SPIROVENT® SUPERIOR S600

User Manual

User Manual

SPIROTECH

maximising performance

TABLE OF CONTENTS

1 PREFACE

1.1 About the device

This user manual describes the installation, commissioning and operation of the following SpiroVent Superior types:

Type	Article code	Description
S600	MV06A..	Automatic vacuum degasser
S600-R	MV06R..	Automatic vacuum degasser, including integrated refill function with direct refill connection.
S600-B	MV06B..	Automatic vacuum degasser, including integrated refill function with backflow prevention.

1.2 About this document

Read the instructions before installation, commissioning and operation. Keep the instructions for future reference.

The original language of the document is English. All other available language versions are translations of the original instructions.
The illustrations in this document show a typical setup with relevant details for instructional use only. Differences between the illustrations and the device are possible but do not have an effect on the comprehensibility of this document.

This manual has been composed with the utmost care. Should, however, this manual contain any inaccuracies, Spirotech bv cannot be held responsible for this.

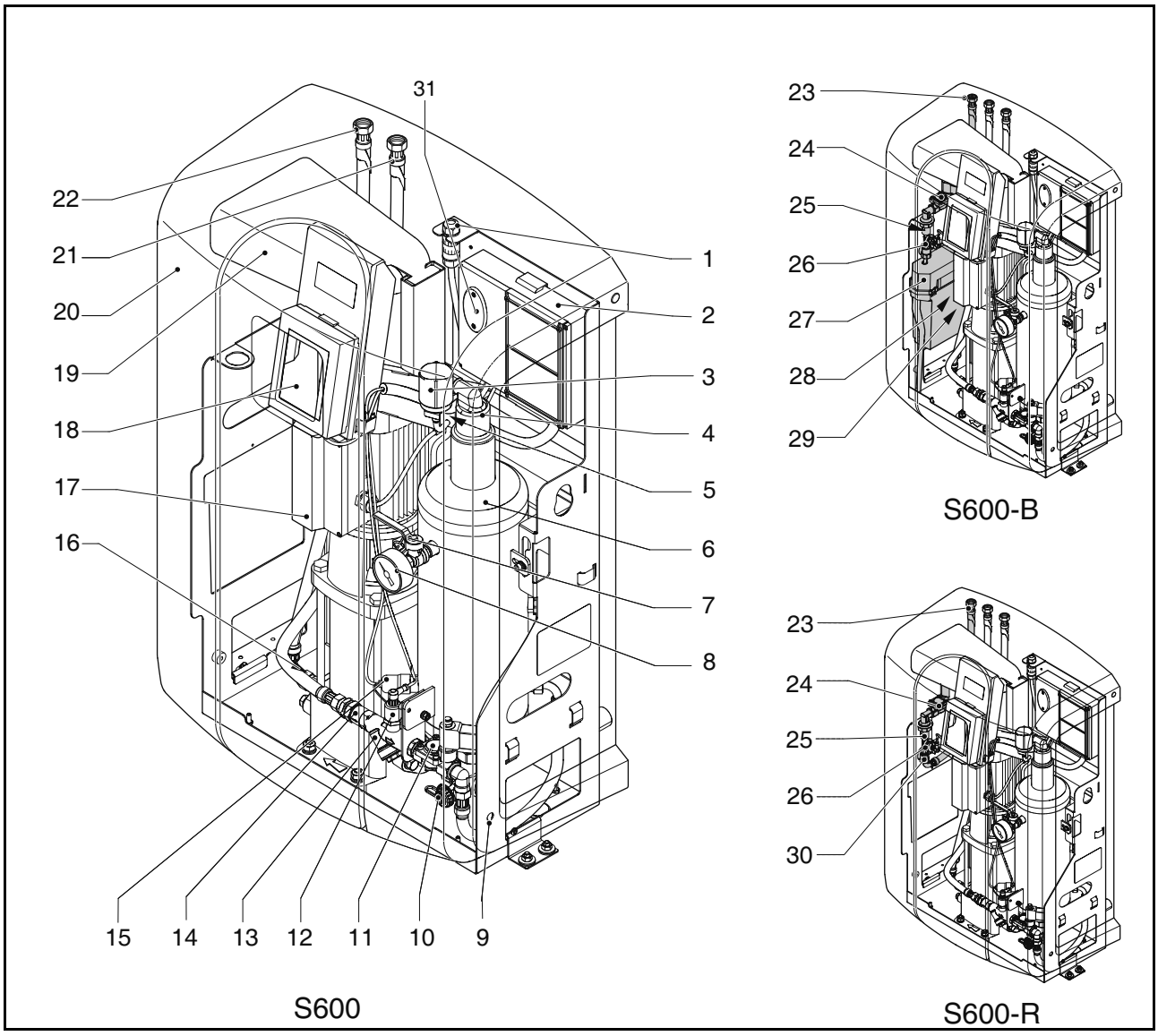
1.3 Symbols

Throughout the instructions the following symbols are used:

	Warning or important note
	Note
	Risk of electric shock
	Risk of burning

2 INTRODUCTION

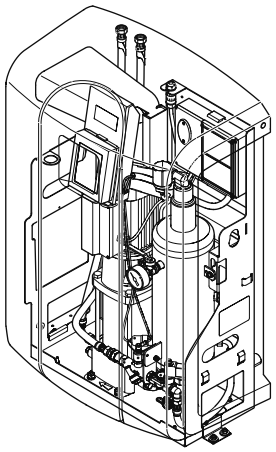
2.1 Overview of the unit



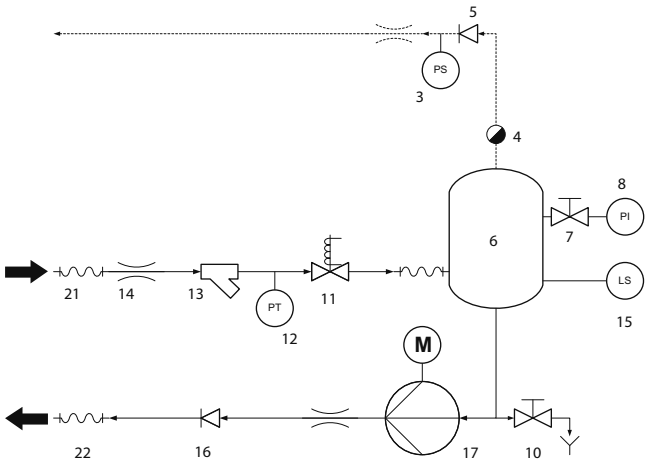
1 Power terminal
2 Control unit - Power box
3 SmartSwitch
4 Automatic air vent
5 Check valve of the air vent
6 Deaeration vessel
7 Valve behind the pressure gauge
8 Pressure gauge
9 Bolt
10 Drain connection
11 Solenoid valve
12 Pressure sensor
13 Y-filter
14 Flow limiter inlet
15 Level switch
16 Check valve of the outlet
17 Pump
18 Control unit (HMI)
19 Cooling channel
20 Cover
21 Inlet connection
22 Outlet connection
23 Refill connection
24 Solenoid valve refill
25 Check valve refill
26 Water flow meter
27 Break tank
28 Float valve
29 Float switch
30 Flow limiter refill
31 Fuses

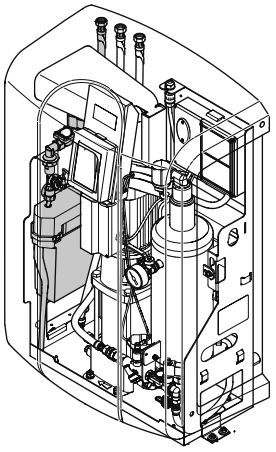
2.2 Operation

The figure below schematically shows the operation of the unit. The letter indications correspond with the main figure on the previous page.

