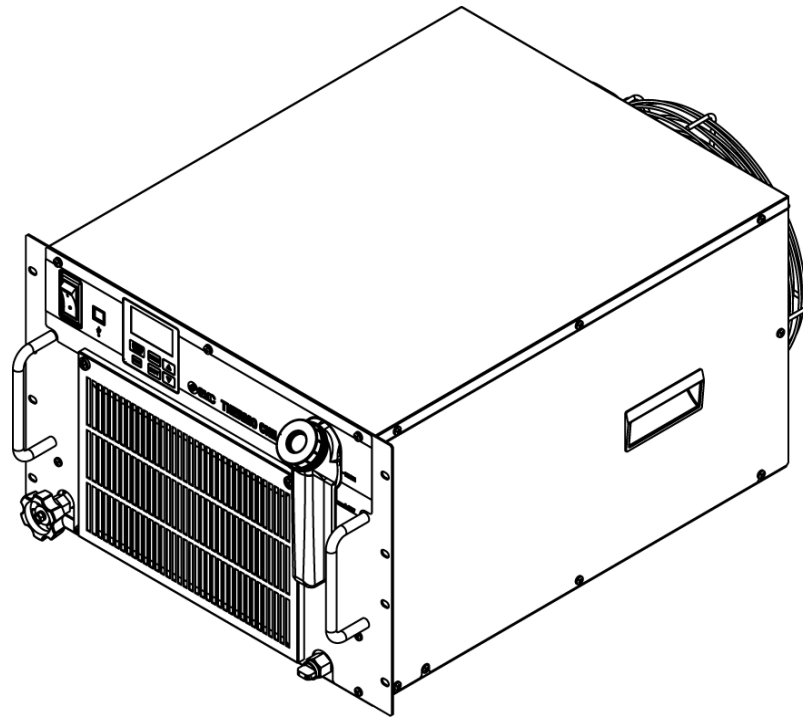




Operation Manual

Monitoring software for Thermo-chillers
HRR series



Keep this manual available whenever necessary

To the users

Thank you for purchasing SMC's Thermo chiller (hereinafter referred to as the "product").

For safety and long life of the product, be sure to read this operation manual (hereinafter referred to as the "manual") and clearly understand the contents.

- Be sure to read and follow all instructions noted with "Warning" or "Caution" in this manual.
- This manual is intended to explain the installation and operation of the product. Only people who understand the basic operation of the product through this manual or who perform installation and operation of or have basic knowledge about industrial machines are allowed to work on the product.
- This manual and other documents attached to the product do not constitute a contract, and will not affect any existing agreements or commitments.
- It is strictly prohibited to copy this manual entirely or partially for the use by a third party without prior permission from SMC.

Note: This manual is subject to possible change without prior notice.

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Indemnification

CAUTION

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries. If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Indemnification

Monitoring software for Thermo-chiller HRR series (hereinafter referred to as "this software"), the "Indemnification" below will be applied.

Read and accept them before using the product.

This agreement comes into effect when the user installs this software to a computer.

The user cannot install, use or copy this software unless they agree to this agreement.

License Agreement

Article 1 (Consent)

1. This software is to be used in accordance with this Agreement non –exclusively for the limited purpose of used for SMC Thermo-chiller HRR series.
2. This software can be installed and saved on a PC for the sole purpose specified in the preceding paragraph.

Article 2 (Restrictions)

1. This software is not to be copied except as specified in Article 1-2.
2. This software license is not to be transferred or lent wholly or in part to a third party, whether for payment or free of charge.
3. Modification, translation, adaptation or reverse engineering and recompiling of this software is not permitted.

Article 3 (Precautions)

1. When using this software, please read the operation manual and the operation manual attached to the thermo-chiller.
2. This Software or the equipment contained in are subject to change without prior notice.

Article 4 (Exemption of liability)

SMC is not responsible for any damage incurred in the use of Software.

Article 5 (Termination)

1. If there is any breach of this Agreement, or when SMC decides to terminate this Agreement, it will be terminated.
2. When this Agreement is terminated, please destroy this Software and any copies.

Article 6 (Rights of this Software)

The copyright and any other rights of this Software are owned by SMC, and protected by Japanese copyright laws and international treaty provisions.

