Systec
the autoclave company

Systec VX-40 to VX-150

Translation of the original operating instructions

Systec VX-40

Systec VX-65

Systec VX-75

Systec VX-95

Systec VX-100

Systec VX-120

Systec VX-150

Starting with design version 2.0

Revision 2.1

Revision history

Version	Date	Modification
Revision 1	08/2023	Initial creation
Revision 2	06/2024	Supplemented and revised edition
Revision 2.1	10/2024	Supplemented and revised edition

Copyright declaration

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Contents

1 General

This operating manual describes how to safely work with and properly operate the device. It also contains the basic safety instructions and safety regulations.

It describes all activities required for working with the device. It is used to inform the target groups for this device.

It should be passed on together with the device.

1.1 Associated documents

Additional documents are applicable in conjunction with this operating manual (refer to the appendix).

1.2 Target group, qualifications and duties

1.2.1 Operator

An operator (such as a university, research lab or company) is any natural or legal person who owns this device. In compliance with the applicable national regulations, the operator is responsible for the safe operations and regular inspections of the device.

1.2.2 Obligations of the operator

The operator has the following obligations:

- The operator must ensure that only qualified users may work on or with the device: this means personnel trained by Systec or by an authorized Systec representative who are familiar with the fundamental regulations on work safety and accident prevention, who have been instructed on handling the device and who have read the operating manual carefully, understood it and confirmed this with their signature.
- The operator must train users about operations and safety regulations and, if necessary, carry out further training at regular intervals.
- The operator must regularly check that all work is carried out in a safety-conscious manner.
- This device is a printing facility that must be inspected. Where required, it must be registered with the relevant authorities in accordance with applicable national regulations and serviced.
- The operator must ensure the functional safety of the device in accordance with the applicable national regulations.
- The operator must ensure that the sterilized product is suitable for treatment in the device using the installed options. This applies in particular to devices without a vacuum unit, for example, when sterilizing hollow objects and porous materials.
- The operator must operate the device with the required technical safety measures.
- The operator must maintain the device in a safe and proper condition.
- The operator must shut down the device immediately whenever defects affecting safety are discovered.
- The operator must follow all current safety regulations and guidelines which apply to this device and its operating surroundings.
- The operator must follow the recommended inspection and maintenance procedures. These must be carried out by a service technician authorized by Systec.
- A pipe separator must be installed according to the safety regulations of the laboratory.

⚠ CAUTION

Danger: Undetected leaks lead to a risk of injury and damage to property!

Improper device loading, closing or lack of device maintenance can lead to leaks and to the discharge of water, steam and sterilization material.

When sterilizing hazardous materials, we recommend that you not operate the machine unattended.

- As an operator, in such a case you should take appropriate safety measures for testing and operational monitoring so that you can react quickly in case of leakage.
- This should also be noted in your internal operating regulations.

NOTICE

Observe the legal requirements concerning the initial commissioning.

The relevant national legislation must be followed before the device is put into operations.

1.2.3 User

Qualified personnel, e.g. technical assistants or persons who are able to operate the device according to their intended purpose because of their training, professional experience and the instruction by the operator, as well as a briefing by Systec or a person authorized by Systec.

1.2.4 Obligations of the user

All persons who work with the device have the following obligations:

- To follow the fundamental regulations regarding work safety and accident prevention.
- To use the prescribed personal protective equipment.
- To perform only the assigned tasks.
- To follow all notes from the operating manual.
- To read this operating manual carefully and confirm with their signature that they have understood it.

1.3 Information on the operating manual

1.3.1 Symbols and abbreviations in this operating manual

Various information and safety symbols are used to highlight relevant information throughout this operating manual.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, *will* result in death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, *could* result in death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices which are not related to personal injury but may result in damage to the device or surroundings.

Notes and information

Cross-reference

1.3.2 Illustrations

All of the illustrations in this operating manual are only examples. Deviations from the illustrations are possible, depending on your particular model and size.

1.3.3 List of abbreviations

Abbreviation	Description
ET	External Thread
BSL	Bio-Safety Level
$CaCO_3$	Calcium carbonate, lime
DHCP	Dynamic Host Configuration Protocol
DIN	German industry standard
DN	Nominal Diameter
I/O	Input/Output
EC	European Community
EU	European Union
F_0	Lethality product, lethality value
FDA 21 CFR Part 11	Food and Drug Administration Title 21, Code of Federal Regulations Part 11
FTP	File Transfer Protocol
GMP	Good Manufacturing Practice
HEPA filter	High Efficiency Particulate Air filter
IO	Input/Output
IP	Ingress protection (protection degree)
ISO	International Organization for Standardization
UEFF	Upper Edge of Finished Floor
PH2	Phillips 2 (screw head size)
RJ45	Registered Jack 45 (network connector)
SD card	Secure Digital memory card
PLC	Programmable logic controller
USB	Universal Serial Bus
Demineralized water	Completely demineralized water

2 Safety instructions

2.1 Conformity notices

Autoclaves of the types

- Systec VX-40
- Systec VX-65
- Systec VX-75
- Systec VX-95
- Systec VX-100
- Systec VX-120
- Systec VX-150

have been declared by Systec GmbH & Co. KG compliant in line with the EU Directive 2006/42/EC, Appendix II, No. 1A.

The following harmonized standards (or sections of these standards) have been applied:

- 2014/68/EU (Pressure Equipment Directive)
- 2014/35/EU (Low Voltage Directive)
- 2014/30/EU (Directive on Electromagnetic Compatibility)
- 2006/42/EC (Machinery Directive)

This conformity declaration will be invalidated if any changes are made to the device which have not been approved by the manufacturer.

2.2 Unauthorized usage and misuse

Unauthorized or incorrect use of this device includes:

- The sterilization of instruments used for human medicinal purposes.
- The sterilization of substances not covered by the intended usage specification. This would include:
  - Explosive/combustible substances and explosives
  - Corrosive substances
  - Alcohol
  - Dyeing agents
  - Liquids with a boiling point lower than that of water
- Improper assembly, commissioning, operation or maintenance of the device, or disregard of the applicable national regulations.
- Operation of the device with defective safety equipment, or the use of safety and protective devices which have not been installed correctly or are not functioning correctly.
- Non-observance of the instructions in the operating manual.
- Unauthorized structural alterations to the device.
- Insufficient monitoring of components exposed to wear.
- Improper cleaning and maintenance procedures.

2.3 Permissible sterilization materials

The sterilization materials and vessels being used must be suitable for sterilization in steam and steam/air mixtures within the device using the installed options.

According to the state of the art or from the operational experience of the operator, it must be ensured that the sterilization materials used have all the biological, chemical and physical properties required for operational safety.

2.4 Residual risks when handling the device

This device has been built according to the state of the art and in accordance with all recognised safety-related rules. Nevertheless, the danger of death or injury to the user or a third party, or damage to the device or other material assets, can arise when using the device.

The device must therefore only be used for its intended purpose when in a proper, safe condition.

Faults or malfunctions that could negatively affect safety must be resolved immediately.

2.4.1 Hazardous substances

⚠ WARNING

Environmental damage caused by hazardous substances

During the processes of sterilization, filling, emptying or cleaning, there are hazardous substances which may enter the environment. In the event of an accident, the sterilizing chamber or the device itself can become contaminated with hazardous substances.

- Follow the official regulations for cleaning and disposal.
- Wear the prescribed personal protective equipment.

2.4.2 Calcification

NOTICE

The device may be damaged by incorrect water quality!

The quality of the water used has a major influence on the functionality and lifespan of the device. It also influences the reproducibility of the sterilization results.

- Adhere to the water quality thresholds as described in Connection data, Page 61.

2.4.3 Unsuitable vessels

NOTICE

The device may be damaged by improper vessels!

To avoid damage to the sterilization chamber or to the sterilization materials, make sure the vessels being used fulfil the required quality level.

- Use only vessels that can withstand the physical conditions inside the device.

2.5 Warning sticker on the device

The warning signs on the device should not be removed or covered.

Symbol/icon	Meaning
	**Danger of burns!** This symbol warns you of the risk of burning and scalding. After sterilization, the surfaces of the door and the sterilization chamber are hot. When the door is opened, hot clouds of steam and hot water can escape. The surfaces of the sterilization chamber and the sterilization material may also be very hot and can cause burns upon contact. ■ Always move the door using the recessed grip. ■ Check the temperature display before opening the door. ■ Wear the prescribed personal protective equipment.
	**Follow the operating manual!** This symbol indicates that you must read and observe all safety precautions and instructions in the operating manual before using the device.

3 System description

The Systec VX series are top-loading vertical floor-standing autoclaves for demanding laboratory applications.

These are available in 8 sizes with 40 to 150 litres of usable space and are characterised by their small footprint and large usable chamber height.

Even the basic version of device comes with a full feature set. The functionality of the device can be extended by the additional options.

3.1 Proper and intended usage

This device should only be used for sterilizing aqueous nutrient solutions, biological waste, medical residues and solids (sterilization materials) within steam or steam-air mixtures.

Other use or use beyond that described above is considered as improper use.

NOTICE

For Saudi Arabia only

These autoclaves are not intended to be used for medical applications; also the liquid cycles are not intended for the sterilization of liquids used for direct patient contact.

3.2 Design

3.2.1 Controls, sensors and ports

Due to the variable design of the device, the position of individual ports on your device may be different than the example shown in the operating manual.

Figure 1: Controls and ports (example)

A	Touch screen	F	Printer
B	Recessed grip	G	Areas for further connections or functions (optional, e.g. manometer)
C	Position of ratings plate	H	Steam extraction (optional)
D	Main switch	I	Exhaust air filter (optional)
E	Emergency stop (optional)	J	USB port

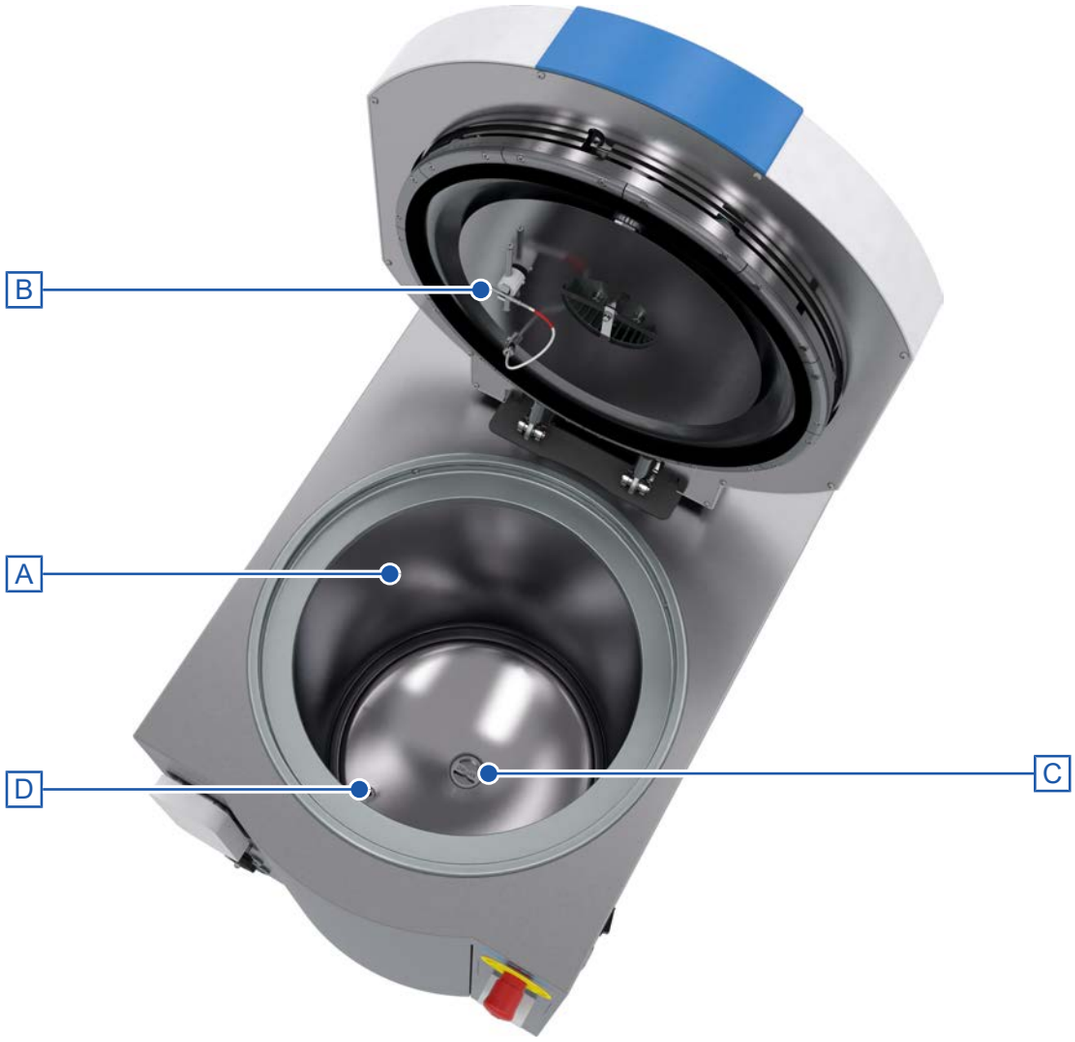


Figure 2: Sterilization chamber (door opened)

A	Sterilization chamber	C	Dirt strainer
B	Control sensor	D	Water level sensor

3.3 Features and functions (standard version)

Even the basic version of this Systec device comes with a full feature set. The functionality of the device can be extended by the additional options.

Additional options may restrict the standard functions and configurations.

The standard configuration includes:

- Waste water temperature control
- Compensatory time
- Automatic door opening after program finishes
- User account control (standard)
- Batch information
- Electronic data output
- Calculation of F0 value
- Flexible PT-100 temperature sensor
- Fractionated heating
- Housing, support frame and sterilization chamber, made of corrosion-resistant stainless steel
- Glass breakage detection
- Customized maintenance counters
- Built-in steam generator
- Condensate drain control
- Waste (bags) program
- Waste (Liquids) program
- Durham program
- Solids program
- Liquids program
- Cleaning program
- Programmable starting time
- Process log
- PT-100 temperature sensor at the condensate outlet
- Ambient air cooling
- Satur. steam monitoring
- Programmable logic controller
  - Audio output
  - Backup functions
  - Real-time clock
  - Error log
  - Internal memory
  - Configuration via USB
  - Multilingual user interface

  - Ethernet port
  - Sleep mode
  - Warning and error management
  - Maintenance and service counter
- Touch screen
- Door quick-release
- USB port

In the standard configuration, the device does not have a cooling mechanism for liquefied sterilization material. The cooling results from the heat that radiates from the sterilization chamber to the room air.

The sterilization phase is monitored in all programs using pre-configured factory-set acceptance criteria. An error is issued whenever the temperature or pressure values are not within the permissible minimum/maximum range.

The device has user-dependent access rights which are used for changing parameters or making other safety-related changes.

3.3.1 Waste water temperature control

The waste water is cooled down to ≈ 70 °C (the pre-set value). This protects the customer's drain pipe against thermal stress. This default setting can only be changed by a service technician authorized by Systec.

3.3.2 Compensatory time

With the optional program cycle phase compensation time, an adjustable time is waited between the heating and sterilization program cycle phases until the desired target temperature is reached at all control sensors.

Parameters

SettlingTime	WaitforSterTemp	SettlingTime

3.3.3 Automatic door opening after program finishes

The door is automatically unlocked after a successful program cycle and this opens a gap.

If an error occurs during operations, the door will not be automatically opened at the end of the program.

If the Audit Trail is enabled and the user must acknowledge the door open action, then this function is disabled.

Parameters

AutoOpenDoor	OpenDoor

Refer to Automatic door opening after program finishes (parameters), Page 171 for more information on the specific parameters.

3.3.4 User account control (standard)

Function-dependent permissions may be required to operate the device.

The permissions are assigned via user groups to individual users.

The user account control exists for the variants Standard and Extended (optional).

Standard user account control

The standard user account control has three pre-configured user groups, each with one available user (Administrator, Operator or Supervisor). The authorizations are pre-set. Users can set their own password. Further settings are not possible.

The factory default passwords for all user groups should be changed after the initial commissioning.

User accounts

User group	User	Password (factory setting)
Operator	Operator	Operator
Supervisor	Supervisor	Supervisor
Administrator	Administrator	Administrator

3.3.5 Batch information

Batch information can be added to the current process. This information is stored in the Process log.

3.3.6 Electronic data output

The electronic data output extends the features of Process log, Error log and Audit Trail with the possibility to export data in electronic form.

The export can take place in various formats such as PDF or CSV.

3.3.7 Calculation of F0 value

The F_0 value specifies a sterilization effect referenced at 121.11 °C. This means, for example, that an F_0 value of 15 min is equivalent to a temperature effect of 121.11 °C for 15 minutes.

Operating principle

The sterilizing effect is calculated during the entire program cycle. The z-values characteristic for different microorganisms are taken into account in the calculation.

z value

The z value indicates the influence of temperatures other than 121.11 °C on the sterilizing effect.

- z=10, T=131.11 °C
  After one minute, an F_0 value of 10 minutes is reached
- z=5, T=126.11 °C
  After one minute, an F_0 value of 10 minutes is reached

D value = decimal reduction time

The D value is not included in the F_0 value calculation. The F_0 value can be used together with the D value (D121.11) to calculate the sterilisation assurance level (SAL). This is not part of the process control.

Parameters

F0-Value	F0-z	F0-Mode	F0

Refer to F0 value calculation (parameter), Page 173 for more information on the specific parameters.

3.3.8 Flexible PT-100 temperature sensor

The built-in flexible temperature sensor can be used, depending on the program, as a control sensor for checking the sterilization temperature.

3.3.9 Fractionated heating

Fractionated heating is used to improve the exhaust ventilation during the heating phase.

Operating principle

During fractionated heating, steam is supplied into the sterilization chamber to pressurise it. Steam is then released so that the pressure drops. This process is repeated several times. The steam condenses on the cold surfaces and cavities of the sterilization material. During the subsequent steam supply cycles, this condensate heats up again until it evaporates. This forces the air out of the cavities.

Parameters

PulsedHeating	Pulses	PulseStart	PulseEnd
PulseFillRate	PulseExhRate		

Refer to Fractionated heating (parameters), Page 173 for more information on the specific parameters.

3.3.10 Glass breakage detection

Glass breakage is detected if all the control sensors selected in a program register a sharp drop in temperature. If the reference vessels burst during the sterilization process, a safe removal temperature cannot be guaranteed. In this case, access to the sterilization chamber is blocked for 24 hours.

If the power supply is interrupted, the status of the temperature sensors is retained and the chamber remains locked.

3.3.11 Customized maintenance counters

In addition to the standard maintenance counters, up to three individual, adjustable maintenance counters can be configured using the Device parameters.

These can be reset by the user in the Maintenance window. The Overview Maintenance window displays information about the current maintenance status of the device.

Parameters

CustMaintMsg1	CustMaintLimit1	CustMaintStatus1

Refer to Customized maintenance counters (parameters), Page 174 for more information on the specific parameters.

3.3.12 Built-in steam generator

The built-in steam generator generates the steam required for the sterilization process outside of the sterilization chamber.

Operating principle

In this type of steam generator, the steam enters the sterilization chamber from above. Air is heavier than water vapour, so gravity facilitates the air extraction. The air is displaced downwards and discharged at the lowest point. This results in the optimal venting process and ensures a precise, reproducible sterilization. Moreover, by being separated from the sterilization chamber, it is possible to keep the steam generator at its operating temperature during standby mode. This results in quicker heating-up times compared to generating steam within the sterilization chamber.

3.3.13 Condensate drain control

The condensate flush control ensures that condensate remaining in the sterilization chamber is reduced to a minimum when the door is opened.

If the exhaust air filter is installed, the condensate flush control prevents the contaminated condensate from flushing inadvertently. This prevents a dangerous situation from arising when the door is opened.

The condensate flush control prevents the door from being opened in certain situations.

3.3.14 Waste (bags) program

The "Waste (bags)" program is used for sterilizing normal laboratory waste in bags or buckets (solid waste with low liquid content < 15 litres).

Program cycle

When selecting the program from the menu, the displayed parameters can be changed to modify the program phases.

Depending on the configuration, there are two pre-treatment phases that are possible (fractionated pre-vacuum using the optional vacuum equipment or the fractionated heating). This is followed by the heating phase and then the sterilization phase.

After the sterilization time has elapsed, the exhaust phase takes place, in which the over-pressure from the sterilization chamber is discharged in a regulated manner. If vacuum equipment is present, a vacuum is generated after atmospheric conditions have been reached in order to minimise any odours and to dry out the sterilization material.

Any Superdry option that may be included in the configuration is not used.

If a cooling option (such as Rapid cooling with support pressure or rapid cooler without support pressure) is available in your device's configuration, active cooling can be used until the unloading temperature has been reached.

The program ends when the unloading temperature and the atmospheric conditions have been reached in the sterilization chamber.

Parameters

SterTemp	EndTemp	SterLvl	SterTempLimLow	SterTempLimHigh
SterTime				

Refer to Program parameters , Page 170 for more information on the general parameters.

3.3.15 Waste (Liquids) program

The "Waste (Liquids)" program is used for the sterilization of liquid laboratory waste in suitable vessels.

Program cycle

When selecting the program from the menu, the displayed parameters can be changed to modify the program phases.

This program starts with the heating phase. When the sterilization temperature has been reached, the sterilization phase follows (in which the temperature is kept constant throughout the sterilization time). This is followed by the cooling phase (in which the sterilized product is cooled down according to the selected configuration).

The program ends when the unloading temperature and the atmospheric conditions have been reached in the sterilization chamber.

Parameters

SterTemp	EndTemp	SterLvl	SterTempLimLow	SterTempLimHigh
SterTime				

Refer to Program parameters , Page 170 for more information on the general parameters.

3.3.16 Durham program

The "Durham" program is used to prepare Durham tubes. The air is forced out of the fermentation tubes during the program cycle.

Program cycle

When selecting the program from the menu, the displayed parameters can be changed to modify the program phases.

This program starts with the heating phase. When the sterilization temperature has been reached, the sterilization phase follows (in which the temperature is kept constant throughout the sterilization time). Following the sterilization phase, the pressure is regulated during the cooling phase so that the air contained in the fermentation tube is displaced. The cooling is then followed by the unloading temperature according to the selected configuration.

The program ends when the unloading temperature and the atmospheric conditions have been reached in the sterilization chamber.

Parameters

SterTemp	EndTemp	SterLvl	SterTempLimLow	SterTempLimHigh
SterTime				

Refer to Program parameters , Page 170 for more information on the general parameters.

3.3.17 Solids program

The "Solids" program is used for sterilizing solids (e.g. instruments or glass).

Program cycle

When selecting the program from the menu, the displayed parameters can be changed to modify the program phases.

Depending on the configuration, there are two pre-treatment phases that are possible (fractionated pre-vacuum using the optional vacuum equipment or the fractionated heating). This is followed by the heating phase and then the sterilization phase.

After the sterilization time has elapsed, the exhaust phase takes place, in which the over-pressure from the sterilization chamber is rapidly discharged. If vacuum equipment is present, a vacuum is generated after atmospheric conditions have been reached so that the sterilization material can be dried out.

The program ends when the unloading temperature and the atmospheric conditions have been reached in the sterilization chamber.

Parameters

SterTemp	EndTemp	SterLvl	SterTempLimLow	SterTempLimHigh
SterTime				

Refer to Program parameters , Page 170 for more information on the general parameters.

3.3.18 Liquids program

The "Liquids" program is used for the sterilization of liquids in suitable vessels.

Program cycle

When selecting the program from the menu, the displayed parameters can be changed to modify the program phases.

This program starts with the heating phase. When the sterilization temperature has been reached, the sterilization phase follows (in which the temperature is kept constant throughout the sterilization time). This is followed by the cooling phase (in which the sterilized product is cooled down according to the selected configuration).

The program ends when the unloading temperature and the atmospheric conditions have been reached in the sterilization chamber.

Parameters

SterTemp	SterTime	EndTemp	SterTempLimLow	SterTempLimHigh
SterLvl				

Refer to Program parameters , Page 170 for more information on the general parameters.

3.3.19 Cleaning program

The "Cleaning" program is not used for sterilization. It is used to clean the device (remove dirt and residue).

To achieve optimal cleaning results, this program should be started immediately after the batch run which caused the unclean conditions.

Program cycle

When selecting the program from the menu, the displayed parameters can be changed to modify the program phases.

The program works similarly to the Solids program.

Parameters

SterTemp	EndTemp	SterLvl	SterTempLimLow	SterTempLimHigh
SterTime				

Refer to Program parameters , Page 170 for more information on the general parameters.

3.3.20 Programmable starting time

A programmable start time allows a time to be pre-set (including the date) at which a selected sterilization program should be started.

Parameters

StartByTime

Refer to Programmable start time (parameter), Page 177 for more information on the specific parameters.

3.3.21 Process log

All relevant data for a program cycle are stored in the Process log. In particular, it contains the basic parameter settings as well as information on the success or failure of a program cycle.

The program cycle data can be printed out via the printer, exported using the electronic data output or displayed on the touch display.

Under normal use, the log saved in memory can store data for at least 10 years. The operator is responsible for ensuring that the process log is backed up regularly.

3.3.22 PT-100 temperature sensor at the condensate drain

The permanently installed temperature sensor in the condensate drain is a control sensor. Depending on the particular program, it can be used to check the sterilization temperature.

3.3.23 Air Cooling

The outer wall of the sterilization chamber at one point is exposed to room air by a fan. As a result, the sterilisation chamber cools down at this point and indirectly the sterilised material also cools down.

Liquid loss can be expected due to the boiling of the liquid.

The ambient air cooling method is only suitable for open vessels.

3.3.24 Satur. steam monitoring

The Satur. steam monitoring monitoring function ensures that saturated steam conditions prevail during the transition to the sterilization phase and during the sterilization phase. A saturated steam condition is ensured by continually comparing the temperature and pressure with the steam pressure curve.

3.3.25 Programmable logic controller

The programmable logic controller is a control unit developed by Systec for this device.

The control unit of the device features the following basic functionalities:

- Audio output
- Backup functions
- Real time clock (Date/Time with automatic switch to daylight saving time)
- Error log
- Internal memory
- Configuration via USB
- Multilingual user interface
- Ethernet port
- Process log
- Sleep mode
- Warning and error management
- Maintenance and service counter

Audio output

The device has an integrated loudspeaker. The speaker is used to generate system sounds for the following events:

- End of program
- Error
- Button pressed
- Opening Door

The Sound Volume for audio playback can be adjusted at the touch display.

If the Sound Volume is off, no system sounds are audible. The maximum Sound Volume is about 80 dB.

Backup functions

The backup functions enable the user to save the Device settings. The following backup functions are available:

- The configuration backup saves the program lists and their parameters, Device parameters, I/O parameters, user groups and their permissions.
- The complete backup of the device includes the current device software and its databases, as well as all contents in the configuration backup.

The backup file is encrypted and thus protected against manipulation.
System backups can only be restored by a service technician authorized by Systec.

Real-time clock

The device has a real-time clock with automatic time changeover to daylight saving time. Time, Date and Time zone can be set manually via the touch screen or automatically via the internet. To set the time automatically, a time server and an active internet connection are required.

Characteristics:

- Deviation 1s/24h
- Automatic summer / winter time
- Automatic leap year detection
- Standard format dd.mm.yyyy hh:mm:ss

Error log

When an error occurs, the following data is saved:

General info

- Device type
- Device serial number
- Software version
- Firmware of the connected hardware
- Hardware status
- General Info
- Error description
- Date/Time (time of occurrence)
- All analog input/output values
- All digital input/output values

Further information in the program cycle:

- Selected program
- Program phase
- Program parameters
- Load (run) number
- User who started the program

Internal memory

An SD card provides the internal memory for the process data. Faulty or incompatible SD cards will report an error. The System information can be used to display the status of the internal memory. The Audit Trail records whenever an SD card is changed or initialised.

SD cards are supported up to a size of 32GB. The device automatically formats and initialises the SD card.

Configuration via USB

The device can be configured by importing using a USB storage medium containing configuration files specially prepared by Systec.

The configuration file can contain:

- Device information
- Device parameters
- Group permissions
- Programs incl. Program parameters
- IO configuration
- Options

Multilingual user interface

A multilingual user interface is available for operating the device.

The display on the touch display, Systec Connect DS as well as the printer printout is output in the selected language. The keyboard layout on the touch display is also displayed in the selected language and can be temporarily switched to enable input.

The language cannot be changed during the program cycle. Only languages with UTF8-compatible character set are supported.

Ethernet port

The programmable logic controller has an Ethernet network connection. The device can therefore be integrated into existing laboratory networks.

With appropriate permission, the network settings can be made in the user interface.

Process log

All relevant data for a program cycle are stored in the Process log. In particular, it contains the basic parameter settings as well as information on the success or failure of a program cycle.

The program cycle data can be printed out via the printer, exported using the electronic data output or displayed on the touch display.

Under normal use, the log saved in memory can store data for at least 10 years. The operator is responsible for ensuring that the process log is backed up regularly.

Sleep mode

Sleep mode is a power-saving state; the device will switch to this mode after a time period defined by the user. This time starts after the most recent user input or after the program has ended. After this time has elapsed, the touch screen and the heating elements are switched off. Sleep mode is deactivated by pressing the touch screen.

Parameters

SleepModeTO

Refer to Sleep mode (parameter), Page 179 for more information on the specific parameters.

Warning and error management

Malfunctions that occur while operating the device are indicated to the user using warnings and errors. The device reacts to these as follows:

Warnings

Warnings are triggered when the device is in a state that conflicts with successful program cycle and could lead to an error. Active warnings prevent the program from starting. A running process is not terminated when a warning occurs.

Error

Errors are triggered when one of the device functions cannot operate correctly. Active errors prevent the program from starting. In addition, an active process is terminated when an error occurs. Errors are always documented in the error log and must be acknowledged by the user. An error can only be acknowledged when the cause has been rectified.

Maintenance and service counter

Maintenance and service measures are provided to maintain the functionality and reliability of the device:

- Maintenance is required to renew the wear parts and can be performed by the user
- Service is required to maintain operating safety and must be performed by a Systec authorized service technician

All counters are incremented every time the program starts. The user is made aware of the due date before the program starts 30 program cycles before a maintenance or service measure is required. The device parameter list can be used to set whether or not the device should be locked when maintenance or service work is required.

3.3.26 Touch screen

The device is operated using a touch-sensitive, high-detail, colour-rich TFT touch screen with LED background lighting.

3.3.27 Door quick release

The door is easy and convenient to open and close because of the door quick-release mechanism. It also can be closed more quickly.

Operating principle

By lightly pressing the door, the device automatically initiates the mechanical locking of the door.

The door can be opened by pressing the corresponding button on the touch screen. A door-open signal will sound just before the door opens. The volume of this signal depends on the Sound Volume. The mechanical lock releases the door which then opens.

3.3.28 USB port

The USB port is used for electronic data output from the device to a USB storage medium.

Special USB storage media prepared by Systec can be used to configure and update the device software.

3.4 Optional equipment and functions

Devices from Systec can be equipped with numerous options at the factory or retro-fitted later.

Optional functions are added depending on how your device will be customized. The following list shows all options offered by Systec for the device types described in this operating manual. The list does not explicitly refer to particular configuration of your device.

Not all options can be combined.

Optional configuration equipment includes:

- Exhaust air filter management
- Exhaust air filtration
- Connection to cooling circuit
- Audit Trail
- Extended user account control
- Steam tapping
- Steam-air mixture
- Double exhaust air filtration
- Double temperature sensor (PT-100)
- Printer
- Compressed air drying
- Extended electronic data output
- Fractionated pre-vacuum
- Auxiliary steam heater
- Lift
- Spray heating
- Internal-external cooling
- Internal-external vacuum
- Combined heating
- Cooling panel
- Castor
- Manometer (pressure gauge)
- Medium monitoring
- Diaphragm vacuum pump
- Emergency-stop switch
- Potential-free Contact
- Bowie-Dick-Test program
- Steam tapping program
- Steam-air mixture program
- Free steam program
- Fermenter program

- Liquids flexible program
- Glass test program
- Spray heating program
- Material test program
- Rubber closures test program
- Vacuum test program
- Radial fan
- Ramp function
- Ambient air cooling 2
- Repeated program cycle
- Rapid cooling with support pressure
- Rapid cooling without support pressure
- Black steam heating
- Signalling device
- Superdry
- Systec Connect
  - Systec Connect App
  - Systec Connect DS
  - Systec Connect OPC-UA
  - Systec Connect STF
  - Systec Connect Save to Jira
- Temperature extension at 150 °C
- Ultra-cooler
- UltraSense
- Vacuum device
- Vacuum drying
- Extension of the temperature holding time
- Pre-heating the sterilization chamber
- Keep-warm function for liquids after program has finished
- Keep-warm function for material tests after program has finished
- Soft water sprinkler
- Accessories Baskets, buckets and tubs
- Additional pressure sensor
- Additional temperature sensor (PT-100)

3.4.1 Exhaust air filter management

The Exhaust air filter management function is an extension for the exhaust air filtration.

The filtration of the exhaust air can be enabled or disabled for specific programs.

The Exhaust air filter management function requires the built-in exhaust air filtration.

Disabling the exhaust air filter and the associated risks are the responsibility of the operator. Here, it is important to note that there is a risk of contaminating your surroundings from insufficiently autoclaved organic materials.

Parameters

Filtermanagement

Refer to Exhaust air filter management (parameters), Page 170 for more information on the specific parameters.

This equipment is not available for the VX-40 device.

3.4.2 Exhaust air filter

With exhaust air filtration, all escaping gases are passed through a sterile air filter during the heating and sterilization phase.

This and the additional condensate inactivation ensures that no non-sterile or contaminated material can escape from the sterilization chamber.

To ensure the sterilization conditions during the sterilization phase, separate temperature sensors are used to monitor both the sterile air filter through which the air is vented and the condensate produced.

If sterilization is not successful, the unsterilized condensate remains in the sterilization chamber.

Such a system may be mandatory for laboratories, depending on the applicable national safety regulations (refer to the bio-safety level).

The operator is responsible for ensuring that the selected program is suitable for deactivating their infectious material.

If the process does not finish properly, then the condensate will not flush automatically.

3.4.3 Connection to cooling circuit

In order to reduce the tap water consumption, the device is connected to a cooling circuit provided by the customer.

The cooling circuit provided by the customer supplies the configuration-dependent internal equipment (such as for the Rapid cooling with support pressure).

