



Flamco

ENA 50-60

Installation and operating instructions



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Contents	Page
1. General	3
1.1. About this manual	3
1.2. Other supplied documentation	3
1.3. Use of Flamco products	3
1.4. Further help and information	3
1.5. EC declaration of conformity (Certification)	3
2. Safety	3
2.1. Intended use	3
2.2. Important information	3
2.3. Signs in this manual	3
2.4. Specifications	3
2.5. Safety devices	3
2.5.1. Avoiding excessive pressure	3
2.5.2. Avoiding excessive temperature	4
2.6. Signs on the automat	4
3. Description	5
3.1. Component overview	5
3.2. Controller SCU	6
3.3. Working principle	6
3.3.1. Deaeration	6
4. Transport and storage	7
4.1. Transport	7
4.2. Storage	7
5. Installation	8
5.1. Prepare for installation	8
5.2. Ambient conditions	8
5.3. Hydraulic installation	8
5.4. Electrical installation	9
5.5. Basic electrical connections	10
6. Startup controller	11
6.1. Controller menu structure	11
6.2. Menu symbols	11
6.3. Working principle controller	12
6.4. Controller inputs	13
7. Maintenance and troubleshooting	14
7.1. Before maintenance	14
7.2. After a power failure	14
7.3. Maintenance interval	14
7.4. Clean the strainer	15
7.5. Error messages	16
8. Disposal	17
9. Technical specifications	18

Note: Appendix available



1. General

1.1. About this manual

This manual includes technical specifications, instructions and explanations that helps to use this automat safely. Read and understand all the instructions before you transport, install, commission, restart, operate or maintain the automat.

This manual was originally written in English. If applicable, a copy is available on written request.

1.2. Other supplied documentation

General information of additional components, such as the pump and the sensors, is included in this manual. If additional documentation is supplied, also follow the instructions in those.

1.3. Use of Flamco products

According to order or execution complementary documentations can be added. Follow the positions performed in the dispatch papers.

1.4. Further help and information

Contact your local supplier for additional services as:

- Training.
- Maintenance agreements.
- Service contracts.
- Repairs and improvements.

1.5. EC declaration of conformity (Certification)

The machine is CE certified. It means that the machine complies with the essential requirements concerning safety and hygiene. The directives that have been taken into consideration in the design are available on the internet: <http://www.flamcogroup.com/flamco/en/media.html>

2. Safety

2.1. Intended use

The automat is designed for deaerating water in closed heating and in cooling water systems. The automat is not designed for the initial filling or re-filling of systems.

2.2. Important information

The automat has safety devices intended to prevent injury and damage. Use the automat in the following way:

- Have the installation be carried out by qualified personnel.
- Comply with local legislation and guidelines.
- Do not make modifications to the automat without prior written permission of Flamco.
- Make sure that all automat covers and doors are closed when operating the automat.
- Do not touch live voltage. The sensor units and the capacity pressure sensors operate with extra low safety voltage.

Flamco shall not be liable for any losses arising from the non-observance of safety conditions or as a consequence of the disregard of standard precautionary measures when performing such services as transport, installation, commissioning, re-starting, operation, maintenance, testing and repair, even in the event that these are not expressly described in these instructions.

2.3. Signs in this manual



Identifies a hazard that could lead to personal injury including death/damage to the automat, damage to other equipment and/or environmental pollution.



Identifies an electric hazard that could lead to personal injury including death/damage to the automat, damage to other equipment and/or environmental pollution.



Earthing



Important information.

2.4. Specifications

The construction of the automat is designed in accordance with the norms DIN EN 12828.

2.5. Safety devices

The automat does not contain any safety components that prevent that the operation pressure and the operation temperature range are exceeded or go below a limit. Install components for the limitation of pressure and temperature in the system.

2.5.1. Avoiding excessive pressure

Appropriate safety valves that prevent that the maximum operation pressure is exceeded:

- Open not later than the maximum allowable working pressure is reached.
- Can conduct the occurring volume flow (including the maximum possible refilling volume) up to the 1.1-fold of the maximum operation pressure;
- Have a proven reliability or are certified.