Chapter 1 Information on using the operating instructions

Using the instructions

These instructions enable the safe and efficient handling of the monitoring software for thermo-chillers (HRR series). The instructions are part of the software and must be stored so that they are easily accessible to personnel at all times.

The personnel must carefully read through and understand these instructions before starting all activities. Compliance with all the handling instructions is required to ensure safe operation.

Illustrations in these instructions are intended to provide a basic understanding and may differ from the actual design.

Chapter 2 Introduction

These operating instructions describe the set-up and functions of the monitoring software (hereinafter referred to as the Software) for thermo-chillers made by SMC corporation.

The software enables users to adjust settings, start and stop the thermo-chiller and analyze and store process values. The software also helps users detect and rectify faults.

Chapter 3 System requirements

- Windows: 7 or 10
- Net Framework: Version 3.5 or higher
- RAM: min. 1 GB
- Monitor resolution: min. 1366 x 768 ^{*Note 1}
- Thermo-chiller firmware version: ^{*Note 2}
 - HRR012 - ## - 10 1.3 or higher
 - HRR018 - ## - 10 1.3 or higher
 - HRR010 - ## - 20 1.2 or higher
 - HRR012 - ## - 20 2.3 or higher
 - HRR018 - ## - 20 2.3 or higher
 - HRR024 - ## - 20 2.3 or higher
 - HRR030 - ## - 20 2.3 or higher
 - HRR050 - ## - 20 1.1 or higher

*Note 1) If using other monitor resolution, some character and figures may be cut.

*Note 2) If HRR has uncomfortable firmware version, this monitoring software may not work correctly.

Chapter 4 Installation

4.1 Device driver

4.1.1 Windows 7

A device driver is required in order to connect thermo-chillers to a PC running the Windows 7 operating system. The PC will not detect the thermo-chiller without it.

4.1.2 Windows 10

No device driver is needed to connect thermo-chillers to a PC running the Windows 10 operating system. The thermo-chiller is supported by a standard driver under Windows 10

4.2 Monitoring software

The software does not have to be installed. The **.exe file** merely has to be copied to the designated folder and can be started from there.

Chapter 5 Connecting the thermo-chiller to a PC

The thermo-chiller has a USB type B port on the front. To connect the thermo-chiller to a PC, remove the cover cap that protects the thermo-chiller's USB port and plug in a USB cable. A USB cable is not included with the thermo-chiller. It has to be provided by the user.

Chapter 6 Starting the monitoring software

Once the software has been started by double-clicking the **.exe file**, the start screen opens. The software checks whether a thermo-chiller is attached. If so, it establishes a connection.

A start button appears regardless of whether a thermo-chiller was found. Pressing the start button opens the software (Fig. 1).



Fig. 1 Start screen

Chapter 7 Establishing a connection between the monitoring software and the thermo-chiller

If a thermo-chiller was detected when the software was started, the connection is established automatically. If multiple thermo-chillers are connected, a connection is established with the first thermo-chiller that detected. If no thermo-chiller was found automatically, a connection to the software can be established manually (see 8.1.2.5).

Chapter 8 Operation

8.1 Main window

The main window consists of multiple areas, which are described in detail in this section.