3.4.4 Audit Trail

The Audit Trail is a chronological documentation of the development and modification of system or process activities.

This function enables you to monitor and record the sequence of user inputs, system events or process states. The user-based monitoring is in accordance with international regulations such as FDA 21 CFR Part 11 or EU-GMP guidelines.

The Audit Trail data can be exported using the electronic data output and displayed on the touch display.

Under normal use, the log saved in memory can store data for at least 10 years.

The operator is responsible for ensuring that the Process log is backed up regularly.

The following data are saved:

- Device type
- Device serial number
- Date / Time (time of occurrence)
- Associated user (if available)
- Load (run) number Type of event
- Affected device component
- Reason (Reason of Change)
- If necessary, Old value, New value (e.g. parameter change, calibration, ...)

Refer to AUDIT TRAIL window , Page 90 for more information on the Parameter window.

3.4.5 Extended user account control

Function-dependent permissions may be required to operate the device.

The permissions are assigned via user groups to individual users.

The user account control exists in the variants Standard and Extended.

Extended user account control

Only with the extended user account control can up to 100 user groups and 100 users be freely administered in addition to the fixed pre-set user groups and users. The administrator is given the appropriate additional permissions.

The factory default passwords for all user groups should be changed after the initial commissioning.

User accounts

User group	User	Password (factory setting)
Operator	Operator	Operator
Supervisor	Supervisor	Supervisor
Administrator	Administrator	Administrator

Parameters

StopPw	DoorPw	ClearPw	SetDateTimePW	ProgListPw
CalibPw	MaintResetPw	StartPw	GlobalParPw	ExportPw
UserPwLength	UserPwRetries	UserPwExpiry	UserMaxCount	ProgBtnPw
UserAutoLogOffTO				

Refer to Extended user account control (parameters), Page 171 for more information on the specific parameters.

3.4.6 Steam tapping

The Steam tapping option is used to test the steam quality or to remove steam for external applications.

Operating principle

When using this function, the steam is extracted out of an externally accessible connection.

This connection is switched using a separate program and can be controlled via a valve.

The description of the program sequence also describes the operating principle. Refer to section Steam tapping program, Page 44 for details.

This equipment is not available for the VX-40 device.

3.4.7 Steam-air mixture

When using a Steam-air mixture mixture, support pressure may be used during the heat-up, sterilization and cooling phases. Thus, it is well suited for use with closed vessels which are susceptible to bursting or deformation (rigid or flexible vessels: plastic bottles, bags, cans, blister packs, food packaging, large glass bottles etc.).

Operating principle

The explanation of the operating principle can be found under Steam-air mixture program, Page 45 ,

The total pressure is limited depending on the permitted operating pressure of the sterilization chamber.

3.4.8 Double exhaust air filtration

During exhaust air filtration, all escaping gases are passed through two sterile air filters connected in series during the heating and sterilization phases.

This and the additional condensate inactivation ensures that no non-sterile or contaminated material can escape from the sterilization chamber.

To ensure the sterilization conditions during the sterilization phase, separate temperature sensors are used to monitor both the sterile air filter through which the air is vented and the condensate produced.

If sterilization is not successful, the unsterilized condensate remains in the sterilization chamber.

Such a system may be mandatory for laboratories, depending on the applicable national safety regulations (refer to the bio-safety level).

The operator is responsible for ensuring that the selected program is suitable for deactivating their infectious material.

If the process does not finish properly, then the condensate will not flush automatically.

This equipment is not available for the VX-40 device.

3.4.9 Double temperature sensor (PT-100)

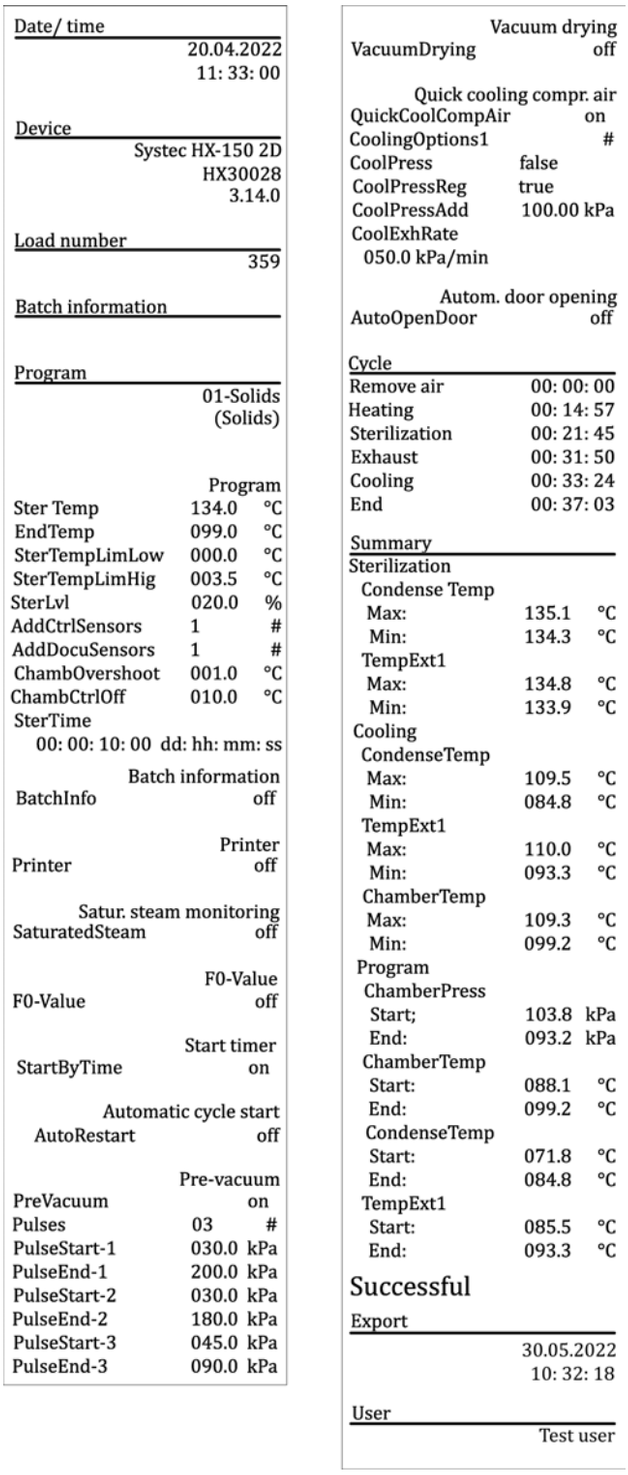
This sensor has a double sensor head. Thus, a redundant temperature measurement in the sterilization chamber can be taken using the double sensor head. Both outputs can be processed internally by the device. Otherwise, it is possible to connect one output to an external signal analysis instrument for comparison purposes.

3.4.10 Printer

The integrated printer is used for batch documentation. The printout contains the essential information about a program cycle. It shows the basic parameter settings and the success or failure of a program cycle.

The print-out is created in the language that has been selected on the device.

Data to be printed are taken from the process log. Designations and names are translated according to the set national language.



Date/ time
20.04.2022
11: 33: 00

Device
Systec HX-150 2D
HX30028
3.14.0

Load number
359

Batch information

Program
01-Solids
(Solids)

	Program	
Ster Temp	134.0	°C
EndTemp	099.0	°C
SterTempLimLow	000.0	°C
SterTempLimHig	003.5	°C
SterLvl	020.0	%
AddCtrlSensors	1	#
AddDocuSensors	1	#
ChambOvershoot	001.0	°C
ChambCtrlOff	010.0	°C

SterTime
00: 00: 10: 00 dd: hh: mm: ss

Batch information
BatchInfo off

Printer
Printer off

Satur. steam monitoring
SaturatedSteam off

F0-Value
F0-Value off

Start timer
StartByTime on

Automatic cycle start
AutoRestart off

Pre-vacuum		
PreVacuum	on	
Pulses	03	#
PulseStart-1	030.0	kPa
PulseEnd-1	200.0	kPa
PulseStart-2	030.0	kPa
PulseEnd-2	180.0	kPa
PulseStart-3	045.0	kPa
PulseEnd-3	090.0	kPa

Vacuum drying
VacuumDrying off

Quick cooling compr. air
QuickCoolCompAir on
CoolingOptions1 #
CoolPress false
CoolPressReg true
CoolPressAdd 100.00 kPa
CoolExhRate
050.0 kPa/min

Autom. door opening
AutoOpenDoor off

Cycle

Remove air	00: 00: 00
Heating	00: 14: 57
Sterilization	00: 21: 45
Exhaust	00: 31: 50
Cooling	00: 33: 24
End	00: 37: 03

Summary

Sterilization		
Condense Temp		
Max:	135.1	°C
Min:	134.3	°C
TempExt1		
Max:	134.8	°C
Min:	133.9	°C
Cooling		
CondenseTemp		
Max:	109.5	°C
Min:	084.8	°C
TempExt1		
Max:	110.0	°C
Min:	093.3	°C
ChamberTemp		
Max:	109.3	°C
Min:	099.2	°C
Program		
ChamberPress		
Start;	103.8	kPa
End:	093.2	kPa
ChamberTemp		
Start:	088.1	°C
End:	099.2	°C
CondenseTemp		
Start:	071.8	°C
End:	084.8	°C
TempExt1		
Start:	085.5	°C
End:	093.3	°C

Successful

Export
30.05.2022
10: 32: 18

User
Test user

Figure 3: Printout (example)

Content of the printout

The log's header contains the general info on process flow:

- Date/Time (process end)
- Device type and serial number
- Load (run) number (only if function enabled)
- Batch information
- Selected program (complete program name)
- General Program parameters

Program phases

The names of the program phases and their start time.

Summary

An analysis of the control sensors for the program cycle is printed out.

- Temperature sensors
  - Minimum at the sterilization phase
  - Maximum at the sterilization phase
  - F_0 total value, if the F_0 value calculation function is enabled.
- Result (program cycle successful, program cycle faulty)
- Date/Time of the printout
- Available field for name and signature of the user (name will be filled in if known)

Parameters

Printer

Refer to Batch documentation via printer (parameter), Page 172 for more information on the specific parameters.

3.4.11 Compressed air drying

The Compressed air drying system uses sterile-filtered compressed air to dry the sterilization materials. The Compressed air drying system is suitable for solid and liquid programs when used with closed vessels.

The drying effect of theCompressed air drying system is further increased by the radial fan and Super-dry functions.

Parameters

DryPress	DryTime	CompAirDry	DryPressHyst

Refer to Compressed air drying (parameters), Page 172 for more information on the specific parameters.

3.4.12 Extended electronic data output

The electronic data output extends the features of Process log, Error log and Audit Trail with the possibility to export data in electronic form.

The export can take place in various formats such as PDF or CSV.

Extended electronic data output adds a digital signature to the electronic data output to ensure the "authenticity" of the data.

3.4.13 Fractionated pre-vacuum

The fractionated pre-vacuum is used to reliably vent the sterilization chamber. It also removes the air out of any cavities in the sterilization material from which the air cannot escape downwards by means of gravity (e.g. in open vessels, pipette tips, pipette boxes).

Operating principle

The sterilization chamber is evacuated several times and then re-filled with steam. More air is extracted from the cavities during each of these cycles. It is possible to adjust the number of vacuum pulses and the vacuum level so that the venting can be optimized for the sterilization material.

The fractionated pre-vacuum is a functionality of the vacuum equipment.

Parameters

PreVacuum	Pulse	PulseExhRate	PulseStart	PulseEnd
PulseExhTO	PulseFillRate			

Refer to Fractionated pre-vacuum (parameters), Page 173 for more information on the specific parameters.

3.4.14 Auxiliary steam heater

The auxiliary steam heater supplements the integrated steam generator with an external steam connection that heats using on-site steam.

There is more information about the steam quality in section Connection data, Page 61.

This equipment is not available for the VX-40 device.

3.4.15 Lift

The Systec lift can be used to load the vertical stationary devices by inserting or lifting appropriate loading containers, such as baskets or buckets, into or out of the device.

The permissible total weight of the loading containers and the load must not exceed 35 kg.

This equipment is not available for the VX-40 device.

3.4.16 Spray heating

When using the Spray heating, support pressure may be used during the heat-up, sterilization and cooling phases. The surfaces of the vessels containing the sterilization material are wetted directly with the demineralized water. Thus, the Spray heating is well suited for use with closed vessels which are susceptible to bursting or deformation and for rapid heating (rigid or flexible vessels: plastic bottles, bags, cans, blister packs, food packaging, large glass bottles etc.).

Because of the poor heat transfer characteristics of plastic, this method is ideal for heating and cooling plastic containers.

Operating principle

The explanation of the operating principle can be found under Spray heating program , Page 48 ,

The total pressure is limited depending on the permitted operating pressure of the sterilization chamber.

The Spray heating cannot be combined with the soft water sprinkler.
This equipment is not available for the VX-40 device.

3.4.17 Internal-external cooling

In this optional configuration, the cooling coils of an existing rapid cooling system (with and without support pressure) form a closed, internal cooling circuit. The water from this internal cooling circuit is cooled by a heat exchanger that is cooled by external water.

This equipment is not available for the VX-40 device.

3.4.18 Internal-external vacuum

The vacuum pump is operated using condensate from the sterilization chamber. This protects the vacuum pump against scale deposits.

Operating principle

With this type of connection for the vacuum unit, the condensate from the sterilization chamber is collected in a container. During this process, the vacuum device evacuates its process water out of this container, which also flows back into the container. The container itself is connected via an overflow to the drain. Since the condensate has a much higher temperature than is required to operate the vacuum pump, the process water is cooled down to the required temperature by a heat exchanger. Depending on your configuration, the heat exchanger itself is operated with cooling water.

The cooling water can also be on-site cooling circuit water if the "Connection to cooling circuit" option is installed.

This equipment is not available for the VX-40 device.

3.4.19 Combined heating

This combined heating supplements the integrated steam generator with the option to also heat with auxiliary steam or black steam. The program can be configured to use the internal, auxiliary or black steam heating option. The auxiliary steam or black steam is supplied through a separate connection.

There is more information about the steam quality in section Connection data, Page 61.

Parameters

ExtSteamSupply

Refer to Combined heating (parameter), Page 174 for more information on the specific parameters.

This equipment is not available for the VX-40 device.

3.4.20 Cooling panel

In this optional configuration, the cooling coils of an existing rapid cooling system (with and without support pressure) form a closed, internal cooling circuit. This internal circuit is cooled by a heat exchanger with room air. The process heat is then passed on to the room air.

Operating principle

In order to achieve this cooling effect, the water of the internal cooling circuit is cooled with a fan and a heat exchanger.

This equipment is not available for the VX-40 device.

3.4.21 Castors

The manoeuvrability of vertical floor-standing autoclaves can be improved with castors. Two parking brakes on the front castors prevent the device from moving unintentionally.

3.4.22 Manometer

The manometer serves as an additional analog controller-independent instrument for monitoring the operating pressure in the sterilization chamber and/or steam generator.

Its display is located externally on the device.

3.4.23 Medium monitoring

The medium monitoring mechanism is used to check the availability of the supply media (e.g. compressed air). If a particular supply medium is not available, a warning message is issued.

This equipment is not available for the VX-40 device.

3.4.24 Diaphragm vacuum pump

The diaphragm vacuum pump is a special version of the vacuum device. The pump does not require an additional water supply.

This equipment is only available for the VX-40 device.

3.4.25 Emergency-stop switch

The emergency-stop switch is a protective device which immediately disconnects the device from its mains power supply.

The pass-through autoclave always has an emergency-stop switch at the bio-shield side. A second emergency-stop switch can also be optionally installed on the machine side.

Operating principle

When the emergency-stop switch is triggered, the device is disconnected from the power supply and the currently running program is interrupted. The actuators switch to a safe state so that steam, gas or water cannot escape from the sterilization chamber.

The emergency-stop switch must be unlocked (pulled out) to resume operations. After a subsequent restart, the device will boot up as if there was a power failure.

More information can be found in section Procedure for actions after a power failure, Page 189.

3.4.26 Potential-free Contact

The potential-free contact can be used to establish an external potential-free connection to one or more digital outputs or device status lines.

The potential-free contact helps to prevent malfunctions when switching external actuators (such as signal lamps, valves and pumps).

The configuration is made by a service technician authorised by Systec.

3.4.27 Bowie-Dick-Test program

The "Bowie-Dick-Test" test program is used to check the air extraction of the sterilization chamber. A test packet must be placed as an indicator in the device.

The "Bowie-Dick-Test" program is only available when the vacuum equipment has been installed.

A failed test may have the following causes:

- Non-condensing gases in the demineralized water vapour
- A leakage at the device, or
- Improper configuration of parameters (follow the manufacturer's specifications for the testing time and temperature)

Program cycle

The displayed parameters can be changed when selecting the program from the menu.

The program starts with the air extraction phase, in which a fractionated pre-vacuum is generated according to the set parameters. The heating phase and the sterilization phase follow the air extraction phase. Subsequently, atmospheric conditions are established in the sterilization chamber and a vacuum is then generated.

The program ends when the unloading temperature and the atmospheric conditions have been reached.

Parameters

SterTemp	EndTemp	SterLvl	SterTempLimLow	SterTempLimHigh
SterTime				

Refer to Program parameters , Page 170 for more information on the general parameters.

3.4.28 Steam tapping program

The "Steam tapping" program is used to test the steam quality or to remove steam for external applications.

Program cycle

After it is selected in the menu, the program can be configured according to the displayed parameters.

The displayed parameters describe the state of the steam which can be extracted via the connection. These are:

- The temperature at which the steam is supplied and
- The duration that the steam is available at the connection.

Parameters

TargetTemp	Time-(Steam)

Refer to Program parameters , Page 170 for more information on the general parameters.

Refer to Steam tapping program (parameters), Page 174 for more information on the specific parameters.

Refer to the section Steam tapping program (optional), Page 113 for more information about this program.

This equipment is not available for the VX-40 device.

3.4.29 Steam-air mixture program

This is the program for Steam-air mixture.

Further information can be found in the corresponding description. Refer to section Steam-air mixture , Page 38 for details.

Program cycle

When selecting the program from the menu, the displayed parameters can be changed to modify the program phases.

First, sterile-filtered compressed air is passed into the sterilization chamber to produce the support pressure. Steam is then let in to initiate the heating phase. The support pressure can be kept constant throughout all program phases or regulated according the temperature of the sterilization material. A flexible temperature sensor in a reference vessel is used to regulate the support pressure. The steam pressure is determined that corresponds to the temperature measured for the vessels. The support pressure is then set accordingly.

When the sterilization temperature has been reached, the sterilization phase follows (in which the temperature is kept constant throughout the sterilization time). This is followed by the cooling phase (in which the sterilized product is cooled down according to the selected configuration).

The program ends when the unloading temperature and the atmospheric conditions have been reached in the sterilization chamber.

The built-in radial fan ensures a homogeneous steam-air mixture throughout all program phases. This also ensures an even temperature distribution.

Parameters

CoolCompAirTO	CoolErrRate	CoolingOptions	AirPressReg	AirPressAdd

Refer to Program parameters , Page 170 for more information on the general parameters.

Refer to Steam-air mixture program, Page 45 for more information on the specific parameters.

3.4.30 Free steam program

This "Free steam" program is used to dissolve pre-sterilized nutrient media. It's not a sterilization program.

In combination with the keep-warm function for liquids after the program has finished, the nutrient media can be prepared for laboratory usage and kept at a desired temperature.

Program cycle

When selecting the program from the menu, the displayed parameters can be changed to modify the program phases.

This program starts with the heating phase. When the target temperature is reached, the temperature holding phase follows (in which the temperature is kept constant). The program finishes after the temperature holding time has elapsed.

Parameters

TargetTemp	EndTemp	SterLvl	SterTempLimLow	SterTempLimHigh
SterTime				

Refer to Program parameters , Page 170 for more information on the general parameters.

3.4.31 Fermenter program

The "fermenter" program is used to sterilize bio-reactors, with or without liquids.

Bio-reactors are usually aerated and de-aerated (air let in and out) using filters. The filters provide resistance to the ingress of steam and the vacuum-based air extraction. Thus, it is possible to set speeds for different program phases (e.g. for steam pressure surges and vacuum pulls).

Program cycle

When selecting the program from the menu, the displayed parameters can be changed to modify the program phases.

The "Fermenter" program is divided into "Fermenter (full)" and "Fermenter (empty)".

The "Fermenter (full)" program operates similarly to a liquid program.

A "Fermenter (empty)" program works similarly to the solids program.

Parameters

SterTemp	EndTemp	SterLvl	SterTempLimLow	SterTempLimHigh
SterTime				

Refer to Program parameters , Page 170 for more information on the general parameters.

This equipment is not available for the VX-40 device.

3.4.32 Liquids flexible program

The "Liquids flexible" program is used for the sterilization of liquids in vessels that are not at risk of bursting.

Program cycle

When selecting the program from the menu, the displayed parameters can be changed to modify the program phases.

This program starts with the heating phase. When the sterilization temperature has been reached, the sterilization phase follows (in which the temperature is kept constant throughout the sterilization time). This is followed by the cooling phase (in which the sterilized product is cooled down according to the selected configuration).

The program ends when the unloading temperature and the atmospheric conditions have been reached in the sterilization chamber.

Parameters

SterTemp	SterTime	EndTemp	SterTempLimLow	SterTempLimHigh
SterLvl				

Refer to Program parameters , Page 170 for more information on the general parameters.

3.4.33 Glass test program

The "Glass test" program is used to test the water resistance of the glass surfaces (e.g. to assess the suitability of the vessels for medical specimens).

Program cycle

When selecting the program from the menu, the displayed parameters can be changed to modify the program phases. The default setting is in compliance with ISO 4802:

- The device heats up to a temperature of 100 °C.
- The temperature is maintained for 10 minutes at 100 °C.
- After 21 minutes, the device heats up to 121 °C.
- The temperature is maintained for 60 minutes at 121 °C.
- In 42 minutes, the device cools down from 121 °C to 100 °C. Optionally, you can configure a cooling down to less than 100 °C.

The program ends when the unloading temperature and the atmospheric conditions have been reached in the sterilization chamber.

Parameters

StayTemp-(H-1)	RampTime-(H-1)	StayTime-(H-1)	StayTemp-(H-2)	RampTime-(H-2)
SterTime	StayTemp-(C)	RampTime-(C)	SterTemp	EndTemp
SterLvl	SterTempLimLow	SterTempLimHigh	EndTemp	RampTLow-(C)
RampTLow-(H)	RampTHigh-(C)	RampTHigh-(H)	RampTOff-(H)	ChambTCtrlOff
ChambOvershoot				

Refer to Program parameters , Page 170 for more information on the general parameters.
Refer to Glass test (parameters), Page 175 for more information on the specific parameters.

3.4.34 Spray heating program

This is the Spray heating program.

Further information can be found in the corresponding description. Refer to section Spray heating , Page 42 for details.

Program cycle

When selecting the program from the window, the displayed parameters can be changed to modify the program phases.

The demineralized water is first supplied into the sterilization chamber. By permanently circulating the demineralized water throughout all program phases, the sterilization material is wetted by spray nozzles. After the demineralized water is in the chamber, sterile-filtered compressed air is then let in to create the support pressure.

Steam is then let in to initiate the heating phase. During the heating, sterilization and cooling phases, the support pressure is either kept constant or regulated by the medium temperature. A flexible temperature sensor in a reference vessel is used to regulate the support pressure. The steam pressure is determined that corresponds to the temperature measured for the vessels. The support pressure is then set accordingly.

When the sterilization temperature has been reached, the sterilization phase follows (in which the temperature is kept constant throughout the sterilization time). The cooling phase comes next.

The demineralized water is cooled down by a heat exchanger so that the sterilization material can be cooled during the cooling phase.

After the unloading temperature has been reached, the demineralized water is discharged from the sterilization chamber.

The program ends when the atmospheric conditions have been reached in the sterilization chamber.

Parameters

CoolCompAirTO	CoolErrRate	CoolingOptions	AirPressAdd	AirPressReg
WaterTime	ProgFillTO			

Refer to Program parameters , Page 170 for more information on the general parameters.

Refer to Spray heating (parameters), Page 176 for more information on the specific parameters.
This equipment is not available for the VX-40 device.

3.4.35 Material test program

This program is designed for material tests or lifespan simulations. In allows low unloading temperatures to be reached, with or without drying of the sterilization material.

The minimum unloading temperature depends on your selected cooling configuration. The lowest unloading temperatures can be achieved when using the spray cooling. This will wet the sterilization material again.

Program cycle

When selecting the program from the menu, the displayed parameters can be changed to modify the program phases.

This program operates similarly to a solids program. The difference is that a cooling phase follows after the sterilization or drying phase.

The program ends when the unloading temperature and the atmospheric conditions have been reached in the sterilization chamber.

Parameters

SterTemp	SterTime	EndTemp

Refer to Program parameters , Page 170 for more information on the general parameters.

3.4.36 Rubber closures test program

The Rubber closures test program is used to determine the chemical resistance of rubber plugs. It's not a sterilization program.

Program cycle

The Rubber closures test functions like a liquid program.

When selecting the program from the menu, the displayed parameters can be changed to modify the program phases. The default settings correspond to the standards in Ph. Eur., USP and DIN EN 8871-1:

- The device heats up to a temperature of 121 °C (±2 °C) in 20 to 30 minutes.
- The temperature is maintained for 30 minutes at 121 °C (±2 °C).
- In approx. 30 minutes, the device cools down from 121 °C to 25 °C.

The program ends when the unloading temperature and the atmospheric conditions have been reached in the sterilization chamber.

Parameters

SterTemp	EndTemp	SterLvl	SterTempLimLow	SterTempLimHigh
SterTime	WaterTime	Stay-Temp-(H)	RampTime-(H)	RampTOff-(H)
RampTOvers-(H)	RampTBoost-(H)	RampTLow-(H)	RampTHigh-(H)	

Refer to Program parameters , Page 170 for more information on the general parameters.

Refer to Rubber closures test program (parameters), Page 176 for more information on the specific parameters.

3.4.37 Vacuum test program

The "Vacuum test" program is used to check for leaks in the sterilization chamber.

The "Vacuum test” program is only available when the vacuum equipment has been installed.

A requirement for a successful vacuum test is that the sterilization chamber is dry and at room temperature when the program starts.

Program cycle

This program starts with the air extraction phase. An equalization phase takes place after the test pressure is reached. During the equalization phase, the pressure in the sterilization chamber must not rise above the factory-set equalization value.

After the equalization phase has elapsed, a pressure holding phase takes place. During this phase, the pressure in the sterilization chamber must not increase above the factory-set limit value. When this phase is finished, the sterilization chamber is vented. The program finishes when atmospheric conditions have been reached.

Parameters

SterTemp	EndTemp	SterTempLimLow	SterTempLimHigh	SterLvl

Refer to Program parameters , Page 170 for more information on the general parameters.

3.4.38 Radial fan

The radial fan is a fan which is built into the sterilization chamber. It is used to swirl the air in the cooling phase and also to create a homogeneous temperature distribution in the steam-air mixture.

Operating principle

During the heating phase, the radial fan produces a homogeneous mix of steam and air in the sterilization chamber, thus ensuring an even temperature distribution.

During the cooling phase, the radial fan supports the existing rapid cooler with or without support pressure. The radial fan uses forced convection to facilitate rapid heat transfer between the cooled inner wall of the sterilization chamber and the gas contained within.

The cooling performance of the rapid cooler with radial fan is improved when the ultra-cooler is used.

3.4.39 Ramp function

The ramp function is an extension for programs which can be used during material testing. The ramp function can be used to make a step-by-step adaptation of the temperature during the heating phase as well as the cooling phase. During this process, adjustments can be made corresponding to the temperatures achieved, the duration of the ramp times, and the temperature holding times.

Parameters

Ramps	RampCount-(H)	StayTemp	RampTime	StayTime
RampTOff-(H)	RampTOvers-(H)	RampTLow-(H)	RampTHigh-(H)	RampCount-(C)
RampMinP(C)	RampMaxP(C)	RampTLow-(C)	RampTHigh-(C)	

Refer to Ramp function (parameter), Page 177 for more information on the specific parameters.

3.4.40 Ambient air cooling 2

The outer wall of the sterilization chamber at one point is exposed to room air by a highly efficient fan. As a result, the sterilisation chamber cools down at this point and indirectly the sterilised material also cools down.

Liquid loss can be expected due to the boiling of the liquid.

The ambient air cooling method is only suitable for open vessels.

3.4.41 Repeated program cycle

The repeated program cycle is an extension for programs. It enables the user to have a selected program repeat automatically. The number of program repetitions and the pause interval between the individual program repetitions can be set.

Parameters

Cycle Count	Restart delay	Dynamic Count

Refer to Repeated program cycle (parameters), Page 178 for more information on the specific parameters.

3.4.42 Rapid cooling with support pressure

The sterilization chamber is cooled by external cooling coils. In addition to open vessels, suitable burst-proof closed vessels may also be cooled by applying support pressure during the cooling phase. Experience shows that such vessels can have a volume of up to 1000 ml.

The cooling is additionally optimized when the radial fan and ultra-cooler options are in use.

Operating principle

After the sterilization phase has elapsed, sterile-filtered compressed air is supplied into the sterilization chamber to build up the support pressure. The support pressure can be kept constant over the cooling phase or can be regulated according to the temperature of the medium. A flexible temperature sensor in a reference vessel is used to regulate the support pressure. The steam pressure is determined that corresponds to the temperature measured for the vessels. The support pressure is then set accordingly.

After the sterilization chamber has reaching the required support pressure, the sterilization chamber is cooled externally with water via the cooling coils. The sterilization material is cooled by heat radiating to the inner walls of the sterilization chamber. When open vessels are being used, the support pressure prevents the sterilization material from boiling, thus avoiding fluid loss. When closed vessels are used, the support pressure prevents the vessels from bursting.

Parameters

QuickCoolCompAir	CoolingOptions	CoolPressReg	CoolPressAdd	CoolExhRate
CoolErrRate				

Refer to Rapid cooling with support pressure (parameters), Page 179 for more information on the specific parameters.

3.4.43 Rapid cooler without support pressure

The pressure in the sterilization chamber is discharged in a controlled manner and the chamber is cooled using the external cooling coils. This cooling method is only suitable for open vessels.

The cooling is additionally optimized when the radial fan and ultra-cooler options are in use.

Liquid loss can be expected due to the boiling of the liquid.

Operating principle

The pressure is released in a method regulated by the temperature of the medium. A flexible temperature sensor in a reference vessel is used to regulate the pressure reduction. After the atmospheric pressure is reached in the sterilization chamber, the chamber is cooled externally with water via the cooling coils. Two processes are used to cool the sterilization material. Firstly, the liquids in open vessels begin to boil due to the pressure reduction and then cool down during the evaporation process. Secondly, the material being sterilized is cooled by heat radiated to the walls of the sterilization chamber (which are cooled from the outside).

Parameters

QuickCool	CoolExhRate	CoolErrRate

Refer to Rapid cooling without support pressure (parameter), Page 179 for more information on the specific parameters.

3.4.44 Black steam heating

The black (non-sterile) steam heating function extends the integrated steam generator with a heat exchanger .

The heat exchanger prevents direct contact between the black steam and the steam required for sterilization.

This equipment is not available for the VX-40 device.

3.4.45 Signalling device

The signalling device is an extension to the potential-free contacts. It has optional signal lights and/or acoustic signals that can be assigned to the states of the autoclave. The bright LEDs of the signal lights are clearly visible from all sides and the acoustic signal can be heard from far away.

3.4.46 Superdry

The Superdry function is used to bring heat into the sterilization chamber. Depending on your configuration, this offers the following functionality:

- Pre-heating the sterilization chamber , Page 55
- Less formation of condensation in the heating phase
- Improving the drying results of Compressed air drying and Vacuum drying
- Keep-warm function for liquids after program has finished

Operating principle

Steam is directed into the external heating coils of the sterilizing chamber and, as a result, the sterilization chamber heats up.

3.4.47 Systec Connect

Systec Connect contains several applications and functions for data management from and for Systec devices.

Systec Connect App

The Systec Connect app makes it possible to find Systec devices in the network and retrieve basic information about operational readiness and process progress.

The Systec Connect app is available for Android, iOS and iPadOS.

Android is a trademark of Google LLC.

iOS and iPadOS is a trademark of Apple Inc.

Systec Connect DS

In addition to the touch display, the Systec Connect DS (Documentation System) can be used to call up information or the contents of the internal memory. Systec Connect DS is independent of the operating system and can be opened in the browser of an end device with networking capability.

The operation of the Systec Connect DS is described in a separate operating manual.

Systec Connect OPC-UA

The Systec Connect OPC-UA (Open Platform Communications Unified Architecture) is used to provide data from the device to the network in accordance with DIN-EN-62541.

Data provided includes:

- Current values of the device's specified analogue and digital inputs and the device's outputs
- Current process progress
- Errors and warnings

Through the Systec Connect OPC-UA, the autoclave has a server.

The user receives the required data from the autoclave through a client application.

- To use the OPC UA interface, the user needs to have the OpcUAConnect event permission on the autoclave, which is assigned to the administrator by default.
  - The Extended user account control option can be used to assign the OpcUAConnect event permission to additional users.
- For a secure connection between the autoclave and the client application, a certificate is integrated in the Certificate management window.
  - As the autoclave only acts as a server, the trustworthiness, validity or a "revocation list" are not checked. The client application is responsible for checking whether the certificate used by the autoclave is trustworthy.
  - A "self-signed certificate" in the format of a PEM file is sufficient as an OPC UA certificate. In addition to the certificate, the PEM file must also contain the corresponding private key. The file name must be named "opcua_cert.pem".

Systec Connect STF

Systec Connect STF (Save to Folder) is used for electronic data output of the process log from the device to a server.

The Systec Connect STF function automatically exports the current process log to a server after a program cycle. Individual or multiple elements can also be exported manually at a later date via the Process Log window.

The following servers are supported:

- FTP
- SFTP
- FTPS

Systec Connect Save to Jira

The Systec Connect Save to Jira function is used to save the device's process log to a Jira server.

The Systec Connect Save to Jira function automatically exports the current process log to a server after a program cycle. Individual or multiple elements can also be exported manually at a later date via the Process Log window.

Jira is a server-based ticketing software program from the company Atlassian.

Only secure HTTPS connections can be used to communicate with the Jira server.

Jira Server version 4 or higher is supported.

3.4.48 Temperature extension at 150 °C

This extension enables sterilization at higher temperatures up to 150 °C.