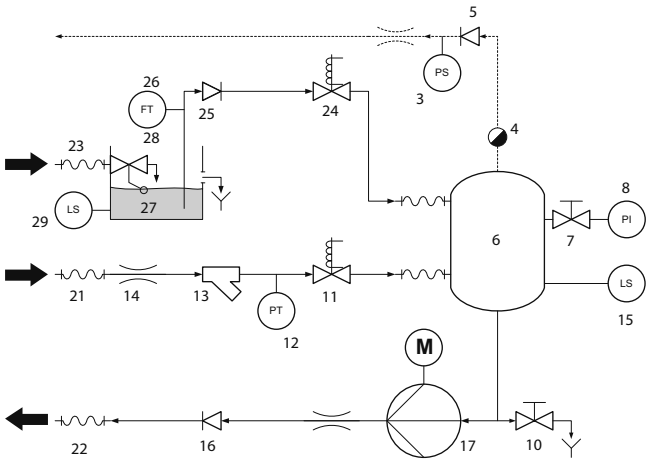


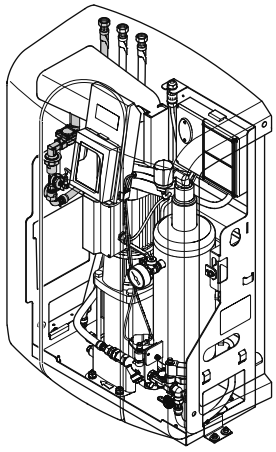
S600



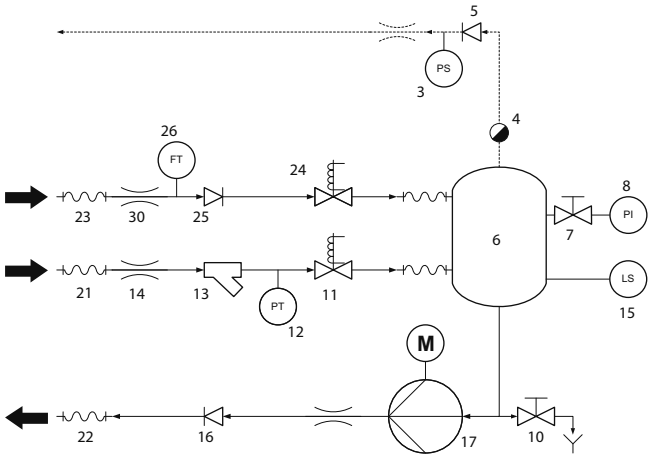


S600-B





S600-R



2.2.1 General

The Spirovent Superior is a fully automatic vacuum degasser for heating and cooling installations, filled with heat transfer fluids. These fluids contain dissolved and free gases. The Spirovent Superior removes these gases from the installation, preventing problems, caused by gases in the installation.

2.2.2 Degassing

The unit starts up a degassing process each day at a time set by the user. The process has two phases:

1 The rinsing phase: The fluid flows from the installation through the solenoid valve (11) into the vessel (6). The pump (17) continuously pumps the fluid from the vessel into the installation. Here the fluid absorbs gases present in the installation.

2 The vacuum phase: The solenoid valve (11) regularly closes, starting a vacuum phase. The continuously running pump (17) provides the necessary underpressure in the vessel (6). The underpressure causes the release of the gases dissolved in the fluid, and these gases are collected at the top of the vessel. At the end of the vacuum phase, the solenoid valve (11) opens again, releasing the gases from the installation through the automatic air vent (4). The SmartSwitch (3) at the automatic air vent ensures that the degassing is stopped as soon as the content of dissolved gases has reached the minimum level.

2.2.3 Refilling

S600-B and S600-R have an integrated refill function, and can control the pressure of the installation. To control the pressure the unit inserts, if necessary, additional (degassed) fluid into the installation. Alternatively, the unit can refill on demand of external equipment e.g. expansion systems.
The refill process consists of a vacuum phase where fresh fluid is sucked into the vessel (6): system valve (11) closed, refill valve (24) opened. This is followed by a flushing phase during which system fluid is flushed through the vessel to degass the refill fluid.
The unit can also refill the installation in case of abnormal or total pressure loss.

2.3 Operating conditions

The unit is suitable for use in systems filled with clean water or mixtures of water and glycol up to 40% .
Operation in combination with other fluids may result in irreparable damage.

The unit should be used within the limits of the technical specifications as given in chapter 3. In case of doubt, always contact the supplier.

2.4 Remote monitoring

2.4.1 Building Management System (BMS)

The Superior has a series of external connectors for remote monitoring and control.
The device also has the possibility to connect Building Management Systems to the RS485 connector in order to communicate, utilizing the following bus system:

- Modbus RTU

2.4.2 Internet

The Superior control unit can be connected to the Internet, either by means of a LAN cable or by means of an optional WiFi connection dongle. This allows remote monitoring of the system. It is also possible to upgrade the Superior with new firmware (if available) when connected to the Internet.

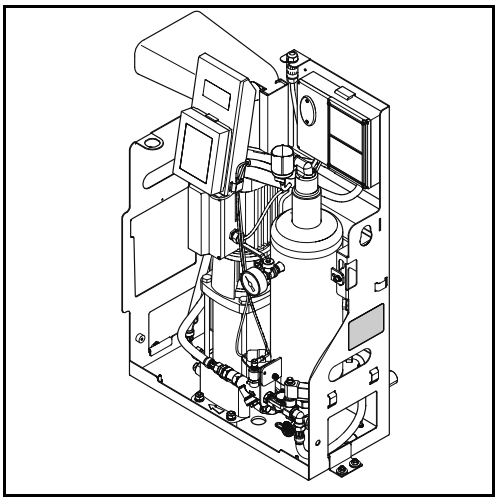
2.5 Scope of delivery

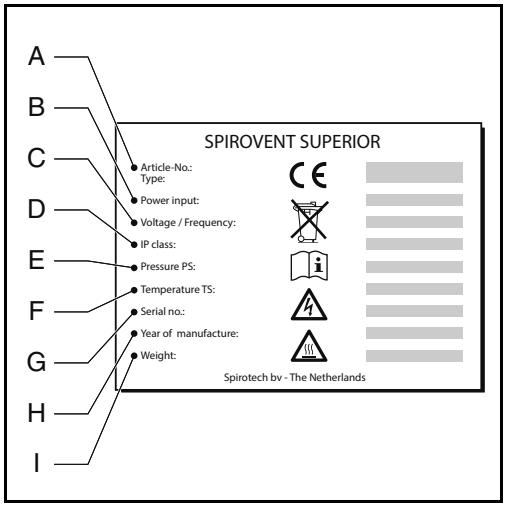
- 1x SpiroVent Superior
- 1x User documentation
- 1x Non-return protection (optional)

2.6 CE marking

The unit has a CE marking. This means that the unit has been designed, constructed and tested in compliance with the current safety and health regulations.
Provided that the user manual is adhered to, the unit can be safely used and maintained.

2.7 Type plate





A Type of the unit
B Absorbed power
C Supply voltage
D Protection class
E System pressure
F System temperature
G Serial number
H Year of construction
I Weight

3 TECHNICAL SPECIFICATIONS

3.1 General specifications

Item	S600	S600-R	S600-B
Empty weight [kg]	62	63	64
Noise level [dB (A)], at 1 m	57	57	57
Fluid connections inlet/ outlet	Swivel G¾" female	Swivel G¾" female	Swivel G¾" female
Fluid connection refil	Swivel G¾" female	Swivel G¾" female	Swivel G¾" female

3.2 Operating characteristics

Item	S600	S600-R	S600-B
System pressure [bar]	2.5 - 6	2.5 - 6	2.5 - 6
Processing capacity [l/h]	1000	1000	1000
Max. system volume [m^3]	325	325	325
System temperature [°C]	0 - 90	0 - 90	0 - 90
Ambient temperature [°C]	0 - 40	0 - 40	0 - 40
Refill pressure [bar]	n/a	0 - 10	1.0 - 10
Refill temperature [°C]	n/a	0 - 65	0 - 60
Effective refill flow [l/h]	n/a	400	300