8.1.1 Overview

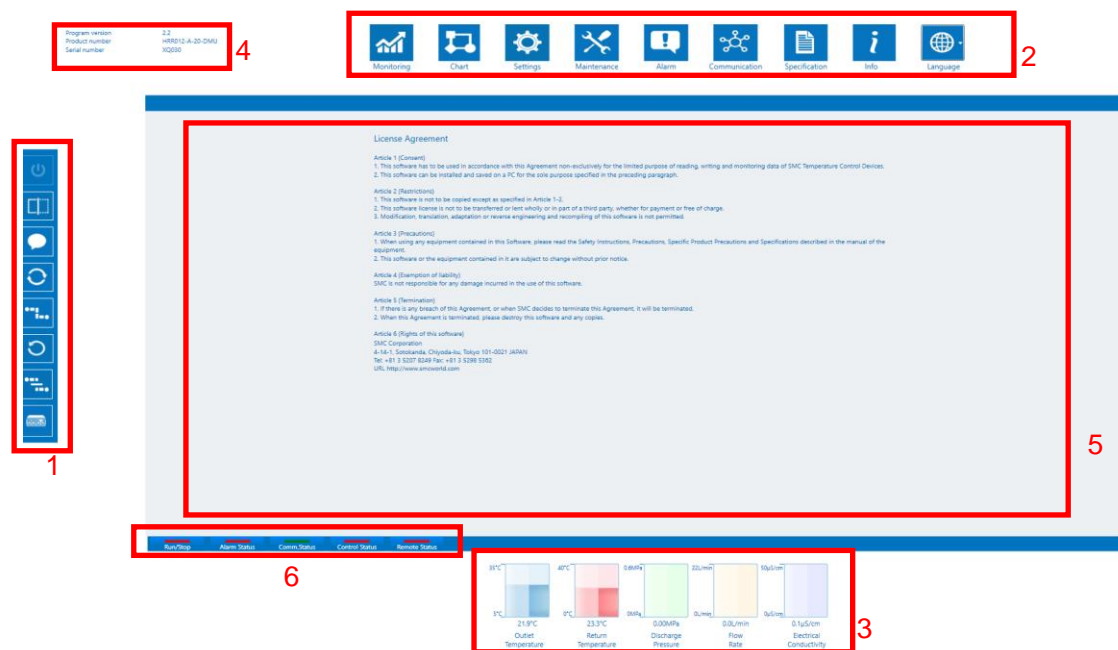


Fig. 2 Main window

1. Control bar (see 8.1.2)
2. Navigation bar (see 8.1.3)
3. Process values (see 8.1.4)
4. Product information (see 8.1.5)
5. Display area (see 8.1.6)
6. Status bar (see 8.1.7)

8.1.2 Control bar

The connection to a thermo-chiller can be controlled via the control bar. The thermo-chiller can also be started and stopped via this bar.

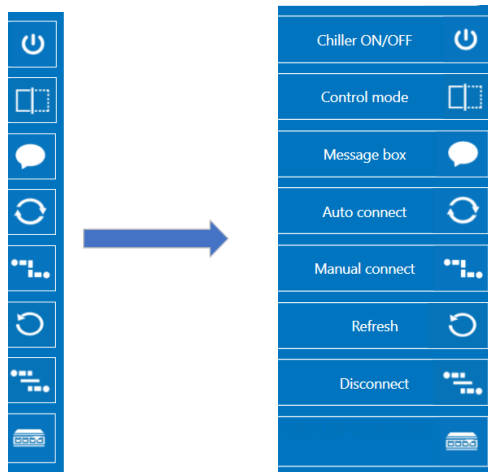


Fig. 3 Control bar

Moving the mouse pointer over the control bar causes it to extend (see Fig. 3).

8.1.2.1 Thermo-chiller on/off

This button can be used to start and stop the thermo-chiller. This is only possible if Control mode is activated.

8.1.2.2 Control mode

Activating Control mode enables the user to start and stop the thermo-chiller and transfer settings. When Control mode is deactivated, all the control buttons that cannot be used in this case are disabled.

8.1.2.3 Messages

A message box appears when this button is pressed. All the messages that have been generated since the software was started can be reread here.

8.1.2.4 Auto connect

This function is used to establish a connection between the software and a thermo-chiller. When the button is pressed, the COM ports are queried one by one. A connection is established as soon as a thermo-chiller responds.

This function is disabled when a thermo-chiller is connected. To select a different thermo-chiller that is connected to the PC, the 'Manual connect' function must be used (see 8.1.2.5).

8.1.2.5 Manual connect

Because 'Auto connect' always connects to the first thermo-chiller on the COM port list, the 'Manual connect' button can be used to connect the software to a different thermo-chiller that is connected to the PC. To this end, the corresponding COM port must be selected via the 'COM port' button (see 8.1.2.8). The connection is terminated to the currently connected thermo-chiller and a connection is established to the selected thermo-chiller.

8.1.2.6 Refresh

This button refreshes the COM port list (see 8.1.2.8). This is necessary if a thermo-chiller is connected when the software is already open.

8.1.2.7 Disconnect

The 'Disconnect' button terminates the connection between the software and the connected thermo-chiller.

8.1.2.8 COM port

The 'COM port list' shows all COM port devices which are connected to the PC. When more than one chiller is connected, it is possible to select the one which should be displayed on the software.

8.1.3 Navigation bar

The navigation bar enables the user to change the contents of the display area (see 8.1.6) and set the language for the software.



