°LAUDA

Operation manual

Command Touch operating unit

An accessory of the Integral IN and PRO product lines
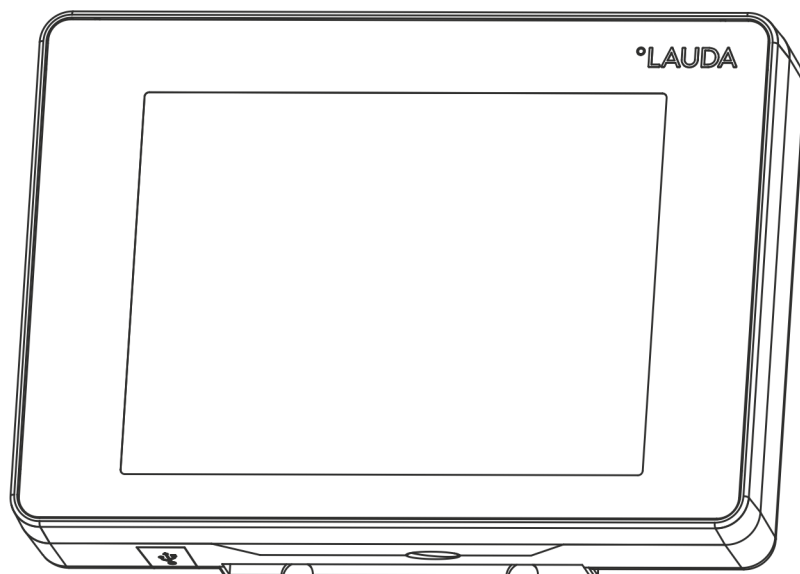
Read this manual prior to performing any task!

°FAHRENHEIT. °CELSIUS. °LAUDA.

Table of contents

1 General

This operating manual explains how to install and operate the Command Touch operating unit (order no. LRT 923).

The Command Touch operating unit ensures user-friendly operation of your LAUDA constant temperature equipment. All operating functions can be accessed easily by tapping, dragging or swiping the high-resolution multi-touch screen with your finger.

The touch display is connected to the constant temperature equipment via a LiBus cable. Remote operation is also possible: for example, you can connect the operating unit directly to the control station PC (maximum permitted cable length: 50 m). The magnets integrated into the back of the casing prevent the operating unit from slipping when placed on a ferromagnetic surface, thus facilitating use of the touch display.

> ℹ️ *This operating manual presents the basic operating concept of the Command Touch operating unit and provides examples of some of the most popular operating functions. Detailed information on how to handle your constant temperature equipment and a description of the functions specific to your device can be found in the operating manual for your constant temperature equipment. This includes, in particular, process technology and safety- and liability-related information.*

1.1 Intended use

The Command Touch operating unit is an accessory which extends the operating possibilities of the LAUDA constant temperature equipment. After connection, the constant temperature equipment can be operated by tapping the elements on the display. This is usually done by tapping or swiping the display with one or more fingers.

The operating unit may only be operated with constant temperature equipment that supports the functions provided. A list of compatible product lines can be found in the "Compatibility" section in this operating manual.

The operating unit should only be operated as intended and under the conditions specified in this operating manual. The instructions in the connected constant temperature equipment's operating manual apply to every interaction. This is particularly true of the safety instructions contained in the manual.

Reasonably foreseeable improper use

- Use with incompatible constant temperature equipment
- Use with defective or non-standard cables or connections
- Operating the display using sharp or sharp-edged objects

1.2 Compatibility

The operating unit is available as an accessory for the following LAUDA product lines:

- Integral IN
- PRO (with "Base" operating unit)

> **LiBus interface**
>
> *The constant temperature equipment must have a free LiBus interface for connecting the operating unit.*
>
> *An interface module can be provided for this purpose if necessary. If you have any questions about technical adaptations, please contact the LAUDA service; see ⮫ Chapter 1.6 "Contact LAUDA" on page 7.*

1.3 Technical changes

All technical modifications are prohibited without the written consent of the manufacturer. Damage resulting from a failure to observe this condition will void all warranty claims.

However, LAUDA reserves the right to make general technical modifications.

1.4 Warranty conditions

LAUDA grants a standard warranty of one year.

1.5 Copyright

This operating manual was written in German, checked and approved. If the content of other language editions deviates from the German edition, the information in the German edition shall take precedence. If you notice any discrepancies in the content, please contact LAUDA Service, see ⮫ Chapter 1.6 "Contact LAUDA" on page 7.

Company and product names mentioned in the operating manual are usually registered trademarks of the respective companies and are therefore subject to brand and patent protection. Some of the images used may also show accessories that are not included in the delivery.

All rights reserved, including those relating to technical modifications and translations. This operating manual or parts thereof may not be modified, translated or used in any other capacity without the written consent of LAUDA. Violation of this may obligate the violator to the payment of damages. Other claims reserved.

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1.6   Contact LAUDA

Contact the LAUDA Service department in the following cases:

- Troubleshooting
- Technical questions
- Ordering accessories and spare parts

Please contact our sales department for questions relating to your specific application.

Contact information

LAUDA Service

Phone: +49 (0)9343 503-350

Fax: +49 (0)9343 503-283

Email: service@lauda.de

2 Safety

2.1 General safety instructions and warnings

- Read this operating manual carefully before use.
- Always keep the operating instructions within reach during use.
- This operating manual is part of the device's accessories. If the device is passed on, the operating manual must be passed on with it.
- This operating manual is applicable in combination with the operating manual of the constant temperature equipment to which the interface module is connected.
- Instructions for LAUDA products can be downloaded from the LAUDA website: https://www.lauda.de
- The warnings and safety instructions in this operating manual must be observed at all times.

Composition of the warning notices

Warning signs	Type of danger
⚠️	Warning – danger zone.

Signal word	Meaning
WARNING!	This combination of symbol and signal word indicates a potentially dangerous situation that can result in death or serious injury if it is not avoided.
CAUTION!	This combination of symbol and signal word indicates a possible dangerous situation that can result in minor injury if it is not avoided.
NOTICE!	This combination of symbol and signal word indicates a potentially dangerous situation that can result in material and environmental damage if it is not avoided.

2.2 Information about the operating unit

- Always switch the constant temperature equipment off before connecting or removing the operating unit.
- Only use suitable cables of a sufficient length to extend the cable.
- Always lay the cables professionally and in a trip-proof manner. Attach any cables that have been laid and make sure that they cannot become damaged during use.
- Check the state of the cables and socket before operating the device.
- Avoid contacting the display with sharp or sharp-edged objects.
- Clean any soiled parts immediately.
- Do not carry out any repairs on the cable or operating unit yourself. Contact the LAUDA service if necessary; see ⮑ Chapter 1.6 "Contact LAUDA" on page 7.
- When not in use, keep the operating unit in its packaging and store in accordance with the specified ambient conditions.

3 Unpacking

> **⚠ WARNING!**
> **Transport damage**
>
> | | Damage |
> | --- | --- |
> | | • Closely inspect the device for transport damage prior to commissioning. |
> | | • Never operate a device that has sustained transport damage. |

Adhere to the following order:

1. Remove the accessory from its packaging.

2. Make sure that the accessory is complete and undamaged.

3. Store the accessory in its packaging after use.

4. Dispose of the packaging materials in an environmentally-friendly way; see ⅍ "Packaging" on page 47.

> ⓘ *If you notice any damage, contact the LAUDA service immediately; see* ⅍ Chapter 1.6 "Contact LAUDA" on page 7.

4 Device description
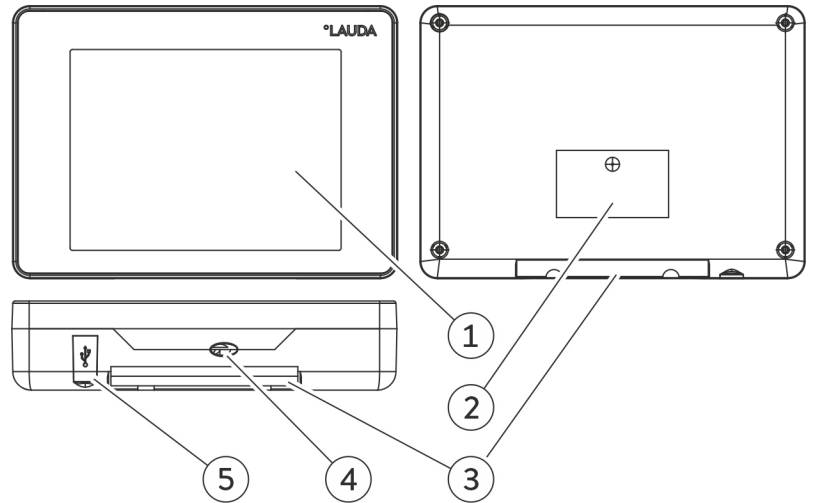

Fig. 1: Command Touch operating unit

1 Touch display
2 Type plate
3 Holding device for attaching the accessory to the LAUDA constant temperature equipment
4 LiBus connecting cable with socket (cable bushing with strain relief)
5 USB interface for data import / data export via USB storage medium

5 Before starting up

5.1 Setting up the operating unit

The operating unit is designed to be connected directly to the constant temperature equipment. It can also be used remotely, for example, connected directly to the control station PC. You can extend the LiBus connecting cable to a maximum length of 50 m; see ⮩ Chapter 12 "Accessories" on page 48.

> ⓘ *The magnets integrated into the back of the casing prevent the operating unit from slipping when placed on a ferromagnetic surface, thus facilitating use of the touch display.*

You can attach the operating unit directly to the constant temperature equipment; the attachment point designed for this purpose is indicated on the constant temperature equipment's casing. Observe the instructions in the operating manual of your LAUDA constant temperature equipment. The adhesive force of the magnets on the back of the device ensure interlocking of the operating unit during connection, and attach it in place.