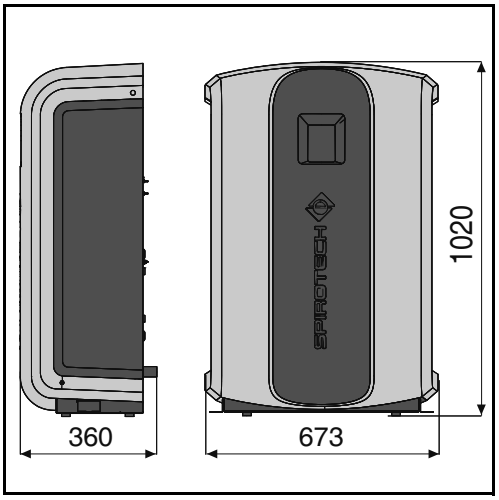
3.3 Electrical specifications

Item	All types
Supply voltage	230 V ± 10% (50 - 60 Hz)
Required supply protection [A]	16
Nominal pump current [A]	5.1
Power consumption [W]	800
Ingress Protection class	IP 44
External contacts: common fault	Voltage free (NO), max. 24V 1A
External contacts: boiler interlock	Voltage free (NO), max. 24V 1A
External contacts: external refill voltage [V]	5
Fuse F1, electronic unit [A(M)]	1
Fuse F2, valves [A(T)]	2.5
Fuse F3, pump [A(T)]	10

3.4 Internet specifications

Item	All types
LAN	RJ45; Cat 5e
WLAN	WiFi dongle (optional); 802.11 B/G/N

3.5 Dimensions



Height [mm]	Width [mm]	Depth [mm]
1020	673	360

4 SAFETY

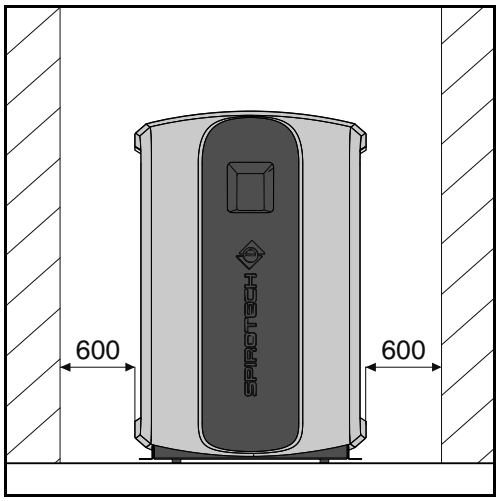
4.1 Safety instructions

Refer to the safety instructions document for the safety instructions and other safety information.

5 INSTALLATION AND COMMISSIONING

5.1 Installation conditions

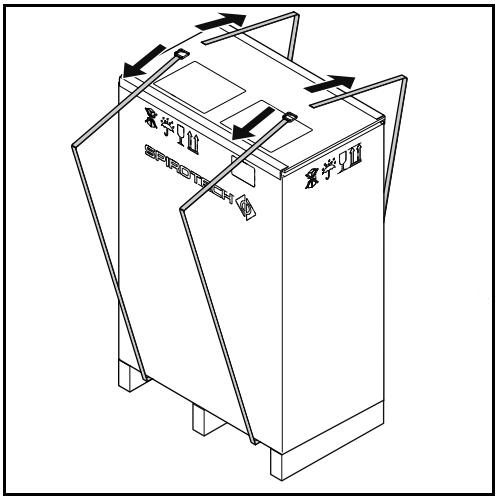
- Install the unit on a frost-free, well-ventilated place.
- Install the unit in accordance with the local guidelines and rules.
- Connect the unit to a 230 V / 50 -60 Hz supply.
- Install the unit as bypass on the main line of the installation.
- Preferably install the unit at the point in the installation with the lowest temperature. Here the most dissolved gases are found in the fluid.
- In case of a heavily contaminated system fluid, a dirt separator is to be installed in the main return line of the installation.
- Make sure that the expansion system has the proper dimensions. The water displacement in the unit can cause pressure variations in the installation. Take into account an extra net expansion volume of at least 8 litres. Make sure the expansion system connection is properly sized (at least ¾"/22mm diameter).
- Make sure that the operating panel is always easily accessible.
- Make sure that you maintain at least the distance as indicated for service and repair.



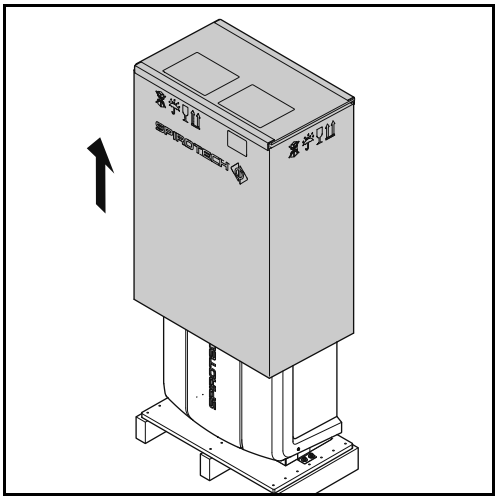
5.2 Unpack

WARNING
To prevent damage to the unit do not hoist the unpacked unit.

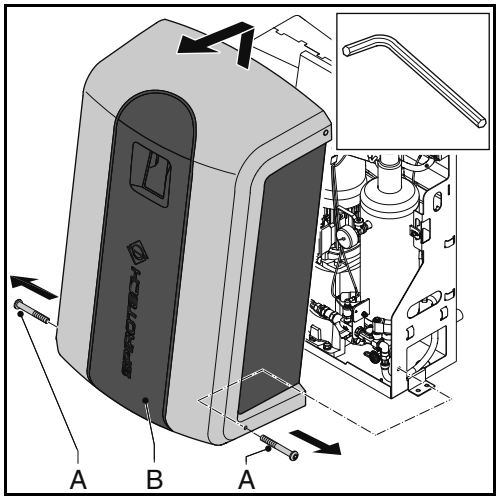
The unit is delivered on a pallet.



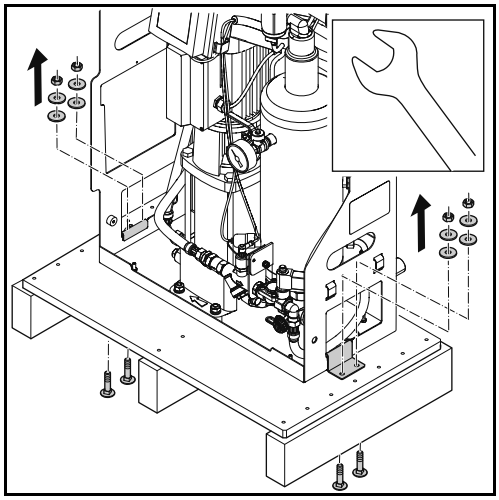
1. Remove the straps.



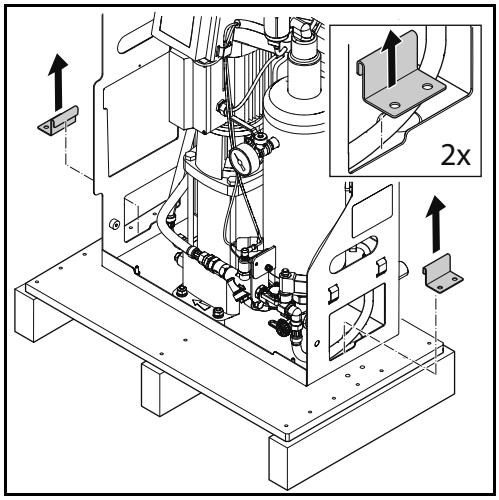
2. Remove the packaging.



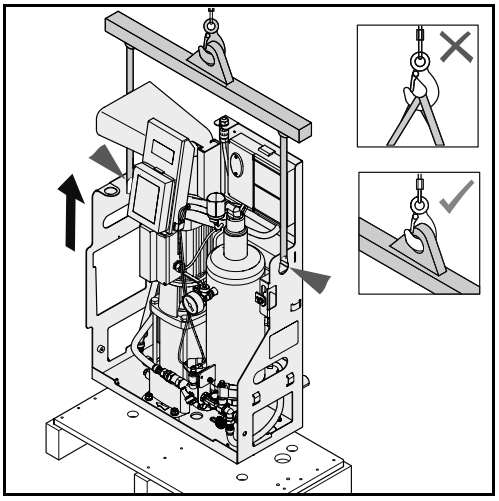
3. Remove the fasteners (A).
4. Remove the cover (B) from the unit.