Fig. 4 Navigation bar

- Monitoring (see 8.2)
- Chart (see 8.3)
- Settings (see 8.4)
- Maintenance (see 8.5)
- Alarm (see 8.6)
- Communication (see 8.7)
- Specification (see 8.8)
- Info (see 8.9)
- Language (see 8.10)

8.1.4 Process values

The most important process values are displayed in the chart in the lower area of the software. Depending on the thermo-chiller, this area may also display the electrical conductivity of the circulating fluid, in addition to the return temperature, pressure and flow rate (Fig. 5).

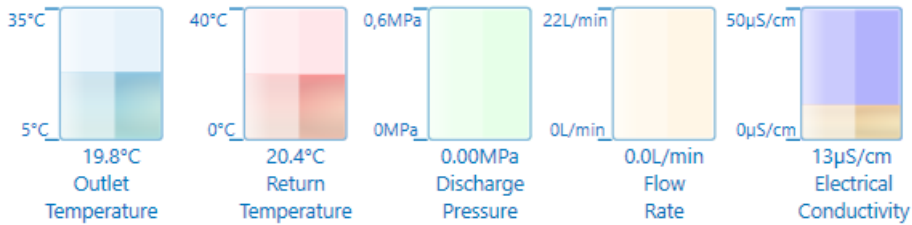


Fig. 5 Process values

8.1.5 Product information

This area displays the product key, the serial number and the version of the firmware installed on the connected thermo-chiller (Fig. 6).



Fig. 6 Product information

8.1.6 Display area

The display area displays the software content that is currently selected on the navigation bar (see 8.1.3).



Fig. 7 Display area

8.1.7 Status bar

The most important status messages are displayed in the display area as green or red buttons (Fig. 8).

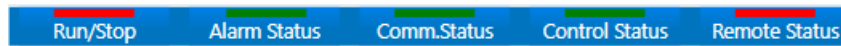


Fig. 8 Status bar

Run/Stop:	Green = Device in operation	Red = Device in standby
Alarm status:	Green = No alarm	Red = Alarm active
Comm. status	Green = Communication active	Red = No communication
Control status	Green = Control mode activated	Red = Control mode deactivated
Remote status	Green = Remote activated	Red = Remote deactivated

8.2 Monitoring

The monitoring menu provides a visual representation of the most important process data. The process data from the past 24 hours can be viewed in the 'Live data' window, while all the process data since recording began can be viewed in the 'Historic data' window.

8.2.1 Live data

The 'Live data' window enables the user to view process data from the past 24 hours since the software was started or the live data of the thermo-chiller was reset. The data can also be saved to a file. In addition, the user can change the set temperature of the thermo-chiller.