5.2 Connecting the operating unit

The operating unit's power is supplied and communication with the constant temperature equipment is transmitted via the LiBus connecting cable.

During connection, adhere to the following order:

1. Switch the constant temperature equipment off.

2. Connect the operating unit's cable to the constant temperature equipment's LiBus socket.

   ▶ The operating unit is ready for use.

6 Commissioning

6.1 Switching the constant temperature equipment on

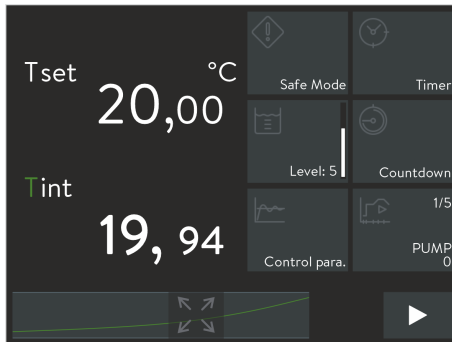| ⚠	**WARNING!** **Risk of contact with cold/warm parts if the operator does not realize that the device is switched on.**
	Scalding, cold burns
	• The remote control unit must be kept within visual range of the device.

1. Switch the constant temperature equipment on at the mains switch.

2. After approx. 30 seconds, the Command Touch operating unit's display shows the Home window with the main menu of the constant temperature equipment.

   ▶ The constant temperature equipment is ready for use and can be operated by tapping the elements on the Touch Display.

Fig. 2: Home window 2

6.2 Operating the device using the Command Touch unit

6.2.1 Home window

The Home window displays the current process temperatures and temperature profile, as well as tile buttons representing the constant temperature equipment's main menu. The type and amount of tile buttons available depend on the range of functions of the constant temperature equipment and the accessory connected to it.

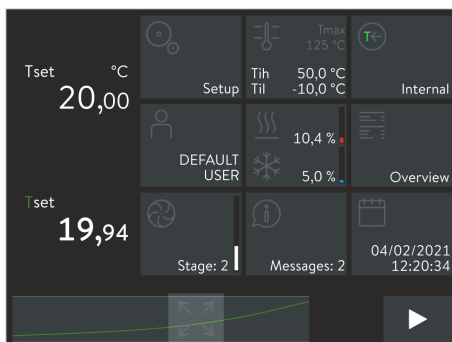**Enlarging/reducing the size of the temperature display**

Fig. 3: Home window 3

- The current process temperatures are displayed on the left of the Home window.
- The temperature display can be enlarged by swiping from left to right. Three displays steps are available; the number of columns displaying three tiles each is reduced accordingly.
- The temperature display can be reduced by swiping from right to left.
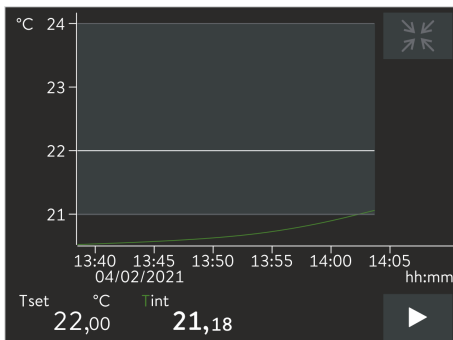
Enlarging/reducing the temperature display

Fig. 4: Graph window

- ■ The current temperature profile is displayed in the footer of the Home window.
- ■ Tap the [Maximize] button in the center of the temperature profile to display the temperature profile in full screen.

  Tap the temperature axis or time axis to open the *Graph settings* menu where you can carry out further settings, ⬫ Chapter 6.2.4 "Graph window" on page 16.
- ■ Back to the Home window:

  Tap the [Minimize] button on the top right of the graph window.

Working with tiles

- ■ To open the menu of a specific tile:

  Tap the required [tile] to display the associated menu.
- ■ Back to the Home window:

  Press the [<] button in the bottom left of a submenu to switch to the previous or next higher menu level. To do so, tap this button directly.
- ■ To display a hidden [tile]:

  Depending on the setting, the Home window displays a maximum of nine tiles. To display more tiles, swipe any [tile] with your finger to the left or right.
- ■ To switch between Standby and Operating modes:

  In the Home window, press the button in the bottom right for about 1 second. The [Stop] button switches the constant temperature equipment to Standby mode, the [Play] button activates Operating mode.

6.2.2 Selecting the menu language

There is a choice of several menu languages in which to display the operating functions:

1. Open the Home window.

2. Touch the *Settings* tile.

    ▶ A list of settings appears.

3. Scroll down to the end of the [Settings] list.

    ▶ The current language setting is displayed on the menu item.

4. Touch the [Language] menu item.

    ▶ A list of languages appears. The current language setting is marked with a check mark.

5. Touch a different language to select it.

    ▶ The setting is immediately active.

6. Tap the [<] button repeatedly until the home window appears.

6.2.3 Input window

The Input window is always displayed when you call up a setting that can be modified. Depending on the request, the input is carried out by selecting a predefined option or entering a numerical value or date.
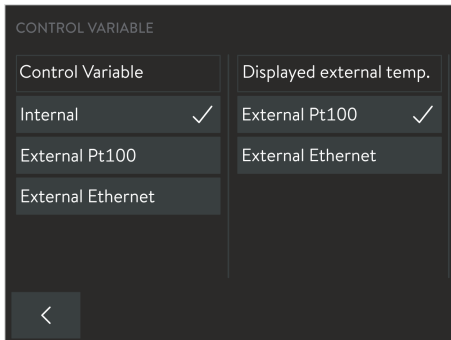
Input window with option selection

You can see all the available options. A check mark indicates the active option.

- A scrollbar on the right indicates that longer lists of options are available. You can access hidden options by pushing the menu.
- You can select and activate this option by tapping the option button. The check mark indicates your selection as a new active option.
- Press the [<] button to go back to the previous display.

ⓘ *If the selected option requires confirmation or a numerical number to be entered, the associated Input window will open automatically when you select the option.*

Fig. 5: Selecting options

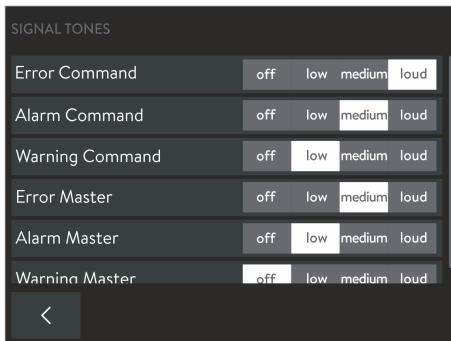### Input window with slide switch

A bar is displayed with all the available options. The slide switch (light button with dark writing) indicates the active option.

- You can select and activate this option by tapping a dark option button. This option is then displayed as a light button.
  Alternatively, you can also push the light button onto the required option.
- Press the [<] button to go back to the previous display.
- You can also repeat the procedure if necessary if you need to correct a wrong selection.

Fig. 6: Selecting option with the slide switch

Input window with a value
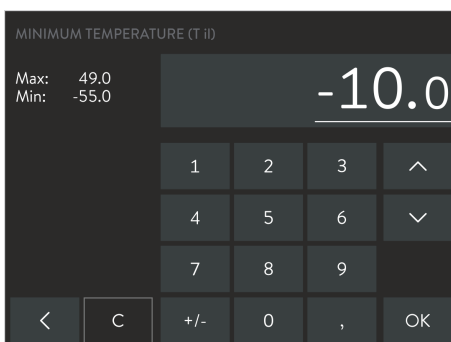
An input field is displayed with a numerical keypad. The currently valid value is entered in the input field. The change in value is limited in each case to the values corresponding to the range of values displayed in the top left (*Min: / Max:*).

If you wish to change the displayed value, you have the following options:

- Change the entire value:
  - When opening the input window, the entire displayed value is underlined.
  - Consecutively tap the number keys required to overwrite the value.
- Change individual digits:
  - In the input field, tap the corresponding value that you wish to change. A line under the digit in question indicates the digit you have selected.
  - Tap the required number key.
    Alternatively, you can change the chosen digit using the arrow buttons on the right.
- Change the sign of the value:
  You can change the sign of the value using the [+/-] button. If negative values are inadmissible (see value area), it will not be possible to use this button.

Fig. 7: Entering values

You can cancel or reject your change or adopt it as the new active value.

- ■ Press the [C] button to delete the new value and display the original value again.
- ■ Press the [<] button to go back to the previous display without any changes.
- ■ Press the [OK] button to save and activate the displayed value and to go back to the previous display. Invalid values will not be accepted.
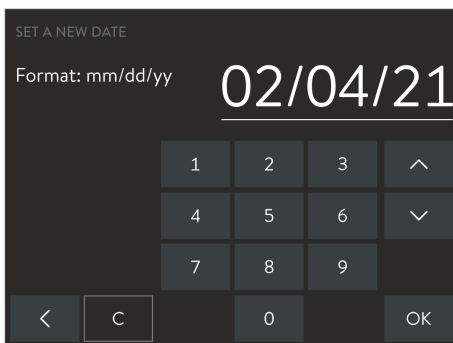
Input window with date entered

Fig. 8: Entering the date

Time or date values are entered in the same way as entering numerical values. However, the following special features must be observed:

- ■ You can select the time format to be displayed in the basic settings. For instance, you can select the US-American date format mm/dd/yy and the am–/–pm format.
- ■ When you select the value you wish to change, a group of digits is selected and underlined in the input field. The values are entered as two digits, i.e. with two numerical keys.

