KAESER service representative.
0211 A Compressor motor FC alarm %d	Frequency converter alarm message with message number.	Contact an authorized KAESER service representative.
0212 A Compressor motor FC AI2 error	Frequency converter speed sensor faulty.	Contact an authorized KAESER service representative.
0220 A Compressor motor FC Motor overload alarm	Compressor motor overload.	Contact an authorized KAESER service representative.
0221 A Compressor motor FC alarm %d	Frequency converter alarm message with message number.	Contact an authorized KAESER service representative.

Message	Possible cause	Remedy
0230 A Compressor motor FC Motor overload alarm	Compressor motor overload.	Contact an authorized KAESER service representative.
0231 A Compressor motor FC alarm %d	Frequency converter alarm message with message number.	Contact an authorized KAESER service representative.
0232 A Compressor motor FC AI1 error	Frequency converter speed sensor faulty.	Contact an authorized KAESER service representative.
0240 A Compressor motor USS alarm	Alarm triggered by software driver.	Contact an authorized KAESER service representative.
0241 A Compressor motor FC PKW error P%d.E%d	Frequency converter fault.	Contact an authorized KAESER service representative.
0242 A Compressor motor USS error %d	Fault on bus to frequency converter.	Contact an authorized KAESER service representative.
0243 A Compressor motor FC alarm %d	Frequency converter alarm message with message number.	Contact an authorized KAESER service representative.
0244 A Compressor motor FC activation failed	Frequency converter switched on incorrectly.	Contact an authorized KAESER service representative.
0245 A Compressor motor FC run-up time exceeded	Minimum speed not reached with a defined time (configurable).	Check the setting. Contact an authorized KAESER service representative.
0246 A Compressor motor FC nMin undershot	Speed dropped below minimum by a specified value (configurable) for a defined time (configurable).	Check the settings. Contact an authorized KAESER service representative.
0247 A Compressor motor FC: STO function inactive	Parametrization error.	Contact an authorized KAESER service representative.
0248 A Compressor motor FC off - STO?	Parametrization error.	Contact an authorized KAESER service representative.
0251 A Oil-/air cooler fan USS alarm	Fault triggered by software driver.	Contact an authorized KAESER service representative.
0253 A Oil-/air cooler fan FC PKW error P%d.E%d	Frequency converter fault.	Contact an authorized KAESER service representative.
0255 A Oil-/air cooler fan USS error %d	Fault triggered by software driver.	Contact an authorized KAESER service representative.

Message	Possible cause	Remedy
0270 A Oil-/air cooler fan FC Motor overload alarm	Fan motor overload.	Contact an authorized KAESER service representative.
0271 A Oil-/air cooler fan FC Alarm %d	Frequency converter alarm message with message number.	Contact an authorized KAESER service representative.
0280 A Oil-/air cooler fan USS alarm	Fault triggered by software driver.	Contact an authorized KAESER service representative.
0281 A Oil-/air cooler fan FC PKW error P%d.E%d	Frequency converter fault.	Contact an authorized KAESER service representative.
0282 A Oil-/air cooler fan USS error %d	Fault triggered by software driver.	Contact an authorized KAESER service representative.
0283 A Oil-/air cooler fan FC Alarm %d	Frequency converter alarm message with message number.	Contact an authorized KAESER service representative.
0284 A Oil-/air cooler fan FC activation failed	Fan frequency converter switched on incorrectly.	Contact an authorized KAESER service representative.
0287 A Oil-/air cooler fan FC: STO function inactive	Frequency converter parametrization incorrect.	Check the frequency converter parametrization. Contact an authorized KAESER service representative.
0288 A Oil-/air cooler fan FC off - STO?	Frequency converter parametrization incorrect.	Check the frequency converter parametrization. Contact an authorized KAESER service representative.
0301 A Oil cooler fan USS alarm	Frequency converter fault.	Contact an authorized KAESER service representative.
0303 A Oil cooler fan FC PKW error P%d.E%d	Frequency converter fault.	Contact an authorized KAESER service representative.
0305 A Oil cooler fan USS error %d	Fault triggered by software driver.	Contact an authorized KAESER service representative.
0320 A Oil cooler fan FC Motor overload alarm	Fan motor overload.	Contact an authorized KAESER service representative.
0321 A Oil cooler fan FC alarm %d	Frequency converter alarm message with message number.	Contact an authorized KAESER service representative.
0330 A Oil cooler fan USS alarm	Frequency converter fault.	Contact an authorized KAESER service representative.