3.4.49 Ultra-cooler

The ultra-cooler is an heat exchanger that is installed in the sterilization chamber. When used together with the radial fan, it strengthens an existing rapid cooler (with or without support pressure); this reduces the cooling time considerably.

Operating principle

The radial fan blows air over the ultra-cooler. Thanks to its large surface area, it ensures rapid heat exchange.

The radial fan must be installed in order to use the ultra-cooler.

3.4.50 UltraSense

The UltraSense electronic level sensor is an extension of the integrated steam generator that is used for detecting high-purity water.

3.4.51 Vacuum device

The vacuum device has two functions which optimize the sterilization of solids:

- the Fractionated pre-vacuum and
- the Vacuum drying

Operating principle

For more information on fractionated pre-vacuum, refer to (Fractionated pre-vacuum , Page 41) and Vacuum drying (Vacuum drying, Page 54).

3.4.52 Vacuum drying

Vacuum drying is used to evaporate the condensate after completion of the sterilization phase for programs working with Solids or solid waste.

The Vacuum drying is a functionality of the vacuum equipment.

The drying effect of the Vacuum drying is further increased by the Superdry function.

Operating principle

In the drying phase, the boiling point of the hot condensate is lowered by generating a vacuum, so that the condensate evaporates. In the program for Waste (bags), odours are minimized by the vacuum drying.

Parameters

VacuumDrying	DryPressStart	DryPressEnd	DryTime	DryFillRate
DryExhRate				

Refer to Vacuum drying (parameters), Page 179 for more information on the specific parameters.

3.4.53 Extension of the temperature hold time

The temperature holding time during the sterilization phase can be extended to several days. This allows you to test the long-term influence of the temperature on the sterilization material or on other materials.

Parameters

SterTime

Refer to Program parameters , Page 170 for more information on the general parameters.

3.4.54 Pre-heating the sterilization chamber

For certain programs, the sterilization chamber can be preheated in the standby mode of the unit. This accelerates the heating phase and reduces the formation of condensate.

The Pre-heating the sterilization chamber is a feature from Superdry.

Parameters

PreHeatChamb

Refer to Pre-heating the sterilization chamber (parameters), Page 180 for more information on the specific parameters.

3.4.55 Keep-warm function for liquids after program has finished

The keep-warm function serves to keep the sterilization material at a desired temperature after a program cycle has finished.

The function works with steam, which continuously produces condensate on the sterilization material.

Parameters

HoldTemp	HoldTime	PostHeatChambLiq

Refer to Keep warm function after program finishes liquids (parameters), Page 180 for more information on the specific parameters.

3.4.56 Keep-warm function for material tests after program has finished

The keep-warm function serves to keep the sterilization material at a desired temperature after a program cycle has finished.

The function works by externally heating the sterilization chamber. This keeps the sterilization material dry.

3.4.57 Spray cooling

The soft water sprinkler uses spray nozzles to wet the sterilization material with externally supplied soft water. The results in a rapid cooling effect. The soft water sprinkler is used for material testing where the material to be sterilized must reach the unloading temperature quickly. By using support pressure during the cooling phase, closed vessels can be cooled by the soft water sprinkler without any risk of vessels bursting.

Since water is added from the outside during the cooling phase, the sterilization material is no longer sterile after the end of the program.

If the support pressure system fails, the sprinkler is automatically stopped.

The soft water sprinkler cannot be combined with the Spray heating.

The customer's facility must supply the demineralized water for the hot water spray cooling.

A sufficient amount of water must be provided to ensure uninterrupted cooling.

Operating principle

After the sterilization phase has elapsed, sterile-filtered compressed air is supplied into the sterilization chamber to build up the support pressure. The support pressure can be kept constant over the cooling phase or can be regulated according to the temperature of the medium. A flexible temperature sensor in a reference vessel is used to regulate the support pressure. The steam pressure is determined that corresponds to the temperature measured for the vessels. The support pressure is then set accordingly. Thus, the risk of rigid vessels bursting is reduced and deformable vessels are stabilized.

Once the required support pressure has been reached, the cooling process starts. In this process, the sterilization material is cooled down directly by the sprinkler (which is supplied with external water).

Parameters

CoolErrRate	CoolCompAirTO	CoolExhRate

Refer to Spray cooling (parameter), Page 180 for more information on the specific parameters.

This equipment is not available for the VX-40 device.

3.4.58 Accessories Baskets, buckets and tubs

Depending on the application, appropriate accessories are available for loading the devices. Baskets are suitable for loading sterilization items when using solid-state and liquid sterilisation. Buckets or tubs are used, for example, to prevent contamination of the sterilization chamber during waste sterilization.

3.4.59 Additional pressure sensor

An additional pressure sensor is installed as a supplement to the built-in pressure sensor. This makes it possible to carry out a comparison measurement. The measuring signal can be processed internally by the device program, or transmitted to an external signal analysis instrument.

3.4.60 Additional temperature sensor (PT-100)

An additional temperature sensor is installed in the sterilization chamber as a supplement to the built-in flexible temperature sensor. This makes it possible to carry out a comparison measurement in the same reference vessel. An additional reference measurement in another vessel can also be taken. The measuring signal can be processed internally by the device program, or transmitted to an external signal analysis instrument.

3.5 Technical data

3.5.1 Ratings plate

A ratings plate (type label) on each device specifies the exact name and serial number of the device. It also states the technical specifications valid for that particular device.

The ratings plate shown is an example. The specifications for your device may differ from this illustration.

Refer to Controls, sensors and ports, Page 20 for the location of the ratings plate.

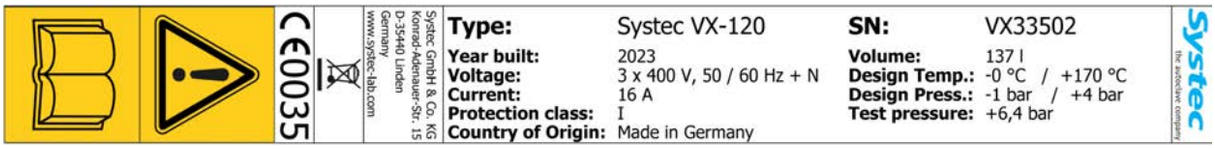


Figure 4: Ratings plate (an example)

Marking on ratings plate

Text / symbol	Meaning
Manufacturer's logo	Company logo of the manufacturer
Type	Device type
SN	Serial number of device
Year built	Year that device was manufactured
Volume	Volume of the sterilization chamber in litres or m³
Voltage	Input voltage (in V) and mains frequency (in Hz)
Design Temp.	Temperature range for processes within the sterilization chamber, in °C
Current	Input current, in A
Design Press.	Pressure range for operations inside the sterilization chamber, in bar
Protection class	Protection class
Test pressure	Pressure that the sterilization chamber can withstand, in bar
Country of origin	Country where the device was manufactured
Manufacturer / Production	Addresses of manufacturer and place of production
	Follow all special disposal instructions!
	Conformity mark
	Observe the safety instructions in the operating manual.

3.5.2 Measurements and weights

Type	VX-40	VX-65	VX-75	VX-95
Weight [kg]	130	145	150	160
Weight may vary depending on equipment!				
External dimension				
Width [mm]	550	550	550	550
Height [mm]	745	955	955	1085
Depth [mm]	815	815	815	815

Type	VX-100	VX-120	VX-150
Weight [kg]	190	195	205
Weight may vary depending on equipment!			
External dimension			
Width [mm]	650	650	650
Height [mm]	990	990	1120
Depth [mm]	935	935	935

3.5.3 Sterilization chamber

Type	VX-40	VX-65	VX-75	VX-95
Depth of chamber [mm]	320	500	600	750
Chamber volume [l]	Nominal 40 Total 51	Nominal 65 Total 73	Nominal 75 Total 85	Nominal 95 Total 104
Inside diameter [mm]	400			
Operating pressure [bar]	-1/+4			
Operating temperature [°C]	-10/+170			
Test pressure [bar]	PED / China: 6.4 ASME / Korea Stamp: 5.2			
Validation connection	Tri-Clamp DN25 A50.5 ISO			

Type	VX-100	VX-120	VX-150
Depth of chamber [mm]	500	600	750
Chamber volume [l]	Nominal 100 Total 117	Nominal 120 Total 137	Nominal 150 Total 166
Inside diameter [mm]	500		
Operating pressure [bar]	-1/+4		
Operating temperature [°C]	-10/+170		
Test pressure [bar]	PED / China: 6.4 ASME / Korea Stamp: 5.2		
Validation connection	Tri-Clamp DN25 A50.5 ISO		

3.5.4 Steam generator

Type	VX-40	VX-65	VX-75	VX-95
Volume [l]	2.3 Standard (PED)	5.7 Standard (PED)		
	2.0 Standard (ASME)	5.3 Standard (ASME)		
Operating pressure [bar]	-1/+5			
Operating temperature [°C]	-0/+170			
Test pressure [bar]	8.0			

Type	VX-100	VX-120	VX-150
Volume [l]	5.7 Standard (PED)		
	5.3 Standard (ASME)		
Operating pressure [bar]	-1/+5		
Operating temperature [°C]	-0/+170		
Test pressure [bar]	8.0		

3.5.5 Other technical data

Type	VX-40	VX-65	VX-75	VX-95
Steam generation	Steam generator			
Temperature sensor	PT-100 class A (4-wire)			
Heat emission [W]	<400	<600	<650	<700
Noise emission [dB(A)]	<70			
Ambient conditions				
Temperature [°C]	4 – 50			
Humidity, in %	25 – 80			

Type	VX-100	VX-120	VX-150
Steam generation	Steam generator		
Temperature sensor	PT-100 class A (4-wire)		
Heat emission [W]	<700	<750	<800
Noise emission [dB(A)]	<70		
Ambient conditions			
Temperature [°C]	4 – 50		
Humidity, in %	25 – 80		

3.5.6 Controller

	All sizes
Type	Systec SPS
Control accuracy	
Temperature [K]	0.3
Pressure [kPa]	±5
Number of programs	Up to 100
Interfaces	
Network (RJ45)	Standard Cat 6 (max. 100 m)
USB (type A)	Standard (max. 500 mA)
	Memory size 128 MB to 128 GB
	Formatting FAT32

3.5.7 Materials and surfaces

Component	Material
Sterilization chamber insulation	Melamine resin foam
Steam generator insulation	Melamine resin foam
Door seal / barrier	Silicone
Accessories	ISO 1.4301 / AISI SS 304
Ultra-cooler	Copper, galvanically nickel-plated
Radial fan	ISO 1.4301 / AISI SS 304

3.5.8 Connection data

Type	VX-40
Electrical	
Standard	
Heating power [kW]	3.5
Steam quantity [kg/h]	4.7
1 x 230V + N + PE	16 A Schuko plug
Tolerance [%]	-10/+10
2 x 208 V + PE	16 A
Tolerance [%]	-0/+10
Reduced heat power	
Heating power [kW]	2.2
Steam quantity [kg/h]	2.9
1 x 230V + N + PE	10 A Schuko plug
Tolerance [%]	-10/+10
2 x 208 V + PE	16 A
Tolerance [%]	-0/+10
Reduced heat power	
Heating power [kW]	2.9
Steam quantity [kg/h]	3.9
1 x 230V + N + PE	13 A Schuko plug
Tolerance [%]	-10/+10
2 x 208 V + PE	16 A
Tolerance [%]	-0/+10

Type	VX-40
Frequency [Hz]	50/60
Protection class	1
Degree of protection	IP22
Notices ■ A mains disconnection device and an emergency stop switch are required on site. ■ The protective conductor must be connected to the main equipotential bonding of the building. ■ A residual current device is recommended.	
Drainage	
Connection [outer thread]	3/4" or Hose connector for DN 15 hose
Temperature controlled (adjustable) [°C]	70
Temperature resistance in case of failure [°C]	100
Height of port from the floor (UEFF) [mm]	≤ 400
Notices ■ A securely attached connection provided on-site is mandatory. ■ The drain must be fitted with a ventilation system on site.	
Demineralized water	
Connection [outer thread]	3/4"
Pressure [bar]	1 – 5
Temperature [°C]	5 – 40
Supply flow rate at 5 bar [l/min]	≥ 1
Alkali concentration [mmol/l]	≤ 0.02
Conductivity at 20°C [µS/cm]	0.1 – 15
Notice: We recommend the UltraSense option for conductivity less than 1 µS/cm.	
Unprocessed (tap) water	
Connection [outer thread]	3/4"
Pressure [bar]	1 – 5
Temperature (recommended < 20 °C) [°C]	5 – 40
Supply flow rate at 5 bar [l/min]	≥ 2
Quality	≤ 10° dH, ≤ 178 mg/l $CaCO_3$

Type	VX-40
Notice: A backflow preventer complying with the laboratory's safety regulations must be installed.	
Compressed air	
Connection	DN 7.2
Pressure [bar]	7
Temperature [°C]	5 – 40
Supply flow rate at 5 bar [l/min]	70
Quality	DIN ISO 8573-1:2010 [4:4:4] or better
Cooling circuit provided on-site (customer)	
Connection [outer thread]	3/4"
Pressure [bar]	0.5 – 5
In-flow temperature (recommended < 20 °C) [°C]	5 – 40
Supply flow rate at 5 bar [l/min]	≥ 2
Average cooling capacity [kW]	≈ 4
Peak cooling capacity [kW]	≤ 12
Quality	≤ 10° dH, 178 mg/l $CaCO_3$
Notice: All wet media used must be colourless, clear and free of particles.	

Type	VX-65	VX-75	VX-95
Electrical			
External steam / black steam			
Heating power [kW]		-	
Steam quantity [kg/h]		-	
1 x 230V + N + PE		16 A Schuko plug	
Tolerance [%]		-10/+10	
2 x 208 V + PE		16 A	
Tolerance [%]		-0/+10	
Standard			
Heating power [kW]		9	
Steam quantity [kg/h]		≤ 12	
3 x 400V + N + PE		16 A CEE	
Tolerance [%]		-10/+10	
3 x 208 V + PE		25 A	

Type	VX-65	VX-75	VX-95
Tolerance [%]		-0/+10	
Extended heating power			
Heating power [kW]		13.8	
Steam quantity [kg/h]		≤ 18.4	
3 x 400V + N + PE		32 A CEE	
Tolerance [%]		-10/+10	
3 x 208 V + PE		50 A	
Tolerance [%]		-0/+10	
Frequency [Hz]		50/60	
Protection class		1	
Degree of protection		IP22	
Notices ■ A mains disconnection device and an emergency stop switch are required on site. ■ The protective conductor must be connected to the main equipotential bonding of the building. ■ A residual current device is recommended.			
Drainage			
Connection [outer thread]		3/4" or Hose connector for DN 25 hose	
Temperature controlled (adjustable) [°C]		70	
Temperature resistance in case of failure [°C]		100	
Height of port from the floor (UEFF) [mm]		≤ 400	
Notices ■ A securely attached connection provided on-site is mandatory. ■ The drain must be fitted with a ventilation system on site.			
Demineralized water			
Connection [outer thread]		3/4"	
Pressure [bar]		1 – 5	
Temperature [°C]		5 – 40	
Supply flow rate at 5 bar [l/min]		≥ 1	

Type	VX-65	VX-75	VX-95
Supply flow rate at 5 bar [l/min] (with soft water sprinkler)		≥ 10	
Alkali concentration		≤ 0.02 mmol/l	
Conductivity at 20°C [µS/cm]		0.1 – 15	
Notice: We recommend the UltraSense option for conductivity less than 1 µS/cm.			
Unprocessed (tap) water			
Connection [outer thread]		3/4"	
Pressure [bar]		1 – 5	
Temperature (recommended < 20 °C) [°C]		5 – 40	
Supply flow rate at 5 bar [l/min]		≥ 2	
Quality		≤ 10° dH, ≤ 178 mg/l $CaCO_3$	
Notice: A backflow preventer complying with the laboratory's safety regulations must be installed.			
Compressed air			
Connection		DN 7.2	
Pressure [bar]		7	
Temperature [°C]		5 – 40	
Supply flow rate at 5 bar [l/min]		70	
Quality		DIN ISO 8573-1:2010 [4:4:4] or better	
Cooling circuit provided on-site (customer)			
Connection [outer thread]		3/4"	
Pressure [bar]		0.5 – 5	
In-flow temperature (recommended < 20 °C) [°C]		5 – 40	
Supply flow rate at 5 bar [l/min]		≥ 2	
Average cooling capacity [kW]		≈ 4	
Peak cooling capacity [kW]		≤ 12	
Quality		≤ 10° dH, ≤ 178 mg/l $CaCO_3$	
Notice: All wet media used must be colourless, clear and free of particles.			

Type	VX-65	VX-75	VX-95
Auxiliary steam			
Connection [outer thread]	3/4“, conical seal		
Steam pressure [bar]	5.5 - 6 or 15% above process pressure		
Required steam quantity [kg/h]	≥ 18.4		
Quality	Pure steam from demineralized water; operating with non-sterile (black) steam is not permitted.		
Notices: ■ A condensation trap and a manometer are required on site. ■ The specified printing specifications must be adhered to. If the pressure is different, a pressure controller must be provided by the operator. ■ The pressure range is specified as absolute pressure.			
Black steam			
Connection [outer thread]	3/4" conical seal		
Steam pressure [bar]	5		
Required steam quantity [kg/h]	≥ 18.4		
Temperature [°C]	≈ 150		

Type	VX-100	VX-120	VX-150
Electrical			
External steam / black steam			
Heating power [kW]	-		
Steam quantity [kg/h]	-		
1 x 230V + N + PE	16 A Schuko plug		
Tolerance [%]	-10/+10		
2 x 208 V + PE	16 A		
Tolerance [%]	-0/+10		
Standard			
Heating power [kW]	9		
Steam quantity [kg/h]	≤ 12		
3 x 400V + N + PE	16 A CEE		
Tolerance [%]	-10/+10		
3 x 208 V + PE	25 A		
Tolerance [%]	-0/+10		

Type	VX-100	VX-120	VX-150
Extended heating power			
Heating power [kW]		13.8	
Steam quantity [kg/h]		≤ 18.4	
3 x 400V + N + PE		32 A CEE	
Tolerance [%]		-10/+10	
3 x 208 V + PE		50 A	
Tolerance [%]		-0/+10	
Frequency [Hz]		50/60	
Protection class		1	
Degree of protection		IP22	
Notices ■ A mains disconnection device and an emergency stop switch are required on site. ■ The protective conductor must be connected to the main equipotential bonding of the building. ■ A residual current device is recommended.			
Drainage			
Connection [outer thread]		3/4" or Hose connector for DN 25 hose	
Temperature controlled (adjustable) [°C]		70	
Temperature resistance in case of failure [°C]		100	
Height of port from the floor (UEFF) [mm]		≤ 400	
Notices ■ A securely attached connection provided on-site is mandatory. ■ The drain must be fitted with a ventilation system on site.			
Demineralized water			
Connection [outer thread]		3/4"	
Pressure [bar]		1 – 5	
Temperature [°C]		5 – 40	
Supply flow rate at 5 bar [l/min]		≥ 1	
Supply flow rate at 5 bar [l/min] (with soft water sprinkler)		≥ 10	

Type	VX-100	VX-120	VX-150
Alkali concentration		≤ 0.02 mmol/l	
Conductivity at 20°C [µS/cm]		0.1 – 15	
Notice: We recommend the UltraSense option for conductivity less than 1 µS/cm.			
Unprocessed (tap) water			
Connection [outer thread]		3/4"	
Pressure [bar]		1 – 5	
Temperature (recommended < 20 °C) [°C]		5 – 40	
Supply flow rate at 5 bar [l/min]		≥ 2	
Quality		≤ 10° dH, ≤ 178 mg/l $CaCO_3$	
Notice: A backflow preventer complying with the laboratory's safety regulations must be installed.			
Compressed air			
Connection		DN 7.2	
Pressure [bar]		7	
Temperature [°C]		5 – 40	
Supply flow rate at 5 bar [l/min]		70	
Quality		DIN ISO 8573-1:2010 [4:4:4] or better	
Cooling circuit provided on-site (customer)			
Connection [outer thread]		3/4"	
Pressure [bar]		0.5 – 5	
In-flow temperature (recommended < 20 °C) [°C]		5 – 40	
Supply flow rate at 5 bar [l/min]		≥ 2	
Average cooling capacity [kW]		≈ 4	
Peak cooling capacity [kW]		≤ 12	
Quality		≤ 10° dH, ≤ 178 mg/l $CaCO_3$	
Notice: All wet media used must be colourless, clear and free of particles.			

Type	VX-100	VX-120	VX-150
Auxiliary steam			
Connection [outer thread]	3/4“, conical seal		
Steam pressure [bar]	5.5 - 6 or 15% above process pressure		
Required steam quantity [kg/h]	≥ 18.4		
Quality	Pure steam from demineralized water; operating with non-sterile (black) steam is not permitted.		
Notices: ■ A condensation trap and a manometer are required on site. ■ The specified printing specifications must be adhered to. If the pressure is different, a pressure controller must be provided by the operator. ■ The pressure range is specified as absolute pressure.			
Black steam			
Connection [outer thread]	3/4" conical seal		
Steam pressure [bar]	5		
Required steam quantity [kg/h]	≥ 18.4		
Temperature [°C]	≈ 150		

4 User interface (GUI)

4.1 Menu structure

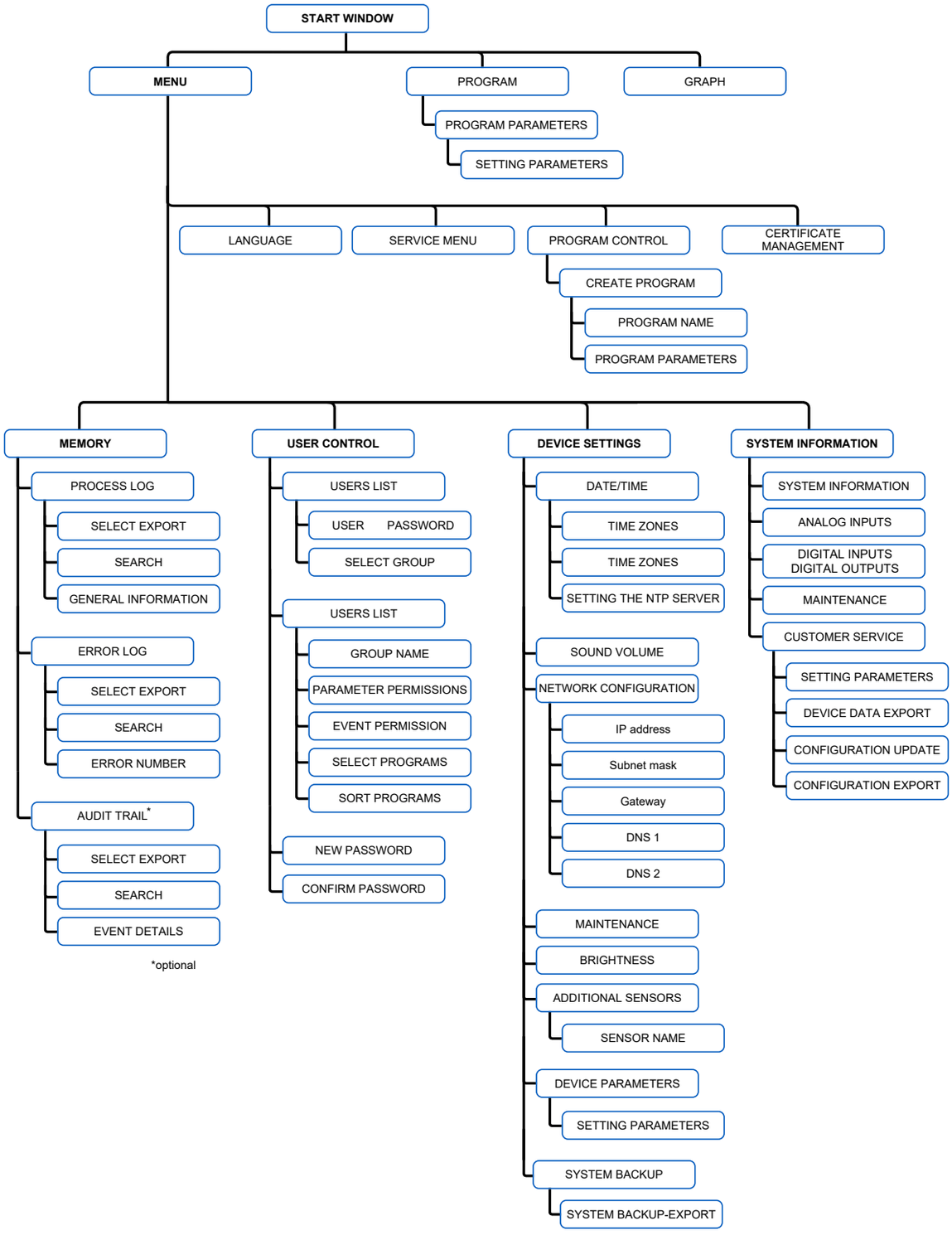


Figure 5: Menu structure

4.2 Window structure and general buttons

The windows-based user interface of the operating program is divided into several functional areas. The basic structure of almost all windows is the same, as is the position of certain buttons and displays.

Figure 6: Areas and functions in the windows (an example)

A	Header	C	Buttons with standard functions
B	Window-specific buttons	D	Window-specific contents

4.2.1 Header

Depending on the specific window, one or more of the following items will appear in the header:

- Window name and possibly additional information. The window name may differ from the text of the menu button that leads to this window.
- Program number and name
- Time
- Load (run) number
- Number of entries in the selection lists
- Run time

4.2.2 Buttons

Buttons displayed in the windows can be either enabled or disabled, depending on the user group or the operating state of the device. This button status is indicated by the button's colour. There is graphical and acoustic feedback when you press a button: the buttons changes colour and a button tone is emitted.

Button	Status
	Button is enabled.
	Button is being pressed. The button tone sounds for confirmation.
	Button is disabled.

4.2.2.1 Buttons with standard functions

Buttons with standard functions are always displayed in the window area. They fulfil the same functions in many windows, so they are only described here once. They are not explained for each window description.

Button	Function
	Invokes the Start window from any window.
	Confirms the input or action.
	Back: Invokes the last displayed window.
	Edits/changes entries.
	Saves changes.
	■ Moves up or down through lists or functions. ■ Changes specific values in input fields.
	Scrolls a page up or down in lists.
	Exports saved data.
	Search / Delete search.

Button	Function
	Changes the language of the virtual keyboard.
	Enables or disables a function, property or parameter.

4.2.2.2 Windows-specific buttons and content

Window-specific buttons are always displayed on the right side of the window. Window-specific content is shown in the left/middle area of the windows and is unique to each window.

A description of the individual functions and content can be found in the corresponding window descriptions.

4.3 Start window

After the device is switched on, the start window is always displayed on the touch screen while in standby mode. After a program is started, the start window displays the new functions that are available.

4.3.1 Start window before program start

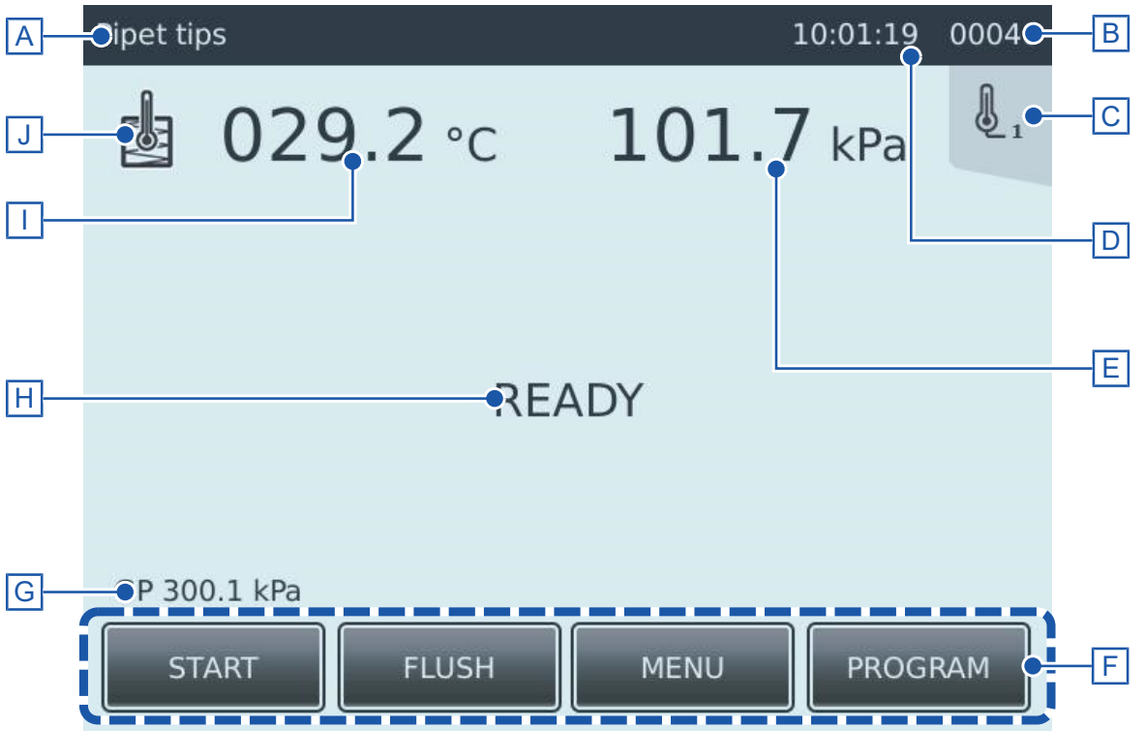


Figure 7: Start window before program start

A	Program number and name (possibly with additional name)	F	Function and menu buttons
B	Load (run) number (increases with each batch run)	G	Current pressure in steam generator
C	Symbols in the program status column. Depending on the selected program, specific symbols are displayed in the program status column.	H	Display field containing instructions, error messages or status information
D	Current Time	I	Current temperature of the selected control sensor
E	Current pressure in the sterilization chamber	J	A symbol representing the selected control sensor

Button / icon	Function
	Versatile, permanently mounted temperature sensor, which is used as a control sensor for reference temperature measurements.
	Permanently installed temperature sensor in the exhaust air filter.
	Displays the number of flexible temperature sensors in the sterilization chamber that regulate the control of the selected program.
	Indicates that the sterilization phase of the last cycle was successfully completed and no door has been opened since then.
	Displays the Keep warm function after program finishes.
	Indicates that the sterilization chamber is already preheated before the program starts.
	Indicates that before the next program start, a query is made whether the program will automatically be executed several times in succession.
	Indicates that the door will be opened automatically after a successful program cycle. Indicates, for pass-through autoclaves, which door should be opened.
START	Start the selected program.
STOP	Cancel current program (in operation).
OPEN	Unlock the door.
MENU	Show the main menu. More information can be found in section Main menu, Page 79.
PROGRAM	Display the PROGRAM LIST window for selecting a specified program. More information can be found in section PROGRAM LIST window , Page 78.
DELETE	This button is displayed instead of START whenever an error message appears. Press DELETE to acknowledge the displayed error message and deactivate the error tone. More information can be found in section Troubleshooting, Page 189.
FLUSH	This button is displayed instead of OPEN if the water level sensor is still sensing condensate in the sterilization chamber after unsuccessful sterilization. Press FLUSH to flush out the condensate.

4.3.2 Start window after the program start

During operation, the program cycle is displayed and constantly updated on the Start window. A chart of the program cycle indicating the pressure and temperature changes can be displayed.

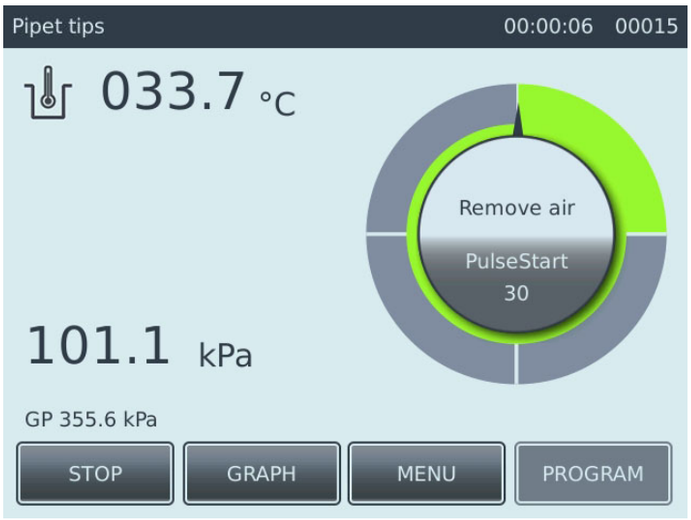


Figure 8: Start window during operations

Button	Function
STOP	Cancel the program. More information can be found in section Cancelling the program, Page 108.
GRAPH	Displays a chart showing the program cycle with the pressure and temperature curves (refer to Program information during operation, Page 77).
MENU	Show the main menu. More information can be found in section Main menu, Page 79.
PROGRAM	Display the PROGRAM LIST window for selecting a specified program. More information can be found in section PROGRAM LIST window , Page 78.

4.3.3 Program information during operation

From the Start window, you can press the GRAPH button to display a graph that shows the program cycle with the pressure and temperature curves during operation.

Figure 9: GRAPH window (during operation)

Button	Function
PROCESS	Go from the GRAPH window back to the Start window (after the program has started).

4.4 PROGRAM LIST window

Use the Program button to open the PROGRAM LIST window from the Start window.

All created programs will be displayed in the PROGRAM LIST window. You can select a suitable program for the sterilization process here. The key Program parameters for the selected program are displayed clearly. The Program parameters can be edited here.

Programs may only be selected during standby mode and not while the device is running.

Figure 10: PROGRAM LIST window

Button / display	Function
	Edit the Program parameters for the selected program. More information can be found in section Displaying and changing Program parameters, Page 167.

4.5 Main menu

The main menu is the central starting point for all activities that are part of the daily routine. You can access additional menus and windows: such as the basic settings for user accounts and programs, or the display of errors and event logs (the Audit Trail).

Figure 11: Main menu

Button	Function	
Language	Open the LANGUAGE window to select the displayed language.	
User control	Opens the USER CONTROL menu. You can access the following windows here:	
	USERS LIST	Displays, creates, changes and deletes user accounts.
	GROUP LIST	Displays, creates, changes and deletes user groups.
	Change password	Changes your own password.
Device settings	Opens the DEVICE SETTINGS menu. You can access the following windows here:	
	DATE/TIME	Set the system time.
	BRIGHTNESS	Adjust the Brightness of the touch display.
	SOUND VOLUME	Set the volume for the system sounds.
	ADDITIONAL SENSORS	Gives an activated, additional temperature sensor a customized name.
	IP CONFIGURATION	Makes network settings.
	DEVICE PARAMETERS	Carry out basic Device settings.
	MAINTENANCE	View the device's current maintenance information and reset the maintenance counter.