6.2.4 Graph window
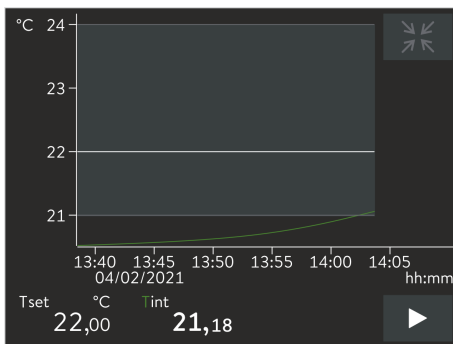
Fig. 9: Graph window

With the Command Touch operating unit, you can display the following temperature profiles in the form of a graph:

T_{set} (white line) - Set temperature

T_{int} (green line) - Internal actual temperature (bath temperature)

T_{ext} (purple line, not shown) - External actual temperature (application)

Displaying the graph window

1. Tap the [Maximize] icon at the bottom center of the Home window.
   - ▶ The graph window containing the temperature profile appears.
2. Touch T_{int} or T_{ext} to show or hide the respective temperature curve.

   This acts as a shortcut to the *Settings* ➞ *Graph settings* ➞ *Displayed measured values* menu item.
3. Tap the temperature scale or the time scale to open the *Graph settings* submenu.

   This acts as a shortcut to the *Settings* ➞ *Graph settings* menu.
4. Tap the [Minimize] symbol in the top right of the graph window.
   - ▶ The Home window appears.

Structure of the graph window

Fig. 10: Graph window with temperature profile
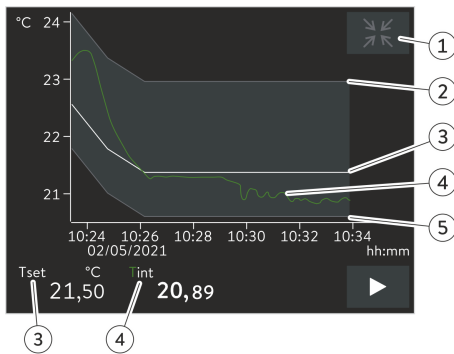
1	[Minimize] icon
2	Maximum limit value
3	Set temperature
4	Internal actual temperature profile
5	Minimum limit value

Adjusting the graph window

1. Open the Home window.

2. Touch the *Settings* ➜ *Graphic settings* tile.

   ▶ The Graph settings submenu opens.
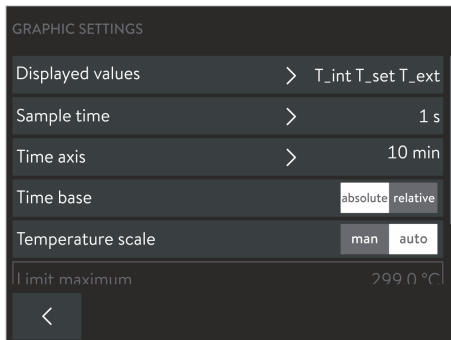
Fig. 11: Graphic settings

The graph window can be adjusted if necessary with the following settings:

■ [Displayed values]: T_{set}, T_{int} and T_{ext}
Here you can define which temperatures are displayed in the graph.

■ [Sample time]: 1, 5, 10 or 30 seconds
Here you can define the time interval at which new temperature values are measured.

■ [Time axis]: 1, 10, 30, 60 or 120 minutes as well as 12 or 24 hours.
Here you can define the time range displayed in the visible graph window (corresponds to scaling of x axis).

■ [Time base]: Slide switch for absolute and relative settings
● When *Absolute* is selected, measurements are recorded with the current time.
● When *Relative* is selected, measurements are recorded from the start time "00:00:00".

■ [Temperature scale]: Slide switch for the manual and automatic settings
● Here you can define the temperature range displayed in the visible graph window (corresponds to scaling of y axis).
● If the slide switch is set to automatic, the size of the visible graph window adapts automatically when the temperature curves change.
● If the slide switch is set to automatic, the two buttons below (limit value) are disabled.

- [Limit maximum] and [Limit minimum]
  - Here you can define the upper and lower temperature value of the graph window (corresponds to scaling of y axis).
  - Note: When setting the two limit values manually, make sure that the temperature curves fall within the range of the two limit values, otherwise the temperature curves will not appear on the graph. You must enter the absolute temperature values.
- [Tolerance range of graph]: A **graphic** tolerance range curve T_{set} can be defined around the temperature and displayed to **visually** assist the control accuracy of the displayed temperature curve T_{set}.
  Touch the [Display tolerance range] button to change the settings.
  - Placing or removing a check mark next to the [Display tolerance range] button displays or hides the tolerance range in the graph window.
  - Touching the [Maximum limit value tolerance range] or [Minimum limit value tolerance range] button opens the input window.
  - Enter a positive and a negative distance to the T_{set} set point for the tolerance range around the temperature curve.

6.3   Basic settings

BASIC SETTINGS		
Temperature unit	°C	°F
Current consumption		16.0A
Time format	24 h	12 h
Date format	dd/mm	mm/dd
Date:		02/04/2021
Time:		12:30:12

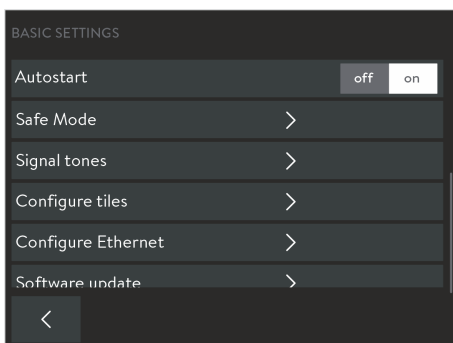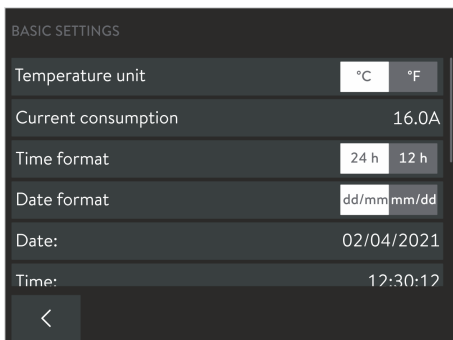| BASIC SETTINGS		
Autostart	off	on
Safe Mode	>	
Signal tones	>	
Configure tiles	>	
Configure Ethernet	>	
Software update	>	

Fig. 12: Basic settings

1. Open the Home window.

2. Tap the *Settings ➞ Basic settings* tile.
   - ▶ The constant temperature equipment settings are listed here, among other things, in the basic settings menu of the Command Touch operating unit. These are explained in more detail below.
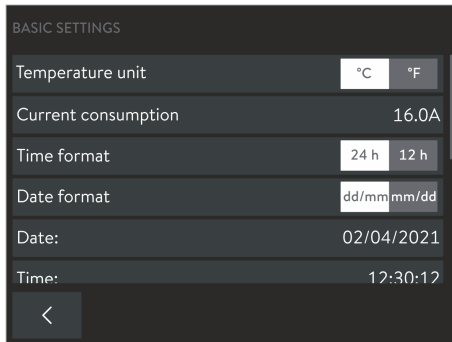
6.3.1 Limiting the current consumption

If your mains fuse is less than 16 A, the current consumption of the constant temperature equipment can be reduced incrementally from 16 A to 8 A. The maximum heating power is reduced accordingly. Establish whether other consuming units or only your device is connected to the fused circuit.

BASIC SETTINGS	
Temperature unit	°C °F
Current consumption	16.0A
Time format	24 h 12 h
Date format	dd/mm mm/dd
Date:	02/04/2021
Time:	12:30:12

Fig. 13: Current consumption 16 amperes at present

1. Open the Home window.

2. Touch the *Settings* ➜ *Basic settings* ➜ *Current consumption* tile.

    ▶   An input window for entering values manually appears.

3. Change the current consumption accordingly.

4. Press [OK] to confirm the new value.

    ▶   The value is accepted.

6.3.2 Safe Mode

Safe Mode is a safe temperature state to which the constant temperature equipment can be switched as soon as any malfunctions or errors occur. Temperatures considered to be safe depend on the type of application connected and should be entered on the LAUDA constant temperature equipment before using the device for the first time. In the event of an error, switching to Safe Mode can be carried out manually or automatically.

When Safe Mode is active, the constant temperature equipment continues to run but the values preset here for the T_{set} set temperature and control variables are automatically set. In the Safe Mode submenu, you specify how the constant temperature equipment should react to certain events (actions):

Which events lead to the activation of Safe Mode?

■   Being activated manually via the constant temperature equipment.
■   Command via interface.
■   Being triggered by certain alarms.
■   Communication with the control station being interrupted.

What indicates that Safe Mode is activated?

■   The *Safe Mode* tile displays a yellow symbol.

What happens in active Safe Mode if **no alarm** is pending?

■   The *Safe Mode* tile displays a yellow symbol.
    Safe Mode is ended by tapping the tile. The tile displays a gray symbol.

What happens in active Safe Mode if **no alarm** is pending?

■   The Touch Display shows the alarm window. The *Safe Mode* tile displays a yellow symbol.
    Safe Mode can only be ended by tapping the tile when the alarm on the constant temperature equipment has been unlocked.
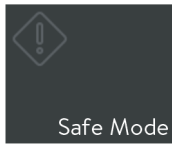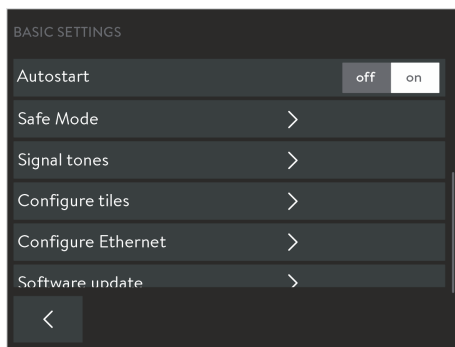
Activating Safe Mode manually

Fig. 14: Safe Mode tile

After you tap the [Safe Mode] tile, a security prompt will be displayed. As soon as you confirm this, the device will be set to a safe state.