Message	Possible cause	Remedy
0331 A Oil cooler fan FC PKW error P%d.E%d	Frequency converter fault.	Contact an authorized KAESER service representative.
0332 A Oil cooler fan USS error %d	Fault triggered by software driver.	Contact an authorized KAESER service representative.
0333 A Oil cooler fan FC alarm %d	Frequency converter alarm message with message number.	Contact an authorized KAESER service representative.
0334 A Oil cooler fan FC activation failed	Fan frequency converter switched on incorrectly.	Contact an authorized KAESER service representative.
0337 A Oil cooler fan FC: STO function inactive	Frequency converter parametrization incorrect.	Check the frequency converter parametrization. Contact an authorized KAESER service representative.
0338 A Oil cooler fan FC off - STO?	Frequency converter parametrization incorrect.	Check the frequency converter parametrization. Contact an authorized KAESER service representative.
0380 A Air cooler fan USS alarm	Frequency converter fault.	Contact an authorized KAESER service representative.
0381 A Air cooler fan FC PKW error P%d.E%d	Frequency converter fault.	Contact an authorized KAESER service representative.
0382 A Air cooler fan USS error %d	Fault triggered by software driver.	Contact an authorized KAESER service representative.
0383 A Air cooler fan FC alarm %d	Frequency converter alarm message with message number.	Contact an authorized KAESER service representative.
0384 A Air cooler fan FC activation failed	Fan frequency converter switched on incorrectly.	Contact an authorized KAESER service representative.
0387 A Air cooler fan FC: STO function inactive	Frequency converter parametrization incorrect.	Check the frequency converter parametrization. Contact an authorized KAESER service representative.
0388 A Air cooler fan FC off - STO?	Frequency converter parametrization incorrect.	Check the frequency converter parametrization. Contact an authorized KAESER service representative.

Message	Possible cause	Remedy
0500 A I/O parameterisation incorrect in module %d!	An I/O address has been assigned more than once.	Display incorrect parametrization via the menu 1.1.3*Address error* and correct the parameter there.

Tab. 87 Fault messages, possible causes and remedies

10.3 Interpreting warning messages

If an input signal is classified as a warning, the controller will display a warning message upon receiving the signal.

Consequences:

- The *yellow LED* flashes.
- The controller does **not** switch off the machine.

Warning messages are indicated with the letter W.

Messages are not numbered consecutively.

In this table, "**%d**" represents a variable value, e.g. a number, period of time or I/O address.

[1] Messages 0073-0078 and 0081-0096, and 0098 are customer-specific.
Add in the meaning for the message text you have defined (see chapter 8.11).

Message	Possible cause	Remedy
0001 W Equipment number incomplete	Equipment number entered incompletely or not given.	Contact an authorized KAESER service representative.
0002 W Motor temperature ↑	Compressor motor hot.	Keep ambient conditions within specified limits. Check the cooling air supply. Clean the motor.
0003 W Air filter Δp ↑ - Change prefilter!	Prefilter clogged.	Replace the prefilter at the earliest opportunity.
0004 W Oil separator Δp ↑	Increased differential pressure in oil separator cartridge. Oil separator cartridge clogged.	Replace the oil separator cartridge.
0005 W Idle warm-up	Idling warm-up activated.	—
0006 W Surge arrester	High voltage in the power supply (Canadian version only).	Check the power supply. Contact an authorized KAESER service representative.
0007 W Power supply monitor	High voltage or low voltage in the power supply.	Check voltage alarm setting and power supply. Contact an authorized KAESER service representative.

Message	Possible cause	Remedy
0008 W Airend discharge temperature ADT ↑	Maximum airend discharge temperature almost reached.	Clean the cooler. Check the cooling oil level. Replace oil filter. Ensure adequate ventilation. Keep installation conditions within specified limits.
0010 W Oil filter 2 Δp ↑	Increased differential pressure in oil filter. Oil filter clogged.	Replace the oil filter.
0011 W Oil filter 1 Δp ↑	Increased differential pressure in oil filter. Oil filter clogged.	Replace the oil filter.
0013 W Air filter Δp ↑ - Change air filter!	Air filter clogged.	Replace the air filter.
0015 W Com-Module communication error	Bus link via PROFIBUS interface interrupted.	Check bus lines and plug.
0021 W Refrigeration dryer T ↡	Refrigerated dryer: Compressed air temperature too low.	Keep ambient conditions within specified limits. Contact an authorized KAESER service representative.
0024 W Mains contactor operations ↡	Maximum permissible number of switching cycles exceeded.	Arrange for the main contactor to be replaced by an authorized KAESER service representative.
0025 W Oil separator h ↡	Oil separator cartridge: Maintenance interval expired.	Replace the oil separator cartridge.
0026 W Oil change h ↡	Cooling oil Maintenance interval expired.	Change the cooling oil.
0027 W Oil filter h ↡	Oil filter: Maintenance interval expired.	Replace the oil filter.
0028 W Air filter h ↡	Air filter: Maintenance interval expired.	Replace the air filter.
0029 W Valve inspection h ↡	Valves: Maintenance interval expired.	Contact an authorized KAESER service representative.
0030 W Belt/coupling inspection h ↡	Belt tension/coupling: Maintenance interval expired.	Carry out a visual inspection. Increase the tension in the drive belt.
0031 W Motor bearing h ↡	Motor bearing, compressor motor: Maintenance interval expired.	Contact an authorized KAESER service representative.
0032 W Electrical equipment h ↡	Electric components and electrical installation: Maintenance interval expired.	Check and reset the maintenance counter.
0033 W Fan bearing h ↡	Motor bearings, fan motors: Maintenance interval expired.	Contact an authorized KAESER service representative.