Button	Function	
Service Menu	Open the SERVICE MENU. The SERVICE MENU can only be opened by service technicians authorized by Systec.	
Memory	Opens the MEMORY menu. You can access the following windows here:	
	PROCESS LOG	Displays run reports.
	ERROR LOG	Displays error logs.
	AUDIT TRAIL	Display event logs (Audit Trail). This window is available as an option.
Program control	Opens the PROGRAM CONTROL window. In this window you can create, change and delete programs.	
Certificate management	Opens the CERTIFICATE MANAGEMENT window. You can manage certificates in this window.	
System information	Opens the SYSTEM INFORMATION menu. The SYSTEM INFORMATION menu has the following sub-menus:	
	General	Displays the device information, such as device type, serial number, and network settings in the SYSTEM INFORMATION window.
	Analog inputs	Display the current operating data from the analog sensors in the ANALOG INPUTS window.
	Digital I/O	Display the current operating data from the digital inputs and outputs in the DIGITAL INPUTS / DIGITAL OUTPUTS window.
	Maintenance	The MAINTENANCE window displays information about the current maintenance status of the device.
	Customer service	Opens the CUSTOMER SERVICE menu. Here you can access additional windows for configuration updates and exporting data.

4.5.1 LANGUAGE window

In the LANGUAGE window, you can set the language displayed on the touch screen and the print language for the print-outs.

For a description of this window and related instructions, refer to Selecting the display language, Page 139.

4.5.2 USER CONTROL menu

In the USER CONTROL, you can access other menus and program functions for managing user accounts and user groups.

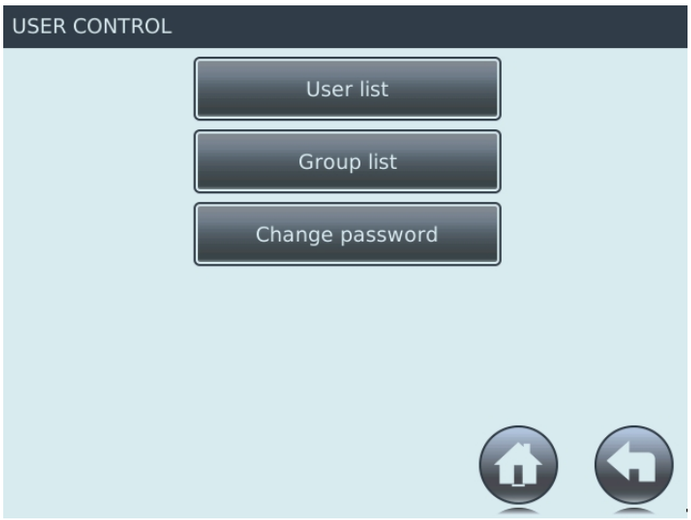


Figure 12: USER CONTROL menu

Button	Function
User list	Opens the USERS LIST window for user control. User control, Page 144
Group list	Opens the GROUP LIST window for user group control. User control, Page 144
Change password	Opens the NEW PASSWORD window to change your own password. Change password, Page 161

4.5.2.1 USERS LIST window

You can create, edit, delete and lock user accounts in the USERS LIST window.

Figure 13: USERS LIST window

Button	Function
	Creates a new user account. Creating a new user, Page 155
	Edits a user account. Edit user, Page 157
	Deletes a user account. Delete user, Page 159
	Locks or unlocks user account. Locking/unlocking users, Page 158

4.5.2.2 GROUP LIST window

You can create, edit and delete user groups in the GROUP LIST window.

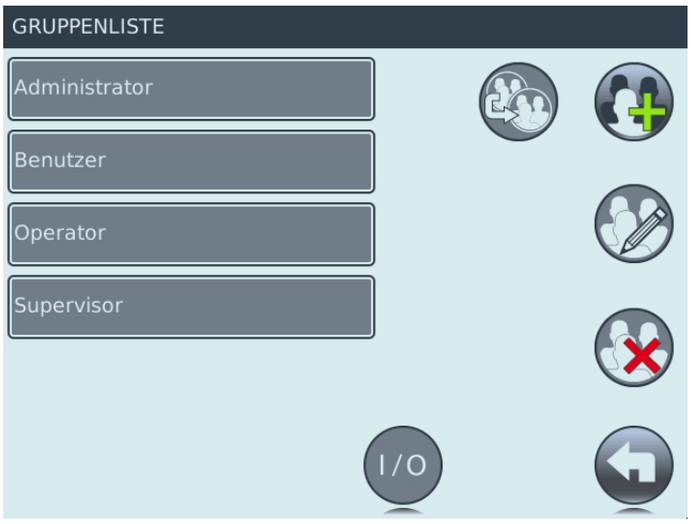


Figure 14: GROUP LIST window

Button	Function
	Copies a user group. Creating a new user group, Page 147
	Creates a new user group. Creating a new user group, Page 147
	Edits a user group. Editing a user group, Page 152
	Deletes a user group. Deleting a user group, Page 154

4.5.3 DEVICE SETTINGS menu

In the DEVICE SETTINGS, you can access additional windows and program functions for configuring the device.

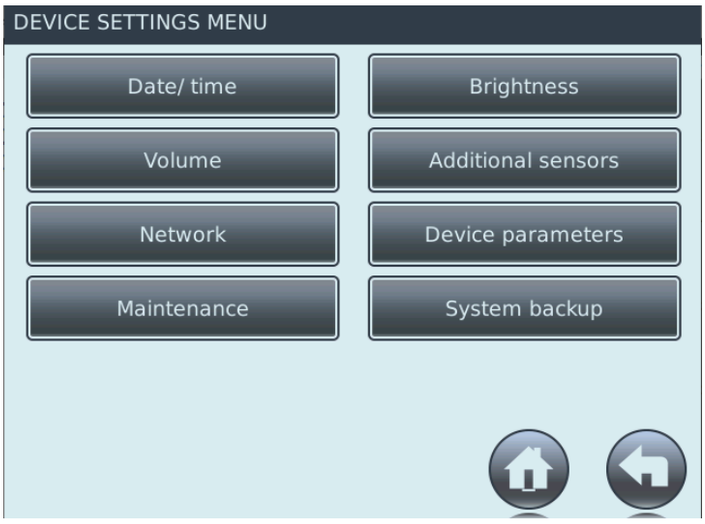


Figure 15: DEVICE SETTINGS menu

Button	Function
Date/Time	Set the system time. Changing the date and time, Page 139
Sound Volume	Sets the Sound Volume. Setting the Sound Volume, Page 169
Network	Makes network settings. Network settings, Page 126
Maintenance	Displays the device's current maintenance information and resets the maintenance counter. Resetting the counters in the MAINTENANCE window, Page 188
Brightness	Adjusts the Brightness of the touch display. Setting the Brightness, Page 143
Additional sensors	Gives an activated, additional temperature sensor an individual name. Naming the Additional sensors, Page 125
Device parameters	Carries out basic Device settings. Setting the Device parameters, Page 127
System backup	Exports the current system configuration file to a USB flash drive. Creating aSystem backup, Page 132

4.5.3.1 DATE/TIME window

In the DATE/TIME window, you can enter the system date and time and configure a connection to a time server.

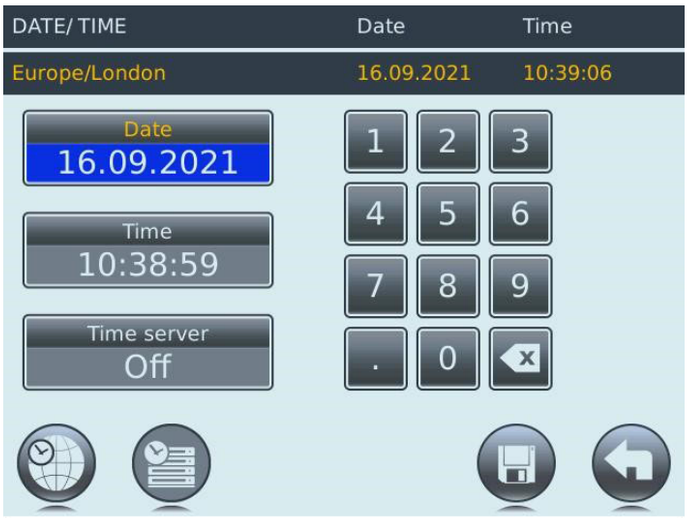


Figure 16: DATE/TIME window

Button	Function
	Selects the time zone for the time setting. Selecting the time zone, Page 140
	Uses the time server to set the time. Using the time server, Page 142

4.5.3.2 SOUND VOLUME window

In the SOUND VOLUME window, you can adjust the volume of the audio output on the touch screen.

If the Sound Volume is OFF, all system sounds (button sounds, door opening sound and error tone) are no longer audible.

For a description of this window and related instructions, refer to Setting the Sound Volume, Page 169.

4.5.3.3 NETWORK CONFIGURATION window

In the NETWORK CONFIGURATION window, you can configure the machine's network settings.

For a description of this window and related instructions, refer to Network settings, Page 126.

4.5.3.4 MAINTENANCE window

The MAINTENANCE window displays information about the current maintenance status of the device. The maintenance counters can be reset here.

For a description of this window and related instructions, refer to Resetting the counters in the MAINTENANCE window, Page 188.

4.5.3.5 BRIGHTNESS window

You can adjust the brightness of the touch screen in the BRIGHTNESS window.

For a description of this window and related instructions, refer to Setting the Brightness, Page 143.

4.5.3.6 ADDITIONAL SENSORS window

In the ADDITIONAL SENSORS window, you can define and name additional temperature sensors.

For a description of this window and related instructions, refer to Naming the Additional sensors, Page 125.

4.5.3.7 DEVICE PARAMETERS window

In the DEVICE PARAMETERS window, you can configure various Device settings.

For a description of this window and related instructions, refer to Setting the Device parameters, Page 127.

4.5.3.8 SYSTEM BACKUP window

In the SYSTEM BACKUP window, the current device configuration can be exported to a USB flash drive in order to backup data. Device configurations previously stored on the the USB flash drive can be deleted.

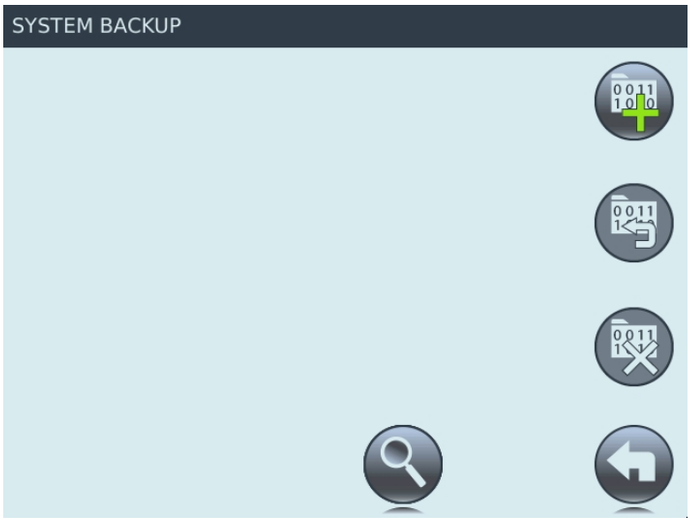


Figure 17: SYSTEM BACKUP window

Button	Function
	Perform a system backup. Creating aSystem backup, Page 132
	Deletes a system backup. Deleting aSystem backup, Page 134

4.5.4 SERVICE MENU

In the SERVICE MENU, service technicians authorized by Systec can access other sub-menus and windows to display or change the device parameters and the operating parameters.

Figure 18: SERVICE MENU

4.5.5 MEMORY menu

You can access additional windows with process, error, and event logs from the MEMORY menu.

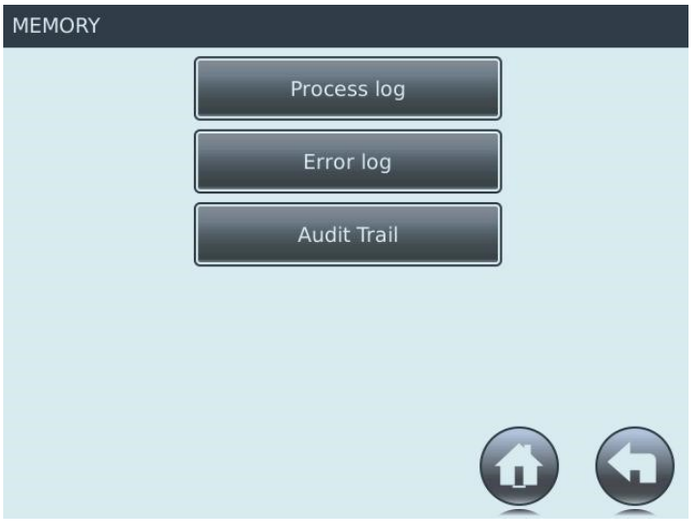


Figure 19: Memory menu

Button	Function
Process log	Opens the PROCESS LOG window.
Error log	Opens the ERROR LOG window.
Audit Trail	Opens the AUDIT TRAIL window. This window is available as an option.

4.5.5.1 PROCESS LOG window

The logs of previous cycles are saved in the PROCESS LOG window. The saved data corresponds to the information on the printed log. It can be printed again if necessary.

The program cycle data can be searched according to various criteria (e.g. Date or Load (run) number) and the data can then be exported.

For more information about the data on the printout, refer to section Printer, Page 39.

Figure 20: PROCESS LOG window

Button / display	Function
Column 1 – 4	Load (run) number, program number and name, Time and Date.
	Search function. Search cycles according to Date or Load (run) number, and display the results in a list.
	Exit the search results list.
	Export the displayed or selected data in the CSV or PDF format. Exporting logs / lists / search results, Page 119

4.5.5.2 ERROR LOG window

The error messages that have occurred are saved and displayed in the ERROR LOG window. The error messages with all detailed information can also be printed out (as an error log).

The program cycle data can be searched according to various criteria (e.g. Date or Load (run) number).

Figure 21: ERROR LOG window

Button / display	Function	
Column 1 – 4	Load (run) number, message text, Time and Date.	
	The Error ID menu displays additional error information (General info, status of the analog and digital inputs/outputs at the time of error, Hardware status).	
	General info	View additional information about the error in the General info window.
	Analog I/O	Data from the analog sensors (e.g. pressure, temperature) at the time of the error is displayed in the Analog I/O window.
	Digital I/O	The data for the digital inputs and outputs (.g. status of valves, pumps, and switches) at the time of the error are displayed in the Digital I/O window.
	Hardware status	Displays all status messages from the analog circuit board.
	Search function. Search for errors according to Date or Load (run) number, and display the results in a list.	
	Exit the search results list.	
	Export the displayed or selected data in the CSV or PDF format. Exporting logs / lists / search results, Page 119	

4.5.5.3 AUDIT TRAIL window

This window is the software function of the optional Audit Trail function. Audit Trail , Page 36

In the Audit Trail window, all events and their relevant user information are saved.

Audit Trail events are:

- Managing user groups and users (create, change, delete)
- Managing programs (create, change, delete)
- Changing the Program parameters
- Starting/stopping a program
- Resetting the service counter
- Setting the Date and Time
- Acknowledge an error
- Opening the door
- Emptying the sterilization chamber
- Calibrating and resetting sensors
- Updating software

Figure 22: Audit Trail window

Button / display	Function
Column 1 – 4	User name, event, Time and Date.
 	Search function. Search for events according to Date, and display the results in a list. Exit the search results list.
	Displays additional information about the event in the EVENT DETAILS window.
	Exports the displayed or selected data in the CSV or PDF format. Exporting logs / lists / search results, Page 119

4.5.5.3.1 EVENT DETAILS window

After selecting and confirming an event in the AUDIT TRAIL window, the associated saved data are displayed:

- Device type
- Device serial number
- Date / Time (time of occurrence)
- Associated user (if available)
- Load (run) number
- Event type
- Affected device component
- Reason (reason of change)

Figure 23: EVENT DETAILS window (Audit Trail)

4.5.6 PROGRAM CONTROL window

All created programs will be displayed in the PROGRAM CONTROL window. Programs can be created, edited, deactivated or deleted here.

Figure 24: PROGRAM CONTROL window

Button / display	Function
	Creates a new program. Creating a new program, Page 162
	Edits a program. Edit program, Page 164
	Deletes a program. Delete program, Page 165
	Enables and disables a program. Deactivate / activate program, Page 165

4.5.7 CERTIFICATE MANAGEMENT window

The device's certificate chains can be managed in the CERTIFICATE MANAGEMENT window.

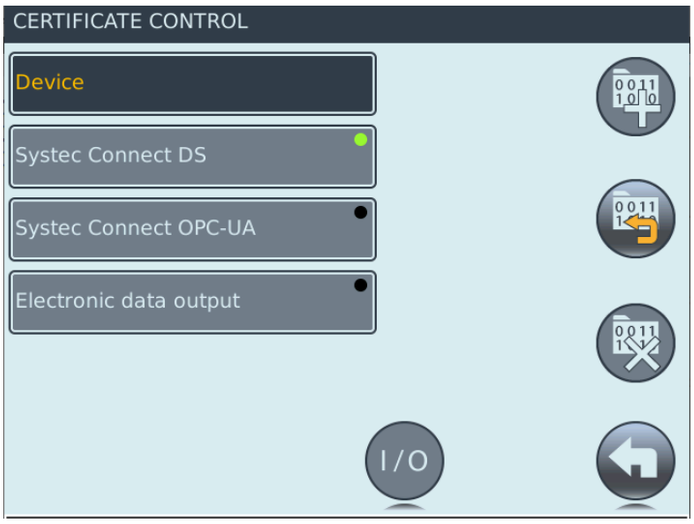


Figure 25: CERTIFICATE MANAGEMENT window

Button	Function
	Install certificate. Installing certificates, Page 135
	Exports a certificate. Exporting certificates, Page 136
	Deletes a certificate. Deleting certificates, Page 138
	Enables and disables a certificate. Activating / deactivating certificates, Page 136

More information on certificates can be found in section Systec Connect, Page 52.

4.5.8 SYSTEM INFORMATION menu

In the SYSTEM INFORMATION menu, you can access additional windows with information about the device as well as digital and analog inputs and outputs.

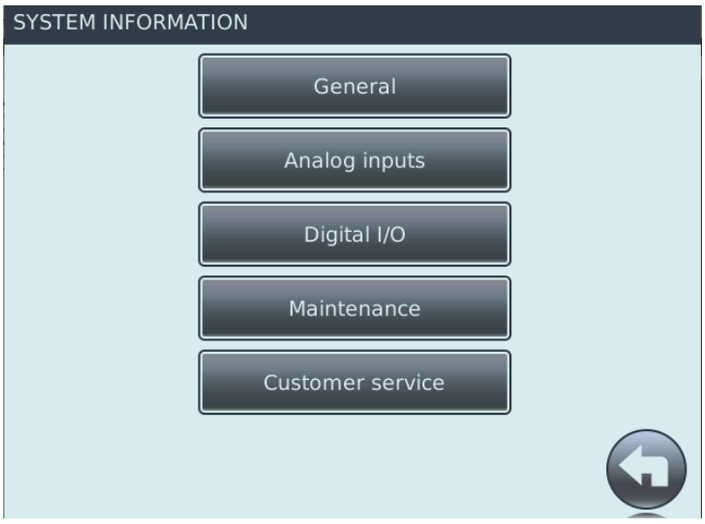


Figure 26: SYSTEM INFORMATION menu

Button	Function
General	Opens the SYSTEM INFORMATION window.
Analog inputs	Opens the ANALOG INPUTS window.
Digital I/O	Opens the DIGITAL INPUTS / DIGITAL OUTPUTS window.
Maintenance	The MAINTENANCE window displays information about the current maintenance status of the device.
Customer service	Opens the CUSTOMER SERVICE menu.

4.5.8.1 SYSTEM INFORMATION window

The SYSTEM INFORMATION window displays detailed information on several screens about the manufacturer, your device, and the software versions installed.

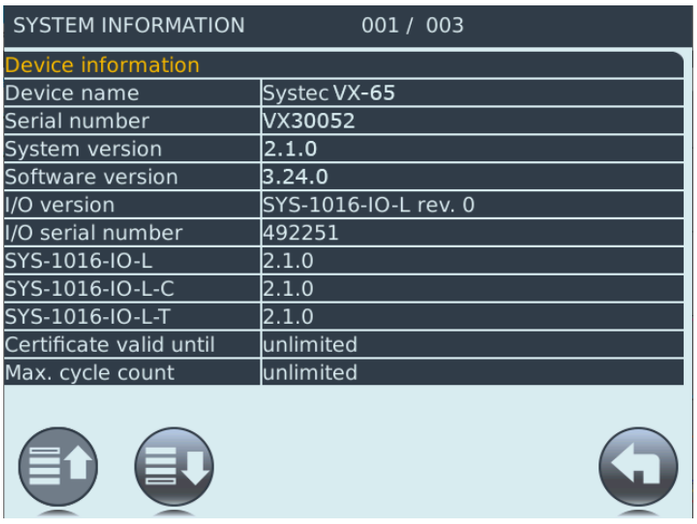


Figure 27: SYSTEM INFORMATION window

4.5.8.2 ANALOG INPUTS window

In the ANALOG INPUTS window, the current operating data from the analog sensors are displayed (sensor name, measured value and unit).

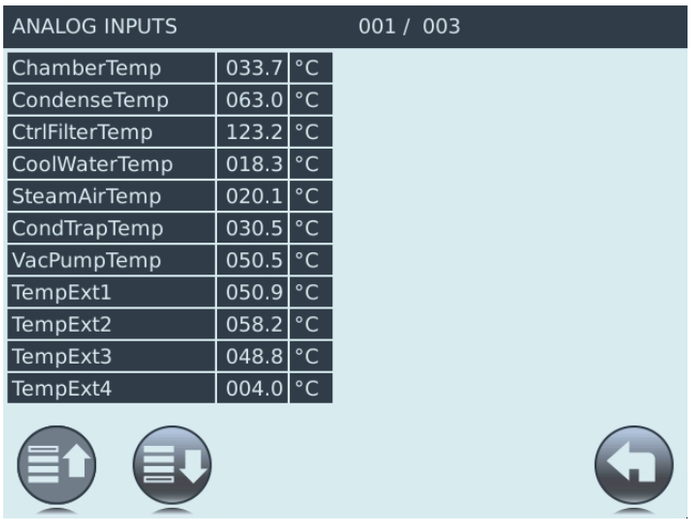


Figure 28: ANALOG INPUTS window

If an error occurs during operation, the data displayed in the ANALOG INPUTS window at the time of the error are stored together with the error message.

4.5.8.3 DIGITAL INPUTS / DIGITAL OUTPUTS window

The current operating data from the digital inputs and outputs are displayed in the DIGITAL INPUTS / DIGITAL OUTPUTS window (e.g. status of valves, pumps and switches).

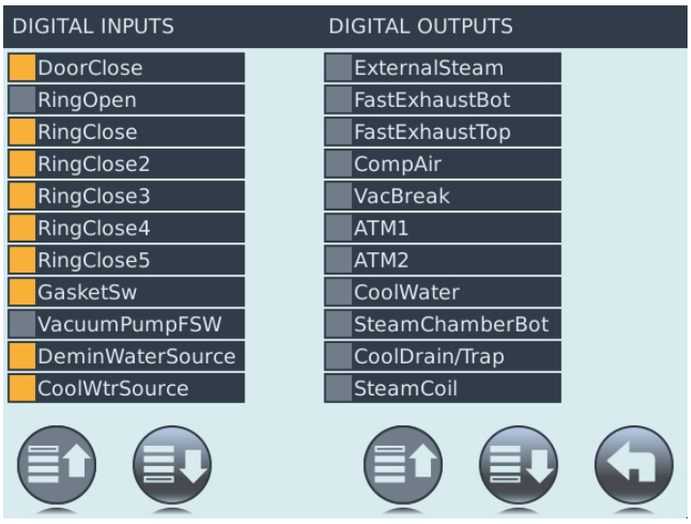


Figure 29: DIGITAL INPUTS / DIGITAL OUTPUTS window

Display	Function
Yellow	Digital I/O enabled.
Grey	Digital I/O disabled.

If an error occurs during operation, the data displayed in the DIGITAL INPUTS / DIGITAL OUTPUTS window at the time of the error are stored together with the error message.

4.5.8.4 MAINTENANCE window

The MAINTENANCE window displays information about the current maintenance status of the device.

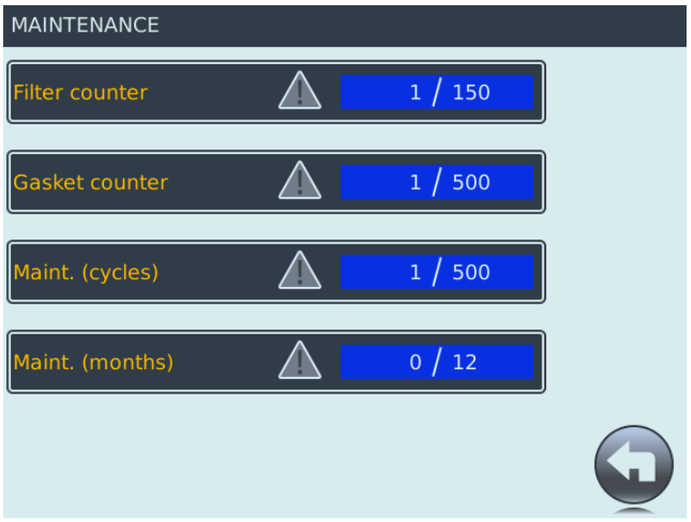


Figure 30: Maintenance window

4.5.8.5 CUSTOMER SERVICE menu

In this menu, you can access additional windows for updating and exporting data.

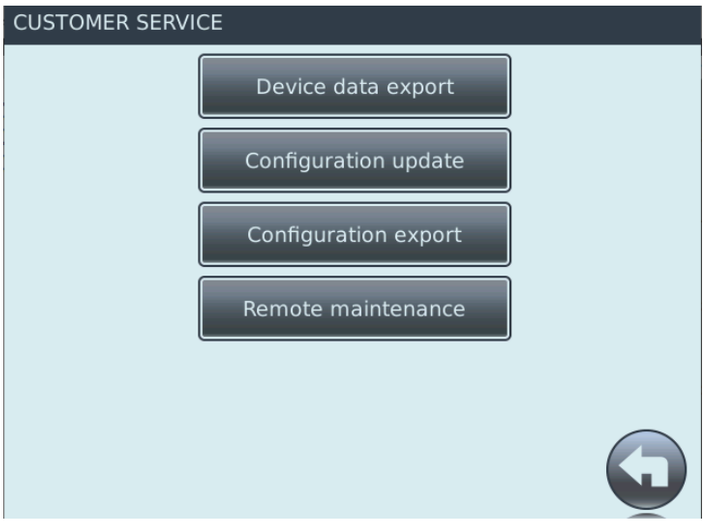


Figure 31: CUSTOMER SERVICE menu

Button	Function
Device data export	Exports the device data to a USB flash drive. Exporting the device data, Page 129
Configuration update	Installs configuration files from a USB flash drive. Installing a Configuration update, Page 130
Configuration export	Exports the configuration file to a USB flash drive. Exporting a configuration, Page 131
Remote maintenance	Button without function.

4.5.8.5.1 SETTING PARAMETERS window

You can export device data in the SETTING PARAMETERS window.

For a description of this window and related instructions, refer to Exporting the device data, Page 129.

4.5.8.5.2 CONFIGURATION UPDATE window

In the CONFIGURATION UPDATE window, you can install a new device configuration from the USB flash drive.

For a description of this window and related instructions, refer to Installing a Configuration update, Page 130.

4.5.8.5.3 CONFIGURATION EXPORT window

In the CONFIGURATION EXPORT window, you can export an existing device configuration to the USB flash drive.

For a description of this window and related instructions, refer to Exporting a configuration, Page 131.

5 Routine operation

1 Ensure all means of supply and disposal
2 Switch on the device
3 Open door if necessary
4 Check the sterilization chamber
5 Load the device
   - Load the device with liquids
   - Load the device with solids
   - Load the device with solid waste
   - Using the loading systems for loading
6 Close the door
7 Select and start the program
8 Cancel the program
9 Respond to error messages during operation
10 Open the door to the end of the program
11 Unload the device
12 Archive the printed logs (optional)
13 Clean the device (after each cycle)
14 Switch off the device
15 Switch off the supply connections

5.1 Ensure all means of supply and disposal

Ensure that all necessary supply and disposal lines are connected.

- Drainage
- Power supply
- Unprocessed (tap) water
- Cooling circuit (optional)
- Demineralized water
- Aqua-stop (optional)
- External steam supply (optional)
- Compressed air (optional)

The connections may differ depending on your device.

The possible connection areas are shown in sectionControls, sensors and ports, Page 20.

Ensure that all necessary communication lines and storage media for your device are connected.

- RS-45 interface

5.2 Switch on the device

1 If necessary, switch on the external steam, water and compressed air supplies.

2 Make sure that the Aqua-stop mechanism has not triggered.

3 Switch on the device using the main switch.

5.3 Check the sterilization chamber

1 Before starting the program cycle, check the sterilization chamber for impurities (glass splinters, sterilization material that has leaked out, etc.).

2 Remove any impurities in the correct manner.

3 You must remove any contaminants from the dirt trap immediately.

Refer to section Cleaning the device (after each program sequence), Page 112 for the cleaning instructions.

5.4 Load the device

5.4.1 Load the device with waste bags

⚠ WARNING

Danger of explosion when sterilizing liquid waste!

The sterilization of liquid waste in the solid waste programs causes dangerous boiling delays or exploding vessels and can result in serious injuries.

- Only sterilize laboratory waste in solid form and with only a small proportion of liquid (less than 50 ml).
- Use the appropriate programs for sterilizing liquid wastes.

⚠ CAUTION

Risk of injury!

Containers fully loaded with sterilization material may be very heavy.

- Unload the loaded containers (at least partially) before manually lifting them in or out; this will minimize the risks of injuries or material damage.
- Use a suitable lifting device for loading and unloading heavy sterilization materials (> 25 kg).

NOTICE

Insufficient sterilization may result from incomplete air extraction!

For an optimal result, the steam must reach all parts of the sterilization material. Overloading the device can lead to insufficient air extraction and may cause malfunctions.

- Reliable sterilization can only be achieved on devices equipped with a vacuum unit.
- Do not overload the device.
- Do not overfill the containers. The sterilization material must not protrude from the containers.

1 Place the waste containers and bags in a suitable container that has a water-impermeable base (e.g. tubs or buckets). Then it will not be possible for any defective waste containers or waste bags to contaminate the device. Condensation accumulated during sterilization will remain in the loading container.

NOTICE

Danger of damage to the device caused by leaking containers!

Waste containers and bags may leak. Leaking sterilization material can contaminate the device and lead to malfunctions.

- Therefore, place the waste containers in suitable containers (e.g. tubs or buckets).

2 Load the sterilization chamber.

NOTICE

There is a risk that the flexible temperature sensor may become damaged

- To prevent the flexible temperature sensor from becoming damaged, it should be placed in the bracket in the sterilization chamber as soon as the door is opened.
- The sterilization material melts during sterilization. The flexible temperature sensor will be damaged if it is placed in the sterilization material.

3 Place the flexible temperature sensor in the holder provided.

5.4.2 Loading the device with solids

⚠ CAUTION

Risk of injury!

Containers fully loaded with sterilization material may be very heavy.

- Unload the loaded containers (at least partially) before manually lifting them in or out; this will minimize the risks of injuries or material damage.
- Use a suitable lifting device for loading and unloading heavy sterilization materials (> 25 kg).

NOTICE

The device may be damaged by improper vessels!

To avoid damage to the sterilization chamber or to the sterilization materials, make sure the vessels being used fulfil the required quality level.

- Use only vessels that can withstand the physical conditions inside the device.

1 Place the vessels with the sterilization material in suitable containers (e.g. in wire mesh baskets or on perforated floor plates). We do not recommend using water-impermeable containers.

2 Load the sterilization chamber.

NOTICE

There is a risk that the flexible temperature sensor may become damaged

To prevent the flexible temperature sensor from becoming damaged, it should be placed in the bracket in the sterilization chamber as soon as the door is opened.

3 Place the flexible temperature sensor in the holder provided.

5.4.3 Load the device with liquids

⚠ WARNING

You can be injured when the solids program is used improperly!

When sterilizing liquids in glass vessels with the solids program, a delay in boiling can occur and the vessel can shatter.

- Do not sterilize liquids during the solids program!

⚠ WARNING

Boiling delays and bursting vessels can cause burn injuries (as a result of steam or broken vessels).

If the temperature sensor has not been placed in the reference liquid by the user, or the reference vessel bursts during the sterilization procedure, the temperature of the sterilization chamber is measured instead of the temperature of the media. However, the sterilization chamber temperature is far less than the temperature of the sterilization material. Because of this incorrect value, the device can already be opened at this point even though the liquids are at a high temperature.

- Make sure that you position the temperature sensor(s) correctly.
- Only use burst-proof vessels suitable for the application or do not seal the vessels.
- Wear the prescribed personal protective equipment.
- Adjust the cooling rate to ensure that all vessels can be safely cooled.

⚠ WARNING

There is a danger of infection during the loading and unloading processes!

There is a risk of infection when loading and unloading infectious material.

- You must adhere to the work and safety regulations applicable on site.

⚠ CAUTION

Risk of injury!

Containers fully loaded with sterilization material may be very heavy.

- Unload the loaded containers (at least partially) before manually lifting them in or out; this will minimize the risks of injuries or material damage.
- Use a suitable lifting device for loading and unloading heavy sterilization materials (> 25 kg).

NOTICE

There is a risk that the sterilization material may become damaged!

The spray cooler is supplied externally with non-sterile water. Therefore, the spray cooling should only be used for tightly closed or covered sterilization materials, in order to avoid dilution or contamination.

NOTICE

There is a risk that the sterilization material may become diluted!

The Spray heating is only suitable for sealed or covered sterilization materials, since the sprayed water would dilute the sterilization material in an open vessel.

NOTICE

There is a risk that the flexible temperature sensor may become damaged.

To prevent the flexible temperature sensor from becoming damaged, it should be placed in the holder in the sterilization chamber as soon as the door is opened.

When using open vessels, the volume of the liquid to be sterilized may be reduced after the sterilization process due to boiling. The fill level of open vessels must not exceed 75% of the total filling volume; this will prevent liquid from leaking out during the boiling process.