Fig. 15: Safe Mode active

Configuring Safe Mode

Fig. 16: Basic settings of Safe Mode

The settings for the safe state are configured in this menu.

1. Open the Home window.

2. Tap the *Settings* ➡ *Basic settings* ➡ *Safe Mode* tile.

   ▶ The *Safe Mode parameters* submenu opens.

3. Define suitable values for the safe operation of your process. To do so, carry out the settings listed below:

■ Switch the [Safe Mode function] off or on:
   ● Slide switch set to [No]: Safe Mode is not available, the *Safe Mode* tile is disabled. Safe Mode cannot be activated manually or by alarms or interfaces.
   ● Slide switch set to [Yes]: Safe Mode is in standby mode. The *Safe Mode* tile is active.

■ Keep or change the [set point]:
   ● Slide switch set to [Unchanged]: The Tset temperature set point defined before Safe Mode was activated is kept and the constant temperature equipment continues operating with this value.
   ● Slide switch set to [Change]: When Safe Mode is activated, the constant temperature equipment sets the new Tset temperature set point which is stored here with the next option.

■ Enter [set point]; this value defines the Tset temperature set point for Safe Mode.

■ Keep or change the [control variable]:
   ● Slide switch set to [Unchanged]: The control variable used prior to activating Safe Mode is kept.
   ● Slide switch set to [Internal]: When Safe Mode is activated, the constant temperature equipment sets the *Internal* control variable.

■ Specify [Timout]; this value defines the duration in seconds within which a contact must be made via the connection to the control station (timeout 1 to 60 seconds, 0 = monitoring disabled).
   If the interval is exceeded, the monitoring system triggers an alarm and the constant temperature equipment switches to Safe Mode.

Switching active Safe Mode off

Active Safe Mode can only be switched off on the operating unit. It is not possible to switch it off via an interface is not possible.

> ℹ️ *If Safe Mode has been triggered by an alarm, you must reset the alarm on the constant temperature equipment before you can switch Safe Mode off.*
>
> *Refer to your constant temperature equipment's operating manual to also obtain information about the Safe Mode function specific to your device.*

6.3.3 Operating mode following a power failure (Autostart)

In general, the device is required to resume operation after a power failure. However, you can introduce a manual activation step for safety reasons.
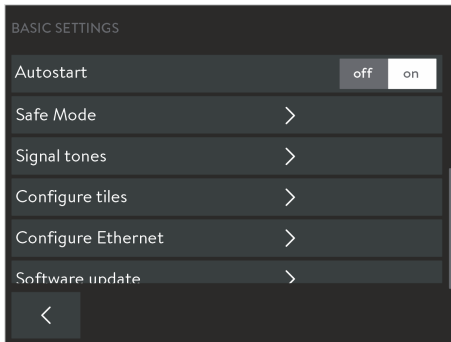
1. Open the Home window.

2. Touch the *Settings* → *Basic settings* → *Autostart* tile.

3. Select one of the following options in the *Autostart* field:

   - ◼ *Off* : After the power supply has been restored, the constant temperature equipment always starts operating in *Standby* mode.
   - ◼ *On* : After the power supply has been restored, the constant temperature equipment starts in the mode in which it was active when the interruption occurred (*Standby / Operation*).

Fig. 17: Autostart with current setting [On]

6.3.4 Positioning tiles

The tiles available for the constant temperature equipment are sorted in any order on the Home window. You can the place the most frequently used tiles in the foremost positions.
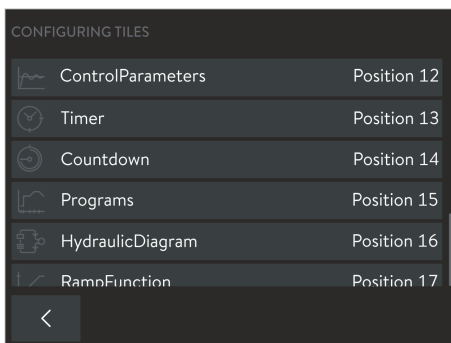
1. Open the Home window.

2. Touch the *Settings* → *Basic settings* → *Tiles configuration* tile.

   ▶ All tiles appear consecutively numbered in a list.

3. Touch the buttons for the tiles you wish to rearrange.

> ℹ️ *Symbols and captions are displayed on each of the buttons. The number on the right of the button indicates its position in the sequence.*

   ▶ An input window appears for manual entry.

4. Enter a new number.

5. Press the [OK] button to return to the previous screen with the new setting.

6. Repeat the process for each additional tile that you would like to sort.

7. Tap the [<] button repeatedly until the Home window appears.

   ▶ The tiles are sorted into the new sequence in the home window.

Fig. 18: Positioning tiles

6.3.5 Adjusting the volume of signal tones

Fig. 19: Adjusting the volume of signal tones

The constant temperature equipment indicates errors, alarms and warnings both visually and acoustically. For each type of message, you can define the volume at which the message is received on the constant temperature equipment and on the operating unit.
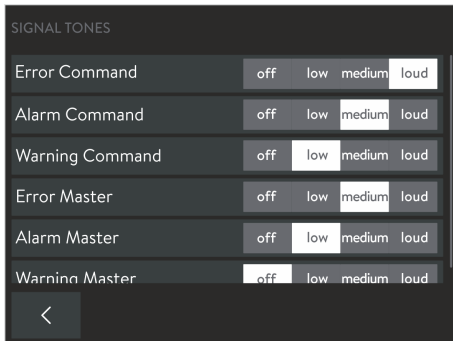
1. Open the Home window.

2. Tap the *Settings* ➞ *Basic settings* ➞ *Signal tones* tile.

   ▶ A list of available message types appears.

3. Set the required volume for each message type.

   You can choose a volume from [Quiet], [Medium] and [Loud]. Select [Off] to disable the acoustic signal.
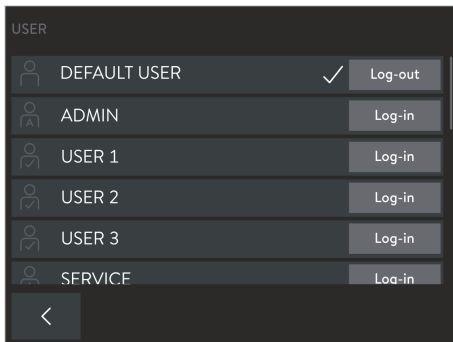
6.4 User database

Fig. 20: User database with different pro-
files

When the device is switched on, you are automatically logged on as a *DEFAULT USER*. The *DEFAULT USER* does not require a PIN. If several users work with the same device in quick succession, it is advantageous for users to each log in to the device with their own profile. In each profile, the Administrator can enable or disable the functions for operating the device.

Profiles in the user database

Accessing the user database via the tiles:

1. Open the Home window.

2. Touch the [User] tile.

   ▶ The user database containing the profiles opens.

Accessing the user database via the menu:

1. Open the Home window.

2. Touch the *Settings* ➞ *User / Administrator Login* tiles.

   ▶ The user database containing the profiles opens.

You can see all the defined profiles in the user database; a check mark indicates the currently logged-in user.

■ The [Log-out] button logs out the current user and activates the *DEFAULT USER* system profile.

■ By tapping any profile name, you can display the permissions stored for this profile.

■ Switch to this profile with the associated [Log-in] button; this will automatically log out the previous user.

°LAUDA

The user database contains a total of 22 predefined user profiles. These cannot be deleted but after logging in with the *ADMIN* (Administrator) system profile, they can be modified. Log-in is protected by a PIN query. The Administrator can change the factory-set PIN, as well as the respective stored range of functions.

- 3 system profiles (profile name cannot be modified):
  - *ADMIN* (default PIN: **9999**): Administrator, entitled to manage the user database.
  - *DEFAULT USER* (no PIN query): Standard user, automatically enabled when device is switched on.
  - *KEY LOCK* (no PIN query): key lock to protect unauthorized access.
- 19 user profiles (profile name can be modified):
  - *USER X* (default PIN: **1111**): Individual user (X = 1 – 19), authorized by the Administrator to use certain functions.

> ℹ️ **PIN**: *Change the default PIN to protect the operating unit from unauthorized access. Define a 4-digit PIN for each user profile required and in particular for the Administrator.*
>
> **Profile name**: *When renaming user profiles, it is preferable to use names that mean something. The profile should either contain the user's actual name or it should be named according to its range of functions.*
>
> **System profile ADMIN** : *Only use this profile to make changes in the user database. Always switch to a user profile to operate the constant temperature equipment.*

Administrator permissions (*ADMIN*)

The Administrator can make the following changes in the user database:

- Change the name of a user profile (not possible for system profiles).
- Change the log-in PIN (only for his/her own profile and use profiles).
- Assign individual permissions for each user profile.
- Transfer the current setting of the *DEFAULT USER* system profile to the current user profile ([Reset] button).

Configuring a profile

1. In the user database, tap [ADMIN] and enter the associated PIN (factory setting **9999**).

    ▶ You are registered as the Administrator.

2. Tap the profile name (not the [Log-in]) of the user profile that you would like to change.

    ▶ You can see the settings currently defined for this user.