5. Remove the fasteners. Keep them for future use.



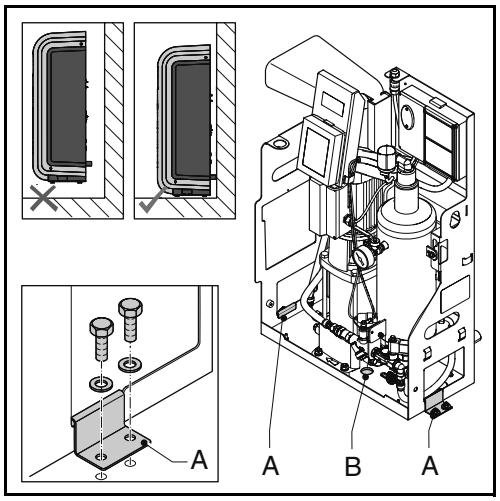
6. Remove the brackets. Keep them for future use.



7. Move the unit to its location of installation. Lift the unit with a hoist.

5.3 Mounting and installation

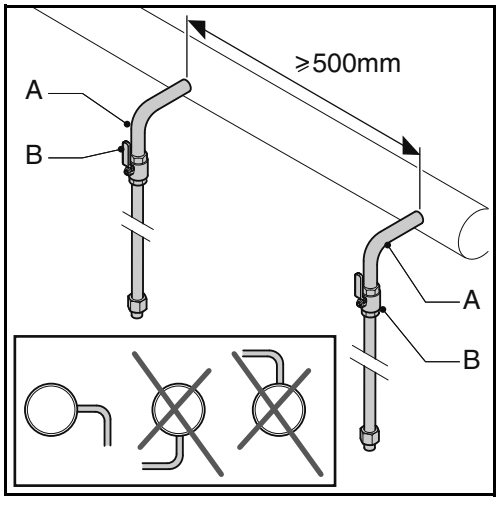
5.3.1 Mounting



1. Place the unit on a flat surface, against a flat, closed wall.
2. It is possible to mount the unit to the floor. Use brackets and adequate fasteners (A).
3. **Under condensing circumstances:** It is possible to remove the plug from the drain hole (B). Use a 1" adapter to connect the unit to a drain tube and a proper waste water outlet.

5.3.2 Installation

Mechanical

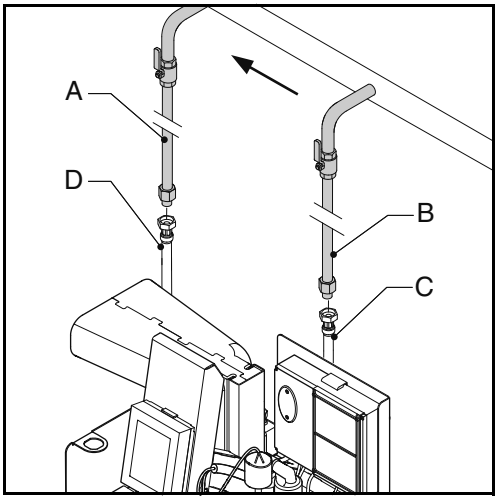


1. Make two branch lines ¾" (A) on the side of the main transport line.

NOTE
The distance between them should be at least 500 mm. The inlet of the unit should be connected to the first connection point in the flow direction.

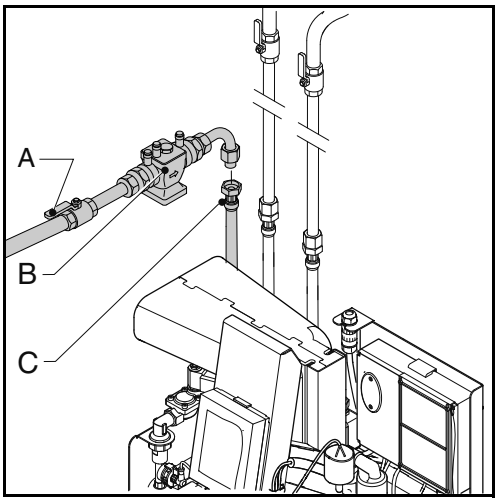
2. Insert a valve (B) in each branch. Preferably, use lockable ball valves.

NOTE
With these valves the unit can be isolated. Keep valves closed until the unit is installed and taken in operation. Refer to § 5.4.



3. Connect the line (A) to the flexible outlet line (D).
4. Connect the line (B) to the flexible inlet line (C).

Only applicable to units with direct refill connections (-R versions):



1. Insert a shutoff valve (A) and a backflow protection (B) in the refill fluid supply line (C).

2. Connect the makeup water supply line to the refill connection line (C).

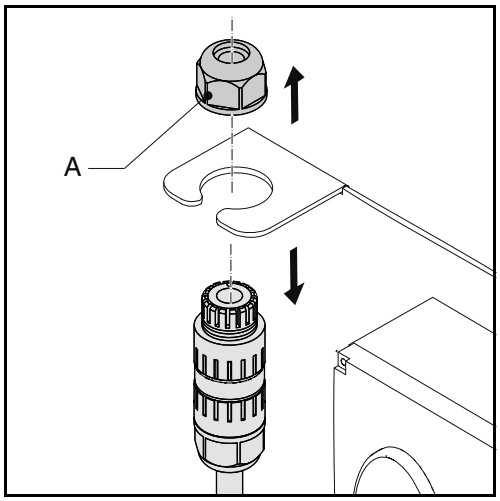
CAUTION

- Use a locally approved backflow protection. A backflow protection can also be supplied as an option with the unit.
- Make sure that the pressure of the feed water is below the system pressure.
- Make sure that the lines leave the unit at the top. This will avoid fast wear of hoses.
- Make sure that the breaktank overflow hose ends inside the unit.

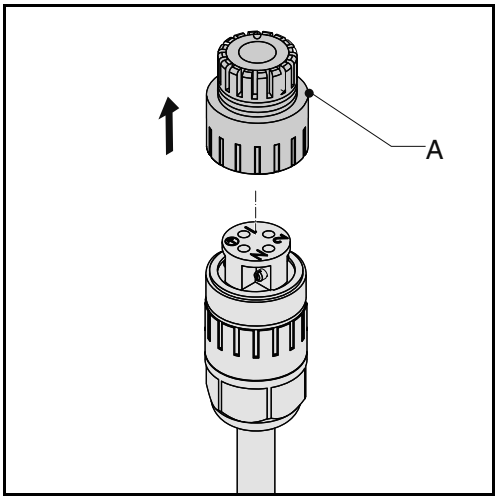
Electrical

CAUTION

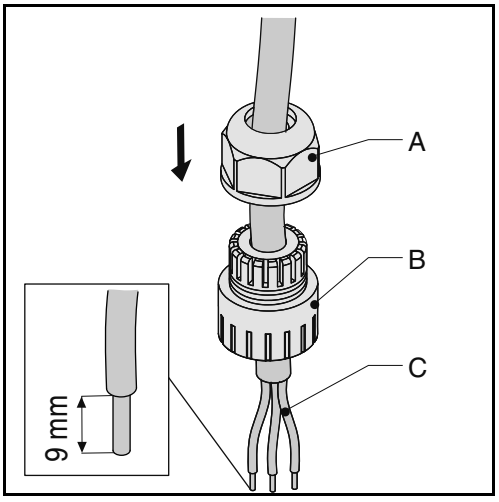
- Preferably, use a grounded wall socket for the power supply to the unit. The socket must stay accessible.
- Mount an all-pole main switch (contact opening >= 3mm) if the unit is directly connected to the power supply.
- Use supply cables with the correct dimensions.



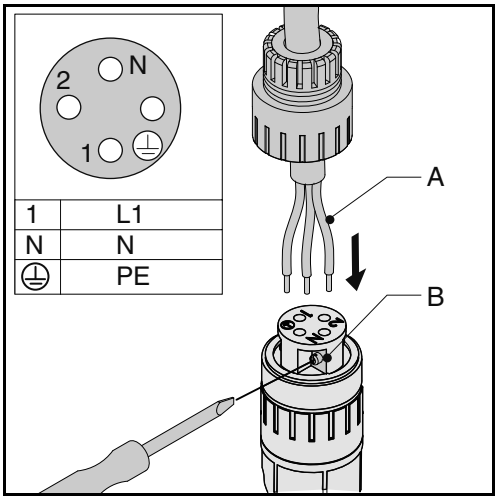
1. Loosen the cable gland (A) and take the connector out of the frame.