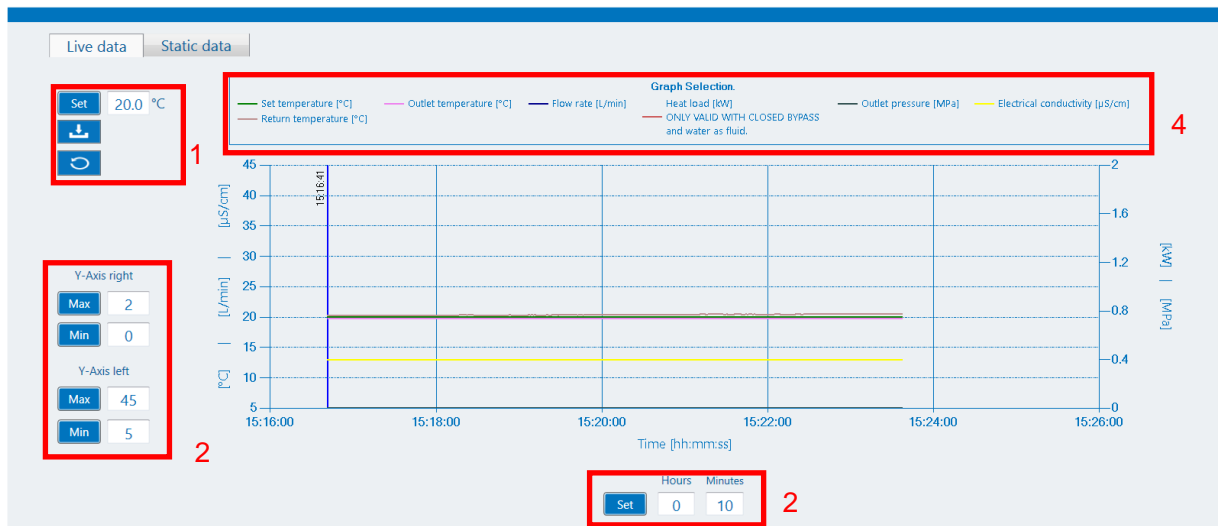


Fig. 9 Monitoring / Live data

1. If Control mode is activated, the user can apply the set temperature in the input field by pressing the 'Set' button. The 'Save' button saves the process data to a file. 'Reset' deletes the previous process data.
2. The Y-axes can be adjusted via the input fields and buttons.
3. The displayed time window level can be set to between 2 minutes and 24 hours.
4. Clicking the corresponding symbol in the 'Graph selection' area enables the user to select which process data should be displayed on the graphs and which should be hidden.

8.2.2 Data history

The 'Static data' window is used to display all the process data since the software started recording. Clicking the 'Reset' button in the 'Live data' window (see 8.2.1) also deletes the data in 'Static data'.

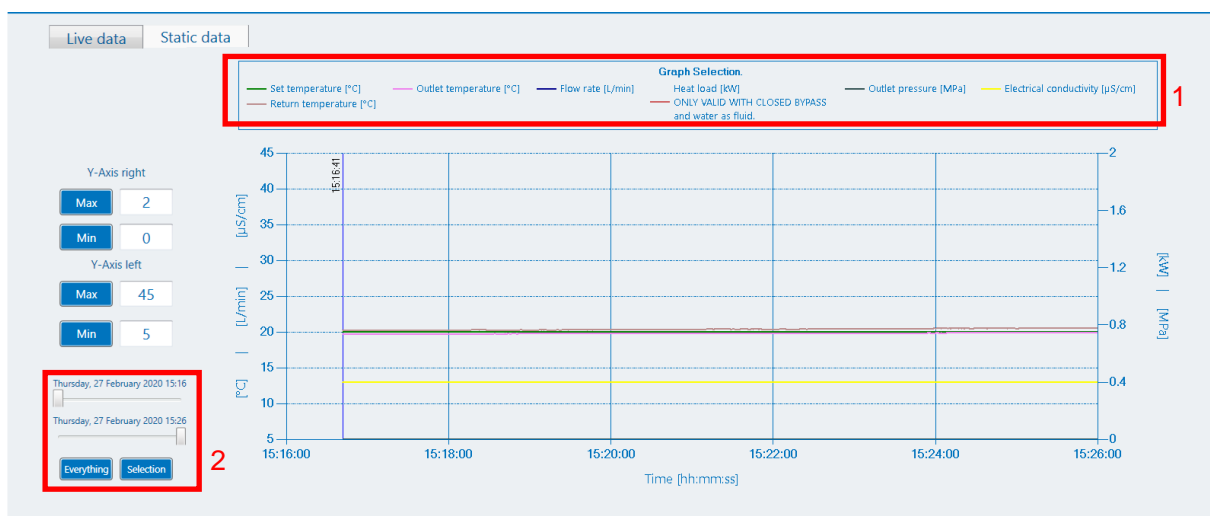


Fig. 10 Monitoring / Data history

8.3 Diagram

The diagram visualizes the internal structure of the thermo-chiller. Relevant process values such as temperatures, pressures, durations, etc. are displayed here. The diagram differs depending on which thermo-chiller is connected. The software distinguishes between the following types of devices: Air-cooled, water-cooled, with DI control and without DI control