1 Place the vessels to be sterilized in suitable containers (e.g. in wire mesh baskets or on perforated floor plates). We do not recommend using water-impermeable containers.

NOTICE

There is a risk of malfunctions when substances that foam easily are over-boiled!

For sterilization materials that tend to form foam, a considerable loss can occur when they are boiled too long. As a consequence, the device can be damaged by some of the sterilization material that remains in the hoses and valves.

- Vessels containing sterilization material that foams easily should not be filled too much.
- For the sterilization of easily foaming sterilization material, use a device that has a Rapid cooling with support pressure.

2 Make sure that the vessels lids are not screwed shut.

For VX 65 – 150: Securely closed vessels may only be used when your device has the support pressure function. (e.g. with the options for Rapid cooling with support pressure, Spray heating or soft water sprinklers).

For VX 40: Only if your device is equipped with support pressure can tightly closed vessels be used.

When sterilizing liquids, according to DIN EN 61010-2-040, the temperature monitoring mechanism may not be based solely on the monitoring of a single reference vessel (which could burst and lose its contents). Systec offers a suitable configuration option to enable redundant temperature monitoring. Refer to Additional temperature sensor (PT-100), Page 56 for more information.

3 Load the sterilization chamber.

4 Place the flexible temperature sensor(s) in suitable reference vessels and place these in the sterilization material.
Always use vessels that have both the largest vessel volume and the largest filling volume as reference vessels. Make sure that the reference vessels are made of the same material and have the same shape as the vessels holding the sterilization material.

5.5 Close the door

⚠ WARNING

You could be injured if foreign objects become stuck in the closed door

If there is a foreign object between the door seal and the device housing when the door is closed, then hot steam can escape during operations! This leads to a risk of burn injuries and contamination.

- When closing the door, make sure that there is no foreign object between the door seal and the housing (for example, a loop of cable from the flexible temperature sensor or a bag).
- Load the device so that the sensor cable and any flexible material (e.g. a bag) is not placed in the immediate vicinity of the door seal.

1 Press the door firmly.

2 This message “Opening Door” appears in the touch display.

3 You can then hear the door lock shut.

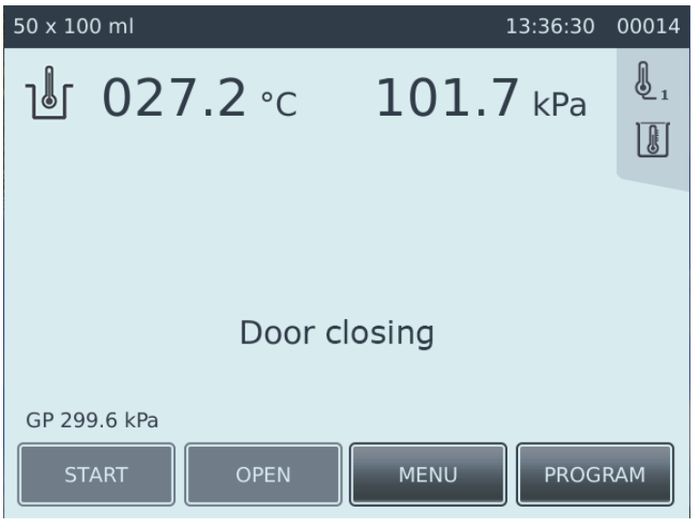


Figure 32: Display after the door is closed

5.6 Select and start the program

The devices have a flexible configuration and design in order to be suitable for all standard laboratory applications. Therefore, the Program parameters are variable to a large degree. Make sure that you only use programs and sterilization materials that can withstand the physical conditions in the device and correspond to your company regulations.

⚠ DANGER

Risk of injury!

When sterilizing solids or liquids that are contaminated with hazardous substances, there is a risk of injury if the sterilization is not completed.

- Make sure that you use the personal protective equipment prescribed for the relevant hazardous substances.

⚠ WARNING

You can be injured when the solids program is used improperly!

When sterilizing liquids in glass vessels with the solids program, a delay in boiling can occur and the vessel can shatter.

- Do not sterilize liquids during the solids program!

⚠ WARNING

There is a risk of injury when using the cleaning program!

Danger of explosion and burns due to vessels in the sterilization chamber! Vessels can burst in the device or during removal.

- Make sure that the sterilization chamber is empty.

A suitable program must be selected, based on the sterilization material, in order to minimize the risks for personnel and the laboratory, and to ensure an error-free sterilization result.

Make sure that you configure a safe cooling rate for the liquid programs:

⚠ WARNING

Boiling delays and bursting vessels can cause burn injuries (as a result of steam or broken vessels).

If the temperature sensor has not been placed in the reference liquid by the user, or the reference vessel bursts during the sterilization procedure, the temperature of the sterilization chamber is measured instead of the temperature of the media. However, the sterilization chamber temperature is far less than the temperature of the sterilization material. Because of this incorrect value, the device can already be opened at this point even though the liquids are at a high temperature.

- Make sure that you position the temperature sensor(s) correctly.
- Only use burst-proof vessels suitable for the application or do not seal the vessels.
- Wear the prescribed personal protective equipment.
- Adjust the cooling rate to ensure that all vessels can be safely cooled.

More detailed information about the programs can be found in the program descriptions in the section Features and functions (standard version), Page 22 and Optional equipment and functions, Page 34.

1 From the Start window, press PROGRAM.

2 Enter your access data if necessary.

3 From the program overview, select the program intended for the item being sterilized. The key program parameters are displayed.

Figure 33: Programs Selection

4 Confirm your selection. The Start window then appears.

Figure 34: Start window

A program can only be changed without interrupting the program if the program has not yet been started and a door has been opened beforehand.

Refer to section Cancelling the program, Page 108 for details.

5 Press the button to START the program.

6 Enter your access data if necessary.

7 If necessary, specify a start time.

8 Enter the Batch information if necessary.

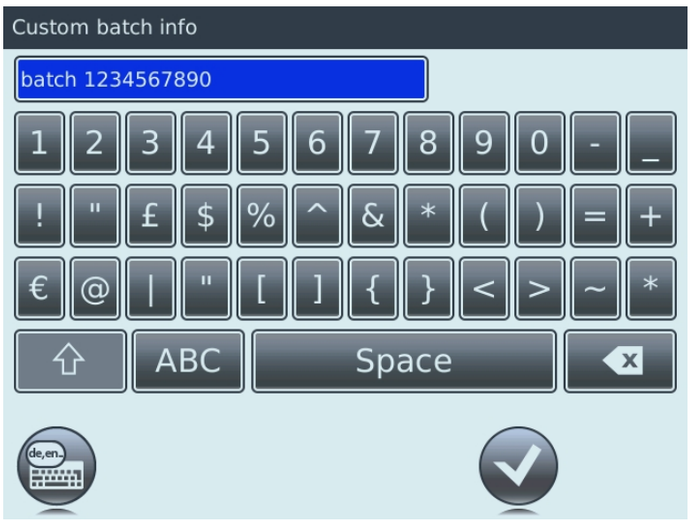


Figure 35: Enter Batch information

9 If necessary, answer the safety queries, e.g.: "No liquids in chamber??".

10 Confirm the maintenance messages, if applicable: Further information about these service messages can be found in Maintenance messages at the start of the program, Page 184.

11 The Start window then appears in operating mode.

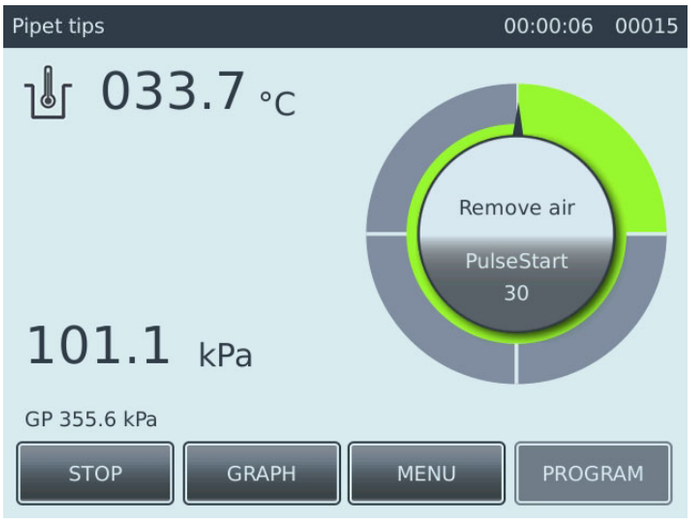


Figure 36: Start window during operations

The program then runs automatically. The controller measures the current temperature, pressure and time values, checks these against the saved set values and adjusts the program cycle accordingly. The program's sequence will be displayed on the touch screen. It displays the current status of the program execution.

If a printer is installed and selected, the most important data from the run are printed out after the program cycle has been run.

5.7 Cancelling the program

A running program may be interrupted by the user when, for example, the sterilization material must be reloaded or a different program must be selected.

⚠ DANGER

Risk of injury!

When sterilizing solids or liquids that are contaminated with hazardous substances, there is a risk of injury if the sterilization is not completed.

- Make sure that you use the personal protective equipment prescribed for the relevant hazardous substances.

⚠ WARNING

Danger of infection if sterilization is not completed

During the sterilization of infectious material, non-sterile condensate can be left behind in the sterilization chamber if the program is not completed successfully.

- You must adhere to the work and safety regulations applicable on site.

NOTICE

Danger from incomplete sterilization!

Depending on the point at which the program has been cancelled, the sterilization process may not be finished. An interruption in the heating or sterilization phase causes the process to pass directly to the final cooling phase.

- Repeat the entire program to guarantee complete sterilization.

The work process is not accelerated by cancelling the process during the cooling phase. The door lock can only be unlocked if the temperature is below the unloading temperature, the condensate is drained, and the sterilization chamber is de-pressurized.

1 From the Start window, press STOP.

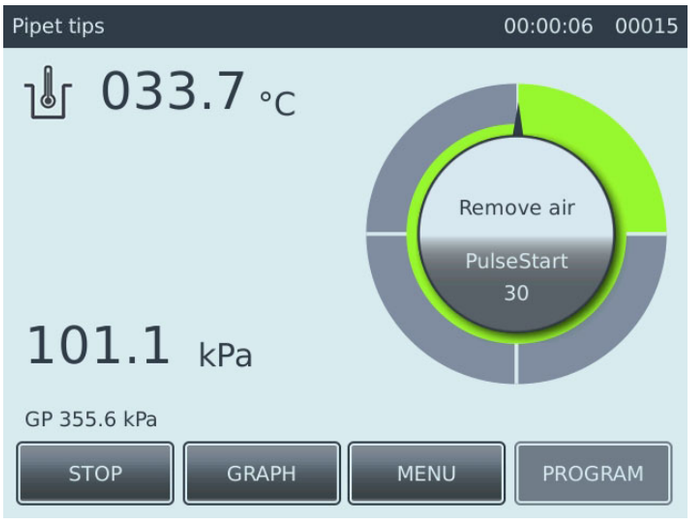


Figure 37: Start window during operations

2 Enter your access data if necessary.

3 Confirm termination of the program by pressing Yes.

Figure 38: Confirm program termination

4 A corresponding message is displayed.

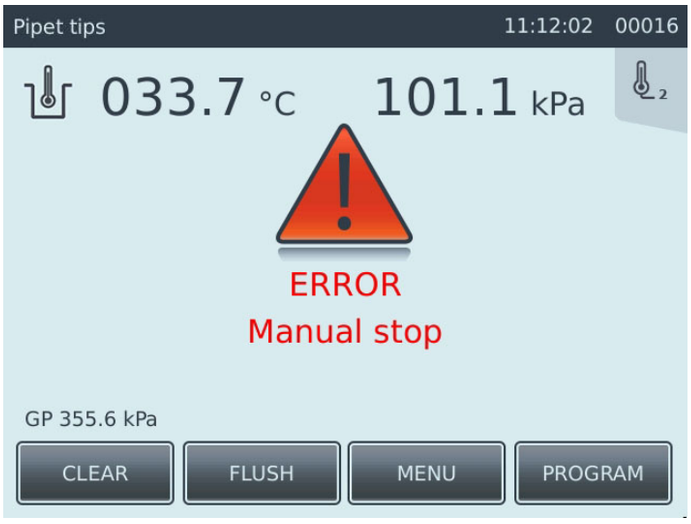


Figure 39: Message after termination of a cycle

5 Press DELETE to acknowledge the error message after the program is finished (when the unloading temperature and the atmospheric conditions have been reached in the sterilization chamber and the condensate has been flushed).

6 You may have to enter your access data again in order to acknowledge the error message.

The program is now finished. The door can be opened.

After the program has been cancelled, the interrupted program cannot be continued, but must be started again if desired.

5.8 Responding to messages during operation

Responding to error messages during operation

If errors occur during a running program, corresponding messages are displayed on the touch screen. An error tone will also sound when the error message is displayed.

1 Wait until the device has returned to the standby mode.
2 If possible, correct the fault.
3 Press DELETE to acknowledge the error message.
4 Enter your access data if necessary.

For information about specific error messages and troubleshooting, refer to Error messages, Page 189.

After the errors that occurred in the program sequence are acknowledged, the condensate drain control is executed again.

Responding to warning messages during operation

Warning messages concern operating conditions and situations which do not immediately lead to a program interruption and do not require immediate intervention.

If warning messages are displayed on the touch screen before or during a program cycle, the displayed cause for the warning should be checked and eliminated promptly in order to prevent a fault.

5.9 Opening the door after the program has finished

⚠ WARNING

Boiling delays and bursting vessels can cause burn injuries (as a result of steam or broken vessels).

If the temperature sensor has not been placed in the reference liquid by the user, or the reference vessel bursts during the sterilization procedure, the temperature of the sterilization chamber is measured instead of the temperature of the media. However, the sterilization chamber temperature is far less than the temperature of the sterilization material. Because of this incorrect value, the device can already be opened at this point even though the liquids are at a high temperature.

- Make sure that you position the temperature sensor(s) correctly.
- Wear the prescribed personal protective equipment.

⚠ WARNING

Risk of contamination!

If the program is interrupted, there is a risk of contamination from non-sterile condensate.

- The condensate must therefore be drained before the door is opened by the user. The system will request that this action is taken.

⚠ WARNING

Danger of burns when opening the door!

After sterilization, the surfaces of the door and the sterilization chamber are hot. When the door is opened, hot clouds of steam and hot water can escape. The surfaces of the sterilization chamber and the sterilization material may also be very hot and can cause burns upon contact.

- Always move the door using the recessed grip.
- Check the temperature display before opening the door.
- Wear the prescribed personal protective equipment.

The door lock can only be unlocked if the temperature is below the unloading temperature, the condensate is drained, and the sterilization chamber is de-pressurized.

The condensate is drained automatically after a successfully finished program run. In the event of a malfunction, the user must confirm the error message “Drain the condensate?” for devices with exhaust air filtration.

1 From the Start window, press OPEN. Enter your access data if necessary. The mechanical lock releases the door which then opens.
When the Automatic door opening after program finishes function is enabled, the tone sounds and the door opens automatically at the end of the program. You do not need to press the OPEN button.

2 Hold the door by the handle and pull the door open as far as it will go.

5.10 Unloading the device

⚠ WARNING

There is a danger of infection during the loading and unloading processes!

There is a risk of infection when loading and unloading infectious material.

- You must adhere to the work and safety regulations applicable on site.

⚠ WARNING

Danger of burns when removing solids!

In solids cycles, the door can be opened when the atmospheric pressure has been reached. The temperature in the device or that of the sterilized products can still be 100 °C or more, which leads to burns.

- Wear the appropriate personal protective equipment.

⚠ WARNING

There is a danger of burn injuries when removing liquids!

Leaking or escaping liquids can cause scalding or burns.

- Only remove vessels filled with liquid using extreme care and following all safety instructions.
- Wear the appropriate personal protective equipment.

1 If required, remove the flexible temperature sensors from the sterilization material or reference vessel and put it in the holder provided.

2 Take the sterilized item out of the sterilization chamber and proceed with it according to your company regulations.

5.11 Archiving the printed logs (optional)

1 Separate the printed log carefully from the printer and proceed with it according to your company regulations.

Protect the printouts from direct sunlight and moisture. Otherwise, they may become illegible.

If the paper or ink ribbon is empty, logs can also be printed later from the PROCESS LOG window, Page 88.

5.12 Cleaning the device (after each program sequence)

⚠ WARNING

Danger of burns!

There is a risk of burn injuries when removing the dirt strainer from the hot sterilization chamber.

- Let the sterilization chamber cool down first or wear suitable protective clothing (gloves).

1 After each cycle, clean the contact surfaces of the doors and the sterilization chamber using a damp, lint-free cloth.

2 Clean the flexible temperature sensor(s) weekly (or as necessary) using a damp, lint-free cloth.

3 Clean the floor of the sterilization chamber and around the strainer weekly (or as necessary).

4 Remove and clean the dirt strainer inside the sterilization chamber weekly (or as needed).

5 Clean the water level sensor weekly (or as needed) using a damp, lint-free cloth, and alcohol if necessary.

6 Close the door.

A cleaning schedule and cleaning instructions are provided in Cleaning, Page 181.

5.13 Switch off the device and its supply connections

1 Switch off the device using the main switch.

2 Switch off the auxiliary/black steam, water supply, and compressed air supply, when present.

6 Extended operation

6.1 Switch off in case of a fault

The program is interrupted when the power supply is interrupted during operations.

The program is resumed after the device is restarted. Any relevant error messages remain on the touch screen. The pressure and temperature values displayed there reflect the current state.

If values for the pressure and temperature are outside the specified limits, the program is aborted.

6.1.1 At the main switch

Always switch off the device at the main switch in case of a fault.

6.1.2 At the emergency-stop switch

Always switch off the device at the main switch in case of a fault. This will interrupt the power supply.

After the fault has been eliminated, release the emergency-stop switch to resume operations.

6.2 Steam tapping program (optional)

The Steam tapping option is used to test the steam quality or to remove steam for external applications.

⚠ WARNING

Danger of burns when extracting steam!

The connection to the steam tapping may be hot.

- Wear the prescribed personal protective equipment.

Due to the variable design of the devices, the position of individual ports on your device may be different than in the following example.

This equipment is not available for the VX-40 device.

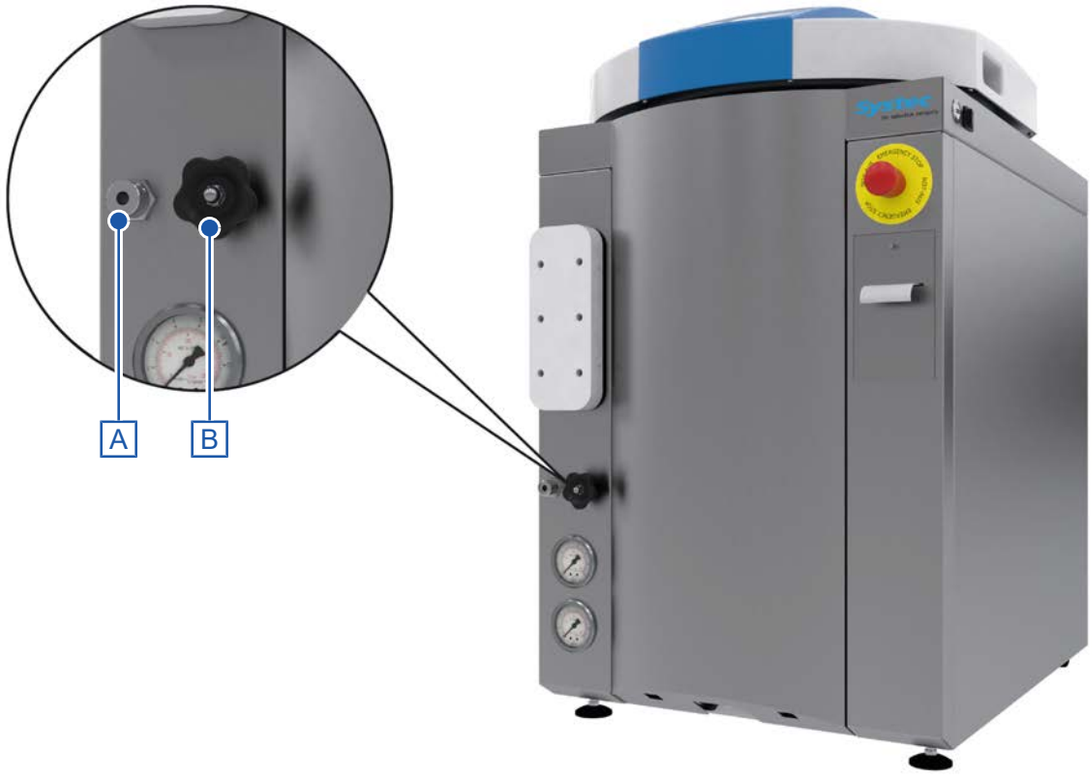


Figure 40: Connection and valve for the steam tapping (an example)

A	Connection (1/2" outer thread flat sealing)	B	Valve

1 Switch the device on.
2 Connect the hose to the connection. The hose must be suitable for steam tapping according to the specified parameters.
3 Close the valve.
4 Close the door.
5 From the Start window, press PROGRAM.
6 Enter your access data if necessary.
7 Select the "steam tapping" program. The key program parameters are displayed.
8 Confirm your selection. The Start window then appears.
9 Press the button to START the program.
10 Confirm the maintenance messages, if applicable: For more information on maintenance messages, refer to the Maintenance Messages section at the program start.
11 Enter your access data if necessary.

Water will initially escape by condensation in the tubing when the program starts. Depending on the application, it may be necessary to drain the water first.

12 Open the valve: The steam flows through the hose for the specified withdrawal (tapping) time (parameter **Time-(Steam)**).

13 You can interrupt the steam extraction by closing the valve or end the program manually by pressing STOP.
When the tapping time is finished, the steam supply stops automatically and the program is finished.

After the steam tapping is finished:

14 Close the valve.

15 Remove the hose.

6.3 Vacuum test program (optional)

NOTICE

Danger of a incorrect (falsified) test results!

The basic requirement for making a vacuum test is that the sterilization chamber is at room temperature when starting the cycle and that it is dry.

1 Close the door.

2 From the Start window, press PROGRAM.

3 Enter your access data if necessary.

4 Select the "Vacuum test" program.

5 Confirm your selection. The Start window then appears.

6 Press the button to START the program.

7 Enter your access data if necessary.

8 Enter the batch information if necessary.

9 If necessary, answer the safety queries, e.g.: "No liquids in chamber?"

10 Confirm the maintenance messages, if applicable: For more information on maintenance messages, refer to the Maintenance Messages section at the program start.

11 The Start window then appears in operating mode.

If the vacuum test fails, the error message "Program cycle" is displayed.

For a description of the program, refer to Vacuum test program , Page 49.

6.4 Bowie-Dick-Test program (optional)

1 Close the door.
2 From the Start window, press PROGRAM.
3 Enter your access data if necessary.
4 Select the "Bowie-Dick-Test" program.
5 Confirm your selection. The Start window then appears.
6 Press the button to START the program.
7 Enter your access data if necessary.
8 If necessary, specify a start time.
9 Enter the batch information if necessary.
10 If necessary, answer the safety queries, e.g.: "No liquids in chamber?"
11 Confirm the maintenance messages, if applicable: For more information on maintenance messages, refer to the Maintenance Messages section at the program start.
12 The Start window then appears in operating mode.

For a description of the program, refer to Bowie-Dick-Test program , Page 44.

6.5 Changing the paper and ink ribbon at the printer

The last meter of the printer's paper roll is marked with a red strip which indicates that the roll must be changed promptly.

NOTICE

The printer can be damaged!

- Never use the printer without paper.
- Use only original paper rolls from Systec.

NOTICE

The printer can be damaged!

- Never pull the paper manually out of the guide slot.
- Always use the Feed button to transport the paper forwards.

You will find the printer on the front right-hand side of the device.

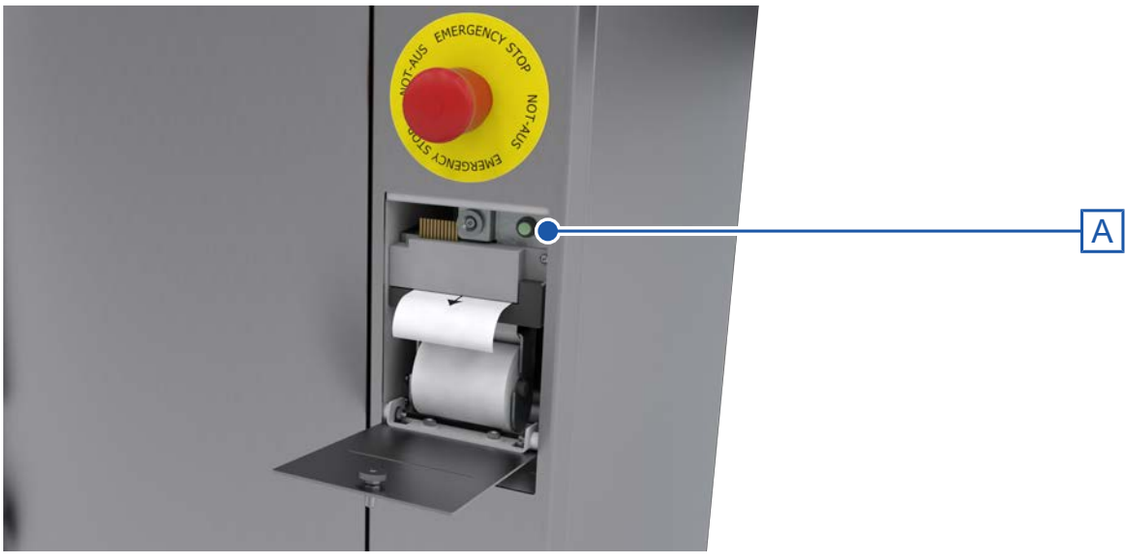


Figure 41: Feeding paper into the printer

A	Feed button for feeding paper

6.5.1 Changing an empty paper roll

1 Open the printer cover by pressing it at the lower end.
2 Remove the empty roll with its axle.
3 Make a straight cut through the start of the new paper roll.
4 Feed the start of the paper into the printer.
5 Press the Feed button and hold it down until the paper has been pulled in about 50 mm. The edge of the paper is clearly protruding from the printer.

The paper must roll off backwards!

6 Put the new paper roll on the spindle.
7 Slide the axle into the corresponding recess.
8 Insert the paper through the slot in the printer cover.
9 Close the printer cover.

If necessary, remove the ink ribbon first so that it is easier to feed in the paper.

6.5.2 Changing the ink ribbon

1 Open the printer cover by pressing it at the lower end.
2 Press down on the left side of the ribbon cartridge. The ribbon cartridge swings up and can be taken out.
3 Tighten the new ribbon by turning the grooved wheel in the direction of the arrow.
4 Pull the strips of paper through the ribbon cartridge and ribbon.
5 Put the ribbon cartridge on the left holder.
6 Insert the cartridge by pressing gently.
7 Insert the paper through the slot in the printer cover.
8 Close the printer cover.

6.6 Searching in saved audits

The search function can be used to filter the logs displayed by Date and/or Load (run) number.

1 Open the desired log window (PROCESS LOG, ERROR LOG or AUDIT TRAIL). All existing logs are displayed in chronological order.

Figure 42: Error log window (example)

2 Press the Search button. The SEARCH window then appears.

Figure 43: Search window (an example)

3 Press an input field on the left side and enter the desired data and/or load numbers.

4 Press the Confirm button to start the search. The appropriate results are displayed in the Log window.

Figure 44: Search results (an example)

5 Press the Delete search button to delete that search criteria. All existing logs are displayed in chronological order.

6.7 Exporting logs / lists / search results

There are three different export options available.

6.7.1 List export

Logs stored in the device's memory can be exported as overview lists to a USB flash drive by using the export function (e.g. export to PDF or CSV format).

Overview lists from the ERROR LOG and AUDIT TRAIL can also be exported to Systec Connect STF.

1 If necessary, connect a USB flash drive to the USB socket on the device.

2 Open the desired log window (PROCESS LOG, ERROR LOG or AUDIT TRAIL).

3 Enter your access data if necessary. All existing logs are displayed in chronological order.

Figure 45: Error log window (example)

4 Press the Export button. The SELECT EXPORT window then appears.

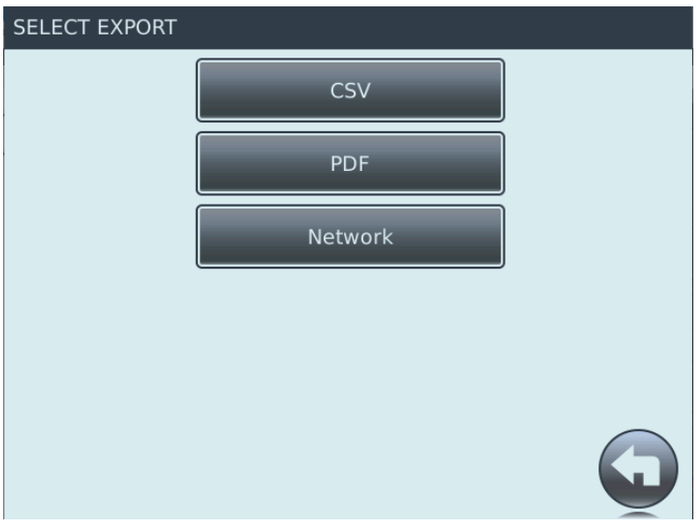


Figure 46: SELECT EXPORT window (example)

5 Select the desired output format. The export progress and any errors are displayed.

Figure 47: Export completed (an example)

6 Press on the message to close it. The SELECT EXPORT window then appears.

7 Pull the USB flash drive out of the USB socket if necessary. The data can be displayed with the appropriate programs.

6.7.2 Export the search results

The display of the logs saved in the device's memory can be narrowed down using the search function. The export function can be used to export both an overview list and details (e.g. in CSV, PDF or extended PDF format) to a USB flash drive or to Systec Connect STF or output to the printer.

1 If necessary, connect a USB flash drive to the USB socket on the device.

2 Open the desired log window (PROCESS LOG, ERROR LOG or AUDIT TRAIL).

3 Enter your access data if necessary. All existing logs are displayed in chronological order.

Figure 48: Error log window (example)

4 If necessary, filter the logs that are displayed with the search function.

5 Press the Export button. The SELECT EXPORT window then appears.

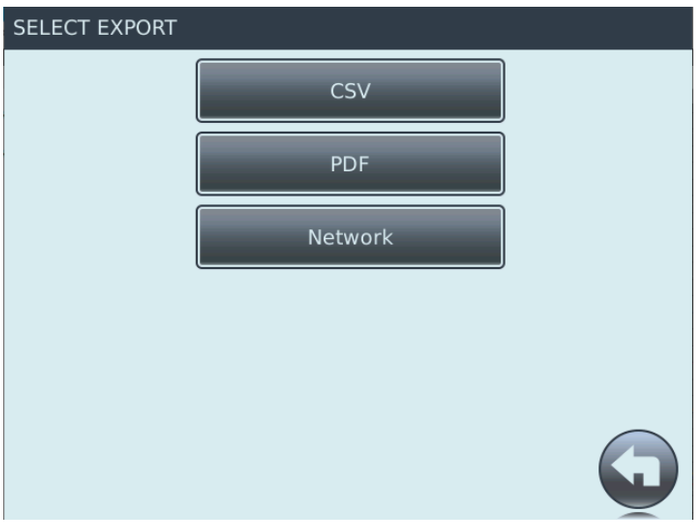


Figure 49: SELECT EXPORT window (example)

6 Select the desired output format. The export progress and any errors are displayed.

Figure 50: Export completed (an example)

7 Press on the message to close it. The SELECT EXPORT window then appears.

8 Pull the USB flash drive out of the USB socket if necessary. The data can be displayed with the appropriate programs.

6.7.3 Log export

Detailed logs saved in the device's memory can be exported to a USB flash drive, to Systec Connect STF or in the network (e.g. in PDF, extended PDF or CSV format) or output to the printer using the export function.

1 If necessary, connect a USB flash drive to the USB socket on the device.

2 Open the desired log window (PROCESS LOG, ERROR LOG or AUDIT TRAIL).

3 Enter your access data if necessary. All existing logs are displayed in chronological order.

Figure 51: Error log window (example)

4 If necessary, filter the logs that are displayed with the search function.

5 Select the desired log from the list.

6 Confirm your selection. A log-specific window with general information is displayed.

7 Press the Export button. The SELECT EXPORT window then appears.

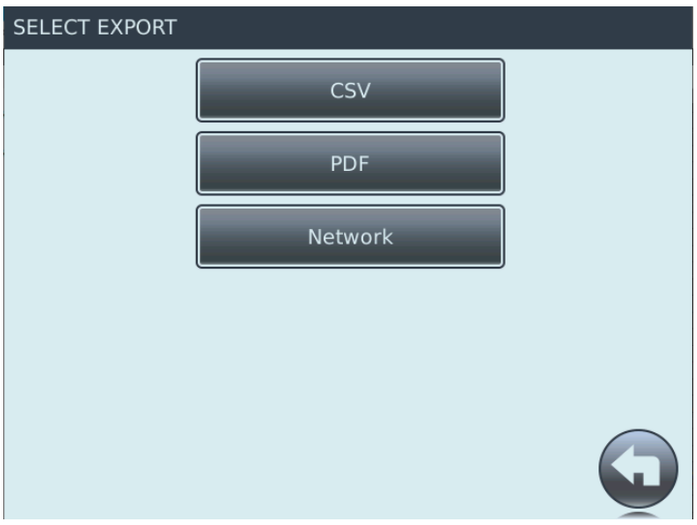


Figure 52: SELECT EXPORT window (example)

8 Select the desired output format. The export progress and any errors are displayed.

Figure 53: Export completed (an example)

9 Press on the message to close it. The SELECT EXPORT window then appears.

10 Pull the USB flash drive out of the USB socket. The data can be displayed with the appropriate programs.

6.8 Calibrating the touch screen

Calibration of the touch screen is always required when the buttons on the touch screen no longer respond correctly.