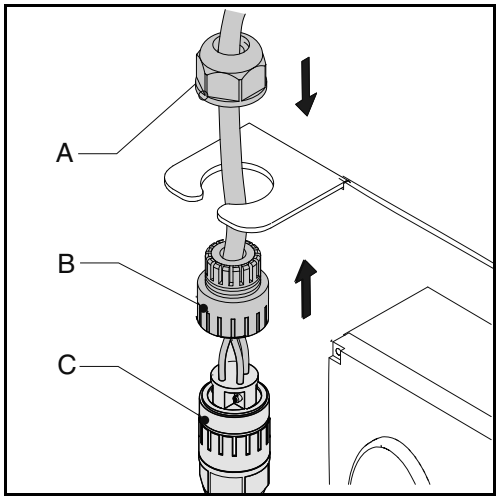
2. Loosen and remove the connector cap (A).



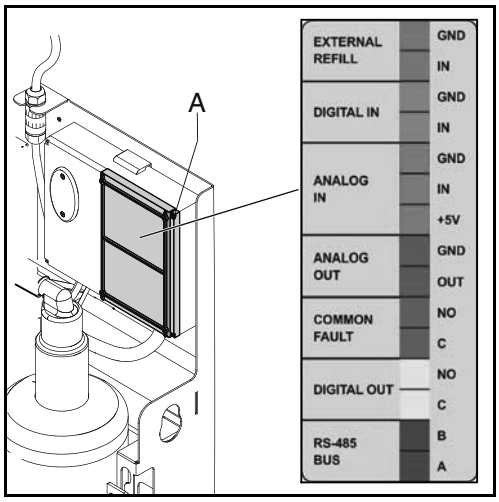
3. Feed a 3-core supply cable (C) through cable gland (A) and the connector cap (B).



4. Loosen the screws (B).
5. Insert the wires (A) into the correct holes of the connector plug.
6. Fasten the screws (B).

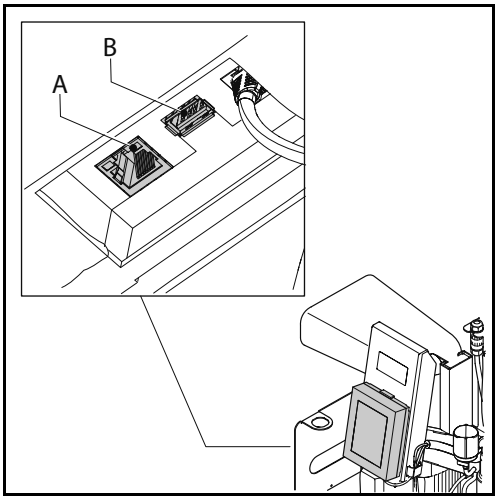


7. Fasten the connector cap (B) to the connector (C).
8. Put back the connector in the frame.
9. Fasten the cable gland (A).



Contact	Connector
External refill	Blue
Fault message	Grey
Boiler interlock	Yellow
BMS	Purple

10. If an external contact (external refill, common fault, and/or boiler interlock) or BMS is used, connect the cables of the external contact or BMS to the correct connector in the power box (A).

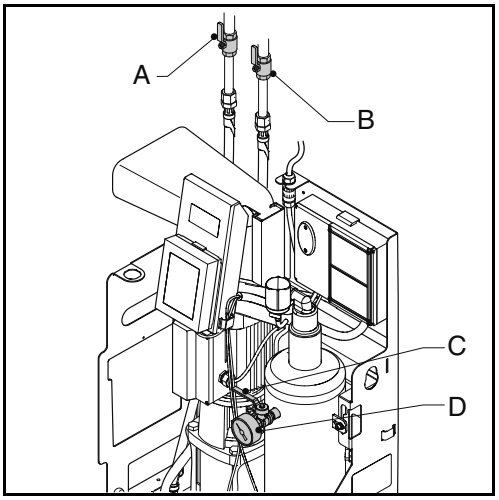


11. For internet connection, either connect the LAN cable to the LAN connector (A), or connect the WiFi dongle (optional) to the USB connector (B).

CAUTION
Make sure that the LAN cable does not touch warm parts.

5.4 Commissioning

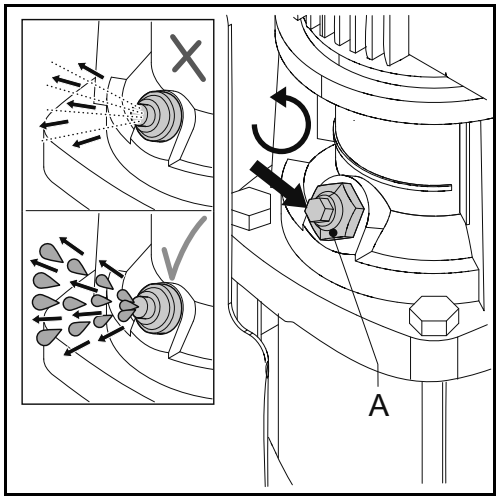
5.4.1 Filling the unit



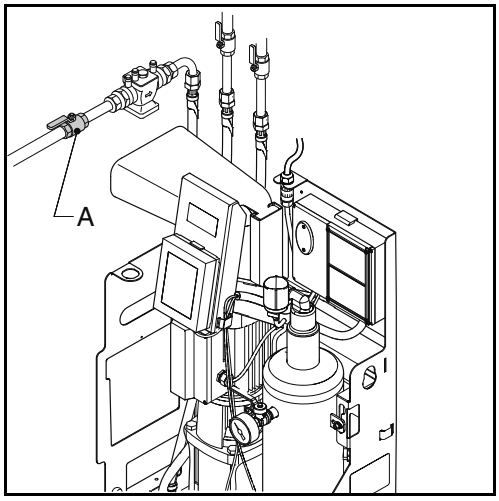
1. Open the valve (C) behind the pressure gauge (D).
2. Open system valves (A and B).

The following processes will automatically start:

- The unit will be filled with water.
- Air will be released.
- The vessel pressure will equalise with system pressure.



3. Open the deaeration valve (A) to deaerate the pump.



4. **For units of -R and -B versions:** Open the shutoff valve (A) in the refill line.
5. **For units of -B versions:** Make sure that there is water in the break tank.

5.4.2 First startup

1. Connect the unit to the mains power.

NOTE
The display of the touchscreen starts and will guide you through the startup procedure (Automatic Commissioning Procedure) and all the basic necessary settings.

For information on the content of the HMI (user interface), refer to § 6.1.

Automatic Commissioning Procedure
The Automatic Commissioning Procedure will guide you through the startup via several screens.
The Automatic Commissioning consists of several steps:

1. Push the start button to start the commissioning procedure.
2. Select the preferred language, refer to *Select the preferred language*.
3. Set the actual time and date, refer to *Set the actual time and date*.
4. Select the correct system fluid, refer to *Select the correct system fluid*.
5. Set the pressure levels, refer to *Set the pressure levels*.
6. Fill up the unit with system fluid, refer to *Fill up the unit with system fluid*.
7. Execute the functional test, refer to *Execute the functional test*.

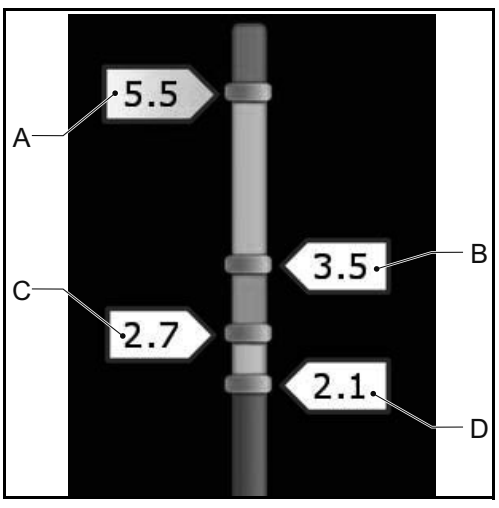
Select the preferred language
1. Select your preferred language. The indicator shows the selected language.
2. Select the next page button (>).