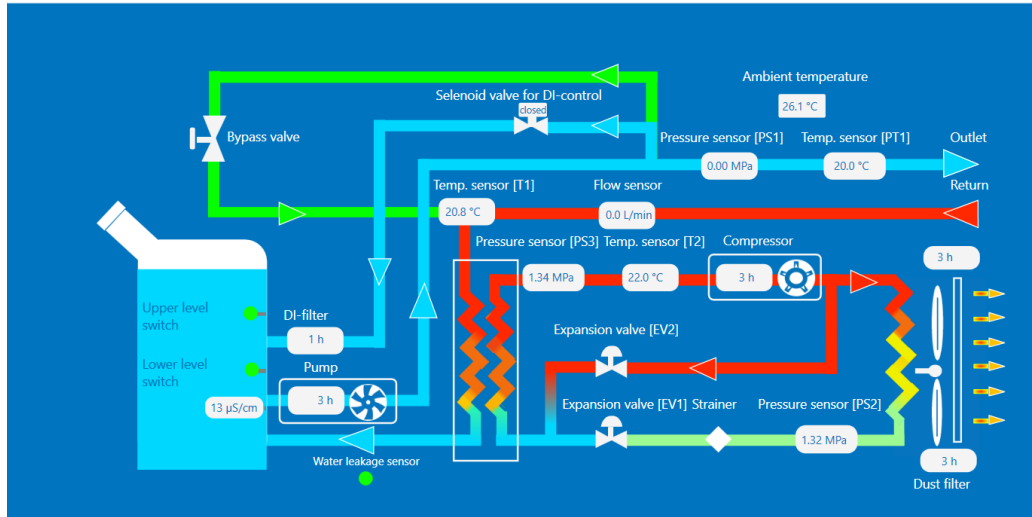


Fig. 11 Diagram

8.4 Settings

In this area, the user can view, change and transfer all thermo-chiller settings and save the settings to a file. The contents of the various settings windows (see 8.4.1 to 8.4.3) are based on the operating instructions for the thermo-chillers.



Fig. 12 Setting menu

The buttons in the upper right-corner enable the user to import the current settings of the thermo-chiller or export the settings that were adjusted by the software. The settings can also be exported to or imported from a file on the PC, and the thermo-chiller can be reset to factory settings.

8.4.1 Standard settings

All the standard settings can be adjusted via this menu. All the settings are described in the operating instructions for the thermo-chillers. Settings that are not supported for the current device are greyed out.

8.4.2 Alarm settings

All the alarm settings can be adjusted via this menu. All the settings are described in the operating instructions for the thermo-chillers. Settings that are not supported for the current device are greyed out.

8.4.3 Communication settings

All the communication settings can be adjusted via this menu. All the settings are described in the operating instructions for the thermo-controllers. Settings that are not supported for the current device are greyed out.

8.5 Maintenance

For preventive maintenance, certain components of the thermo-chillers have operating hour counters. They can be viewed in the maintenance area.