Message	Possible cause	Remedy
0034 W PD temperature ↓	Compressed air discharge temperature too low.	Contact an authorized KAESER service representative.
0035 W PD temperature ↑	Compressed air discharge temperature too high.	Clean the cooler. Check the cooling oil level.
0036 W Motor starts/h ⇞	Permissible number of motor starts was exceeded in the last 60 minutes.	Extend the idling period. Increase capacity of the air receiver. Increase the piping cross-section between compressor and air receiver.
0037 W Motor starts/d ⇞	Permissible number of motor starts was exceeded in the last 24 hours.	Extend the idling period. Increase capacity of the air receiver. Increase the piping cross-section between compressor and air receiver.
0038 W Blow-off protection ↑	Safety relief valve actuating pressure almost exceeded.	Replace the oil separator cartridge. Open the shut-off valve in the venting line.
0041 W Mains voltage ↓	1. Power supply interrupted: Machine restarts automatically.	Check the power supply.
0043 W External load signal?	External load signal unclear: Increased cut-out pressure exceeded. External load control has not switched to IDLE.	Check external controller settings. Take pressure drop across dryer or filters into account.
0044 W Oil temperature ↓	Cooling oil temperature too low.	Check temperature switch, line and connection. Check the oil circuit. Increase the room temperature.
0045 W DO test active	Test operation for manual actuation of individual outputs is active.	Switch the power supply off and on again.
0046 W System pressure ↓	Network pressure below specified “network pressure low” value. Air consumption too high.	Check the air demand. Check line paths and sensor connection. Check the “network pressure low” warning value.
0047 W No pressure buildup	Machine does not produce compressed air. Gauge working pressure does not rise above 50 psig within a specified time period. Machine does not go into LOAD. Minimum pressure/check valve defective.	Check the machine for leaks. Check coupling and V-belt. Contact an authorized KAESER service representative.

Message	Possible cause	Remedy
0048 W Bearing lube h ⇞	Re-grease the motor bearings. Maintenance interval expired.	Re-grease the motor bearings.
0049 W Annual maintenance	Last maintenance was 1 year ago.	Carry out the required maintenance and reset the corresponding maintenance counter.
0050 W Fan bearing lube h ⇞	Maintenance interval expired.	Re-grease the fan bearing.
0051 W Double aggregate emergency operation!	Double-unit machines: Maintenance or repair work on one of the units.	Once the maintenance or repair work has been completed, deactivate individual operation by resetting the corresponding selection from *single* to *Double*
0053 W Condensate drain 2	Condensate drain 2 faulty / not ready. Too much condensate. Line interrupted. Condensate cannot be drained.	Check condensate drain and condensate lines. Check the inlet conditions. Check the lines. Check the ECO-DRAIN.
0058 W SC2 <=> SC2 communication error	Electrical connection interrupted. IP configuration incorrect.	Check the electrical connection. Check the IP configuration.
0059 W Start temperature ↓ ↓	Airend temperature too low (<14°F) for machine to be operated.	Keep ambient conditions within specified limits.
0060 W Start temperature ↓	Airend temperature too low (<35°F).	Keep ambient conditions within specified limits.
0061 W Compressor T ↓	Airend discharge temperature (ADT) did not reach minimum required value within the specified time.	Contact an authorized KAESER service representative.
0062 W Refrigeration dryer p ⇞	Refrigerated dryer: Pressure in refrigerant circuit too high. Safety pressure switch triggered.	Clean the refrigerant condenser. Check the fan motor. Keep operating conditions within specified limits.
0063 W Refrigeration dryer p ⇟	Refrigerated dryer: Refrigerant loss; pressure in refrigerant circuit too low. Inlet pressure switch triggered.	Contact an authorized KAESER service representative.
0064 W Refrigeration dryer compressor motor temperature ⇞	Permissible ambient temperatures exceeded. Condenser cooling insufficient Compressed air inlet temperature too high. Low refrigerant level.	Check and reduce ambient temperatures. Clean the condenser. Check the fan. Check compressed air cooling on the compressor. Clean the compressor cooler. Contact an authorized KAESER service representative.