3. With the [Name USER X] button, open the input window to change the profile name.

4. With the [PIN ....] button, open the input window to change the log-in PIN.

5. To change the permissions, you have the following options:

    ■ With the [Reset]button, you can first accept the default setting of the *DEFAULT USER* system profile which has been defined for the most popular applications. Then adjust this according to the user.

    ■ Assign individual permissions using the [On] and [Off] slide switches:
       ● [On]: The user is entitled to read and change the values concerned by this permission.
       ● [Off]: The user can read, but not change, associated values.

Overview of possible permissions

Depending on the constant temperature equipment's range of functions, the following permissions, for example, can be configured for a profile:

■ Activate [Standby / Operation]
■ Modify T_{set} (set point)
■ Calibrate
■ Edit programs
■ Start programs
■ Change control parameters
■ Apply control parameter sets
■ Change control variable
■ Change pump parameters
■ Change level parameters
■ Change temperature limits
■ Use timer functions
■ Safe Mode
■ Change basic setup
■ Reset to factory settings
■ Import data
■ Export data
■ Unlock keys

User permissions

After logging on, a user can operate the constant temperature equipment to the extent defined by the Administrator using the permissions for the user profile. Access to the user database is limited to the following tasks:

- Change his/her own permissions.
- Change his/her own log-in PIN.
- Use the [Log-out] button to change to the *DEFAULT USER* system profile.
- Use the [Log-in] button to switch to any profile whose log-in PIN he/she knows.

Change PIN

1. In the user database, tap the [USER X] user profile and enter the associated PIN (factory setting **1111**).

   ▶ You are registered as a user.

2. With the [PIN ....] button, open the input window to change the log-in PIN.

3. Enter the old PIN and press [OK] to confirm.

4. Enter the new PIN and press [OK] to confirm.

   ▶ The new PIN is immediately valid; you can operate the constant temperature equipment.

KEY LOCK special function

The purpose of the *KEY LOCK* special function is to protect the operating unit and constant temperature equipment from unauthorized access. It can be easily switched on or off in the [Settings] menu via the *Key lock* input.

For convenient administration, this special function is created as a system profile in the user database: Switching on logs the current profile off and activates the *KEY LOCK* system profile. The constant temperature equipment can now only be operated to the extent that the Administrator has defined with the aid of the permissions for this profile.

All permissions for this profile are deactivated by default. However, the Administrator can change the settings if necessary. Regardless of this, the basic operation, i.e. switching between different views and menus, is always maintained even when the key lock function is activated. Switching the key lock off automatically actives the *DEFAULT USER* system profile.

> ⓘ *In the* [Settings] *menu, the key lock can only be switched off if the profile currently in use has been granted the Deactivate key lock permission. Otherwise, only a user with this permission can deactivate the key lock.*

Using the key lock function

1. Open the Home window.

2. Touch the *Settings* tile.

    ▶ The Settings menu opens.

3. Scroll down in the menu.

    ▶ You can see the [KEY LOCK] menu point and a slide switch with the [On] and [Off] positions.

4. Slide the slide switch into the [On] position.

    The key lock is immediately enabled; you can recognize this on the Home window by the following features:

    ■ The [User] tile is grayed out.
    ■ The [User] tile displays the *KEY LOCK* designation in place of the previous profile name.
    ■ Locked functions (e.g. T_set or menu points) are grayed out.
    You can call up menus but you cannot change any values or operating statuses.
    ■ If the key lock also includes locking the function for switching between operating modes (Standby / Operation), the [Stop] or [Play] button indicate a lock symbol.

5. If you wish to enable this function again, push this slide switch to the [Off] position. If this is not possible, only the Administrator is able to terminate the key lock function.

    The key lock function is deactivated; you can recognize this on the Home window by the following features:

    ■ The [User] tile is displayed normally.
    ■ The [User] tile displays the *DEFAULT USER* profile names.

6. Log in with your user profile and operate the constant temperature equipment as usual.

7 Operation

7.1 Selecting operating modes

The constant temperature equipment has two operating modes:

- *Operation* : The constant temperature equipment's components are used as intended.
- *Standby* : All functions of the constant temperature equipment are deactivated.
  This operating mode is suitable for adjusting multiple settings, for example.

> ℹ️ *A program that has been started is paused in Standby mode. If the program is to continue later, it must be continued manually after switching to Operation mode.*

Switching operating modes

1. Open the Home window.

2. To interrupt the current mode, tap the [Stop] button in the bottom right for 1 second.

   ▶ The constant temperature equipment is now in *Standby* mode. The [Stop] button has been replaced by the [Play] button.

3. To restart operation, tap the [Play] button in the bottom right for 1 second.

   ▶ The constant temperature equipment starts to operate again. You can now see the [Stop] button in the bottom right.

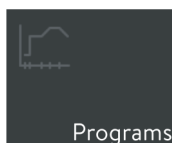## 7.2 Programmer

7.2.1 Basic information

Fig. 21: Programs tile

The programmer allows you to save a temperature-time program. A program consists of several temperature-time segments. A segment contains specifications relating to program replays, temperature, duration, pump level, control variable and behavior of the switching outputs. Ramps, temperature jumps and temperature maintenance phases are possible.

You can start a program manually (↳ Chapter 7.2.2 "Using programs" on page 32), or you can configure a timer and select the required program ↳ Chapter 7.5.1 "Timer" on page 36. In total, you can save up to 100 temperature-time programs. Each program can consist of up to 250 freely programmable segments.
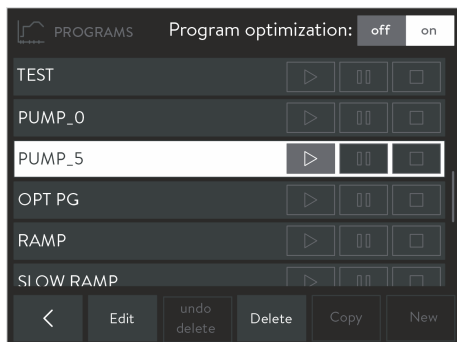
Fig. 22: List of programs in the programmer

1. Open the Home window.

2. Touch the [Programs] tile.

    ▶ The list of available programs appears.

3. Use the buttons under the list of programs to operate this:

    ■ [Edit]: edit program or view without change.
    ■ [Delete]: remove program from list.
    ■ [Undo delete]: reverse last delete operation.
    ■ [Copy]: copy the selected program to the next line.
    ■ [New]: create a new program without segments at the end of the list.

> The [Copy] and [New] buttons are only available if the list has less than 100 entries.

Types of segment

Using the graphical display in the temperature profile, the following types of segment can generally be distinguished:

■ **Ramp**; described by the following values:
   ● Time limit for the duration from the beginning to the end of the segment.
   ● Target temperature which should be achieved at the end of the segment.
■ **Jump** (temperature jump); corresponds to a ramp without a time limit. With the time limit value = 0, the constant temperature equipment tries to reach the target temperature as quickly as is technically possible.
■ **Maintain** (temperature maintaining phase); corresponds to a ramp without a temperature change. The value of the previous segment is entered as the target temperature. Thus, the constant temperature equipment keeps this temperature constant over the entire segment duration (time limit).
■ **Pump level 0** ; can be inserted anywhere in a program to terminate it prematurely. When the program starts, a message is displayed informing you of the existence of the *Pump level 0* segment. When this segment is reached, the constant temperature equipment switches to *Standby* mode.

Creating a program

In the *Edit program* menu, you can edit the settings of the selected program and create the segments for the required program sequence:

1. First carry out the following settings:

    Name - Enter a name with which the program will be displayed in the program list and other menus.

    Cycles - Specify how often the program should be run in succession by entering a number.

Fig. 23: Editing a program

2. Tap the *Seg.* column on the program segment that you wish to edit:

   Start seg. - Carry out the settings for the first segment in the program.

   1 – n seg. - Carry out the setting for the other program segments line by line (n = up to 249 segments).

> ℹ The **Start segment** is always at the start of a program. The temperature defined in it is approached as quickly as possible at the start of the program; a time limit is not possible. Only when this start temperature is achieved does the program flow continue with segment 1. This is also the case for each further cycle of the program.
>
> Without the *Start* segment, segment 1 would lead to different results depending on the bath temperature. On constant temperature equipment without a cooling function, you must set a start temperature which is above the bath temperature expected at the start of the program.

3. Edit the selected segment by tapping and changing the values of the current line, one after the other. The column names indicate what these values mean:

   Seg. - Consecutive segment number; the first segment always has the designation *Start*.

   Tend°C - Target temperature [°C] which should be achieved at the end of the segment.

   Time h:m - Time limit (hours: minutes) to achieve the target temperature.

   ΔT°C - Tolerance [°C]; defines how close the temperature must be to the target temperature before the next segment starts.

   Please note that a tolerance that is set too close can impair the temperature control.

   With the value *0.00* you can deactivate the tolerance check and the segment ends after the time limit has expired.

   Pump - Pump level used when processing the segment.

   Control - Control variable (*internal* / *external*) for the control within the segment sequence.

   Out 1/2/3 - For constant temperature equipment with a contact module (accessory), this is where you can define the status of (up to three) switching contacts in the segment sequence:

   Off: Switching contact is open.

   On: Switching contact is closed.

   ----: Switching contact retains the state of the previous segment.

4. Use the buttons at the bottom to change the number of segments or to display the temperature curve programmed so far:

[Delete]   - Removes the currently selected segment (segment number with a light background) from the program sequence.

[Undo delete] - Reverses the last delete operation.

[Copy]   - Inserts a copy of the currently selected segment into the next line.

[Graph]   - Displays the temperature-time diagram of the program sequence created so far (all segments).