1 Switch the device on.

2 Touch any place on the touch screen. The TOUCH-DISPLAY CALIBRATION window then appears.

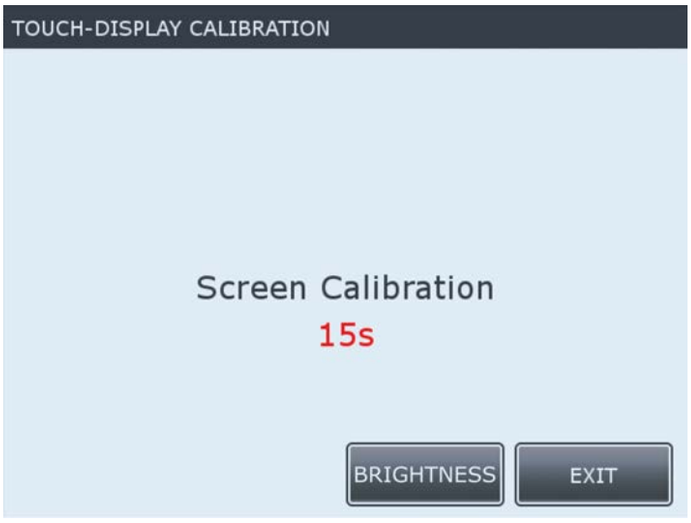


Figure 54: TOUCH-DISPLAY CALIBRATION window

3 The calibration program starts after waiting for 15 seconds.

4 The first of a total of 5 pluses is displayed.

Figure 55: Display of a plus symbol for calibration

5 Press on this as accurately as possible as well as the pluses coming after it. The TOUCH-DISPLAY CALIBRATION window is then displayed again.

6 Press EXIT to close the calibration program. The Start window then appears in standby mode.

The BRIGHTNESS button is a service function.

6.9 Naming the Additional sensors

1 Open the DEVICE SETTINGS / Additional sensors menu.

2 Enter your access data if necessary. The ADDITIONAL SENSORS window then appears.

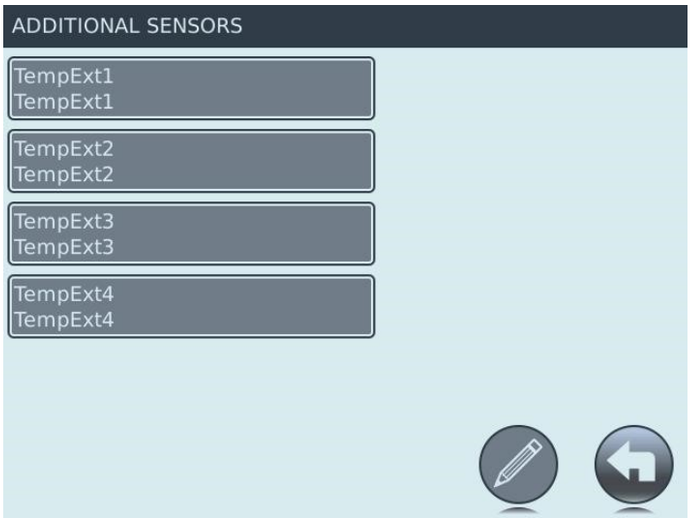


Figure 56: ADDITIONAL SENSORS window

3 Select an additional sensor from the list.

4 Press the Edit button. The SENSOR NAME window then appears.

Figure 57: Entering the sensor name

5 Enter a name for the additional sensor.

6 Press the Confirm button to save the names. The new name of the additional sensor is shown in the ADDITIONAL SENSORS window.

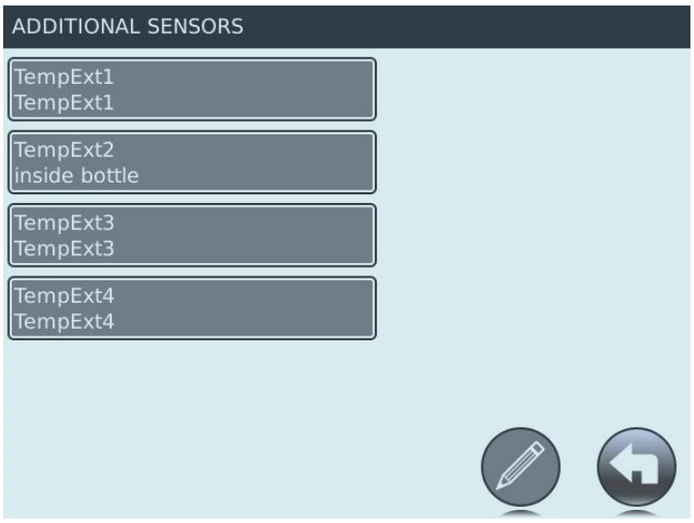


Figure 58: ADDITIONAL SENSORS window updated

The name of the sensor is changed globally.

6.10 Network settings

The network settings can be set automatically via DHCP. No further network parameters need to be set when DHCP is activated.

1 Open the DEVICE SETTINGS / NETWORK CONFIGURATION menu.

2 Enter your access data if necessary. The NETWORK CONFIGURATION window then appears.

3 Press the Ethernet (DHCP) button.

Figure 59: NETWORK CONFIGURATION window - DHCP selection

4 Automatic configuration of the network settings via DHCP can be activated or deactivated by pressing the I/O button.

5 When the network configuration is deactivated, press the other buttons to enter the data for IP address, Subnet mask, Gateway, DNS 1 and DNS 2 using the virtual keyboard.

6 Save the network settings.

6.11 Setting the Device parameters

1 Open the DEVICE SETTINGS / Device parameters menu.

2 Enter your access data if necessary. A "Please wait" message appears until the complete parameter list is retrieved from the system. The DEVICE PARAMETERS window then appears.

Figure 60: Setting the Device parameters

3 Select a parameter from the list. Depending on the parameter, you must then either enable or disable it, edit its numerical value or enter text.

4 For a function: Enable (on) or disable (off) the function.

5 For a numerical parameter: Press the Edit button to edit the parameter value in a new window.

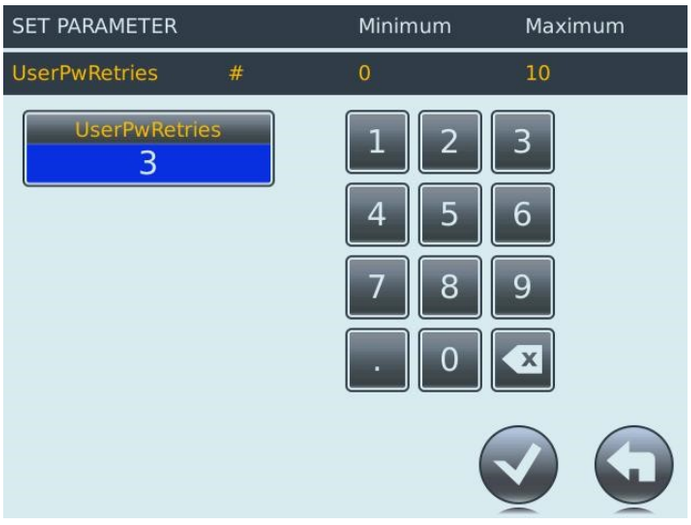


Figure 61: Editing the numerical Device parameters (an example)

6 Change the value. For information purposes, the header line contains the minimum and maximum values for this parameter.

7 Press the Confirm button. The DEVICE PARAMETERS window then appears.

8 For a parameter with text input: Press the Edit button to enter or edit the parameter text in a new window.

Figure 62: Parameter with text input (an example)

9 Press the Confirm button. The DEVICE PARAMETERS window then appears.

10 For a parameter with selection list: Press the Edit button to display the selection list in a new window.

Figure 63: Selection list (an example)

11 Select or deselect the elements you require.

12 Press the Save button. The DEVICE PARAMETERS window then appears.

13 Change other Device parameters if necessary.

14 Save the changed Device parameters.

6.12 Exporting the device data

The current device data (cycles, Error log and Audit Trail) can be exported as a file to a USB flash drive and used to prepare a customer service enquiry.

1 Connect a USB storage medium (flash drive) to the USB socket on the device.

2 Open the SYSTEM INFORMATION / CUSTOMER SERVICE menu. Enter your access data if necessary.

3 Press the Device data export button. The SETTING PARAMETERS window then appears.

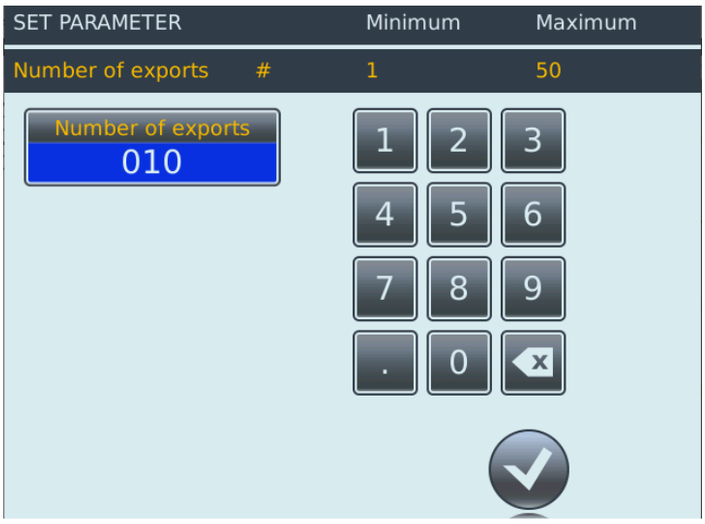


Figure 64: SETTING PARAMETERS window

4 Enter the desired number of exports using the number buttons.

5 Press the Confirm button.

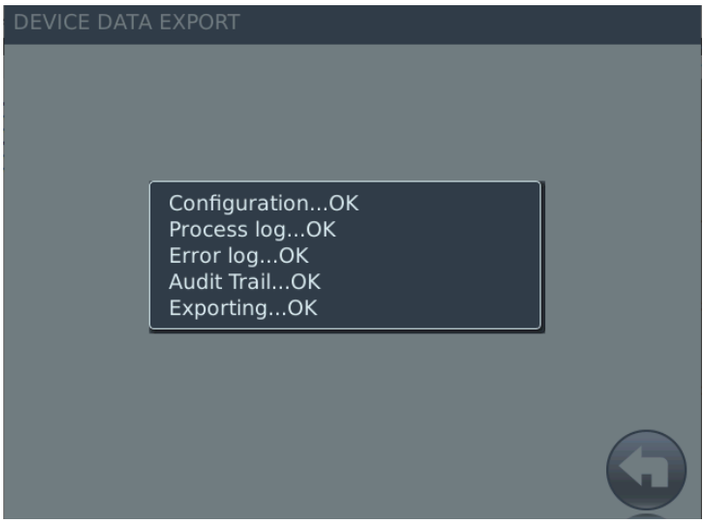


Figure 65: Message window for the export result

6 A message is displayed after the device data has been successfully exported. Press on the message to return to the CUSTOMER SERVICE menu.

6.13 Installing a Configuration update

1 Connect a the USB flash drive with the new configuration to the USB socket on the device.

2 Open the DEVICE SETTINGS / CONFIGURATION UPDATE menu. Enter your access data if necessary. The device reads the new configuration data from the USB flash drive and displays them in the window.

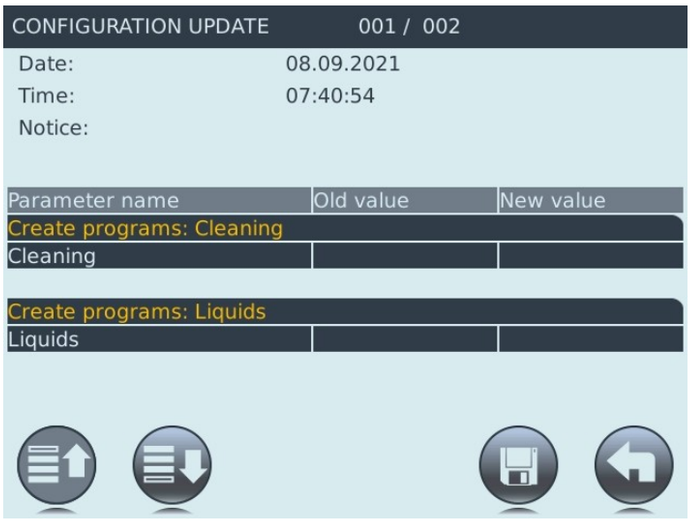


Figure 66: Reading in the Configuration update

3 Check the date and time and the parameters of the new configuration.

4 Press Save to install the new configuration parameters on the device. The installation progress and any error messages are displayed.

5 Switch the device off and on again when prompted.

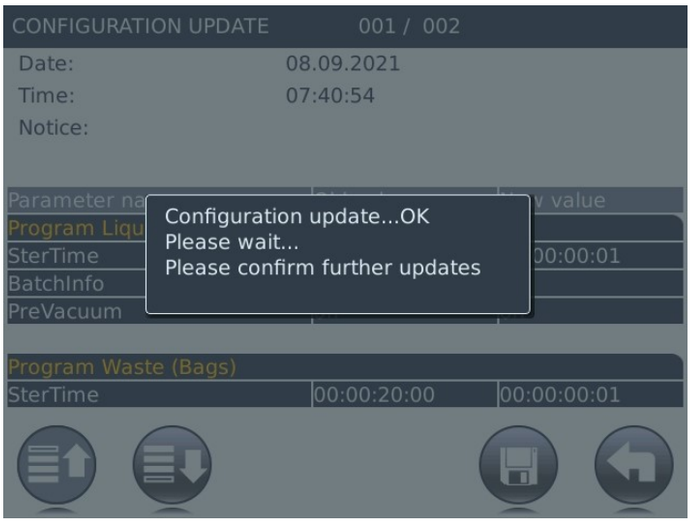


Figure 67: Configuration update message (example)

Repeat steps 2 to 4 until no new parameters are displayed in the CONFIGURATION UPDATE window.

6 Exit the window. The new configuration is activated.

7 Pull out the USB flash drive from the USB socket on the device.

6.14 Exporting a configuration

The current device configuration can be exported as a file to a USB flash drive.

1 Connect a USB storage medium (flash drive) to the USB socket on the device.

2 Open the DEVICE SETTINGS / CONFIGURATION EXPORT menu. Enter your access data if necessary. The export process starts immediately and the export progress or any error messages are displayed.

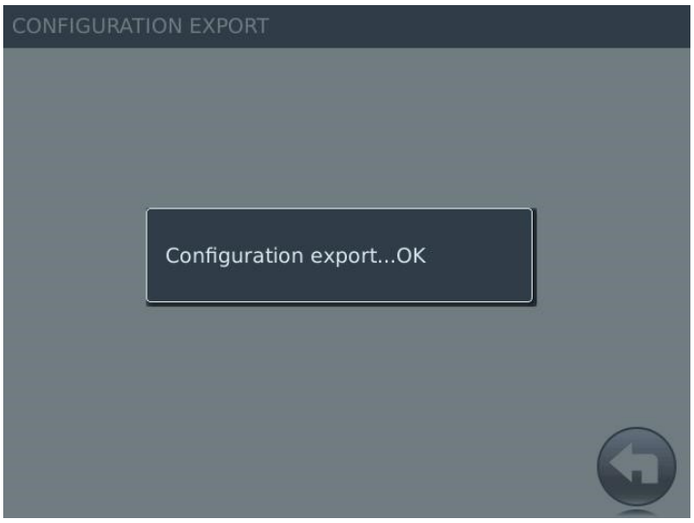


Figure 68: CONFIGURATION EXPORT window

3 A message is displayed after the configuration has been successfully exported. Press on the message to return to the DEVICE SETTINGS menu.

6.15 Creating aSystem backup

The current system configuration can be exported as a file to the USB flash drive or to Systec Connect STF.

1 If necessary, connect a USB flash drive to the USB socket on the device.

2 Open the DEVICE SETTINGS / SYSTEM BACKUP menu.

3 Enter your access data if necessary. The SYSTEM BACKUP window is displayed, showing all the backups on the USB flash drive.

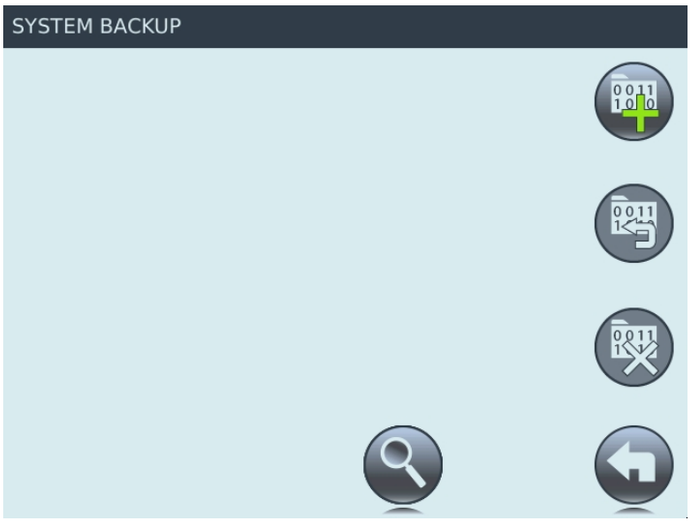


Figure 69: SYSTEM BACKUP window

The system backups available on the FTP server are not displayed in the SYSTEM BACKUP window.

4 Press the New backup button to save the system configuration to the USB flash drive or via Systec Connect STF. The SYSTEM BACKUP-EXPORT window then appears.

Figure 70: SYSTEM BACKUP-EXPORT window

5 Select the desired output format. The export progress and any error messages are displayed.

Figure 71: Messages about the System backup

6 Press on the message to return to the SYSTEM BACKUP window.

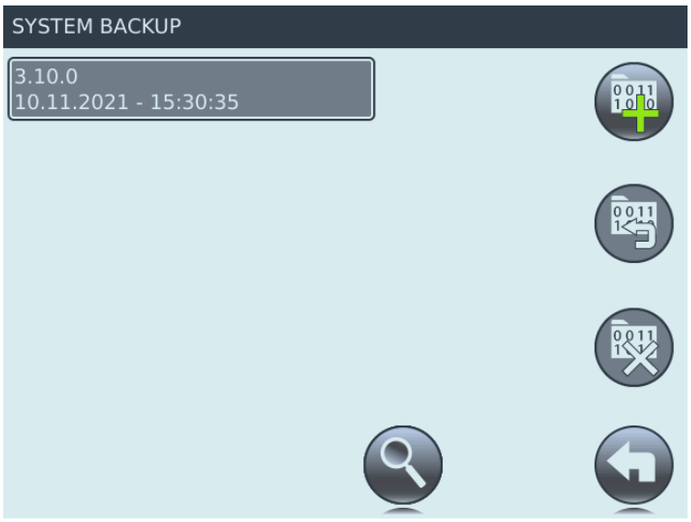


Figure 72: System backup created

7 If necessary, pull the USB flash drive out of the USB socket.

6.16 Deleting aSystem backup

Existing system backups can be deleted.

1 Connect a USB storage medium (flash drive) to the USB socket on the device.

2 Open the DEVICE SETTINGS / System backup menu. Enter your access data if necessary. The SYSTEM BACKUP window is displayed, showing all the backups on the USB flash drive.

3 Select the system backup you want to delete.

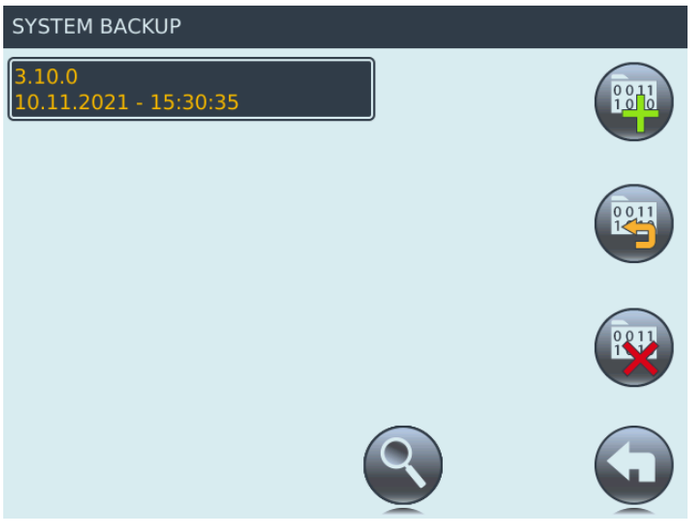


Figure 73: System backup selected

4 Press Delete backup to delete the System backup. A dialog box is displayed.

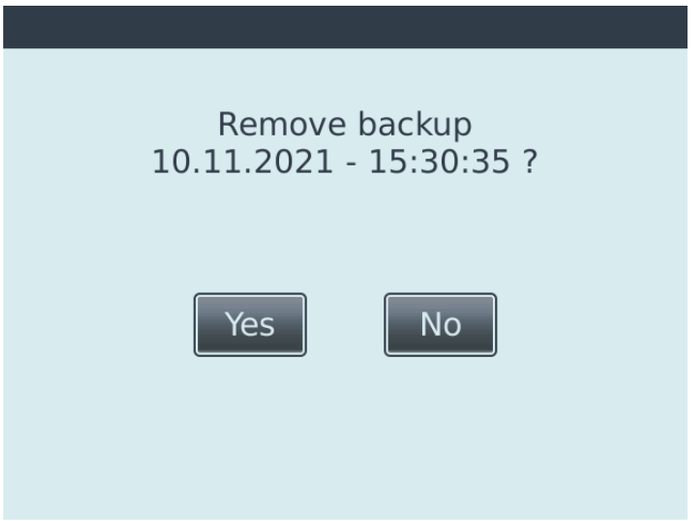


Figure 74: Confirm the deletion

5 Confirm the action by pressing Yes in the dialog box that appears. The backup is deleted and the updated list of system backups is displayed.

6.17 Managing certificates

More information on certificates can be found in section Systec Connect, Page 52.

6.17.1 Installing certificates

1 Connect a the USB flash drive with the certificates to be installed to the USB socket on the device.

2 Open the CERTIFICATE MANAGEMENT menu.
Enter your access data if necessary. The CERTIFICATE MANAGEMENT window then appears.

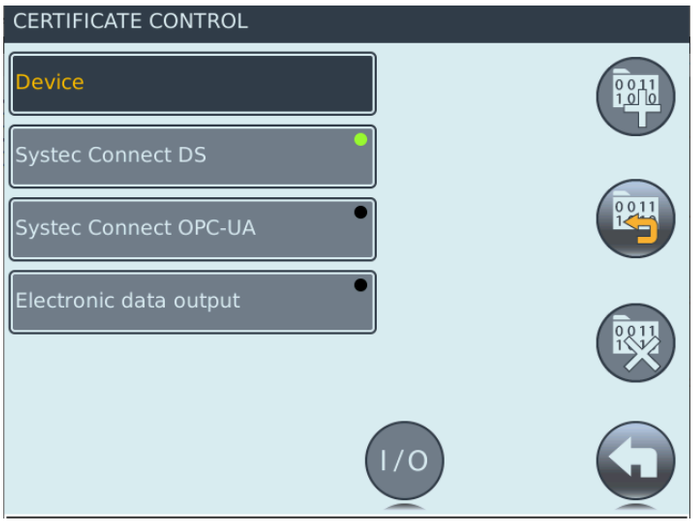


Figure 75: CERTIFICATE MANAGEMENT window

3 Select the certificate you want to install.

4 Click on Install certificate to install the certificate. The installation process starts immediately and the installation progress or any error messages are displayed.

Figure 76: Message on installation progress

5 Press on the message. The CERTIFICATE MANAGEMENT window then appears.

6.17.2 Activating / deactivating certificates

The active certificates are marked with a green circle.

1 Open the CERTIFICATE MANAGEMENT menu.
Enter your access data if necessary. The CERTIFICATE MANAGEMENT window then appears.

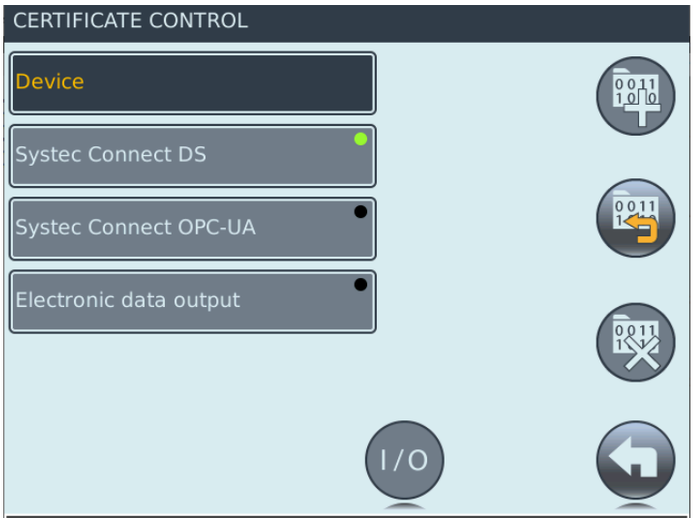


Figure 77: CERTIFICATE MANAGEMENT window

2 Activate/deactivate the certificate you want to deactivate.

3 Press Activate/deactivate certificate to activate/deactivate the certificate.

6.17.3 Exporting certificates

The current certificate chains can be exported as a file to a USB flash drive.

1 Connect a USB storage medium (flash drive) to the USB socket on the device.

2 Open the CERTIFICATE MANAGEMENT menu.
Enter your access data if necessary. The CERTIFICATE MANAGEMENT window then appears.

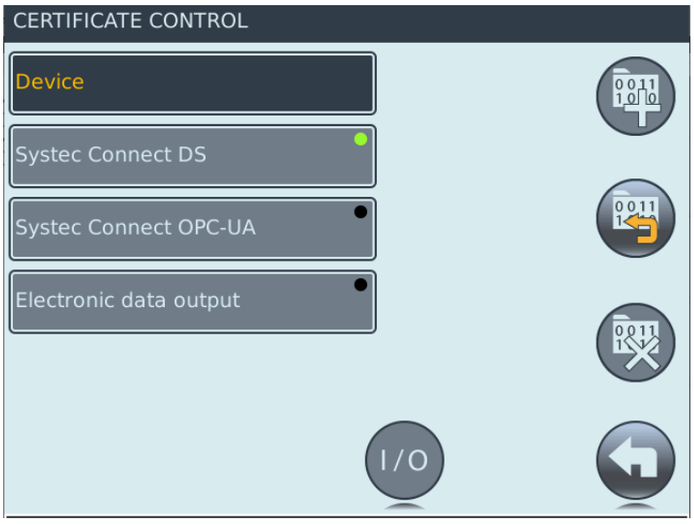


Figure 78: CERTIFICATE MANAGEMENT window

3 Select the certificate you want to export.

4 Press Export certificate to export the certificate.
The export process starts and the export progress or any error messages are displayed.

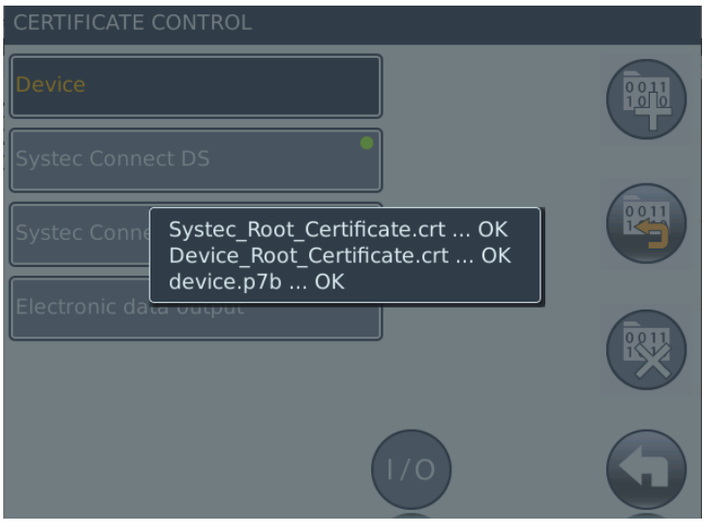


Figure 79: Message on export progress

5 Press on the message. The CERTIFICATE MANAGEMENT window then appears.

6.17.4 Deleting certificates

A certificate can only be deleted if it is not active. The Delete certificates button is then deactivated.

If a certificate has been deleted, a standardised certificate is automatically installed following a restart.

1 Open the CERTIFICATE MANAGEMENT menu.
Enter your access data if necessary. The CERTIFICATE MANAGEMENT window then appears.

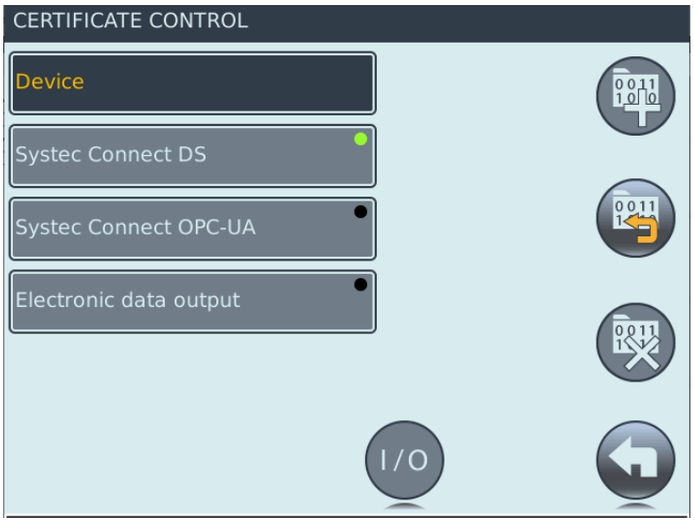


Figure 80: CERTIFICATE MANAGEMENT window

2 Select the certificate you want to delete.

3 Press Delete certificate to delete the certificate. The deletion process starts immediately and the deletion progress or any error messages are displayed.

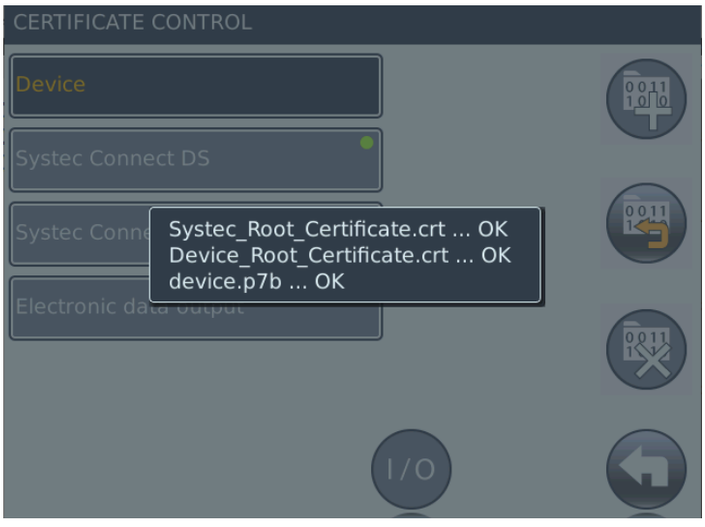


Figure 81: Message of deletion progress

4 Press on the message. The CERTIFICATE MANAGEMENT window then appears.

7 Basic settings

7.1 Selecting the display language

1 Open the Language menu.

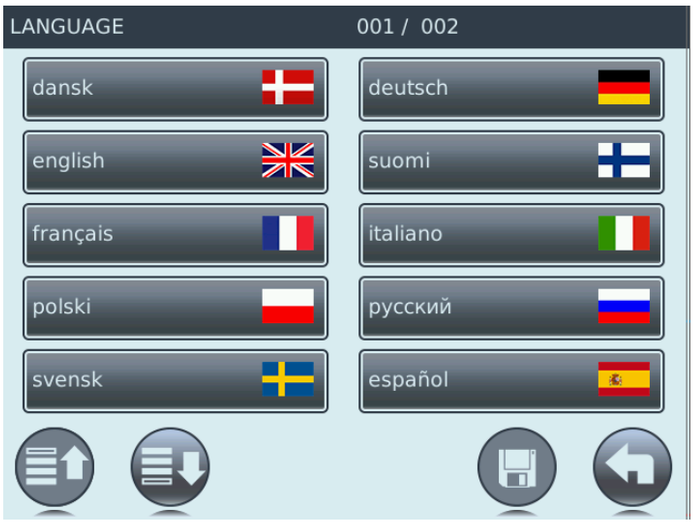


Figure 82: LANGUAGE window

2 Select the language you require.

3 Press the Save button.

7.2 Changing the date and time

An automatic changeover between summer time and winter time is only carried out when a time zone is selected. Selecting the time zone, Page 140

7.2.1 Setting the date

1 Open the DEVICE SETTINGS / Date/Time menu; if necessary, enter your access data. The DATE/TIME window then appears.

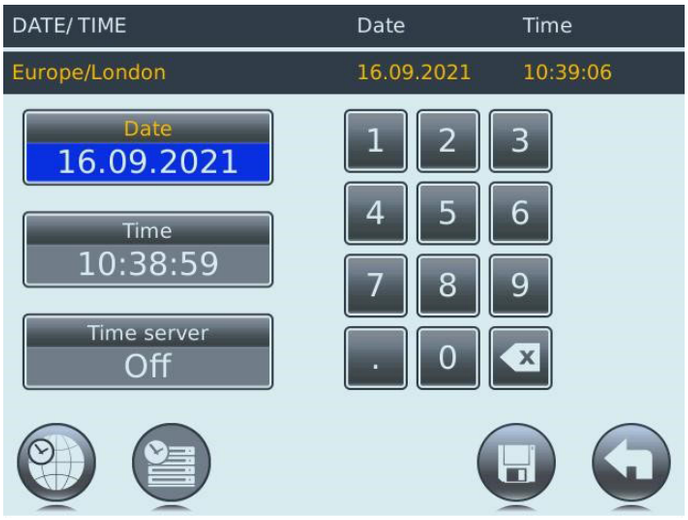


Figure 83: DATE/TIME window

2 Select the Date display field.

3 Enter the new date using the number buttons.

4 Press the Save button.

7.2.2 Setting the time

1 Open the DEVICE SETTINGS / Date/Time menu; if necessary, enter your access data. The DATE/TIME window then appears.

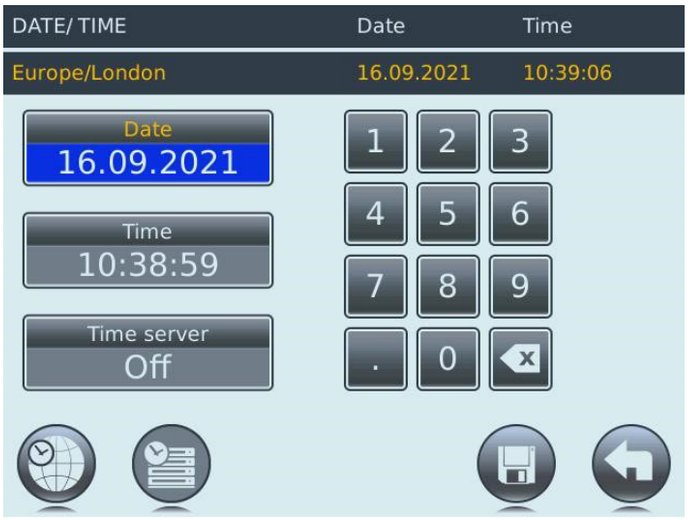


Figure 84: DATE/TIME window

2 Select the Time display field.

3 Enter the new time using the number buttons.

4 Press the Save button.

7.2.3 Selecting the time zone

1 Open the DEVICE SETTINGS / Date/Time menu; if necessary, enter the access data. The DATE/TIME window then appears.

Figure 85: DATE/TIME window

2 Press the Time zone button. The TIME ZONES window then appears.

Figure 86: TIME ZONES window (World)

3 Select the time zone you require.

4 Press the Confirm button. The following window shows the individual countries or regions of the selected time zone.

Figure 87: Countries/regions of the time zone

5 Select the country or region.

6 Press the Save button.

7.2.4 Using the time server

1 Open the DEVICE SETTINGS / Date/Time menu; if necessary, enter the access data. The DATE/TIME window then appears.

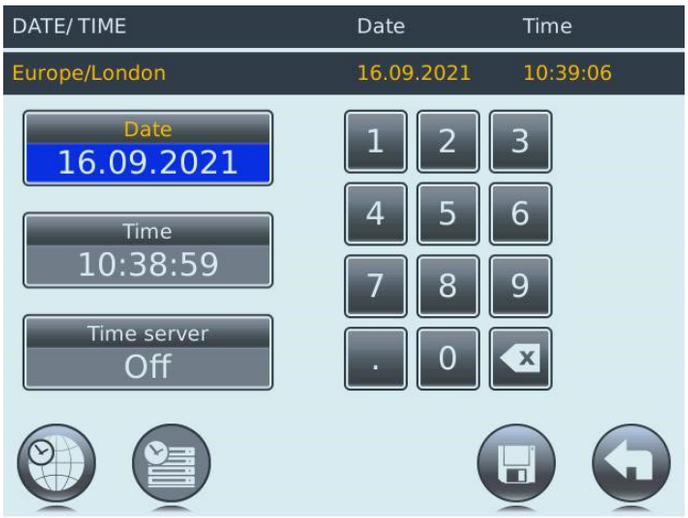


Figure 88: DATE/TIME window

2 Press the Time server display field.

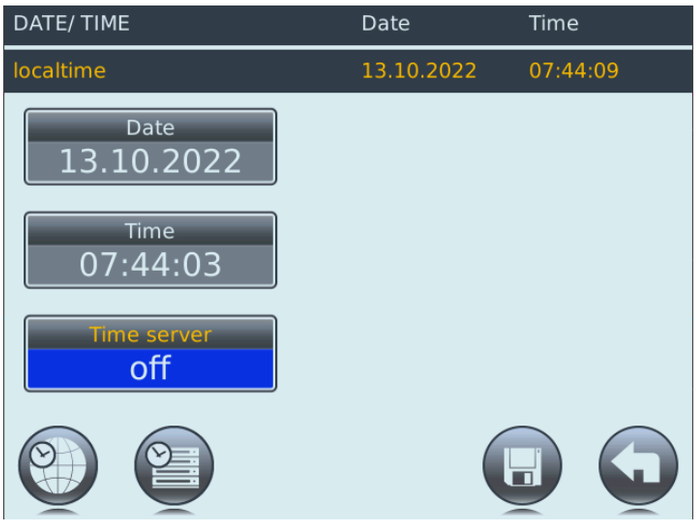


Figure 89: Time server display field

3 Press the Time server button. The SETTING THE NTP SERVER window then appears.

Figure 90: SETTING THE NTP SERVER window

4 Enter the address of a time server.

5 Press the Confirm button. The DATE/TIME window then appears.

6 "on" appears in the Time server display field. Updating of the date and time via the time server is enabled.