Message	Possible cause	Remedy
0065 W Refrigeration dryer external shut-off	Room temperature low. Danger of refrigerated dryer freezing. Refrigerated dryer deactivated automatically.	Keep ambient conditions within specified limits. Check temperature sensor.
0067 W System pressure ↑	Network pressure above the “network pressure high” setting.	Check line paths and sensor connection. Check the “network pressure high” warning setting.
0068 W Condensate drain 1	Condensate drain faulty / not ready. Too much condensate. Line interrupted. Condensate cannot be drained.	Check condensate drain and condensate lines. Check the lines. Check the ECO-DRAIN. Check the inlet conditions.
0069 W Error operation without RD → Call service!	Refrigerated dryer defective. Compressed air supply without air drying is activated.	Contact an authorized KAESER service representative immediately.
0070 W Refrigeration dryer T ↑	Refrigerated dryer: Compressed air temperature too high.	Keep operating conditions within specified limits. Clean the refrigerant condenser. Clean the cooler. Install an exhaust fan.
0071 W Oil level ↓	Cooling oil level too low.	Replenish the cooling oil.
0072 W RD condensate drain	Refrigerated dryer: Condensate drain faulty.	Check the condensate drain.
0073 W External message 1	[1]	
0074 W External message 2	[1]	
0075 W External message 3	[1]	
0076 W External message 4	[1]	
0077 W External message 5	[1]	
0078 W External message 6	[1]	
0081 W AnMod_p_1	[1]	
0082 W AnMod_p_2	[1]	
0083 W AnMod_T_1	[1]	

Message	Possible cause	Remedy
0084 W AnMod_T_2	1)	
0085 W AnMod_I_1	1)	
0086 W AnMod_I_2	1)	
0087 W AnMod_p_3	1)	
0088 W AnMod_p_4	1)	
0089 W AnMod_T_3	1)	
0090 W AnMod_T_4	1)	
0092 W T-Switch inlet temperature	1)	
0093 W p-Switch pi	1)	
0094 W T-Switch ADT	1)	
0095 W p-Switch pN	1)	
0096 W T-Switch PDT	1)	
0097 W SAM 4.0 communication error	Bus link via SIGMA NETWORK interrupted	Check bus lines and plug.
0098 W n-Switch Compressor motor	1)	
0200 W Compressor motor FC Service mode active	Frequency converter in service mode.	Exit service mode.
0201 W Compressor motor FC Service mode active	Frequency converter in service mode.	Exit service mode.
0202 W Compressor motor FC Service mode active	Frequency converter in service mode.	Exit service mode.
0203 W Compressor motor FC Service mode active	Frequency converter in service mode.	Exit service mode.
0210 W Compressor motor FC AI1 error	Frequency converter pressure transducer faulty.	Contact an authorized KAESER service representative.

Message	Possible cause	Remedy
0230 W Compressor motor FC AI0 error	Frequency converter pressure transducer faulty.	Contact an authorized KAESER service representative.
0231 W Compressor motor FC alarm %d	Fault at compressor motor or frequency converter.	Contact an authorized KAESER service representative.
0240 W Compressor motor FC test shut-off required	Frequency converter running period since last shutdown too long.	Fully disconnect the machine from its power supply for a short period. (Necessary for the safety functions)
0243 W Compressor motor FC alarm %d	Fault in compressor motor or its frequency converter.	Contact an authorized KAESER service representative.
0251 W Oil-/air cooler fan FC Service mode active	Frequency converter in service mode.	Exit service mode.
0253 W Oil cooler fan FC Service mode active	Frequency converter in service mode.	Exit service mode.
0254 W Oil cooler fan FC Service mode active	Frequency converter in service mode.	Exit service mode.
0255 W Oil-/air cooler fan FC Service mode active	Frequency converter in service mode.	Exit service mode.
0256 W Air cooler fan FC Service mode active	Frequency converter in service mode.	Exit service mode.
0260 W Oil-/air cooler fan FC Alarm %d	Fan frequency converter faulty.	Acknowledge message. Contact an authorized KAESER service representative.
0261 W Oil-/air cooler fan FC Alarm %d	Fan frequency converter faulty.	Acknowledge message. Contact an authorized KAESER service representative.
0262 W Oil cooler fan FC alarm %d	Fan frequency converter faulty.	Acknowledge message. Contact an authorized KAESER service representative.
0263 W Oil cooler fan FC alarm %d	Fan frequency converter faulty.	Acknowledge message. Contact an authorized KAESER service representative.
0264 W Air cooler fan FC alarm %d	Fan frequency converter faulty.	Acknowledge message. Contact an authorized KAESER service representative.
0300 W SD card write error	Write protection activated? Memory card defective.	Deactivate write protection. Use a new memory card.