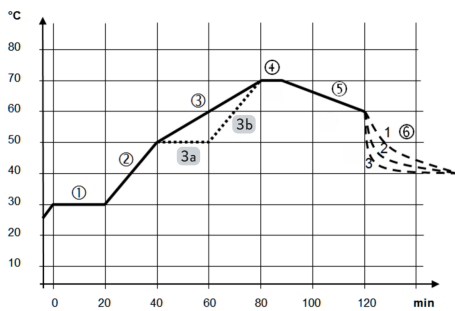### Example of a program with changes

Fig. 24: Example of a program with temperature profiles

This aim of this example is to show you how it is possible to influence the temperature profile of a program by changing individual segment settings. The graphic opposite shows the original profile with a solid line, and the edited profile with a dotted line. The cooling duration (*segment 6*) varies depending on the type of device, application and other factors; it is shown by dashed lines.

The original profile (solid line) roughly shows three sequence phases; the values defined for them can be seen in the table below:

- *Segment 1*: The start temperature 30 °C is maintained for 20 min.
- *Segment 2 – 4*: The temperature is increased in 2 phases to 70 °C within an hour, and then maintained for 10 min.
- *Segment 5 – 6*: The temperature is increased to 60 °C within half an hour and should then reduce to, and be maintained at, 40 °C without a time limit, i.e. as quickly as possible.

Table 1: Example of a program with segments

Seg.	Seg. type	Tend°C	Time h:m	ΔT°C	Pump	Control	Out1	Out2	Out3
Start	*Start*	30.00	- - - -	- - - - -	1	internal	- - - - -	- - - - -	- - - - -
1	*Maintain*	30.00	0:20	- - - - -	1	internal	- - - - -	- - - - -	- - - - -
2	*Ramp*	50.00	0:20	- - - - -	6	internal	- - - - -	- - - - -	- - - - -
3	*Ramp*	70.00	0:40	- - - - -	6	internal	- - - - -	- - - - -	- - - - -
4	*Maintain*	70.00	0:10	- - - - -	1	internal	- - - - -	- - - - -	- - - - -
5	*Ramp*	60.00	0:30	- - - - -	4	internal	- - - - -	- - - - -	- - - - -
6	*Jump*	40.00	0:00	- - - - -	4	internal	- - - - -	- - - - -	- - - - -

The edited profile (dotted line) is essentially achieved by splitting up the previous *segments 3*:

- *3a* (seg. 3 new): A maintain phase is added in front of *segment 3* which maintains the temperature of 50 °C reached with the first ramp for 20 min. The segment numbers of the following segments increase by one counter.
- *3b* (seg. 4 new): The time limit for the previous *segment 3* has been halved, the increase of the second ramp now corresponds to that of the first ramp. In this way, the total duration of the program sequence remains unchanged.

Example of a program with tolerance

Specifying a tolerance ensures strict compliance with the retention time at a specific temperature, for example. The effect of specified tolerances is shown here for the edited profile of the previous example of a program. To this end, the following additional tolerances were entered for the start of the temperature maintenance phases:

Seg. 1　　　　- Tolerance = 0.1 °C

Seg. 3 new (3a)　- Tolerance = 0.1 °C
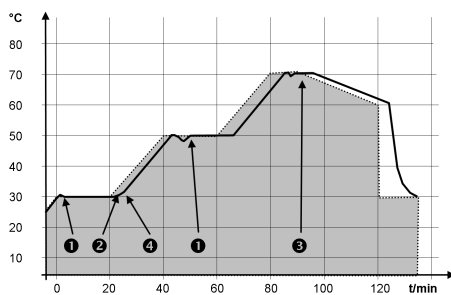
Seg. 5 new (4)　- Tolerance = 0.8 °C

In the graph opposite, the programmer's target setting is shown as a gray area, the curve shows the delay caused by the tolerances. Note the following information about the marked points:

- *(1):* Each temperature change indicates a transient response when the target temperature is reached. Its duration depends on the steepness of the previous ramp resulting from the ratio between the duration of the segment and the difference in temperature.
- *(2):* A specified tolerance is only achieved when the target temperature remains within the tolerance range. This causes the next segment to have a delayed start.
- *(3):* A generous tolerance range has been set here with 0.8 °C. Despite a steep ramp, this causes manageable delays. The time limit of 10 minutes can also be maintained with transient processes.
- *(4):* For this ramp, a narrow tolerance range was selected with 0.1 °C. Severe delays can be the result, in the worst case, the next program sequence is prevented. This is especially true in conjunction with external control and for steep ramps that are close to the maximum possible heating rates or cooling rates of the constant temperature equipment.

Fig. 25: Example of a program with a temperature profile for a specified tolerance

> ⓘ *If possible, only program tolerances for flat (slow) ramps or with an appropriate tolerance range.*

Program optimization

The purpose of program optimization is to improve a program's control action and minimize overshooting. Programs that contain other segment types in addition to ramps usually achieve a significantly better match between the actual temperature curve and the target temperature curve when program optimization is activated.

There can only be increased undershooting at the ramp ends if the control parameters are very unfavorable. In this case, you should deactivate program optimization.
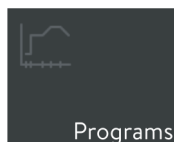
7.2.2 Using programs
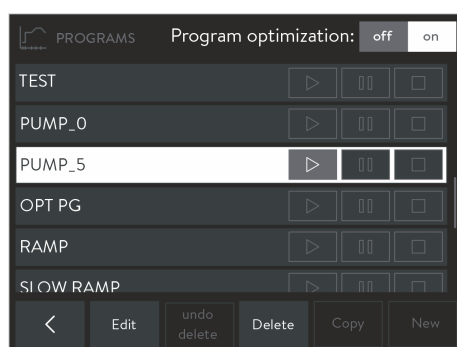
Running programs

Fig. 26: Programs tile
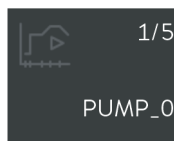
1. Open the Home window.
2. Touch the [Programs] tile.
   ▶ The list of available programs appears.

Fig. 27: List of programs in the programmer

3. Push the list of programs until you can see the program you require.
4. Use one of the following buttons to run the associated program:
   - ▷ : Start/continue a program.
   - ‖ : Pause program.
   - ☐ : End program.

> ⓘ When switching the constant temperature equipment to Standby mode, a running program is automatically paused.

Program status

Fig. 28: Currently active program

The [Program] tile on the Home window always shows the currently active program and its status. You can see the following information:

- Tile symbol which shows the current program status with one of the following symbols:
  - ▷: Program running.
  - ‖: Program paused.
- Number of segments currently being processed.
- Total number of segments.
- Name of the program.

7.3 Control parameters

To operate your constant temperature equipment, a few control parameters are factory-set. These control parameters were determined with the heat transfer liquid, water, for the internal control and external control, and optimized for each type of device.

It may be necessary to change the preset control parameters in the following cases:

- The characteristics of your application require a different configuration, for example, for the external temperature control of very small or very large masses.
- The properties of your heat transfer liquid must be taken into account, for example, heat capacity and viscosity can influence the control action.

> *Only modify the control parameters if you have adequate knowledge of control system engineering.*
>
> *Observe the corresponding instructions in your constant temperature equipment's operating manual.*

7.3.1 Self adaptation

The self-adaptation function can be used to automatically find the best control parameters for the internal bath application or external application. Note the following instructions:

- Self-adaptation can only be performed on constant temperature equipment with active cooling.
- The self-adaptation function performs a test run of the constant temperature equipment to determine the parameters. The constant temperature equipment and, if applicable, the external application must be ready for operation.
- The self-adaptation test is performed with the preset pump level. The best results can be expected at the highest pump levels.
- The adaptation cycle must be performed on a passive system. In other words, changes cannot be made to the system and exothermic or endothermic reactions must not occur during the test run.

The adaptation cycle takes between 30 minutes and a maximum of 3 hours, depending on the application. During the run, the bath temperature deviates by a maximum of ±15 Kelvin from the defined set point. At the end of the adaptation cycle, the calculated control parameters are adopted automatically and can be saved.

Opening the Self-adaptation menu

1. Open the Home window.

2. Touch the *Settings* → *Control* → *Self-adaptation controller* tile.

   ▶ A submenu opens.

3. Use the following buttons to set and perform self-adaptation:

   ◼ *Status* ; perform self-adaptation:
      ● [Start]; starts the adaptation cycle.
      ● [Stop]; interrupts a currently active self-adaptation.
   ◼ *Set point* ; specify the T_{set} temperature set point.
      Make sure you take the maximum temperature fluctuations of ±15 Kelvin into consideration and set the [Tih] and [Til] accordingly.
   ◼ *Determination* ; determine the extent of the self-adaptation.
      ● *Internal* : The adaptation cycle only determines the internal control parameters.
      ● *Internal + External* : The adaptation cycle determines the internal and external control parameters.
   ◼ *Control parameter* ; display control parameter (or result of the self-adaptation), rename or save the parameter set.

7.3.2 Managing parameter sets

You can save the currently valid control parameters as a parameter set or replace them by loading an existing parameter set.

> ℹ *You can export parameter sets to a USB storage medium via the USB interface of the operating unit, ⤶ Chapter 7.7 "Exporting / importing data" on page 39. The export data can be added to your data backup or imported to your constant temperature equipment with similar equipment.*

Saving a parameter set

1. Open the Home window.

2. Tap the *Settings* → *Control* → *Control parameter* tile.

   ▶ A list of the currently valid control parameters is displayed.

3. Tap [Save as...] to save the displayed control parameters as a parameter set.

   ▶ An input window with an alphanumerical keyboard is displayed.

4. Enter a name for the parameter set. You can choose any name and it can contain up to 16 characters.

> ℹ *If this name is already assigned, the existing parameter set under this name will be overwritten when you save it.*

5. Press [OK] to confirm your entry.

   ▶ The new parameter set is saved in the list of available parameter sets.