No longer using the time server

7 Press the Time server button again to deactivate the updating of date and time via the time server. "off" appears in the Time server display field.

8 Press the Save button.

7.3 Setting the Brightness

1 Open the DEVICE SETTINGS / Brightness menu. The BRIGHTNESS window then appears.

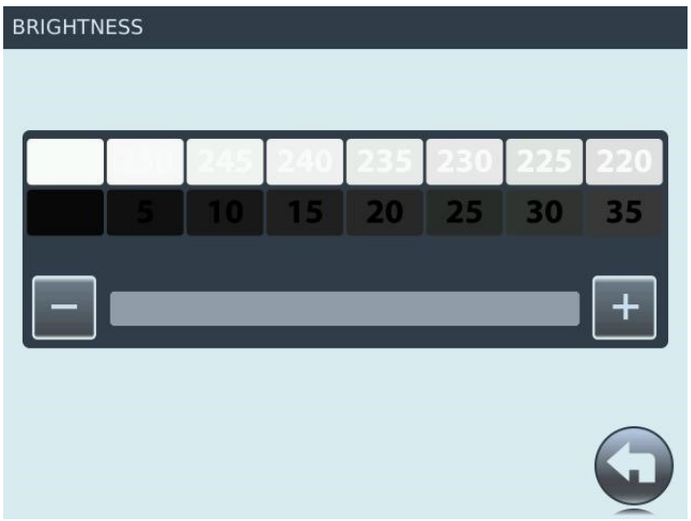


Figure 91: BRIGHTNESS window

2 Use the +/- buttons to adjust to the desired brightness.

3 Press the Back button to save the settings.

7.4 User control

The User control functionality depends on the existing user account control. The user account control exists in the variants Standard and Extended.

Standard user account control

The standard user account control consists of 3 permanently pre-configured groups with exactly one user available. Users can set their own password. Further settings are not possible.

Extended user account control

With the Extended user account control option, you can add and manage up to a maximum of 100 users and other groups in addition to the preset groups and users. With this option, the administrator receives the corresponding permissions for administration.

User

A user belongs to exactly one group and inherits its permissions. Users can be created, changed, enabled, disabled and deleted. User name, password and the user group can be set during creation and when making changes.

User groups

User groups can be created, copied, changed, enabled, disabled and deleted. The user group sets the permissions for events and parameters. If necessary, it defines the assigned programs and their order in the program list.

When editing user groups, you can only set the permissions of the permissions that the logged-in user himself has. The basic requirement is the permission for the "Group control” event. When editing parameters (e.g. Program parameters), you can only change the parameters of the permissions the logged-in user has.

BackupAdmin

The BackupAdmin is a non-visible user that is used for password recovery.

The BackupAdmin is not blocked if the incorrect password is entered and is authorised to make changes to the user list.

Permissions

The permissions define which user groups/users are allowed to trigger certain events. Whether the permission is required can be set using the device parameter list. If permission is required for an event, the user must enter his user name and password.

The following table lists all permissions in detail (both for standard and extended user account control).

Authorization	Event	Operator (standard)	Supervisor (standard)	Administrator (standard)	Administrator (extended)	Comment
Manage users	Create a user				✓	
	Modify a user				✓	
	Delete a user				✓	*
	Enable a user				✓	
	Disable a user				✓	
Unlock a user	Unlock a user		✓	✓	✓	
Own Change password	Own Change password	✓	✓	✓	✓	
Manage groups	Create groups				✓	
	Change groups				✓	
	Delete groups				✓	*
	Enable groups				✓	
	Disable groups				✓	
Manage the programs	Create programs			✓	✓	*[2]
	Change programs			✓	✓	*[2]
	Delete programs			✓	✓	*
	Enable programs			✓	✓	
	Disable programs			✓	✓	
Program parameters	Program parameters		✓	✓	✓	*[2]
Program list	Select a program	✓	✓	✓	✓	*[3]
	Start a program	✓	✓	✓	✓	*[3]
Stop a program	Stop a program	✓	✓	✓	✓	
Changing the Device parameters	Changing the Device parameters		✓	✓	✓	*[2]
Date Time settings	Date Time settings			✓	✓	
Acknowledge an error	Acknowledge an error	✓	✓	✓	✓	
Opening the door	Open door 1	✓	✓	✓	✓	
	Open door 2	✓	✓	✓	✓	

Authorization	Event	Operator (standard)	Supervisor (standard)	Administrator (standard)	Administrator (extended)	Comment
Emptying the sterilization chamber	Emptying the sterilization chamber		✓	✓	✓	
Export	Export Error log	✓	✓	✓	✓	
	Export Process log	✓	✓	✓	✓	
	Export Audit Trail	✓	✓	✓	✓	*[4]
	Export program(s)			✓	✓	
	Export Device parameters			✓	✓	
Designating the additional sensors	Designate additional sensors			✓	✓	
Network settings	Network settings			✓	✓	
Device backup	Create a device backup			✓	✓	
Maintenance	Maintenance		✓	✓	✓	*[5]

* Not in conjunction with Audit Trail.

*[2] Only parameters for which the user has permission.

*[3] An individual program list is assigned to each group when this permission is requested and the extended user account control is active. This determines which programs that particular user can select and start.

*[4] Only in conjunction with Audit Trail.

*[5] Maintenance: Exhaust air filter, door seal, individual maintenance counters.

7.4.1 Creating a new user group

A new user group can also be created by copying and then editing an existing user group. Copying a user group, Page 150

1 Open the USER CONTROL / GROUP LIST menu.

2 Enter your access data. The GROUP LIST window then appears.

Figure 92: GROUP LIST window

3 Press the Create new user group button to create a user group. The GROUP NAME window then appears.

Figure 93: GROUP NAME window

4 Enter the desired group names.

5 Confirm your entry. The PARAMETER PERMISSIONS window then appears.

Figure 94: PARAMETER PERMISSIONS window

6 Select an individual permission from the list.

7 Enable (ON) or disable (OFF) the permission for this user group.

8 Confirm the settings. The EVENT PERMISSION window then appears.

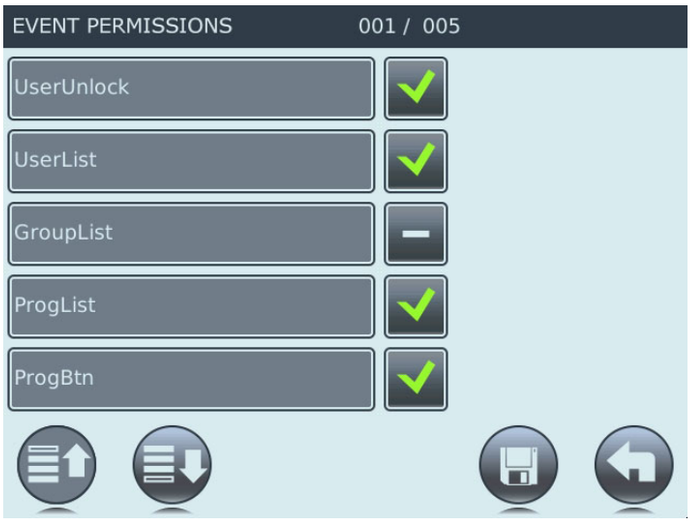


Figure 95: EVENT PERMISSION window

9 Enable or disable the events for this user group.

10 Save the settings for the new user group. The updated Group list is displayed.

Figure 96: GROUP LIST window

7.4.2 Locking/unlocking a user group

When a user group is blocked, all associated user accounts are also blocked.

1 Open the USER CONTROL / Group list menu.

2 Enter your access data if necessary. The GROUP LIST window then appears.

Figure 97: GROUP LIST window

3 Select the user group in the list that you wish to lock.

4 Press the Lock/unlock button. The locked user group is marked with a red dot in the Group list.

Figure 98: User group locked

5 Unlock the user group by pressing the Lock/unlock button again. The user group can now be used again.

7.4.3 Copying a user group

1 Open the USER CONTROL / Group list menu.

2 Enter your access data if necessary. The GROUP LIST window then appears.

Figure 99: GROUP LIST window

3 Select the user group in the list that you wish to copy.

4 Press the Copy user group button.

5 Enter the desired group names.

Figure 100: Enter group name

6 Confirm your entry. The PARAMETER PERMISSIONS window then appears.

Figure 101: PARAMETER PERMISSIONS window

7 Select the individual permissions from the list.

8 Enable (ON) or disable (OFF) the permission for this user group.

9 Confirm the settings. The EVENT PERMISSION window then appears.

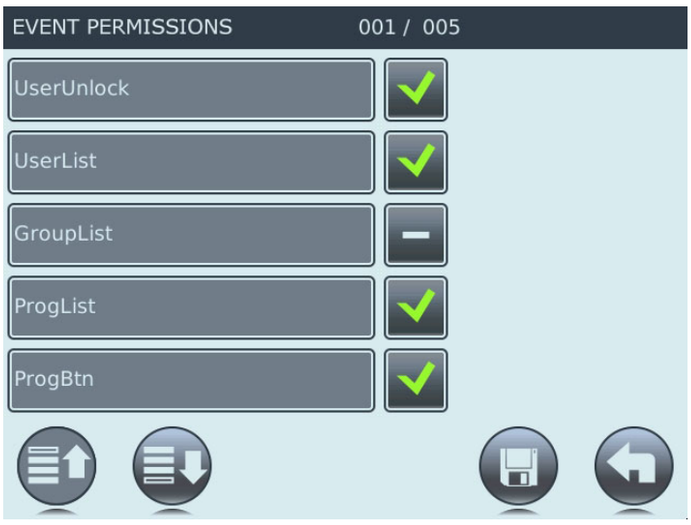


Figure 102: Event permissions

10 Enable or disable the events for this user group.

11 Save the settings for the new user group. The updated Group list is displayed.

7.4.4 Editing a user group

User groups can only be changed by authorized users.

1 Open the USER CONTROL / Group list menu.

2 Enter your access data if necessary. The GROUP LIST window then appears.

Figure 103: GROUP LIST window

3 Select the user group from the list.

4 Press Edit user group to change the user group. The GROUP NAME window then appears.

Figure 104: GROUP NAME window

5 Change the group names if desired.

6 Confirm your entry. The PARAMETER PERMISSIONS window then appears.

Figure 105: PARAMETER PERMISSIONS window

7 Select the individual permissions from the list.

8 Enable (ON) or disable (OFF) the permission for this user group.

9 Confirm the settings. The EVENT PERMISSION window then appears.

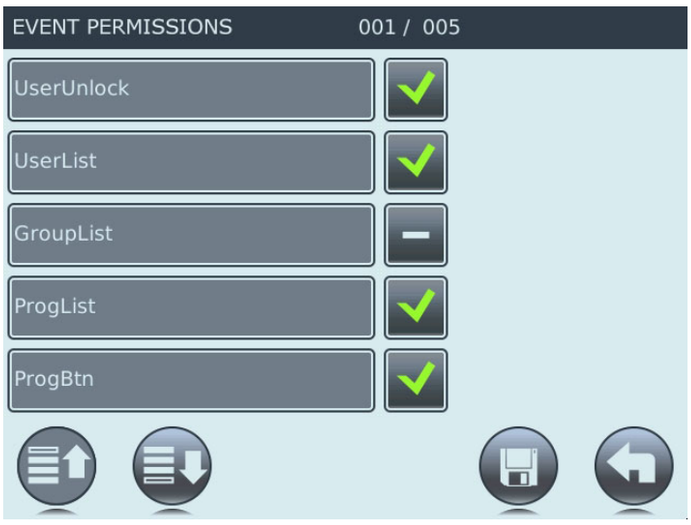


Figure 106: EVENT PERMISSION window

10 Enable or disable events for this user group.

11 Save the modified settings for this user group. The updated group list is displayed.

7.4.5 Deleting a user group

A user group can only be deleted if no more users are assigned to it. The Delete user group button is then deactivated.

If the Audit Trail option is enabled, user groups cannot be deleted.

1 Open the USER CONTROL / Group list menu.

2 Enter your access data if necessary. The GROUP LIST window then appears.

Figure 107: GROUP LIST window

3 Select the user group from the list.

4 Press the Delete user group button. A dialog box is displayed.

5 Confirm the action by pressing Yes in the dialog box that appears. The user group is deleted.

7.4.6 Creating a new user

1 Open the USER CONTROL / User list menu.

2 Enter your access data if necessary.

Figure 108: USERS LIST window

3 Press the Create New User button to create a user. A window for entering a user name and password is displayed.

Figure 109: Entering the User and password

4 Enter the desired user name and password.

5 Confirm your entry. The SELECT GROUP window for selecting the user group is displayed.

Figure 110: SELECT GROUP window

6 Select the user group for the new user.

7 Confirm your selection. The updated User list is displayed.

Figure 111: Updated User list

7.4.7 Edit user

User accounts can only be changed by authorized users.

1 Open the USER CONTROL / User list menu.

2 Enter your access data if necessary. The USERS LIST window then appears.

Figure 112: USERS LIST window

3 Select a user from the list.

4 Press the Edit user button to change the user names. The window for entering a user name and password is displayed.

Figure 113: User names and Change password

5 Change the user names and/or password.

6 Confirm your entry. The SELECT GROUP window for selecting the user group is displayed.

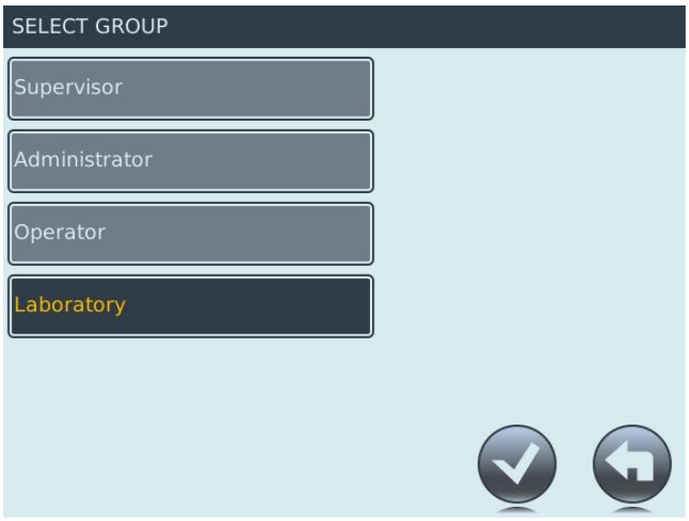


Figure 114: SELECT GROUP window

7 Select the user group for the user.

8 Confirm your selection. The updated User list is displayed.

7.4.8 Locking/unlocking users

User accounts can be permanently locked by the administrator. These are marked with a red dot.

User accounts that have been automatically locked due to incorrect password entry are marked with a yellow dot.

If a user is part of a blocked user group, this user is also automatically blocked.

1 Open the USER CONTROL / User list menu.

2 Enter your access data if necessary. The USERS LIST window then appears.

3 Select the user from the list that you want to lock/unlock.

Figure 115: User selected for locking

4 Press the Lock/unlock button.

Figure 116: User locked

7.4.9 Delete user

A user can always be deleted when the Audit Trail is disabled. The exceptions are the 3 standard users.

If the Audit Trail option is enabled, users cannot be deleted.

1 Open the USER CONTROL / User list menu.

2 Enter your access data if necessary. The USERS LIST window then appears.

Figure 117: USERS LIST window

3 Select the user to be deleted from the list.

4 Press the Delete user button. A dialog box is displayed.

Figure 118: Confirm the deletion

5 Confirm the action by pressing Yes in the dialog box that appears. The user account has been deleted.

6 The updated User list is displayed.

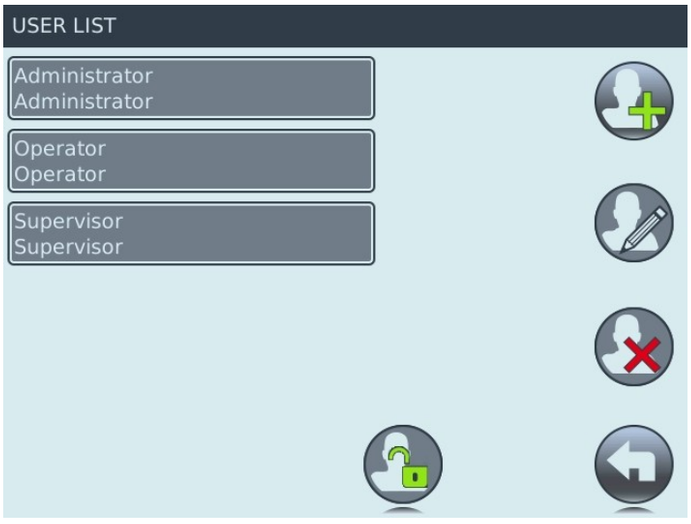


Figure 119: User account deleted

7.4.10 Forgotten password

You can obtain the Systec Electronic Signature Certificate document with the BackupAdmin password from the Systec service.

Tel.: +49 (0) 6403 67070-0

Keep the Systec Electronic Signature Certificate document with the BackupAdmin password in a safe place.

1 Open the USER CONTROL / User list menu.

2 Enter the User BackupAdmin and the password noted on the Systec Electronic Signature Certificate document. The USERS LIST window then appears.

Instructions for editing a user can be found in section Edit user, Page 157.

The user concerned should then set a new password.

For information on changing the password, refer to the section Change password, Page 161.

7.4.11 Change password

1 Open the USER CONTROL / Change password menu.

2 Enter your access data if necessary. The NEW PASSWORD window then appears.

Figure 120: NEW PASSWORD window

3 Enter a new password.

4 Confirm your entry.

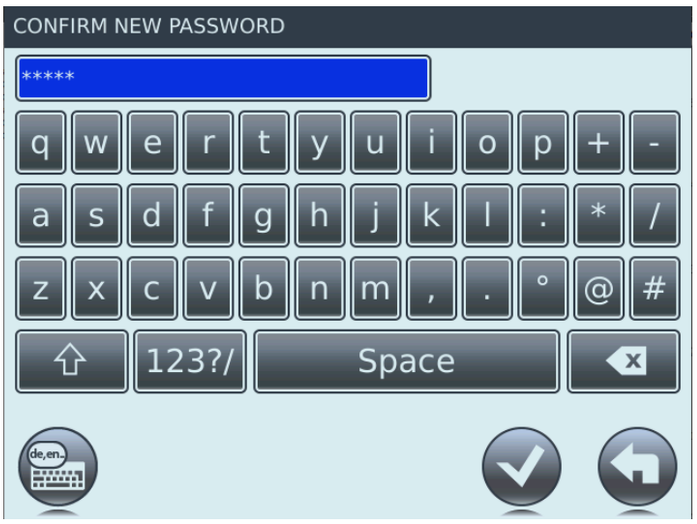


Figure 121: CONFIRM PASSWORD window

5 Enter the new password a second time.

6 Confirm your entry. The new password is now valid.

7.5 Manage the programs

In addition to the programs already created by default, you can create new programs (up to 100) and customize them to fit your requirements.

7.5.1 Creating a new program

1 Open the Program control.

2 Enter your access data if necessary. The PROGRAM CONTROL window then appears.

Figure 122: PROGRAM CONTROL window

3 Press the New Program button to create a new program. The CREATE PROGRAM window appears along with all program types available for your device.

Figure 123: CREATE PROGRAM window

4 Select the desired program types. The PROGRAM NAME window then appears.

Figure 124: PROGRAM NAME window

5 If necessary, enter a unique name for the program so that it can be better distinguished from other programs of the same type.

6 Confirm your entry. The PROGRAM PARAMETERS window is displayed. It shows all program parameters that are accessible for your user group.

Figure 125: PROGRAM PARAMETERS window

7 Select a parameter. Adjust the parameter value as needed. Press the Edit button to make a change.

The parameters can also be changed later.

For information on editing parameters, refer to the section Displaying and changing Program parameters, Page 167.

8 Edit further parameters as required.

9 Press the Save button to save the new program. The PROGRAM CONTROL window is displayed with the new program.

Figure 126: PROGRAM CONTROL window with new program

7.5.2 Edit program

1 Open the Program control.

2 Enter your access data if necessary. The PROGRAM CONTROL window then appears.

Figure 127: PROGRAM CONTROL window

3 Select the program to be edited.

4 Press Edit program to edit the program settings. You can change the program name and the Program parameters if necessary.

For information on editing parameters, refer to the section Displaying and changing Program parameters, Page 167.

5 Save your changes. The PROGRAM CONTROL window then appears.

7.5.3 Delete program

The program which is active in the Start window cannot be deleted.

If the Audit Trail option is enabled, programs cannot be deleted.

1 Open the Program control.

2 Enter your access data if necessary. The PROGRAM CONTROL window then appears.

Figure 128: PROGRAM CONTROL window

3 Select the program to be deleted.

4 Press the Delete Program button. A dialog box is displayed.

5 Confirm the action by pressing Yes in the dialog box that appears. The program is deleted.

7.5.4 Deactivate / activate program

Programs can be permanently deactivated. These are marked with a red dot.

1 Open the Program control.

2 Enter your access data if necessary. The PROGRAM CONTROL window then appears.

Figure 129: PROGRAM CONTROL window

3 Select the program to be activated/deactivated.

4 Press Activate/deactivate program.

5 When deactivating programs, a dialog box is displayed.

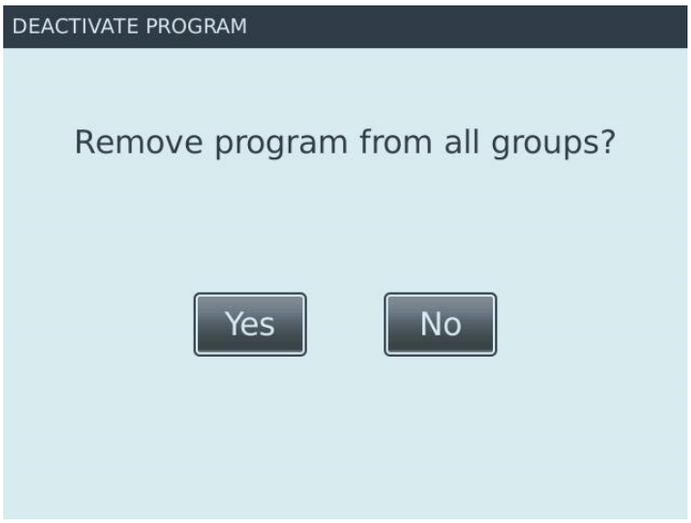


Figure 130: DISABLE PROGRAM dialog window

6 Confirm the action by pressing Yes in the dialog box that appears. The PROGRAM CONTROL window then appears.

Figure 131: Program deactivated

7.5.5 Displaying and changing Program parameters

The parameters for the individual programs can be customized to fit the individual circumstances of your company.

The pre-set programs in the device can be changed significantly using the parameters, which can lead to an incomplete sterilization.

- Changes may be made by certain users, depending on the user's user group.
- Document all changes in the device logbook.

1 From the Start window, press PROGRAM.

2 Enter your access data if necessary. The PROGRAM LIST window then appears.

3 Select a program. The key program parameters are displayed on the right.

Figure 132: PROGRAM LIST window (example)

4 Press the Edit program button to edit the Program parameters.

5 Enter your access data if necessary. The PROGRAM PARAMETERS window then appears.

Figure 133: PROGRAM PARAMETERS window (example)

6 Select the parameter from the parameter list that you want to change.

7 For a numerical parameter: Press Edit to change the parameter. The SETTING PARAMETERS input window is displayed.

For information purposes, the header line contains the minimum and maximum values for this parameter. If you enter a value outside the permissible limit, the display field will be outlined in red and cannot be saved.

Figure 134: Changing the numerical parameters (an example)

8 Enter a new value along with any decimals, using the number buttons on the screen.

9 For a parameter with selection list: Press the Edit button to display the selection list in a new window.

Figure 135: Selection list (an example)

10 Select or deselect the elements you require.

11 Press the Save button. The PROGRAM PARAMETERS window then appears.

12 Change other parameters if necessary.

13 Save the changed parameters.

7.6 Setting the Sound Volume

1 Open the DEVICE SETTINGS / Sound Volume menu. The SOUND VOLUME window then appears.

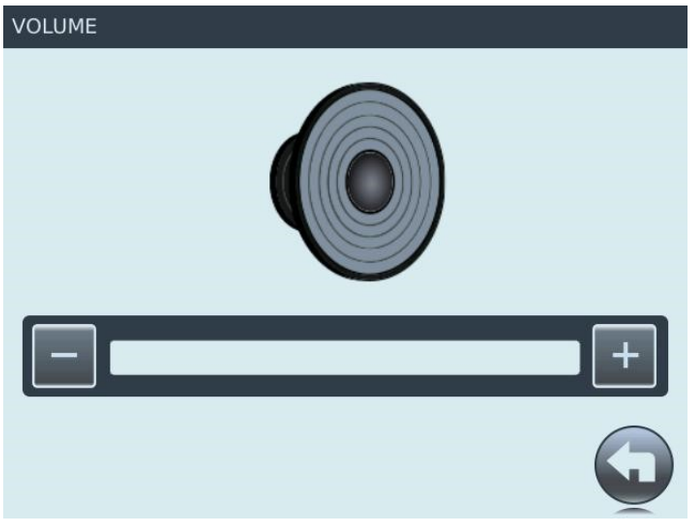


Figure 136: SOUND VOLUME window

2 Use the +/- buttons to adjust the volume of the system tones.

3 Press the Back button to save the settings.

When the Sound Volume is off, all system sounds (button sounds, door opening sound and error tone) are no longer audible.

8 Parameters

These devices have pre-set (factory default) programs for certain sterilization materials. These settings correspond to DIN 58951-2 recommendations for steam sterilizers used for laboratory sterilization materials.

Optionally, other programs can be set up for special applications on your device, either at the factory or at a later date.

The program's sequence is defined by parameters which define the program phases, time intervals, temperature, pressure, etc.

You can adjust the device functions to suit your individual requirements using the parameters.

The usage of some parameters depends on the options installed.

There are three types of programs:

- Programs for the sterilization or treatment of liquids
- Programs for the sterilization or treatment of solids
- Special programs for special usage

8.1 List of parameters

The minimum and maximum values of the parameters depend on your selected configuration. The limits are displayed on the touch screen when the parameters are set. Within these upper and lower limits, the user can adjust the parameters according to his access level.

8.1.1 Exhaust air filter management (parameters)

Parameters	Description
FilterManagement	Activates the exhaust air filtration bypass for a program. This decision must be acknowledged at each program start. ■ FilterManagement On – The Exhaust air filter management is activated and the exhaust air filter is bypassed. ■ FilterManagement Off – The Exhaust air filter management is deactivated and the exhaust air filter is used.

8.1.2 Program parameters

Parameters	Description
AddDocuSensors	Defines the additional temperature sensors to be documented that are selected in a program sequence. The selected temperature sensors are then used in the electronic data output and printer options.
SterTemp	Defines the sterilization temperature.
EndTemp	Defines the withdrawal temperature: As long as the temperature for CoolPT100 control sensor is higher than the set value, the door stays locked. In liquid programs, cooling is always 20 K below boiling temperature, depending on the atmospheric pressure.
SterTempLimLow	The value for the downward deviation of the temperature of one of the control sensors from the set target value.

Parameters	Description
SterTempLimHigh	The value for the upward deviation of the temperature of one of the control sensors from the set target value.
SterLvl	The level within the tolerance range for the sterilization temperature. Together with **SterTempLimLow**, **SterTempLimHigh** and **SterTemp,** this results in the target temperature for the chamber temperature control.
SterTime	The temperature holding time of the Sterilize program cycle phase.

8.1.3 Automatic door opening after program finishes (parameters)

Parameters	Description
AutoOpenDoor	Defines whether a door should open automatically after a program finishes successfully: ■ 0 = Door 1 or Door 2 remains closed ■ 1 = Door 1 opens automatically ■ 2 = Door 2 opens automatically **Note:** ■ Door 2 is only for pass-through autoclaves Function is disabled when DoorLevel > 0
OpenDoor	If automatic door opening at the program end is enabled for a pass-through autoclave, this parameter is used to set which door is opened.

8.1.4 Extended user account control (parameters)

Parameters	Description
StopPw	Defines if terminating a running program must be confirmed with user name and password.
DoorPw	Defines if opening a door must be confirmed with user name and password.
ClearPw	Defines if deleting an error must be confirmed with user name and password.
SetDateTimePW	Defines if setting the date and time must be confirmed with user name and password.
ProgListPw	Defines if displaying and editing the program list must be confirmed with user name and password.
CalibPw	Defines if calibrating the sensors must be confirmed with user name and password.
MaintResetPw	Defines if resetting the maintenance intervals accessible to the user must be confirmed with user name and password.
StartPw	Defines if starting a program must be confirmed with user name and password.
GlobalParPw	Defines if displaying and editing the device parameter list must be confirmed with user name and password.
ExportPw	Defines if exporting the program memory, Error log and Audit Trail must be confirmed with user name and password.
UserPwLength	Defines the minimum number of characters for the user password.

Parameters	Description
UserPwRetries	Defines the maximum number of failed password attempts for a user. The user is then locked.
UserPwExpiry	Defines the number of days after which a user must change their password. The value "0" deactivates the expiration of passwords.
UserAutoLo-gOffTO	Defines the time after which the control program switches back to the start page if no user input is made.
ProgBtnPw	Defines if selecting the active program must be confirmed with user name and password and if each user gets his own program list. Users can then start only those programs that are included in their program list.
UserMaxCount	Defines the maximum number of users that can be created.

8.1.5 Batch documentation via printer (parameter)

Parameters	Description
Printer	Defines if a summary should be printed automatically after the program ends.

8.1.6 Door Mode (parameter)

Parameters	Description
Door mode	Defines the door mode: ■ 0 = Device is not a pass-through autoclave. ■ 1 = Only one door can be opened at a time (without further restrictions). ■ 2 = After the door 1 is opened (on the machine side), the door 2 (on the bio-shield side) can only be opened after the program has finished successfully. ■ 3 = After the door 2 is opened (on the bio-shield side), the door 1 (on the machine side) can only be opened after the program has finished successfully. ■ 4 = If one of the doors has been opened, the opposing door can only be opened again after a sterilization process has finished successfully.

8.1.7 Compressed air drying (parameters)

Parameters	Description
CompAirDry	Activates the Compressed air drying function for the program.
DryPress	The target pressure in the sterilization chamber during the Drying program cycle phase.
DryPressHyst	The pressure increase that the chamber pressure may deviate upward from the target pressure during the Drying program cycle phase before pressure is released from the sterilization chamber.
DryTime	Defines the drying time.

8.1.8 F0 value calculation (parameter)

Parameters	Description
F0-Value	Activates the F_0 value calculation function for the selected program.
F0-z	The z value for calculating the F_0 value.
F0-Mode	Defines if F_0 values are output only for information or whether the Sterilizing program cycle phase is terminated when the F_0 value is reached.
F0	The Sterilizing program cycle phase is terminated as soon as the set F_0 value for all reference temperature sensors has been reached.