Message	Possible cause	Remedy
0866 W AII%d.0%d - error power supply	Power supply for ext. sensor at analog input faulty.	Check the power supply.
0867 W AII%d.0%d - overload fault	Overload at analog input for ext. sensor.	Contact an authorized KAESER service representative.
0868 W AII%d.0%d - open circuit	Wire break in line for ext. sensor at analog input.	Check line paths and sensor connection.
0869 W AII%d.0%d - short-circuit	Short circuit in line for ext. sensor at analog input.	Check line paths and sensor connection.
0872 W AII%d.0%d - error power supply	Power supply for ext. sensor at analog input faulty.	Check the power supply.
0873 W AII%d.0%d - overload fault	Overload at analog input for ext. sensor.	Contact an authorized KAESER service representative.
0874 W AII%d.0%d - open circuit	Wire break in line for ext. sensor at analog input.	Check line paths and sensor connection.
0875 W AII%d.0%d - short-circuit	Short circuit in line for ext. sensor at analog input.	Check line paths and sensor connection.
0878 W AII%d.0%d - error power supply	Power supply for ext. sensor at analog input faulty.	Check the power supply.
0879 W AII%d.0%d - overload fault	Overload at analog input for ext. sensor.	Contact an authorized KAESER service representative.
0880 W AII%d.0%d - open circuit	Wire break in line for ext. sensor at analog input.	Check line paths and sensor connection.
0881 W AII%d.0%d - short-circuit	Short circuit in line for ext. sensor at analog input.	Check line paths and sensor connection.
0884 W AII%d.0%d - error power supply	Power supply for ext. sensor at analog input faulty.	Check the power supply.
0885 W AII%d.0%d - overload fault	Overload at analog input for ext. sensor.	Contact an authorized KAESER service representative.
0886 W AII%d.0%d - open circuit	Wire break in line for ext. sensor at analog input.	Check line paths and sensor connection.

Message	Possible cause	Remedy
0887 W AII%d.0%d - short-circuit	Short circuit in line for ext. sensor at analog input.	Check line paths and sensor connection.
0897 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
0898 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0899 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
0900 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0903 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
0904 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0905 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
0906 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0909 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
0910 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0911 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
0912 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0915 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
0916 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.

Message	Possible cause	Remedy
0917 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
0918 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0921 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
0922 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0923 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
0924 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0927 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
0928 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0929 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
0930 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0933 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
0934 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0935 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
0936 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0939 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.

Message	Possible cause	Remedy
0940 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0941 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
0942 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0945 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
0946 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0947 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
0948 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0951 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
0952 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
0953 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
0954 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1000 W RFID error: switch SIGMA CONTROL power supply OFF → ON!	System error	Contact an authorized KAESER service representative if the message is displayed again after restarting.
1034 W AII%d.0%d - error power supply	Power supply for ext. sensor at analog input faulty.	Check the power supply.
1035 W AII%d.0%d - overload fault	Overload at analog input for ext. sensor.	Contact an authorized KAESER service representative.
1036 W AII%d.0%d - open circuit	Wire break in line for ext. sensor at analog input.	Check line paths and sensor connection.

Message	Possible cause	Remedy
1037 W AII%d.0%d - short-circuit	Short circuit in line for ext. sensor at analog input.	Check line paths and sensor connection.
1040 W AII%d.0%d - error power supply	Power supply for ext. sensor at analog input faulty.	Check the power supply.
1041 W AII%d.0%d - overload fault	Overload at analog input for ext. sensor.	Contact an authorized KAESER service representative.
1042 W AII%d.0%d - open circuit	Wire break in line for ext. sensor at analog input.	Check line paths and sensor connection.
1043 W AII%d.0%d - short-circuit	Short circuit in line for ext. sensor at analog input.	Check line paths and sensor connection.
1046 W AII%d.0%d - error power supply	Power supply for ext. sensor at analog input faulty.	Check the power supply.
1047 W AII%d.0%d - overload fault	Overload at analog input for ext. sensor.	Contact an authorized KAESER service representative.
1048 W AII%d.0%d - open circuit	Wire break in line for ext. sensor at analog input.	Check line paths and sensor connection.
1049 W AII%d.0%d - short-circuit	Short circuit in line for ext. sensor at analog input.	Check line paths and sensor connection.
1052 W AII%d.0%d - error power supply	Power supply for ext. sensor at analog input faulty.	Check the power supply.
1053 W AII%d.0%d - overload fault	Overload at analog input for ext. sensor.	Contact an authorized KAESER service representative.
1054 W AII%d.0%d - open circuit	Wire break in line for ext. sensor at analog input.	Check line paths and sensor connection.
1055 W AII%d.0%d - short-circuit	Short circuit in line for ext. sensor at analog input.	Check line paths and sensor connection.
1058 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1059 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.