Displaying and loading parameter sets

1. In the *Control parameter* menu, tap the [Parameter sets] button.

   ▶ A list of available parameter sets is displayed.

2. Tap the required parameter set.

   ▶ The selected parameter set is displayed with a light background.

3. Tap one of the following buttons to use the selected parameter set:

   ■ [Display]: Displays the control parameters saved in the parameter set. You can read the data but you cannot modify it.
   ■ [Load]: Loads and activates the parameter set. The previously valid control parameters are overwritten.
   ■ [Delete]: Removes the parameter set when you confirm this with the [OK] button.

7.4 Ramp function

The ramp function allows you to conveniently enter temperature changes that occur over any period of time. The function is particularly useful for recording extremely small temperature changes (for example, 0.1 °C/day).

Example:

If the current bath or outflow temperature (for example, 142.4 °C) should decrease by 80 °C within 5 days, a temperature change of 80 °C must be entered. A time of 5 days must also be entered.

> ⓘ *The ramp function remains active until it is stopped manually or the temperature limit values T_{ih} or T_{il} are reached.*

1. Open the Home window.

2. Touch the [Ramp] tile.

   ▶ The Ramp function submenu appears.

3. Touch the [Temperature increase] button.

   ▶ Enter the temperature change in the input window (not the end temperature!). You can also enter negative temperature changes.

4. Press the [OK] button to return to the previous screen with the new setting configured.

5. Move the slide switch on the [Time unit] button to the required time unit.

   ss   - Seconds

   mm - Minutes

   hh   - Hours

   dd   - Days

6. Touch the [Duration of temperature increase] button.

   ▶ The Input window opens.

7. Enter the numerical value in the input window (unit not available!).

8. Press the [OK] button to return to the previous screen with the new setting configured.

9. The purpose of the [Status] button is to activate /deactivate the ramp function.

■ Slide switch set to [Off]: The ramp function is not active.
■ Slide switch set to [On]: The ramp function is started immediately.
When the ramp function is executed, *Active* appears on the [Ramp] tile.

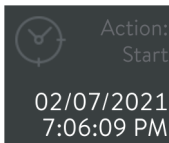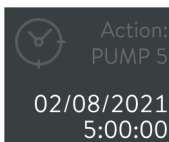## 7.5 Timer and countdown

7.5.1 Timer

⚠	**CAUTION!** **Automatic device start with the timer**
	Scalding, cold burns, injury
	● Before using the timer, ensure that all preparatory measures for intended use have been implemented!

Fig. 29: Timer with start action

The constant temperature equipment can be set to carry out one of the following actions at any predefined time via the timer:

■ Activate the constant temperature equipment's operating mode (*Standby* / *Operation*)
■ Start one of the programs saved in the programmer.

The [Timer] tile shows the name of the action and the programmed times. The names of actions have the following meaning:

Fig. 30: Timer with program action

Action	Description
- - - - -	This display indicates a weekly schedule for which no action to be performed has been defined.
Start	When the set time period expires, the timer switches the constant temperature equipment's operating mode from *Standby* to *Operation*.
Standby	When the set time period expires, the timer switches the constant temperature equipment's operating mode from *Operation* to *Standby*.
< Program >	When the set time period expires, the timer starts the program for which the name is indicated on the tile.

You can program the following time periods for the timer:

■ **Weekly schedule 1 and 2**: The action is started at a specific time in the weekly rhythm (from Monday to Sunday).
■ **Time absolute 1 and 2**: The action is started at the given time (date, time).
■ **Time relative 1 and 2**: The action is started after the given time expires.

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7.5.2 Countdown

Several countdowns can be entered and started independently of one another. Unlike the timer function, the countdown cannot trigger an action. Instead, you can use the countdown as a reminder if, for example, you only wish to maintain the temperature of a sample for a certain duration. This reminder will be indicated acoustically and visually.

Configuring countdowns

1. Open the Home window.
2. Touch the [Countdown] tile.
   ▶ The consecutively numbered list of countdowns, the associated control buttons and the [Config.] button are displayed.
3. Tap the [Config.] button.
4. Select how many countdowns you wish to use.
5. Touch the [<] button.
   ▶ A window containing the name "Countdown" and the previously selected number appears.
6. In the [Duration] field, enter a time period for the countdowns and confirm the entry with [OK].
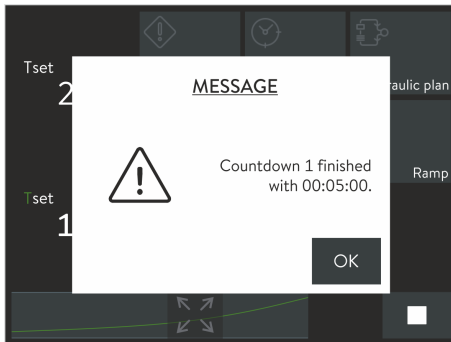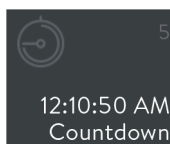
Operating countdowns

1. Open the Home window.
2. Touch the [Countdown] tile.
   ▶ The consecutively numbered list of countdowns and the associated control buttons are displayed.
3. Use one of the following buttons to operate the associated countdown:
   ■ [▷]: Start/continue the countdown.
   ■ [❙❙]: Pause the countdown.
   ■ [□]: End the countdown.

   After the start, a message window shows the remaining duration. You have the following options:
   ■ Leave the message window in the foreground until the end of the countdown is indicated.
   ■ Confirm the message window with the [OK] button to switch to any menu. When the countdown has expired, a new message will be displayed.

Fig. 31: Countdown finished

4.
   ⓘ *In the Home window, the* [Countdown] *tile shows the number and remaining duration of the next countdown due.*

   You can pause or interrupt the countdown if necessary. Switch to the *Countdown* menu again and use the [❙❙] or [□] button.

Fig. 32: Tile during active countdown

5. When the countdown has expired, a message will be displayed. Confirm this with the [OK] button to close the message window.

7.6   Calibrating the temperature probe

> ℹ️ *Only carry out the steps described here using a reference thermom-eter that has been calibrated for the required degree of accuracy. Otherwise you will not achieve a sufficiently accurate measurement result and you should not change the factory calibration of the constant temperature equipment.*

If, when checking the temperature in a steady state, you discover a constant temperature deviation of T_{int} or T_{ext} from the reference thermometer, you can equal this out using the *Calibration* menu point.

With the menu point *Offset* (1-point comparison), the characteristic of the temperature switch is adjusted in parallel by the input value. With the menu point *2-point calibration* (2-point comparison), the characteristic of the temperature switch is adjusted and the slope of the characteristic is changed.

> ℹ️ *It is possible to change the T_{int} and T_{ext} temperature values within a range of ±3 K respectively.*

Offset

- For internal bath applications, hang the reference thermometer in the bath. Observe the corresponding information on the calibration certifi-cate.
- For external applications, install the reference thermometer in the inlet of the constant temperature equipment. Observe the corresponding information on the calibration certificate.
- Wait until the system is in a steady state before measuring the tem-perature.

1.   Open the Home window.

2.   Tap the *Settings* ➙ *Calibration* ➙ *Internal Pt1000 / External Pt100* ➙ *Offset* tile.

   ▶   The Input window opens.

3.   Enter the value of the temperature read from the reference ther-mometer.

4.   Press [OK] to confirm the new offset value.

   ▶   The new value has been accepted.

| 2-point calibration | ■ For internal bath applications, hang the reference thermometer in the bath. Observe the corresponding information on the calibration certificate. |

2-point calibration

■ For internal bath applications, hang the reference thermometer in the bath. Observe the corresponding information on the calibration certificate.

■ For external applications, install the reference thermometer in the inlet of the constant temperature equipment. Observe the corresponding information on the calibration certificate.

■ Wait until the system is in a steady state before measuring the temperature.

■ The difference between the lower and upper temperature value must be at least 40 K.

1. Set a lower T_{set} set point on the constant temperature equipment and wait until the heat transfer liquid has approached this temperature.

2. Open the Home window.

3. Tap the *Settings* ➝ *Calibration* ➝ *Internal Pt1000 / External Pt100* ➝ *2-point lower* tile.

   ▶ The Input window opens.

4. Enter the value of the temperature read from the reference thermometer and confirm the entry with [OK].

   ▶ The lower value has been accepted.

5. On the constant temperature equipment, increase the T_{set} set point by at least 40 K. Wait until the heat transfer liquid has approached the new temperature.

6. Touch the [2-point upper] button in the *Calibration* menu.

7. Enter the value of the temperature read from the reference thermometer and confirm the entry with [OK].

   ▶ The upper value has been accepted. 2-point calibration has been completed.

Restore factory calibration

Use this menu item to restore the calibration configured in the factory.

1. Touch the tile *Settings* ➝ *Calibration* ➝ *Internal Pt1000* or ➝ *External Pt100* ➝ *Factory Calibration*.

   ▶ This deletes the customer's calibration and restores the calibration as it was configured in the factory.

7.7 Exporting / importing data

You can export or import data sets and programs via the USB interface of the Command Touch operating unit. For example, you can distribute a tried and tested configuration to other devices via a USB storage medium, or secure your data on an external system.

Opening the export menu

1. Open the Home window.

2. Select the *Settings* ➝ *Data export* tiles.

   ▶ The *Export data* menu appears.

The export function creates the *CommandFiles* root directory on the USB storage medium and saves all export data to it. Any data sets with the same name that already exist in this directory will be overwritten during the export.