8.1.9 Fractionated heating (parameters)

Parameters	Description
PulsedHeating	Activates the Fractionated heating function.
Pulses	Defines the number of steam bursts and/or pre-vacuum pulse in the pre-treatment phase. Fractionated heating: Pulses of steam. Fractionated pre-vacuum: Vacuum pulses and steam pulses.
PulseStart	The first pressure point to be reached in the pre-treatment phase.
PulseEnd	The second of two pressure points to be reached in the pre-treatment phase.
PulseFillRate	The rate at which the chamber is filled with compressed air during the pre-treatment phase.
PulseExhRate	The rate at which pressure is released from the sterilization chamber during the pre-treatment phase.

8.1.10 Fractionated pre-vacuum (parameters)

Parameters	Description
Pulses	Defines the number of steam bursts and/or pre-vacuum pulse in the pre-treatment phase. Fractionated heating: Pulses of steam. Fractionated pre-vacuum: Vacuum pulses and steam pulses.
PreVacuum	Activates the Fractionated pre-vacuum function.
PulseStart	The first pressure point to be reached in the pre-treatment phase.
PulseEnd	The second of two pressure points to be reached in the pre-treatment phase.
PulseExhTO	Maximum time that a change between the two pressure points of the pre-treatment phase may take.
PulseFillRate	The rate at which the chamber is filled with compressed air during the pre-treatment phase.
PulseExhRate	The rate at which pressure is released from the sterilization chamber during the pre-treatment phase.

8.1.11 Customized maintenance counters (parameters)

Parameters	Description
CustMaintMsg1	Defines the title of the first customized maintenance counter.
CustMaintLimit1	Defines the number of cycles of the first customized maintenance counter.
CustMaintStatus1	Activates the first customized maintenance counter.

8.1.12 Combined heating (parameter)

Parameters	Description
ExtSteamSupply	Defines whether the device is heated with external steam: ■ 0 = Built-in steam generator ■ 1 = External steam

8.1.13 Steam-air mixture program (parameters)

Parameters	Description
CoolCompAirTO	Maximum time for filling the sterilization chamber with compressed air in the Drying program cycle phase.
CoolErrRate	Maximum rate at which the temperature of the main control sensor is allowed to cool down before an incorrect temperature measurement is assumed.
CoolingOptions	Defines which of the installed cooling options should be used in the program cycle phase cooling.
AirPressReg	Defines how the **AirPressAdd** support pressure is interpreted.
AirPressAdd	The support pressure in the Steam-air mixture program and in the Spray heating program.

8.1.14 Steam tapping program (parameters)

Parameters	Description
TargetTemp	Target temperature of the hold phase in the Free steam program.
Time-(Steam)	Period in which a steam sample is taken.

8.1.15 Glass test (parameters)

Parameters	Description
StayTemp	Target temperature for the temperature hold phase in the Ramp program cycle phase.
StayTime	The residence time in the temperature hold phase of the Ramp program cycle phase.
SterTime	The temperature holding time of the Sterilize program cycle phase.
RampTime	Time required to reach the temperature hold phase in the Ramp program cycle phase.
RampTLow-(C)	The value for the downward deviation of the temperature of one of the control sensors from the set target value.
RampTLow-(H)	The value for the downward deviation of the temperature of one of the control sensors from the set target value.
RampTHigh-(C)	The value for the upward deviation of the temperature of one of the control sensors from the set target value.
RampTHigh-(H)	The value for the upward deviation of the temperature of one of the control sensors from the set target value.
RampTOff-(H)	As soon as the selected control sensor for the chamber temperature while heating up to this value has approached the target temperature of a hold phase, the sterilization chamber is then heated with reduced power. This parameter is used to optimize the heat-up behaviour of the device and influences the compromise between rapid heat-up, maximum overshooting of the control sensor and smooth transition of the temperature at the control sensor during a hold phase. See also **RampTOvers-(H).**
RampTOvers-(H)	Defines how much hotter than the set target temperature the chamber may become. This parameter is used to optimize the heating process. It shifts the compromise between rapid heating, maximum overshooting of the control sensor and smooth transition of the temperature at the control sensor during a hold phase. See also **RampTOff-(H).**
ChambTCtrlOff	As soon as the selected control sensor for the sterilization chamber temperature while heating up to this value has approached the target temperature of a hold phase, the sterilization chamber is then heated with reduced power. This parameter helps to optimize the heating behaviour of the device. It influences the compromise between rapid heating, maximum overshooting of the control sensor and smooth transition of the temperature at the control sensor during a hold phase. Also refer to **ChambOvershoot**.
ChambOvershoot	Defines how much hotter than the set target temperature the sterilization chamber may become. This parameter is used to optimize the heating process. It shifts the compromise between rapid heating, maximum overshooting of the control sensor and smooth transition of the temperature at the control sensor during a hold phase. Also refer to **ChambTCtrlOff**.

8.1.16 Rubber closures test program (parameters)

Parameters	Description
WaterTime	Run-on time when filling the sterilization chamber in the Spray heating program. The run-on time starts as soon as the water level electrode (Electrode3D) indicates water.
StayTemp	Target temperature for the temperature hold phase in the Ramp program cycle phase.
RampTime	Time required to reach the temperature hold phase in the Ramp program cycle phase.
RampTOff-(H)	As soon as the selected control sensor for the chamber temperature while heating up to this value has approached the target temperature of a hold phase, the sterilization chamber is then heated with reduced power. This parameter is used to optimize the heat-up behaviour of the device and influences the compromise between rapid heat-up, maximum overshooting of the control sensor and smooth transition of the temperature at the control sensor during a hold phase. See also **RampTOvers-(H).**
RampTOvers-(H)	Defines how much hotter than the set target temperature the chamber may become. This parameter is used to optimize the heating process. It shifts the compromise between rapid heating, maximum overshooting of the control sensor and smooth transition of the temperature at the control sensor during a hold phase. See also **RampTOff-(H).**
RampTBoost	Defines the temperature rise at the control sensor, for which heating is carried out at full power at the start of a heating ramp.
RampTLow-(H)	The value for the downward deviation of the temperature of one of the control sensors from the set target value.
RampTHigh-(H)	The value for the upward deviation of the temperature of one of the control sensors from the set target value.

8.1.17 Spray heating (parameters)

Parameters	Description
CoolCompAirTO	Maximum time for filling the sterilization chamber with compressed air in the Drying program cycle phase.
CoolErrRate	Maximum rate at which the temperature of the main control sensor is allowed to cool down before an incorrect temperature measurement is assumed.
CoolingOptions	Defines which of the installed cooling options should be used in the program cycle phase cooling.
AirPressAdd	The support pressure in the Steam-air mixture program and in the Spray heating program.
AirPressReg	Defines how the **AirPressAdd** support pressure is interpreted.
WaterTime	Run-on time when filling the sterilization chamber in the Spray heating program. The run-on time starts as soon as the water level electrode (Electrode3D) indicates water.
ProgFillTO	Maximum time that the sterilization chamber may take to be filled with demineralized water during the Spray heating program before an error is triggered.

8.1.18 Programmable start time (parameter)

Parameters	Description
StartByTime	Defines whether the function of the programmable start time is enabled. ■ off = disabled ■ on = enabled (the desired start time can be set after you press START in the selected program.)

8.1.19 Ramp function (parameter)

Parameters	Description
Ramps	Enables the ramp function for the selected program.
RampCount-(H)	The number of ramps passed when heating the sterilization chamber.
StayTemp	Target temperature for the temperature hold phase in the Ramp program cycle phase.
RampTime	Time required to reach the temperature hold phase in the Ramp program cycle phase.
StayTime	The residence time in the temperature hold phase of the Ramp program cycle phase.
RampTOff-(H)	As soon as the selected control sensor for the chamber temperature while heating up to this value has approached the target temperature of a hold phase, the sterilization chamber is then heated with reduced power. This parameter is used to optimize the heat-up behaviour of the device and influences the compromise between rapid heat-up, maximum overshooting of the control sensor and smooth transition of the temperature at the control sensor during a hold phase. See also **RampTOvers-(H).**
RampTOvers-(H)	Defines how much hotter than the set target temperature the chamber may become. This parameter is used to optimize the heating process. It shifts the compromise between rapid heating, maximum overshooting of the control sensor and smooth transition of the temperature at the control sensor during a hold phase. See also **RampTOff-(H).**
RampTLow-(H)	The value for the downward deviation of the temperature of one of the control sensors from the set target value.
RampTHigh-(H)	The value for the upward deviation of the temperature of one of the control sensors from the set target value.
RampCount-(C)	The number of ramps passed during cooling of the sterilization chamber.
RampMinP	The minimum pressure to be maintained in the sterilization chamber for a cooling ramp that is operated without an auxiliary cooling option.
RampMaxP	The upper limit for the target pressure in the sterilization chamber when a cooling ramp is used without an auxiliary cooling option.
RampTLow-(C)	The value for the downward deviation of the temperature of one of the control sensors from the set target value.
RampTHigh-(C)	The value for the upward deviation of the temperature of one of the control sensors from the set target value.

Parameters	Description
RampTBoost	Defines the temperature rise at the control sensor, for which heating is carried out at full power at the start of a heating ramp.

8.1.20 Repeated program cycle (parameters)

Parameters	Description
Cycle Count	Defines the number of repeating program cycles (e.g. material tests).
Restart delay	Defines the pause interval between the program cycles when CycleCounter > 1.
Dynamic Count	Defines if the total number of cycles is queried when starting the program for a program with an active repeating program cycle.

8.1.21 Save to Folder (parameter)

Parameters	Description
FtpURL	The address of the FTP server to which the PDF/CSV documentation should be automatically saved after a cycle.
FtpUser	The user for the FTP server (specified by **FtpURL**).
FtpPw	The password for the **FTPUser** (of the FTP server specified by **FtpURL**).
FtpExtPDF	Specifies whether an extended PDF documentation should be automatically exported to the FTP server after a cycle.
FtpPDF	Specifies whether PDF documentation should be automatically exported to the FTP server after a cycle.
FtpCSV	Specifies whether CSV documentation should be automatically exported to the FTP server after a cycle.

8.1.22 Save to Jira (parameter)

Parameters	Description
JiraURL	The address of the Jira server to which the PDF/CSV documentation should be automatically saved after a cycle.
JiraTickets	The ID of the ticket in the JIRA system to which the digital exports should be attached.
JiraUser	The user for the FTP server (specified by **JiraURL**).
JiraPw	The password for the **JiraUser** (of the FTP server specified by **JiraURL**).
JiraPDF	Specifies whether PDF documentation should be automatically exported to the Jira system after a cycle.
JiraExtPDF	Specifies whether an extended PDF documentation should be automatically exported to the Jira system after a cycle.
JiraCSV	Specifies whether CSV documentation should be automatically exported to the Jira system after a cycle.

8.1.23 Rapid cooling with support pressure (parameters)

Parameters	Description
QuickCoolCompAir	Activates the Rapid cooling with support pressure function.
CoolingOptions	Defines which of the installed cooling options should be used in the program cycle phase cooling.
CoolPressReg	Defines if the support pressure set in the Cooling program cycle phase is relative to the temperature in the sterilization phase (false) or relative to the temperature at the control sensor (true).
CoolPressAdd	The support pressure applied during the Cooling program cycle phase. Depending on the value of **CoolPressReg**, the support pressure is interpreted relative to the temperature in the sterilization phase or the temperature at the control sensor.
CoolExhRate	Discharge rate for the pressure inside the sterilization chamber during the Drying program cycle phase.
CoolErrRate	Maximum rate at which the temperature of the main control sensor is allowed to cool down before an incorrect temperature measurement is assumed.

8.1.24 Rapid cooling without support pressure (parameter)

Parameters	Description
CoolExhRate	Discharge rate for the pressure inside the sterilization chamber during the Drying program cycle phase.
QuickCool	Enables the function Rapid cooler without support pressure.

8.1.25 Sleep mode (parameter)

Parameters	Description
SleepModeTO	Defines the time interval after which the device switches to sleep mode. ■ 0 = Function disabled ■ > 0 = Time until the device switches to sleep mode

8.1.26 Vacuum drying (parameters)

Parameters	Description
VacuumDrying	Activates the Vacuum drying function.
DryPressStart	The upper pressure point during the Drying program cycle phase.
DryPressEnd	The lower pressure point during the Drying program cycle phase.
DryTime	Defines the drying time.
DryFillRate	The rate at which the sterilization chamber is filled with air during the Drying program cycle phase.
DryExhRate	The rate at which the sterilization chamber is evacuated during the Drying program cycle phase.

8.1.27 Pre-heating the sterilization chamber (parameters)

Parameters	Description
PreHeatChamb	Activates the Pre-heating the sterilization chamber to the sterilization temperature.

8.1.28 Keep warm function after program finishes liquids (parameters)

Parameters	Description
PostHeatCham-bLiq	Activates the Keep warm function after program finishes.
HoldTemp	Defines the hold temperature which shall be maintained in the sterilization chamber after the cycle (only in liquid programs), if HoldTime > 0.
HoldTime	Defines the holding time, after the run has ended, for which the sterilization material is maintained at HoldTemp: ■ 0 = Function disabled. ■ 1 = Keep warm by heating the sterilization chamber from the outside for an indefinite time, until the STOP button is pressed: The door can be opened and closed several times without interrupting the keep-warm function. ■ 2 = Keep warm using the steam supply in the sterilization chamber, for max. 24 hours (it is possible that the volume of the sterilization material will increase). ■ > 2 = Time in minutes, with one decimal place.

8.1.29 Spray cooling (parameter)

Parameters	Description
CoolErrRate	Maximum rate at which the temperature of the main control sensor is allowed to cool down before an incorrect temperature measurement is assumed.
CoolCompAirTO	Maximum time for filling the sterilization chamber with compressed air in the Drying program cycle phase.
CoolExhRate	Discharge rate for the pressure inside the sterilization chamber during the Drying program cycle phase.

9 Cleaning and maintenance

The maintenance and care tasks described in this section must be carried out at regular intervals. This ensures the proper functionality and reliability of the device. It also helps you to detect faults and defects promptly and increases the lifespan of the device.

These specified cleaning steps and simple maintenance procedures can be carried out by the user.

All further maintenance work must be carried out at regular intervals, according to country-specific regulations, by a trained service technician authorized by Systec or by a registered testing body. Maintenance work includes the airing out of the safety valves.

9.1 Safety notices for maintenance

NOTICE

Danger of damage to the device caused by impurities or contamination!

The operating safety of the device can no longer be ensured if the sterilization chamber has been contaminated by medium that has leaked out.

Remove any residual materials/media.

Carry out the cleaning program immediately after you empty out the sterilization chamber.

NOTICE

Danger of the device malfunctioning because of contamination!

If the water level sensor in the sterilization chamber is contaminated or dirty, the measurement result will be incorrect.

Clean the water level sensor with a damp, lint-free cloth; use alcohol if necessary.

9.2 Cleaning

9.2.1 Cleaning schedule

Interval	Component / action
Daily	■ Clean the door seal ■ Clean the contact surfaces of the door and the sterilization chamber
Weekly / as required	■ Clean the sterilization chamber ■ Clean the accessories ■ Clean the dirt strainer ■ Clean the water level sensor ■ Clean the device surface ■ Clean the touch screen ■ Check the supply and disposal lines ■ Check the aquastop ■ Check the flexible temperature sensors

9.2.2 Clean the touch screen

1 Switch the device off.

2 Only clean the touch screen using a lint-free cloth.

9.2.3 Clean the device surfaces

NOTICE

Aggressive cleaning agents can harm this device!

Steel wool, wire brushes, and aggressive cleaning agents can damage this device and the surface of the device.

For example, you may use a two-to-three-percent citric acid solution as a mild detergent.

Clean the exterior surfaces of the device using a moist soft cloth.

9.2.4 Clean the sterilization chamber

⚠ WARNING

Risk of burns on hot surfaces

There is a risk of burn injuries on hot surfaces if the sterilization chamber is cleaned immediately after operation.

- Let the device cool down before cleaning the sterilization chamber.
- Wear appropriate personal protective equipment.

⚠ CAUTION

Risk of injury from falling floor plate!

The floor plate can be heavy. If floor plate falls when you take it out, it may injure your feet.

- If necessary, use two people to lift the floor plate out of the device.
- Wear appropriate personal protective equipment.
- Prepare a trolley to place the floor late on.

1 Open the door.

2 Switch the device off.

3 Secure the main switch against being switched on again.

4 Clean the door seal using a damp, lint-free cloth.

5 Clean the contact surfaces of the sterilization chamber and door with a damp, lint-free cloth.

6 Clean the flexible temperature sensor(s) using a damp, lint-free cloth.

7 Remove the loading containers and vessels from the device.

8 Remove the floor plates from the device.

9 Clean the sterilization chamber, loading containers and the floor plate using a mild cleaning agent and water. Use only a damp, lint-free cloth.

10 Remove the dirt strainer from inside the sterilization chamber and clean it.

11 Clean the water level sensor with a damp, lint-free cloth; use alcohol if necessary.

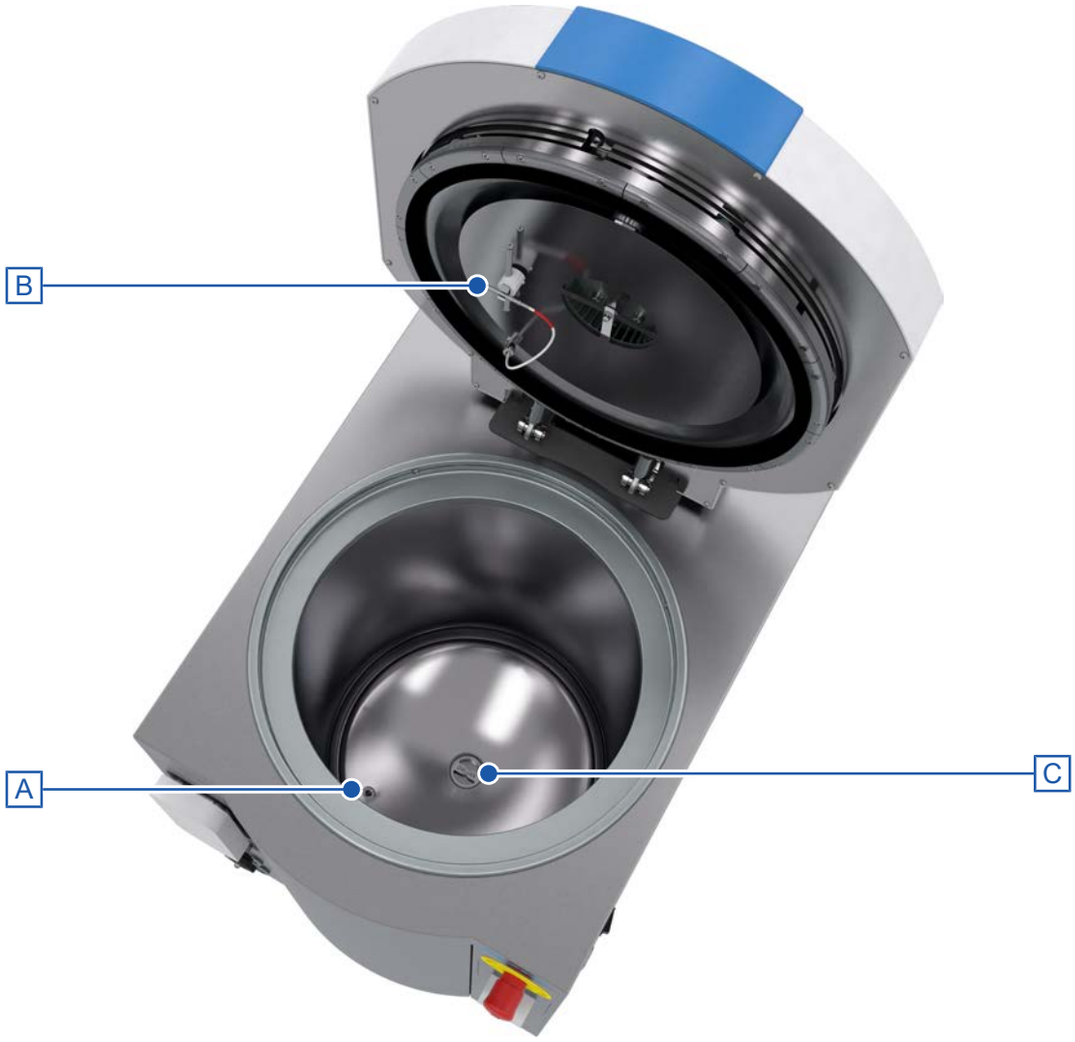


Figure 137: Location of the water level sensor and dirt strainer (an example)

A	Water level sensor	C	Dirt strainer
B	Control sensor		

Figure 138: Dirt strainer

9.3 Maintenance messages at the start of the program

In addition to these maintenance tasks that need to be carried out at regular intervals, other regularly occurring tasks need to be performed depending on the number of program cycles and the configuration of your device.

This may include the following maintenance tasks:

- Changing the exhaust air filter/sterile air filter
- Changing the door gasket
- Required Maintenance
- Customized maintenance counters

When the number of pre-set program cycles for a maintenance task has been reached, the prompt to carry out the work step appears:

Figure 139: Prompt to change the filter

1 Press Yes if the work has not been done and will be performed at a later time. The program cycle continues. At the start of each program, you will be prompted to perform the particular task.

or

Press No, if the corresponding work is to be performed. The program is not continued and you return to the start window before starting the program.

9.4 Replace exhaust air filter / double exhaust air filter

One or two exhaust air filters are placed on the left front of the device in an exhaust air filter housing and sealed closed by a cover.

Required tools:

- Screwdriver 4 mm
- Allen (hex) screwdriver
- Filter pliers

Exhaust air filters may only be replaced after successful sterilization and when the device is depressurised and the door is open.

⚠ WARNING

There is a risk of infection when replacing the exhaust air filter!

Exhaust air filters are not always sterile. There is therefore a risk of infection when it is changed.

- Wear personal protective clothes and gear.
- Re-sterilize used exhaust filters separately after exchanging them.
- Dispose of the exhaust filter in accordance with your applicable on-site health and safety regulations.

⚠ WARNING

Danger of burns due to hot exhaust air filter housing!

Beware of burning yourself on hot filter housing components when replacing the exhaust air filter housing.

- Let the exhaust air filter housing cool down or wear suitable protective clothing (gloves).
- Only replace the filter when the device is switched off and depressurised.

1 Open the door.

2 Remove the cover of the exhaust air filter housing.

Figure 140: Exhaust air filter

A	Cover on the exhaust air filter housing

3 Remove the cover from the front.

4 Pull the filter cartridge(s) forward to remove it. If necessary, use the filter pliers.

5 Insert the new filter cartridge(s).

6 Reattach the cover. Make sure that the gasket is seated correctly.

7 If necessary, confirm the maintenance message or reset the maintenance counter manually.

If the device is equipped with a vacuum component, the "Vacuum test" program should be performed next to check that the device has the proper seal. Refer to section Vacuum test program , Page 49 for details.

9.5 Replacing the door seal

Required tools: 3-mm hex screwdriver.

⚠ WARNING

Risk of burns on hot surfaces

There is a risk of burn injuries on hot surfaces if the door seal is replaced immediately after operation.

- Let the device cool down before replacing the door seal.
- Wear appropriate personal protective equipment.

1 Open the door.

2 Loosen the screws on the fixing plate by two to three turns. Do not unscrew!

Figure 141: Loosening the screws

Figure 142: Pulling out the door seal

3 Pull out the door seal.

4 Insert the new door seal.

5 Carefully (only by hand) tighten the screws on the fixing plate.

6 Check that the door seal is positioned correctly.

⚠ WARNING

Risk of burns due to escaping medium!

If the door seal is not installed correctly on a device without a vacuum device, hot medium could escape during the next sterilization process.

- Make sure that the seal is seated correctly.

7 If necessary, confirm the maintenance message or reset the maintenance counter manually.

If the device is equipped with a vacuum component, the "Vacuum test" program should be performed next to check that the device has the proper seal. Refer to section Vacuum test program , Page 49 for details.

Instructions for resetting the maintenance counter can be found in section Resetting the counters in the MAINTENANCE window, Page 188.

9.6 Inspecting the supply and disposal lines

Check the condition of the supply and disposal lines at regular intervals: check for kinks or possible mechanical damage.

9.6.1 Inspecting and servicing the Aquastop

Regularly check the functionality of the Aquastop. Change its battery every year.

Please refer to the enclosed Aquastop Instruction Manual.

9.7 Inspecting the flexible temperature sensors

Check the cable of the flexible temperature sensors (PT-100) for visible damage.

If you detect damage, the sensor must be replaced immediately by an authorized service technician.

9.8 Resetting the counters in the MAINTENANCE window

After the maintenance task has been completed, the counter readings for filter and door seal replacement as well as the customized maintenance counters can be reset manually in the MAINTENANCE window.

The other counters are reset manually by the customer service technician after the corresponding maintenance has been carried out.

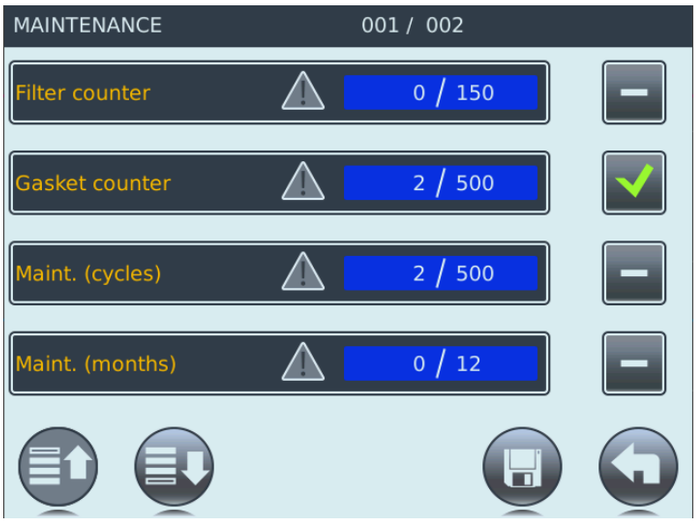


Figure 143: MAINTENANCE window

1 Open the MAINTENANCE window; if necessary, enter your access data.
2 Press the check box to the right of the performed maintenance procedure.
3 Press the Save button. The selected counters are reset.

9.9 Maintenance performed by customer service technicians

Despite all the cleaning and maintenance work done by the operator or user, it is still essential that this device be serviced regularly by a technician authorized by Systec in accordance with the country-specific regulations.

Systec recommends servicing be carried out by a service technician who is authorized by Systec, once every 500 cycles or at least once a year. The maintenance intervals can vary according to the type and frequency of use.

Please contact the manufacturer. Systec would be happy to advise you on the type of maintenance that is suitable for your configuration and can also carry out this maintenance.

10 Troubleshooting

If an error occurs during the program cycle, a corresponding error message will appear on the touch screen.

You should take following actions in the case of an error message:

1 Wait until the device has returned to the standby mode.
2 Correct the error(s).
3 Acknowledge the error message by pressing DELETE.
4 Enter your access data if necessary.
5 Confirm the error message(s).

10.1 Procedure for actions after a power failure

The program is interrupted when the power supply is interrupted during operations.

The program is resumed after the device is restarted. Any relevant error messages remain on the touch screen. The pressure and temperature values displayed there reflect the current state.

If values for the pressure and temperature are outside the specified limits, the program is aborted.

10.2 Error messages

Program error

Error message	Program phase / component	Parameters	Description
Program cycle Pre-treatment timeout	Pre-treatment	Device parameters	Parameter-dependent maximum time that it may take until the target pressure of a pulse (positive and negative) is reached. If you work with one rate, then twice the value of the calculated time applies instead. If 50 kPa should be reached at 5 kPa/min, an error is output after 10 minutes.
Program cycle Heating time exceeded	Heating	Device parameters	Maximum time that the heating phase may last. Calculated from a full load with a cold device multiplied by two.
Program cycle Ramp timeout	Ramp	Program parameters for each ramp	1 Hold temperature. The hold temperature must be between **StayTemp** - **RampTLow** and **StayTemp** + **RampTHigh** for all the control sensors. 2 Ramp time. The target temperature must be reached within twice the ramp time.
Program cycle Fill timeout	Filling	Device parameters	Timeout for the filling process with demineralized water. The timeout is calculated by doubling the time until the water level electrode registers water in an empty sterilization chamber.

Error message	Program phase / component	Parameters	Description
Program cycle Temperature out of range	Sterilization phase	Program parameters	The temperature must be between **SterTemp** - **SterTempLimLow** and **SterTemp** + **SterTempLimHigh** for all control sensors. All additional sensors that are not control sensors must be above the lower limit. This applies to the filter monitoring and condensate monitoring.
Program cycle Pressure out of range	Sterilization phase	Program parameters	Applies only with Satur. steam monitoring: The pressure in the sterilization chamber does not correspond to the set sterilization temperature (**SterTemp**, **SterPressLimLow**, **SterPressLimHigh**).
Cooling fallback mode	Cooling	Device parameters	The target pressure for Rapid cooling with support pressure cannot be reached within the set time. The timeout is calculated by doubling the filling time with 10 kPa to the maximum permissible chamber pressure. After the time out, an emergency mode with timed steam release is enabled.
No water in chamber	Spray heating After filling	None	There is not enough water in the sterilization chamber in the Spray heating program. The chamber electrode detects no water after the filling phase. Notice: This message does not apply to the VX-40 device.
Manual stop	After the program sequence	None	The program cycle was ended by the button STOP.

Device error

Error message	Program phase / component	Parameters	Description
Hardware	I/O board	None	If the I/O board detects an interruption or short circuit at one of the inputs or outputs, this error is triggered.
I/O connection	I/O board	None	If there are connection problems between the I/O board and the controller, this error is triggered.
Chamber limits	Limit value for monitoring	Device parameters	If the maximum permissible chamber pressure or the maximum permissible chamber temperature is exceeded, this error is triggered.
Gen. press. high	Steam generator	Device parameters	If the maximum permissible generator pressure is exceeded by 50 kPa, this warning is triggered.
No gen. water flow	Steam generator	Device parameters	Flow control: No flow to the steam generator is measured for an adjustable period within an adjustable number of start-up attempts.
Door	Door control	Device parameters	■ Consistency: Ring switches and door switches may be inconsistent with the door status for a maximum adjustable time. ■ Pressure equalization: May last for a maximum of an adjustable time interval. ■ Closing: Motor/scissor mechanism is in end position, but the door status is "not closed".
Pressure sensor	Double pressure sensor	Device parameters	**ChamberPress1** and **ChamberPress2** differ from each other by more than one adjustable value for an adjustable time.
Environment	Sensor monitoring	Device parameters	Consistency: The measurement data from the chamber and ambient pressure sensor deviate from each other when the door is open for an adjustable time and for more than one adjustable value.
Vac. pump no water	Vacuum device	Device parameters	Flow control: Within a specified number of start-up attempts, no flow is measured for cooling the vacuum pump for an adjustable time.
Vacuum pump temp.	Vacuum device, heated diaphragm vacuum pump	Device parameters	1 Vacuum pump: Pump is too hot. 2 Diaphragm vacuum pump: Pump is too cold.

Error message	Program phase / component	Parameters	Description
Maintenance	System	Device parameters	The maintenance interval has been exceeded and the device has been configured in such a way that an error then occurs. This concerns both the regular maintenance work to be carried out and the customized maintenance counters.
SD card required	System	None	No SD card installed in the control unit.
SD card invalid	System	None	The SD card in the device is full or defective.
Certificate invalid	System	None	The device's certificate is missing, faulty or expired.

11 Commissioning

NOTICE

Consider the qualifications of your personnel!

This device may only be operated by a service technician who has been authorized by Systec.

NOTICE

Observe the legal requirements concerning the initial commissioning.

The operator must follow the relevant national legislation before the device is put into operations.

The initial commissioning must be carried out according to the relevant national regulations and procedures.

11.1 Installation site

Observe the on-site permissible floor load capacity and the local ambient conditions when selecting the installation location for the device. The operating company is responsible for ensuring that the permissible floor load capacity is not exceeded.

You will find all necessary information concerning the installation location under Connection data, Page 61.

Select an installation location so that there is at least 400 mm of maintenance area to the left, right, above, at the front and at the rear of the device.

No fire/smoke detectors should be installed in the immediate vicinity of the device, since they can be triggered by steam.

⚠ CAUTION

Risk of injury when moving with castors!

Body parts could be crushed when moving a device with castors.

- Maintain a minimum distance of 400 mm from the wall.
- Disconnect the supply media from the device during storage.
- Wear appropriate personal protective equipment (safety shoes).
- Do not move the device alone.

11.2 Connections

The supply and disposal connections should be located in the immediate vicinity of the device.

Hoses and cables must be laid so that accidental disconnection or kinking is avoided.

NOTICE

Leaky connections will cause damages!

Connect the hoses tightly to their on-site connections.

Use only the original hoses provided by the manufacturer.

Contact the manufacturer if you have queries about the connections.

To avoid water damage, we recommend using the Aquastop option as an additional safety measure.

11.3 Transportation

This device may only be transported when its doors are closed.

12 Decommissioning

NOTICE

Consider the qualifications of your personnel!

This device may only be decommissioned by a service technician who has been authorized by Systec.

12.1 Returning the device

When sending the device to Systec for repair or retrofitting, use the original packaging.

Always contact Systec before sending a device back to us.

Please tell us the reason why you are sending it back and consult with us about the next steps to be taken.

In accordance with EU guidelines, the owner of devices that have come into contact with dangerous substances is responsible for the appropriate disposal or the correct declaration for transport of the device. Systec is also obliged to protect its employees from hazardous substances. Therefore, the following points must be observed:

- All devices sent back to us must be free from any kind of dangerous substance (acids, alkalis, dangerous biological substances, etc.).
- The devices must be decontaminated and residual dangerous substances must be neutralized. There are cavities in the interior of the housing of some devices that are difficult to clean. The remains of dangerous substances may be in such cavities.
- When returning the device, you must confirm in writing in the accompanying documents that the above measures have been carried out.

If the owner of the device cannot carry out the measures for eliminating the hazardous substances, the costs which may arise due to the transport and disposal of the hazardous substances during repair work shall be charged to the owner of the device.

12.2 Storage

The device may only be prepared for storage by a service technician authorized by Systec.

When storing, ensure that the device is protected against external influences!

12.3 Transportation

This device may only be transported when its doors are closed.

12.4 Disposal

Figure 144: Disposal

You may NOT dispose of this device with normal household garbage at the end of its service life. Make sure that your device and any accessories are properly disposed of according to your relevant national regulations.

- Decontaminate the device.
- If applicable, de-register the device et Systec.
- You may be able to return components to Systec.
- Dispose of the device in accordance with the nationally applicable laws and regulations.

13 Appendix