Message	Possible cause	Remedy
1060 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1061 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1062 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1064 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1065 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1066 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1067 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1068 W AIR%d.0%d - open circuit	Wire break in line for indicated analogue input.	Check line paths and sensor connection.
1070 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1071 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1072 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1073 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1074 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1076 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1077 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.

Message	Possible cause	Remedy
1078 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1079 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1080 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1082 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1083 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1084 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1085 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1086 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1088 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1089 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1090 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1091 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1092 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1094 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1095 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.

Message	Possible cause	Remedy
1096 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1097 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1098 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1100 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1101 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1102 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1103 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1104 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1106 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1107 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1108 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1109 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1110 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1112 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1113 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.

Message	Possible cause	Remedy
1114 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1115 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1116 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1118 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1119 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1120 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1121 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1122 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1202 W AII%d.0%d - error power supply	Power supply for ext. sensor at analog input faulty.	Check the power supply.
1203 W AII%d.0%d - overload fault	Overload at analog input for ext. sensor.	Contact an authorized KAESER service representative.
1204 W AII%d.0%d - open circuit	Wire break in line for ext. sensor at analog input.	Check line paths and sensor connection.
1205 W AII%d.0%d - short-circuit	Short circuit in line for ext. sensor at analog input.	Check line paths and sensor connection.
1208 W AII%d.0%d - error power supply	Power supply for ext. sensor at analog input faulty.	Check the power supply.
1209 W AII%d.0%d - overload fault	Overload at analog input for ext. sensor.	Contact an authorized KAESER service representative.
1210 W AII%d.0%d - open circuit	Wire break in line for ext. sensor at analog input.	Check line paths and sensor connection.

Message	Possible cause	Remedy
1211 W AII%d.0%d - short-circuit	Short circuit in line for ext. sensor at analog input.	Check line paths and sensor connection.
1214 W AII%d.0%d - error power supply	Power supply for ext. sensor at analog input faulty.	Check the power supply.
1215W AII%d.0%d - overload fault	Overload at analog input for ext. sensor.	Contact an authorized KAESER service representative.
1216 W AII%d.0%d - open circuit	Wire break in line for ext. sensor at analog input.	Check line paths and sensor connection.
1217 W AII%d.0%d - short-circuit	Short circuit in line for ext. sensor at analog input.	Check line paths and sensor connection.
1220 W AII%d.0%d - error power supply	Power supply for ext. sensor at analog input faulty.	Check the power supply.
1221 W AII%d.0%d - overload fault	Overload at analog input for ext. sensor.	Contact an authorized KAESER service representative.
1222 W AII%d.0%d - open circuit	Wire break in line for ext. sensor at analog input.	Check line paths and sensor connection.
1223 W AII%d.0%d - short-circuit	Short circuit in line for ext. sensor at analog input.	Check line paths and sensor connection.
1226 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1227 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1228 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1229 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1230 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1232 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.

Message	Possible cause	Remedy
1233 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1234 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1235 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1236 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1238 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1239 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1240 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1241 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1242 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1244 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1245 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1246 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1247 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1248 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1250 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.

Message	Possible cause	Remedy
1251 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1252 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1253 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1254 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1256 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1257 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1258 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1259 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1260 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1262 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1263 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1264 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1265 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1266 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1268 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.

Message	Possible cause	Remedy
1269 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1270 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1271 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1272 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1274 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1275 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1276 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1277 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1278 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1280 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.
1281 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1282 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1283 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1284 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1286 W AIR%d.0%d - accidental ground	Ground fault in line for ext. sensor at analog input.	Check line paths and sensor connection.

Message	Possible cause	Remedy
1287 W AIR%d.0%d - short-circuit	Short circuit in line for indicated analog input.	Check line paths and sensor connection.
1288 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.
1289 W AIR%d.0%d - sensor fault	Sensor fault at indicated analog input.	Check line paths and sensor connection.
1290 W AIR%d.0%d - open circuit	Wire break in line for indicated analog input.	Check line paths and sensor connection.

Tab. 88 Warning messages and remedies

10.4 Interpreting operating messages

Operating messages informing you about the machine's current operating status will automatically be displayed by the controller.

Operating messages are indicated by the letter O.

Messages are not numbered consecutively.

In this table, "**%d**" represents a variable value, e.g. a number, period of time or I/O address.

[1] Messages 0073-0078 and 0081-0098 are customer-specific.
Add in the meaning for the message text you have defined (also see chapter 8.11).