> *Therefore, for safety reasons you should save a backup copy of the previous directory before starting a new export.*
>
> *In lists, select several or individual data records as required. A check mark highlights all entries to be exported.*

You can display the exportable data using the following buttons:

- ■ [Program]: Displays all saved temperature-time programs.
- ■ [User database]: Displays all saved system and user profiles. The export is carried out with the saved permissions.
- ■ [Control parameters]: Displays the currently valid control parameters. Exactly this parameter set is exported.
- ■ [Parameter sets]: Displays all saved parameter sets.
- ■ [Log file]: Displays the content of the log file which logs the values of the T_{set}, T_{int} and T_{ext} temperatures, including the associated time stamp for each operation. The data period of the recording is limited to less than 24 hours.

  The following platform-independent file formats are available for exporting the log file:
  - ● *PDF (Portable Document Format)* : Printable file in A4 format.
  - ● *Text file* : A file that can be further processed and is suitable, for example, for transferring data to a spreadsheet or other evaluation program.

Export data

You need a USB storage medium with a type A USB socket or corresponding adapter.

The export function is shown here using a log file by way of example. Other data sets can be exported in a similar way.

1. Open the Home window.

2. Select the *Settings* → *Data export* tiles.

   ▶ The *Export data* menu is displayed.

3. Make the USB connection:

   - ■ Remove the cover from the USB interface on the lower edge of the operating unit.
   - ■ Connect the USB storage medium.

4. Tap the [Log file] button.

   ▶ The [Create log file] menu opens.

Fig. 33: Log files on USB stick

5. Define the scope of the log file and the file format:

   - ■ Limit the recording period (maximum 24 hours) by entering the following dates: [Start date], [End date], [Start time] and [End time].
   - ■ Select the required file format ([PDF] / [text file]).

   ▶ Two consecutive messages are displayed, informing you of the file creation and the successful export.

6. Carry out further exports/imports if necessary.

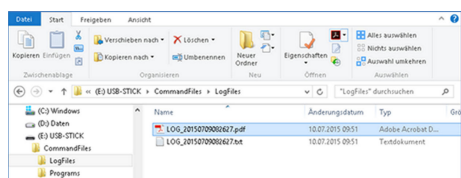   Finally, remove the USB storage medium and replace the cover to protect the USB interface.

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Importing data

Apart from the log file, you can import all exported data sets to any Command Touch-type operating unit. The import process is similar to the export process:

Connect the USB storage medium with the export data to the USB interface.

1. Open the Home window.

2. Select the *Settings* ➝ *Data import* tiles.

   ▶ The *Import data* menu is displayed.

      The [Program], [User database], [Control parameters]and [Parameter sets] buttons can be selected.

Fig. 34: Program files on USB stick

3. Tap the button for which you would like to import a data set.

   ▶ The existing data sets can be seen on the USB storage medium.

4. Choose the data set you require and confirm your selection with the [OK] button.

   ▶ The data set is loaded.

      If the import fails, you will receive a corresponding message.

5. Carry out further exports/imports if necessary.

   Finally, remove the USB storage medium and replace the cover to protect the USB interface.

Log file

Fig. 35: Log file in PDF format

The file name of the log file is created from the abbreviation "LOG_" plus a time stamp. The time stamp corresponds to the date of the first log entry. Depending on the file format, the file names have the following format:

- *LOG_YYYYMMDDhhmmss.txt* (text file)
- *LOG_YYYYMMDDhhmmss.pdf* (PDF)

The time stamp itself is made up of the following date information:

YYYY - Date: Year, 4-digit

MM   - Date: Month, 2-digit

DD   - Date: Day, 2-digit

hh   - Time: Hour, 2-digit

mm   - Time: Minute, 2-digit

ss   - Time: Second, 2-digit

> *Regardless of the current settings, all data is saved with European date spelling, in the 24-hour format.*
>
> *In the Graph settings menu, you can modify the time interval between individual protocol inputs as required. With the [Recording period] option, you can also set one of the pre-defined time intervals.*

7.8   Viewing the device status

1.   Open the home window.

2.   Select the *Settings* ➜ *Device status* tiles.

▶ The *Device status* menu shows product line and device type of the constant temperature equipment. You can also call up the following data:

Read the error memory

For the error analysis, the constant temperature equipment stores the last warning, error and any alarm messages that occurred. The content of this error memory is displayed as a list of messages. The number of messages that can be stored depends on the device.

1.   Tap the *Error memory* tile.

▶ You will see the list of messages; the most recent message is at the top.

2.

Push the scrollbar button to scroll down the list to the required input. You will see the following information for each message:

■ *No.* : Shows a consecutive message number which is given to each message chronologically.

■ *Source* : Shows the name of the module that triggered the message.

■ *Code* : Displays the encoded description of the alarm, warning or error.

■ *Date / time* : Shows the exact time of the message.

■ *Subcode* : Shows additional information about the message.

Display device data

Device data cannot be modified and is only used to support the LAUDA service when carrying out a diagnosis.

1.   Tap the *Device data* tile.

▶ Among other things, temperature values of the constant temperature equipment and the application are displayed, as well as, where applicable, characteristic values and actuating variables of the pump, heating and cooling functions.

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View software versions

For service purposes, you may need the version number of an installed software component.

1. Tap the *Software version* tile.

   ▶ You will see the version numbers of the software components installed on the constant temperature equipment and the connected accessories. This includes, for example, the control system, the protection system, the cooling system and also the software installed on the operating unit.

Displaying serial numbers

For service purposes, you may require the serial numbers of the installations installed on the constant temperature equipment.

1. Select the [Serial no.] entry in the *Device status* menu.

   ▶ You will see, for example, the serial numbers of the control system, cooling system, operating unit and other systems, if applicable.

8 Maintenance

The operating unit is maintenance free.

Dust and dirt deposits should be regularly removed from the display:

> **! NOTICE!**
> **Do not clean the operating unit with unauthorized cleaning agents**
>
> This could cause damage to the operating unit's plastic surface
>
> - Use a cloth to clean the device.
> - As a cleaning agent, use water with a few drops of commercially available washing-up liquid.

> **! NOTICE!**
> **Do not allow live parts to be contacted by the cleaning agent!**
>
> This could cause damage to property!
>
> - Disconnect the device before cleaning it.
> - Water and other liquids must not be allowed to penetrate.

> **! NOTICE!**
> **Repairs performed by unauthorized persons**
>
> Material damage
>
> - Only specialized personnel are permitted to carry out repairs.

1. Use a damp cloth or brush to remove dust and dirt deposits.
2. When using compressed air, always set a low working pressure to prevent mechanical damage.

9   Faults

In the event of a fault, the operating unit indicates all alarms, faults and warnings that occur on the constant temperature equipment. The procedure for rectifying a fault depends on the unit. Observe the corresponding instructions in the constant temperature equipment's operating manual.

The following faults can occur on the operating unit itself:

Fault	Possible cause	Corrective action
The display is not showing anything.	The constant temperature equipment is switched off.	Switch the constant temperature equipment on.
	No LiBus connection.	Check the LiBus connection on the constant temperature equipment and connector.
	The operating unit or LiBus connecting cable is defective.	Contact the LAUDA service.
The display lights up but does not react when entering information.	When touched, the display reacts too hesitantly or too quickly.	Press harder when tapping the display or enter the information more slowly.
	The display does not react at all when touched.	If possible, tap the display with your fingers, remove your gloves if necessary.
	The display is defective.	Contact the LAUDA service.

> ℹ️ *If you are unable to correct a fault, contact the LAUDA service, see* ⮑ *Chapter 1.6 "Contact LAUDA" on page 7.*

10 Decommissioning

⚠	**WARNING!** **Touching live parts**
	Electric shock
	● Disconnect the device from the power supply before starting any installation work. ● Always observe safety measures against electrostatic discharge.

Take the operating unit out of operation by disconnecting it from the constant temperature equipment:

1. Disconnect the LiBus connecting cable from the constant temperature equipment and wind it up properly.

2. Remove the operating unit from the place of use.

3. Protect the operating unit from impacts and humidity if you wish to store it. The storage location must meet the ambient conditions specified in the technical data.

4. In the event of disposal, follow the instructions in ⮠ "Old device" on page 47.

11   Disposal

Packaging

The packaging normally consists of environmentally friendly materials that can be easily recycled when properly disposed of.

1.   Dispose of packaging materials in accordance with the applicable disposal guidelines in your region.

2.   Comply with the requirements of Directive 94/62/EC (packaging and packaging waste) if disposing of the product in a member state of the EU.

Old device

The device must be properly decommissioned and disposed of at the end of its life cycle.

1.   Dispose of the device in accordance with the applicable disposal guidelines in your region.

2.   Comply with Directive 2012/19/EU (WEEE Waste of Electrical and Electronic Equipment) if disposing of the product takes place in a member state of the EU.

12   Accessories

The following LAUDA connecting elements are available for connecting the LiBus accessory:

Item	Catalog number
LiBus T-extender with 2 LiBus sockets	EKS 073
LiBus extension cord, 5 m	EKS 068
LiBus extension cord, 25 m	EKS 069

13 Technical data

Characteristic	Unit	Value/version
Operating unit		
Catalog number	[–]	LRT 923
External dimensions (without cable), W x H x D	[mm]	165 x 118 x 39
Weight	[kg]	0.75
Casing protection class	[–]	IP54
Connection type	[–]	4-wire cable with LiBus socket, cable length approx. 1.5 m
Ambient conditions		
Air humidity	[%]	Maximum relative air humidity 80% at 31 °C and up to 40 °C, 50% with linear decrease.
Ambient temperature range	[°C]	5 – 40
Storage temperature range	[°C]	5 – 50

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