Set the actual time and date
1. Set the actual time. Move the wheels of the time indicator (HH:MM:SS) to the correct time in hours (HH), minutes (MM), and seconds (SS).
2. Set the correct time zone (UTC). Move the wheel to the correct time zone.
3. Select the next page button (>).
4. Set the actual date. Move the wheels of the date indicator (DD:MM:YY) to the correct date in day (DD), month (MM), and year (YY).
5. Select the next page button (>).

Select the correct system fluid
1. Select the type of fluid in the system. The indicator shows the selected type.
2. Select the next page button (>).

Fill up the unit with system fluid
1. Open the valves. Refer to § 5.4.1.
2. Select the next page button (>).
3. Deaerate the pump. Refer to § 5.4.1.
4. Select the next page button (>).

Set the pressure levels



1. Drag the label of the maximum pressure (A) to the desired maximum pressure.
2. **For units of -R and -B versions:** Drag the label of the operating pressure (B) to the desired operating pressure.
3. **For units of -R and -B versions:** Drag the label of the refill pressure (C) to the desired refill pressure.

NOTE
The minimum operating pressure (D) cannot be changed.

4. Select the next page button (>).

Execute the functional test

1. Push the start button to start the functional test.

The functional test only starts if the unit meets the following conditions:

- The deaeration tank is filled with system fluid.
- The measured pressure is above the minimum pressure (0.8 bar).
- **For -B versions**: the break tank is filled with refill fluid.

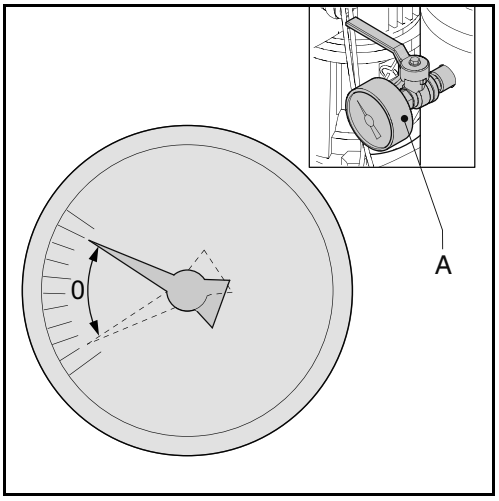
2. When the display shows that the test is completed successfully, push the OK button and proceed to the next step, refer to § 5.4.4. *The display shows the home screen and the status is standby*.

NOTE
During the functional test, warnings and faults can be triggered (refer to § 7.5). If this happens, remedy the failure and start the functional test again.

If it is not possible to remedy the failure at the moment, abort the functional test and remedy the failure later on. When the failure is solved, check if the unit is functioning properly. Refer to § 5.4.3.

5.4.3 Check the operation when the functional test was aborted

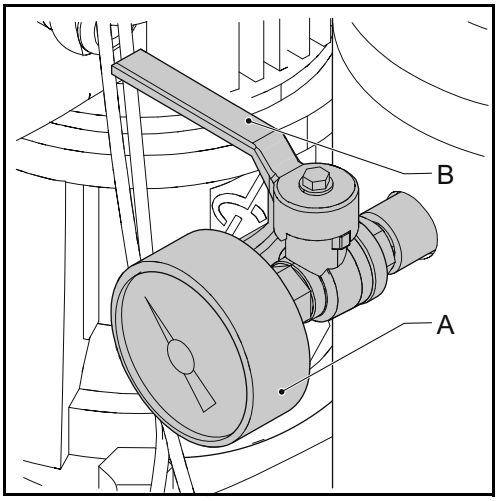
1. Go to the home screen.
2. Push the menu button.
3. Select `Operating mode`.
4. Select `Automatic mode`.
5. Push the button `Degass start`.



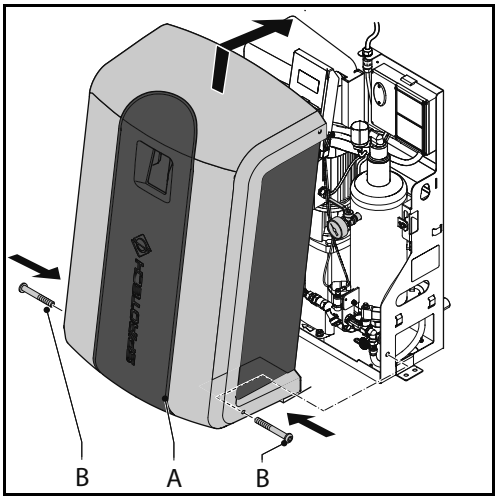
6. Check the indication of the pressure gauge (A). This should alternately display overpressure and underpressure.

NOTE
The SmartSwitch will automatically turn off the unit when the concentration of dissolved gases has reached the minimum level.

5.4.4 Finish the startup



1. Close the valve (B) behind the pressure gauge (A).



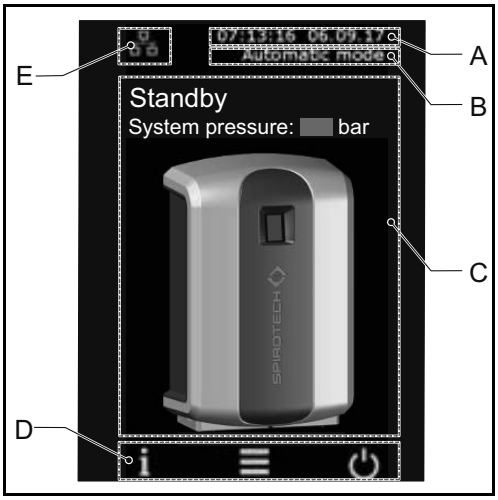
2. Put back the cover (A) on the unit and fasten it with the fasteners (B).

6 OPERATION

6.1 HMI (user interface) description

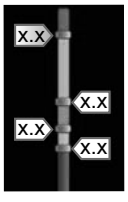
This section shows an overview of the content on the display.

6.1.1 Screen layout



A Date and time indicator
B Operating mode indicator
C Page-specific content
D Navigation bar
E System connection indicator; and Error/warning indicator

6.1.2 Buttons and indicators

Button/indicator	Description
	On/off button
	Menu button
	Information button
	Home button
	Confirm button
	Next page button
	System connection indicator
	WiFi indicator
	Error indicator
	Warning indicator
	Radio button (not selected)
	Radio button (selected)
	Action button (available)
	Action button (not available)
	Selection wheel
	Range indicator with movable labels

6.1.3 Overview of the pages

Page	Content
Start	On/off button
Home	• Actual unit state, refer to § 6.1.4 • Actual system pressure • Unit illustration
Main Menu	Navigation buttons to go to other pages: • Operating mode • User settings • History • Software upgrade • Network • Help (Info)

Main menu	
Page	**Content**
Operating mode	Operating mode selection: a Automatic mode: - Button `Degass start` - Button `Stop processes` - Button `Low Pressure refill` b Manual mode: - Button `Degass start` - Button `Stop processes` - Button `Low Pressure refill` - Button `Manual mode cancel`
User settings	Navigation buttons to go to the user settings pages: • Language • Date and Time • System fluid • Degassing • Refill • Pressures • Boiler interlock • Common fault For user settings, refer to § 6.1.5

Main menu	
Page	**Content**
History	Navigation buttons to go to history pages: • Work history • Faults history • Degass graphs • Counters
Software upgrade	Only accessible for Spirotech
Network	Shows the type of network
Help	Navigation buttons to go to help pages: • Launch guide • Device description: - Overview - External contacts - Fuses • Spare parts • Warnings description • Errors description • Device info (e.g. software version)

6.1.4 Unit state

State	Description
Device turned OFF	The unit is switched off
Standby	The unit is not operating and waiting for a starting command
Pump test	The pump is running. The system valve will stay open
Degassing	The unit is degassing
Refill	The unit is refilling
Manual refill	Refill the unit manually
Stopping	The system valve will open
Error	The unit has stopped because a critical error has occurred

6.1.5 User settings

General settings	
Parameter	**Description**
Language	The language of the display texts Select the desired language by pressing the corresponding radio button.