Message	Meaning
0001 O Delayed start (%ds) active	Total duration until the machine is ready to start after power has been restored or after a communication error to the master controller (e.g. SAM 4.0) or after switching on the SAM manual mode.
0009 O Compressor on	The machine is switched on.
0010 O Controller on	The controller is switched on with the «ON» key.
0011 O Cold start release	The machine can be switched on although the machine temperature is below the permissible starting temperature. The machine can be switched on only as long as the message is displayed.
0027 O Power OFF → ON	Prompt: Switch the power supply off and back on.
0028 O DYNAMIC motor temperature ↑	Control mode DYNAMIC: The temperature of the compressor motor / engine is too high.

Message	Meaning
0030 O Voltage restored	Main power supply available following power failure.
0033 O Machine report	Machine report sent by E-mail.
0034 O E-mail send unsuccessful!	No e-mail sending of machine information.
0073 O External message 1	1)
0074 O External message 2	1)
0075 O External message 3	1)
0076 O External message 4	1)
0077 O External message 5	1)
0078 O External message 6	1)
0081 O AnMod_p_1	1)
0082 O AnMod_p_2	1)
0083 O AnMod_T_1	1)
0084 O AnMod_T_2	1)
0085 O AnMod_I_1	1)
0086 O AnMod_I_2	1)
0087 O AnMod_p_3	1)
0088 O AnMod_p_4	1)
0089 O AnMod_T_3	1)
0090 O AnMod_T_4	1)
0092 O T-Switch inlet temperature	1)

Message	Meaning
0093 O p-Switch pi	1)
0094 O T-Switch ADT	1)
0095 O p-Switch pN	1)
0096 O T-Switch PDT	1)
0098 O n-Switch Compressor motor	1)
0200 O IOSlot1 Undervoltage error %d	The internal voltage monitoring reports low voltage fault IOSlot1.
0201 O IOSlot2 Undervoltage error %d	The internal voltage monitoring reports low voltage fault IOSlot2.
0202 O IOSlot3 Undervoltage error %d	The internal voltage monitoring reports low voltage fault IOSlot3.
0300 O Cycle-exact data recording active	Service information.
0500 O Safety shutdown "IOMDiagnosis()"	Service information.
0501 O Safety shutdown "Safeguard()"	Service information.
0550 O ADT channel error "currleak" detected	Short-term overload fault without shutdown occurred at ADT.
0551 O ADT channel error "channel open" detected	Short-term overload fault without shutdown occurred at ADT.
0850 O IOSlot%d - bus error	Short-term IOM bus fault without shutdown has occurred.
0867 O AII%d.0%d - overload fault	Short-term overload fault without shutdown occurred at AII.
0873 O AII%d.0%d - overload fault	Short-term overload fault without shutdown occurred at AII.
0879 O AII%d.0%d - overload fault	Short-term overload fault without shutdown occurred at AII.
0885 O AII%d.0%d - overload fault	Short-term overload fault without shutdown occurred at AII.
1000 O 2 RFID Equipment Cards successfully registered	You successfully registered 2 RFID Equipment Cards at the controller.

Message	Meaning
1018 O IOSlot%d - bus error	Short-term IOM bus fault without shutdown has occurred.
1035 O All%d.0%d - overload fault	Short-term overload fault without shutdown occurred at All.
1041 O All%d.0%d - overload fault	Short-term overload fault without shutdown occurred at All.
1047 O All%d.0%d - overload fault	Short-term overload fault without shutdown occurred at All.
1053 O All%d.0%d - overload fault	Short-term overload fault without shutdown occurred at All.
1186 O IOSlot%d - bus error	Short-term IOM bus fault without shutdown has occurred.
1203 O All%d.0%d - overload fault	Short-term overload fault without shutdown occurred at All.
1209 O All%d.0%d - overload fault	Short-term overload fault without shutdown occurred at All.
1215 O All%d.0%d - overload fault	Short-term overload fault without shutdown occurred at All.
1221 O All%d.0%d - overload fault	Short-term overload fault without shutdown occurred at All.

Tab. 89 Operational messages

10.5 Interpreting diagnostic messages

A diagnostic message causes the machine to shut down.

Diagnostic messages are identified with the letter D.

They provide information on the status of the controller, the connected input and output modules, and support KAESER service with troubleshooting.

10.6 Interpreting system messages

A system message causes the machine to shut down. Contact an authorized KAESER service representative.

System messages are identified with the letter **Y**.

The message numbers are not numbered consecutively.

Message	Possible cause	Remedy
0001 Y Hardware watchdog reset	System error	Contact an authorized KAESER service representative.