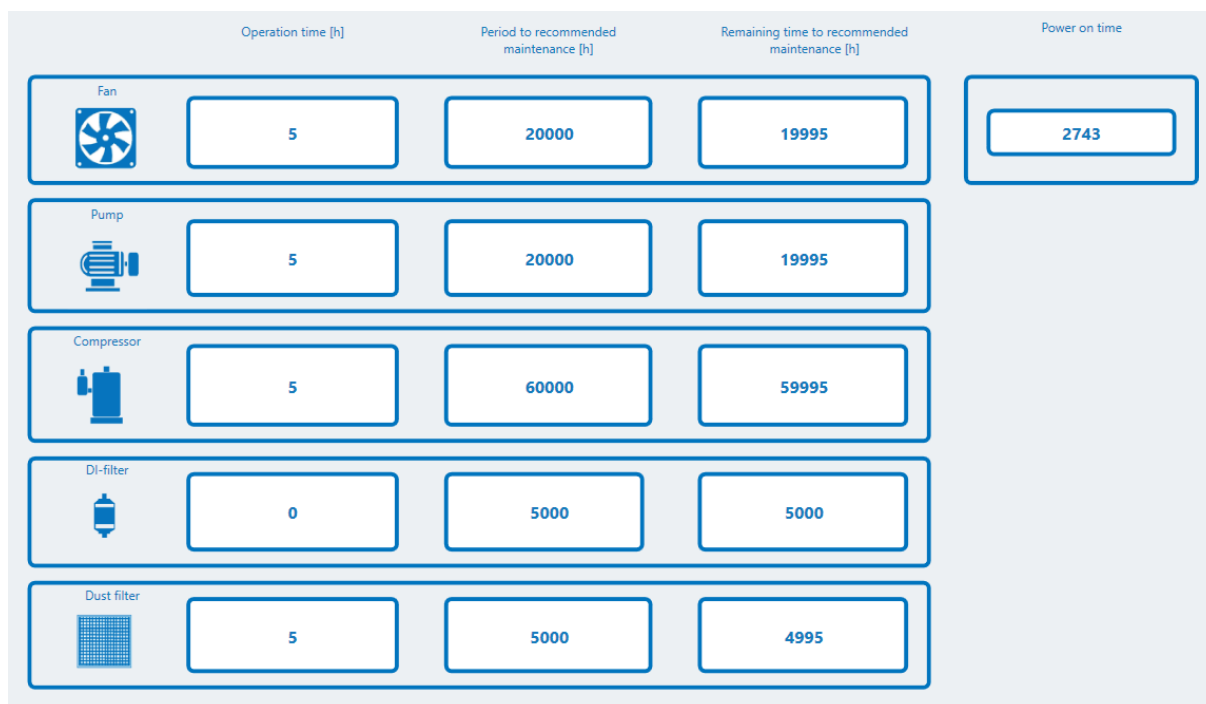


Fig. 13 Maintenance menu

There are fixed, recommended maintenance intervals for the fans, pumps and compressors. The time intervals for the dust filters (air-cooled thermo-chillers only) and DI filters (thermo-chillers with DM option only) can be adjusted via the settings (see 8.4.1) depending on the operating conditions. Operating hour counters that are unnecessary for the current device are hidden. The counters can be reset individually via the thermo-chiller display.

8.6 Alarms

Thermo-chillers feature a variety of alarms. When one or more alarms are triggered, they can be analyzed in greater detail in the 'Alarms' area. It is also possible to download and analyze the last 150 alarms from the thermo-chiller's alarm memory. In addition to the process data at the time the alarm occurred, the user also receives an alarm description with possible causes and a troubleshooting suggestion.

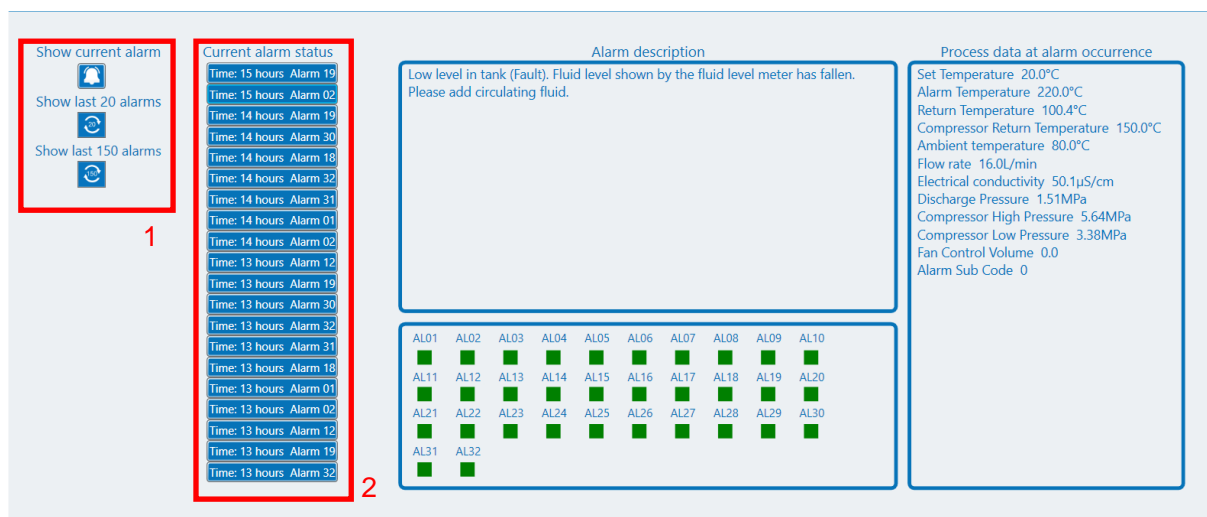


Fig. 14 Alarms menu

1. The three buttons enable the user to download the desired alarms from the thermo-chiller. The top button loads all current alarms, the middle one the alarm history of the last 20 alarms and the bottom one the alarm history of the last 150 alarms.
2. Once the alarms have been loaded successfully, the user can view the alarm description for each alarm as well as the process data at the time the alarm occurred. To do so, the user must select the desired alarm using the button.

8.7 Communication

The communication area displays all the telegrams that are exchanged between the thermo-chiller and the customer application. It also displays information regarding faulty telegrams or communication problems.