General settings	
Parameter	**Description**
Date and Time	The actual date and time Set time (HH:MM:SS), UTC timezone (HH:MM) and date (DD:MM:YY) by scrolling the selection wheels.
System fluid	System fluid. Select the used system fluid out of the list by pressing the corresponding radio button. • Water • Water glycol mixture
Boiler interlock	Boiler interlock settings. External connections/interfaces can be programmed to open when pressure drops below or rises above a critical boiler limit. These limits can be set after selecting the boiler interlock.
Common fault	General contact for errors Contact is normally open (NO) by default, but can be switched to normally closed (NC). Is the common fault set to normally closed (NC), switching off the mains power will make this contact NO as long as the power is switched off.

Degassing settings	
Parameter	**Description**
Auto degass time 1	Time setting for daily start time and stop time of the degassing process.
Auto degass time 2	Second time setting for daily start time and stop time of the degassing process.
Block time	Periods that the unit is not allowed to degass. • Weekday (every day of the week can be chosen) • Year (max. 5 periods per year can be chosen)

Refill settings (only for S600-R and S600-B versions)	
Parameter	**Description**
Refill volume alarm after	Maximum allowed refill quantity per refill. Issues an alarm if a refill exceeds this threshold. Range: 0 - 2500 l; 0 = switched off.
Refill time alarm after	Maximum continuous refill time. Range: 0 - 255 min.; 0 = switched off.
Max. refill frequency	Maximum number of times per day that refilling is allowed Range: 0 - 10 times; 0 = switched off.

Pressure settings	
Parameter	**Description**
Max. system pressure	Pressure at which the unit stops and triggers an alarm. This pressure should be lower than the system safety valve setting. Drag the label to the desired pressure
Desired operating pressure	The preferred system pressure. This is the pressure at which the refilling stops. Drag the label to the desired pressure. Only for S600-R and S600-B versions.
Refill pressure	The preferred system pressure at which the refilling starts. Set this value as low as possible when the refilling is controlled by an external refill system. Drag the label to the desired pressure. Only for S600-R and S600-B versions.

6.2 Switch on the unit

1. Connect the unit to the mains power.
2. Touch the display of the touchscreen.

NOTE
The start page shows on the display.

3. Select the menu button.
4. Select the button `Settings`.
5. Check if the settings are correct. If not, change the settings.
6. Select the home button.
7. Select the on/off button.

NOTE
The unit is standby.

6.3 Change a setting

1. If you are not at the Settings page, go to the Settings page.
2. Select the setting you want to change.
3. Change the setting.
4. Select the confirm button (↵).

NOTE
The new setting parameter shows on the display.

6.4 Switch off the unit

1. Select the on/off button.

NOTE
The unit stops.

2. If necessary, disconnect the unit from the mains power.

6.5 Operating mode

6.5.1 Manual operation

1. Go to the Operating mode page.
2. Select `Manual mode`.
3. Select the button `Degass start`.

NOTE
Every degassing cycle will start in the pump test mode, which is the rinsing phase. After 15 seconds, the degassing mode will appear and the degassing cycle will start (vacuum phase).

CAUTION
Manually started degassing will not be controlled by the Smart switch nor by blocking times and will run continuously.

4. Select the button `Manual stop cancel` to stop the degassing.

6.5.2 Automatic operation

1. Go to the Operating mode page.
2. Select `Automatic mode`.

NOTE
Now the degassing process is controlled by the Smart switch and will start again at the next Auto degass time. A new degassing action always starts with a pump test as a part of the degassing cycle.

The refill process always has priority over the degassing process. As soon as system pressure drops below the “refill pressure”, the refill process will start.

6.6 Refill

The refill process is automatically controlled by the pressure limits as defined under settings. Available in the direct refill version (-R) or the break tank refill version (-B). The net refill flow depends on water supply pressure (-R versions) and system pressure.

6.7 Manual refill

When the system pressure has dropped to a value below the minimum operating pressure (2.5 bar), a low pressure warning will occur and the unit will ask whether a special refill procedure will be started to bring the system to the refill pressure again. In this manual refill cycle, the pump will be switched on and off and the refill valve will stay open.

6.8 Various remarks

- When the unit is connected to power, the display is shown automatically after touching the screen.
- The display switches off automatically after not being touched for 5 minutes.
- The degassing or refilling process is stopped by a stop procedure, making sure that the unit stops in a safe situation (overpressure). This stopping procedure may take some time (max. 20 seconds).
- When a pump has not run for 96 hours, an automatic pump test (15 seconds) will run at the next Auto degass time.

7 FAILURES

7.1 Remedy failures

WARNING

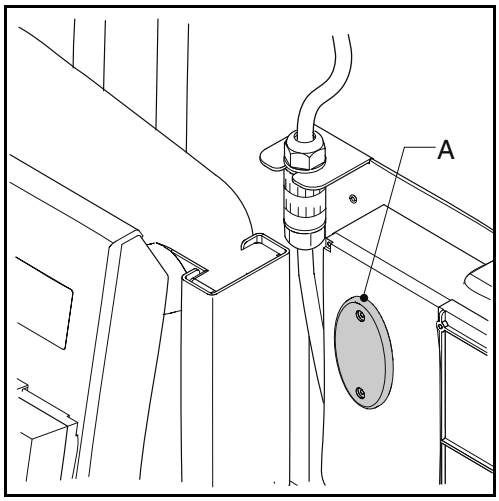
- In case of a failure always warn the installer.
- Remove the power and pressure from the unit before starting repairs. Refer to § 7.3 on how to put the unit out of operation.
- After re-opening the system isolation valves, always check for possible leakages.

WARNING

- There are hot parts under the cover. Let the unit cool down before starting repairs.

1. Use the failure table in § 7.5 to find the cause.
2. If necessary, put the unit out of operation. Refer to § 7.3.
3. Remedy the failure.
4. Reset the unit, refer to § 7.4, or put the unit into operation again, refer to § 6.2.

7.2 Replace a fuse



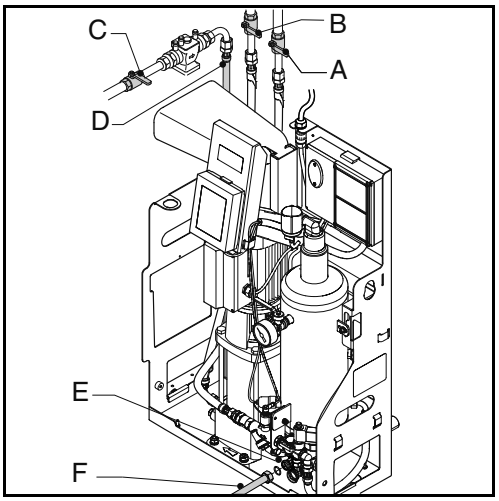
- For electrical specifications, refer to § 3.3.
- Broken fuses F2 and F3 are indicated by error codes, refer to § 7.5.

1. Open the cover (A).
2. Replace the broken fuse.
3. Close the cover.
4. Do a check to see if the failure is resolved.

7.3 Taking out of operation

WARNING

- Make sure that it is not possible to unintentionally supply power to the system.



1. If the unit is switched on, select the on/off button and select “turn off” to stop the unit.
2. Take the plug out of the wall socket.
3. Close the valve of the inlet line (A) and the valve of the outlet line (B).
4. **For units of -R and -B versions:** Close the valve (C) in the refill supply line (D).
5. Connect a drain line (F) to the drain connection (E).
6. Drain the unit through the drain connection.
7. Open the air vent screw on the main pump to completely empty the unit. Refer to the figure in § 5.4.2.

7.4 Resetting the unit

1. At the error or warning pop up, select the button CLEAR FAULT.

NOTE
It is only possible to select the button CLEAR FAULT when it is yellow. If the button is grey, first solve the error.

7.5 Failure table

The number indications correspond with the main figures in § 2.1 and § 2.2. An overview of the replacement parts has been included in § 8.2.

NOTE
Faults and warnings are indicated on the display of the unit as Exx or Wxx, where xx designates a problem (abnormal behaviour). The following tables provide an overview of problems, possible causes and possible remedies. Some problems (warnings) automatically disappear when the cause is taken away. For some problem situations, the unit is blocked completely. In some situations, degassing is blocked but refill is still active. For some other problem situations, refilling is blocked and degassing is still active.

NOTE
In case the Superior continues to run only 10 minutes per event, please check the Smart Switch hose connection.