Message	Possible cause	Remedy
0002 Y Internal software error	System error	Contact an authorized KAESER service representative.
0003 Y Filesystem Read/Write failure	System error	Contact an authorized KAESER service representative.
0004 Y CPU load too high	System error	Contact an authorized KAESER service representative.
0005 Y RAM out of memory	System error	Contact an authorized KAESER service representative.
1000 Y RFID error: switch SIGMA CONTROL power supply OFF → ON!	System error	Contact an authorized KAESER service representative if the message shows again after the restart.

Tab. 90 System messages and remedies

11 Maintenance

11.1 Changing the battery

If the time and date are no longer up-to-date after you switch the supply voltage back on, the integrated battery for buffering the real-time clock is discharged and must be replaced. Contact an authorized KAESER service representative. With a discharged battery, the date and time of the controller always restarts on the 1st of January 1970 at 01:00:00 in the time zone Europe/Berlin.

12 Spares, Operating Materials, Service

12.1 Note the nameplate

The nameplate contains all information to identify your machine. This information is essential to us in order to provide you with optimal service.

➢ Please give the information from the nameplate with every inquiry and order for spare parts.

12.2 KAESER AIR SERVICE

KAESER AIR SERVICE offers:

- authorized KAESER service representatives with KAESER factory training,
- increased operational reliability ensured by preventive maintenance,
- energy savings achieved by avoidance of pressure losses,
- optimum conditions for operation of the compressed air system,
- the security of genuine KAESER spare parts,
- increased legal certainty as all regulations are kept to.

➢ Why not sign a KAESER AIR SERVICE maintenance agreement!

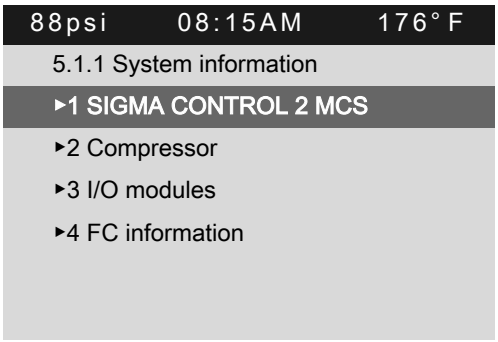
Result Your advantage:
lower costs and higher compressed air availability.

12.3 Service Addresses

Addresses of KAESER representatives are given at the end of this manual.

12.4 Displaying the version number, machine model, part number and serial number

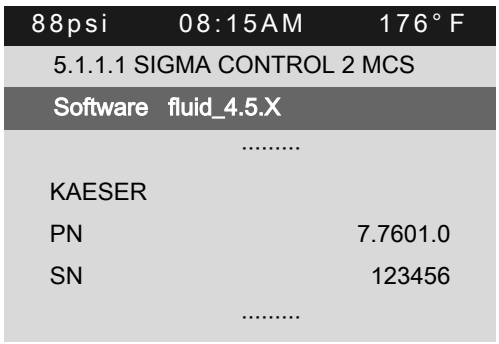
1. Open the 5.1.1 *<Configuration – General – System information>* menu.



Header
Menu
Active line

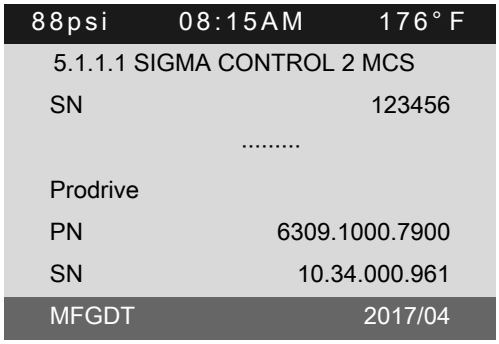
Applies to FLUID only

2. Press «Enter».
   The system information is displayed.



Header
Menu
Software version
Part number
Serial number

3. Repeatedly press «Up» or «Down» to display further information.



Header
Menu
Manufacturer
Part number
Serial number
Manufacturing date

13 Decommissioning, Storage and Transport

13.1 De-commissioning

➢ Follow the instructions in the machine's operator manual.

13.2 Packing

➢ Follow the instructions in the machine's operator manual.

13.3 Storage

➢ Follow the instructions in the machine's operator manual.

13.4 Transporting

➢ Follow the instructions in the machine's operator manual.

13.5 Battery removal and disposal

Precondition SIGMA CONTROL 2 is decommissioned.

1. Disconnect SIGMA CONTROL 2 from all connections.
2. If necessary, use a tool to forcefully remove the rear enclosure panel.
3. If necessary, use a tool to forcefully remove the board from the housing.
4. Use a suitable tool to remove the internally installed battery.
5. Battery disposal in accordance with environmental guidelines.
6. Hand the SIGMA CONTROL 2 over to an authorized disposal expert.

Further information Refer to the machine’s Operating Manual for details regarding the battery’s environmentally sound disposal.