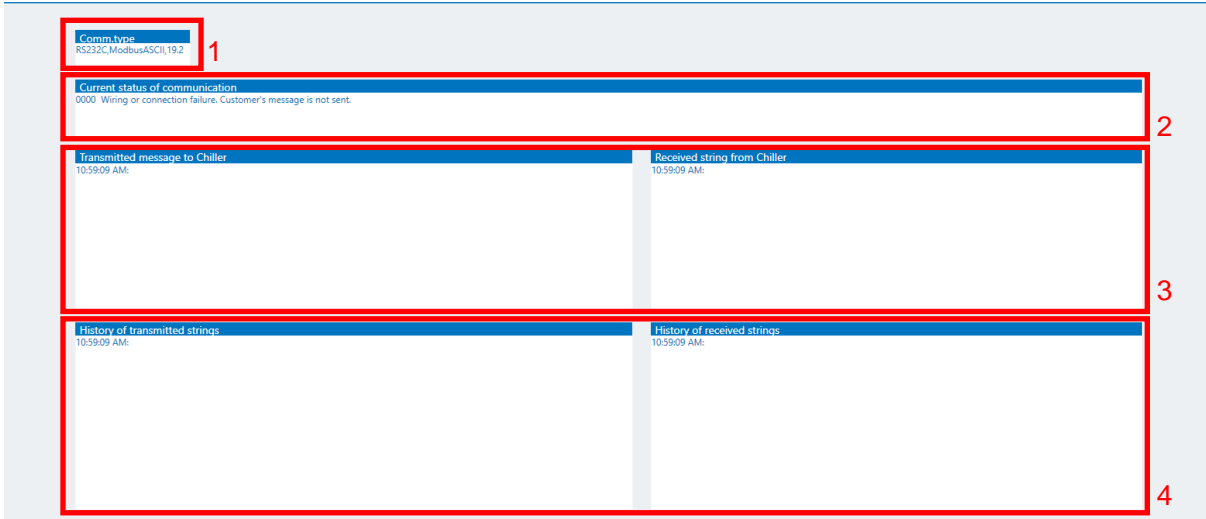


Fig. 15 Communication window

1. Actual communication settings of the chiller.
2. Current communication status
3. Last transmitted and received string
4. History of transmitted and received messages

8.8 Specifications

The Specifications page displays the following characteristics of the thermo-chiller:

- Cooling power (50/60 Hz)
- Heating power (50/60 Hz)
- Pump characteristics (pressure/flow rate)

The software displays the appropriate characteristics for the current device type.

8.9 Info

The information area contains the legal notice and the legal provisions that are relevant to this software.

8.10 Language

When the software is started, the computer's system language is used as the interface language. If the user wants to select another language, they can select it via the 'Language' drop-down menu.

The following languages are available:

- English
- Japanese
- Spanish
- Italian
- Deutsch
- Chinese
- French
- Russian
- Turkish
- Korean

8.11 Messages

8.11.1 General messages

For certain events, information is displayed on the left side of the screen and then automatically hidden. This information is shown when, for example, a command such as 'Reset to factory settings' is successfully executed.

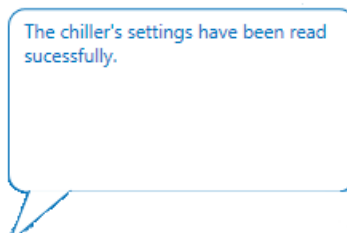


Fig. 16 General message

8.11.2 Important messages

Important messages contain information such as triggered alarms that have a major influence on the software or the thermo-chiller. These messages must be actively acknowledged so that they can be hidden again.

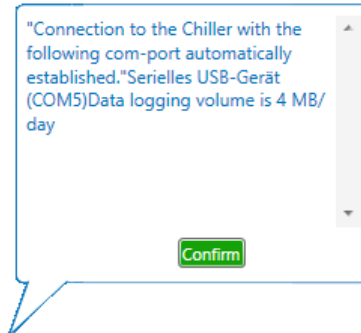


Fig. 17 Important message

8.11.3 Confirmation messages

Certain interactions require confirmation from the user to prevent inadvertent changes to the software or the thermo-chiller.

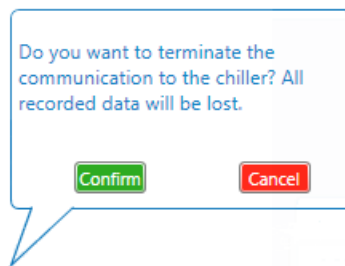


Fig. 18 Confirmation message

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

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