General - all types (S600, S600-R, S600-B)

Problem	Possible cause	Correction
W1 The pressure too low	A failure in the installation	Make sure that the system pressure is above 2.5 bar.
	There is a leak in the installation	Repair the leak.
	The inlet valve is closed	Open the valve.
	The pressure sensor (12) is defective	Replace the pressure sensor.
W2 The pressure is too high	A failure in the installation	Make sure that the system pressure is below the max. pressure setting.
	Max pressure setting is too low	Increase the max pressure setting.
	The pressure sensor (12) is defective	Replace the pressure sensor.
W7 / E7 Low level vessel (fluid lack)	The inlet valve is closed	Open the valve.
	The automatic air vent (4) is defective	Replace the automatic air vent.
	The liquid is not conductive	Contact your liquid supplier.
E19 Pressure sensor out of span	Bad connection	Repair the connection.
	The pressure sensor (12) is defective	Replace the pressure sensor.
E20 Fuse 2 broken	The fuse is broken	Replace the fuse.
E21 Fuse 3 broken	The fuse is broken	Replace the fuse.
W31 / E31 Fill time too long	The inlet valve is closed	Open the valve.
	The inlet line is (partly) blocked	Remove the obstruction.
	The filter (13) is clogged	Clean the filter element.

General - all types (S600, S600-R, S600-B)

Problem	Possible cause	Correction
W32 Pressure drop inlet too high	The inlet valve is closed	Open the valve.
	The inlet is (partly) blocked	Remove the obstruction.
	The filter (13) is clogged	Clean the filter element.
W33 / E33 Pressure drop inlet too low	The outlet valve is closed	Open the valve.
	The outlet line is (partly) blocked	Remove the obstruction.
	The solenoid valve (11) does not open	Replace (part of) the solenoid valve.
	The pump is not running	Check the pump and pump fuse. Replace, if necessary. Refer to § 7.2.
W34 Smart switch problem	The SmartSwitch (3) is broken	Replace the Smart switch.
E36 Check valve problem	Check the valve of the air outlet (5)	If necessary, replace the valve.
E37 Pressure too high, repeatedly	Incompressible system	Check the expansion system.
W38 Pressure increase too high	Incompressible system	Check the expansion system.

Only applicable to the systems with the refill functionality (S600-R, S600-B)

Problem	Possible cause	Correction
W10 / E10 Refill flow too low	A valve in the refill inlet line is closed	Open the valve.
	The solenoid valve (24) does not open	Replace (part of) the solenoid valve.
	The refill line is blocked	Remove the obstruction.
	The flow meter (26) is defective	Replace the flow meter.
W11 / E11 Refill valve open	The solenoid valve (24) of the refill stays open	Replace or clean (part of) the solenoid valve.
W13 Refill: too often	A leak in the system	Repair the leak.
	Interaction with some expansion systems	Check the settings (max. freq. / max. dp).
W14 Refill: too long	A leak in the system	Repair the leak.
	Big installation	Check the settings Max. refill time.
W15 Refill: too much	A leak in the system	Repair the leak.
	Big installation	Check the settings Max. refill volume.
W24 Low level break tank	The inlet valve is closed	Open the valve.
	The inlet is blocked	Check and clean the inlet.
	The float valve is broken	Check or replace the float valve.

8 MAINTENANCE

8.1 Periodic maintenance

1. With every periodic inspection, check the float valve (28) by removing some water from the break tank (27), or by a short push on the float of the float valve (28).
2. Inspect and clean the filter element (13) regularly.
3. Replace the automatic air vent (4) every two years.
4. Replace the interior of the solenoid valve (11) every year.

NOTE

- Proper and regular maintenance will ensure correct functioning of the unit and maximize the life time expectancy as well as a trouble free operation of the unit and system.

8.2 Replacement parts

The number indications correspond with the main figures in § 2.1.

Main item		Spare part	Article number
Pump	17	Pump, 50Hz	R15.328
	17	Pump, 60Hz	R16.801
	17	Capacitor, 50Hz	R15.789
	17	Capacitor, 60Hz	R15.791
	17	Seal set	R15.731
Frame and cover		Cover S600	R73.255
Control unit	2	HV Box	R61.524
	18	Brain	R61.525
	-	Connector for HV box	R61.471
	-	WiFi dongle (USB)	R61.526
	-	Fuse set: - Solenoid fuse 20x5; 2,5AT (10 pcs) - Pump fuse 20x5; 10AT (10 pcs) - Mains supply fuse 20x5; 1AM (10 pcs)	R61.529
Cables	-	Cable set MV06A50/60 / MV06B50/60 / MV06R50/60, basic cable harness	R61.530
	-	Cable set MV06B50/60 / MV06R50/60, additional cable harness refill	R60.247
Break tank		Assembly	R73.263
	28	Float valve	R73.262
	29	Float switch	R73.359
Automatic air vent	4	Automatic air vent, base	R73.235
	5	Check valve including O-ring	R61.417
	3	Smart Switch	R61.531
Inlet	13	Filter element	R73.207
	14	Inlet flow limiter	R61.420
	12	Pressure sensor	R61.412
	12	Pressure sensor spacer	R73.367
	11	Solenoid valve - internal parts	R61.532
	11	Solenoid valve - coil	R10.343

Main item		Spare part	Article number
Outlet	16	Non-return valve	R18.717
Refill line	26	Flow sensor	R61.424
	25	Non-return valve	R61.423
	24	Solenoid valve - internal parts	R12.003
	24	Solenoid valve - coil	R10.343
Level sensor	15	Level sensor	R11.559
Hoses	22	Inlet hose (system to unit)	R73.352
	21	Outlet hose (unit to system)	R73.354
	23	Refill inlet hose break tank (-B versions)	R61.402
	23	Refill inlet hose mains (-R versions)	R73.355
	-	Hose inlet to vessel	R61.437
	-	Hose refill to vessel	R61.438
Miscellaneous	-	- O-ring EPDM 17 x 1.5 - O-ring EPDM Ø33 x 2	R61.537
	-	- Gasket 3/8" - Gasket 3/4" - Gasket 1/2"	R61.538

8.3 Maintenance card

Type: _____

Serial number: _____

Installation date: _____

Installed by firm: _____

Installed by technician: _____

Inspection date:	Technician:	Initials:
Nature of the maintenance:		

Inspection date:	Technician:	Initials:
Nature of the maintenance:		

Inspection date:	Technician:	Initials:
Nature of the maintenance:		

Inspection date:	Technician:	Initials:
Nature of the maintenance:		

Inspection date:	Technician:	Initials:
Nature of the maintenance:		

Inspection date:	Technician:	Initials:
Nature of the maintenance:		

9 GUARANTEE

9.1 Terms of guarantee

- The guarantee for Spirotech products is valid until 2 years following the purchasing date.
- The guarantee lapses in cases of faulty installation, incompetent use and/or non-authorised personnel trying to make repairs.
- **Consequential damage** is not covered by the guarantee.

10 CE STATEMENT

SPIROTECH

EC Declaration of Conformity

Manufacturer: Spirotech bv
Address: Churchilllaan 52
5705 BK Helmond
The Netherlands

Technically represented by the Manager PD&I, declares that the vacuum degassers:
Spirotech SpiroVent Superior, models: S4, S400, S6, S600, S10 and S16 (all types)

Are in compliance with all relevant demands of the following European Directives:
Machine Directive - 2006/42/EC
Low Voltage Directive - 2014/35/EC
EMC Directive - 2014/30/EU
Pressure Equipment Directive - PED 2014/68/EU
Restriction of the use of certain hazardous substances in electrical and electronic equipment - directive 2011/65/EU

The following harmonised and national standards have been applied:
EN 12100: 2010
EN 60730-1: 2012
EN 60204-1: 2006
EN 60335-1: 2012
EN 61000-3-2: 2014
EN 61000-3-3: 2013
EN 61000-6-2: 2005
EN 61000-6-3: 2007

Helmond, 6 February 2018

Drs. A.F.M. van Denderen RA
CFO Spirotech bv

SPIROTECH

The manufacturer reserves the right to make changes without prior notification.

Spirotech bv The Netherlands www.spirotech.com