Do not narrow the inlet or outlet piping of the safety valve.



2.5.2. Avoiding excessive temperature

Appropriate safety components:

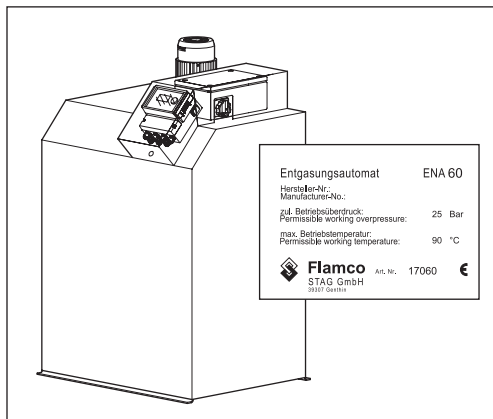
- Guarantee that the operation temperature range is not exceeded at any point of the system. It is advisable to order a unit with a factory-installed thermal cut-out
- Are approved and tested on operation safety.



Activate the pressure and temperature safety devices and check them regular on proper working.

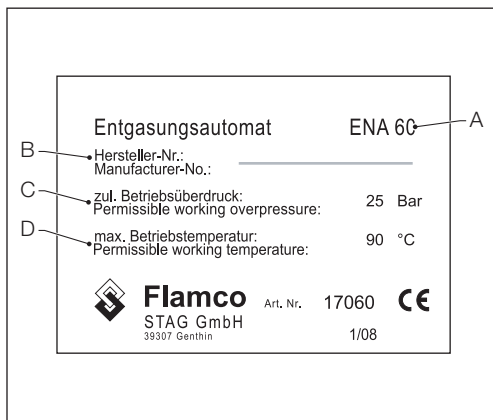
2.6. Signs on the automat

The signs on the automat are part of the safety provisions. Do not cover or remove the signs. Inspect regularly if the signs are present and legible. Replace or repair signs that are illegible or damaged.



On the automat the following product information can be found:

- A Type plate
- B Contact information



On the type plate the following product information can be found:

- A Automat type (ENA 50 or 60)
- B Automat serial number
- C Permissible working overpressure
- D Permissible working temperature

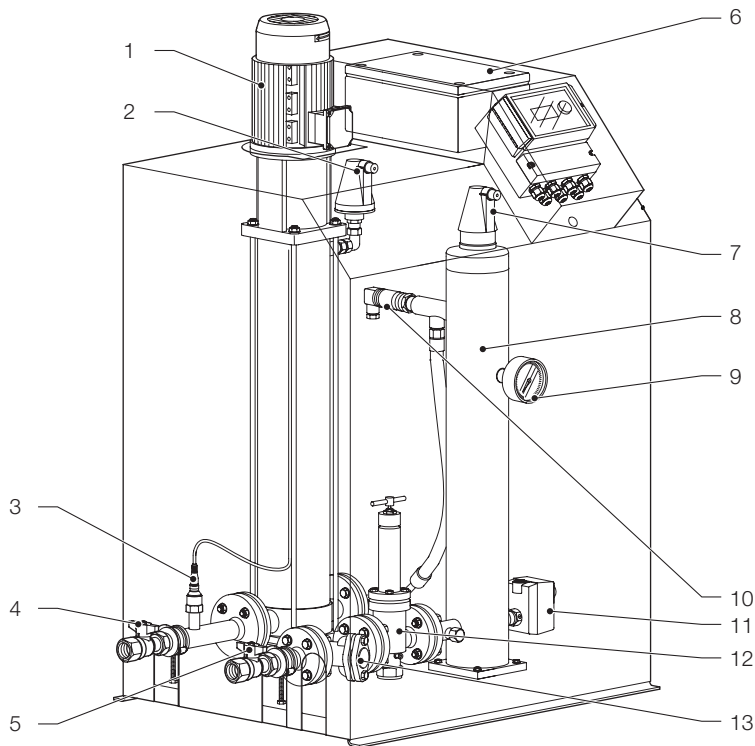


Do not use the automat when the specifications on the type plate differ from the order.

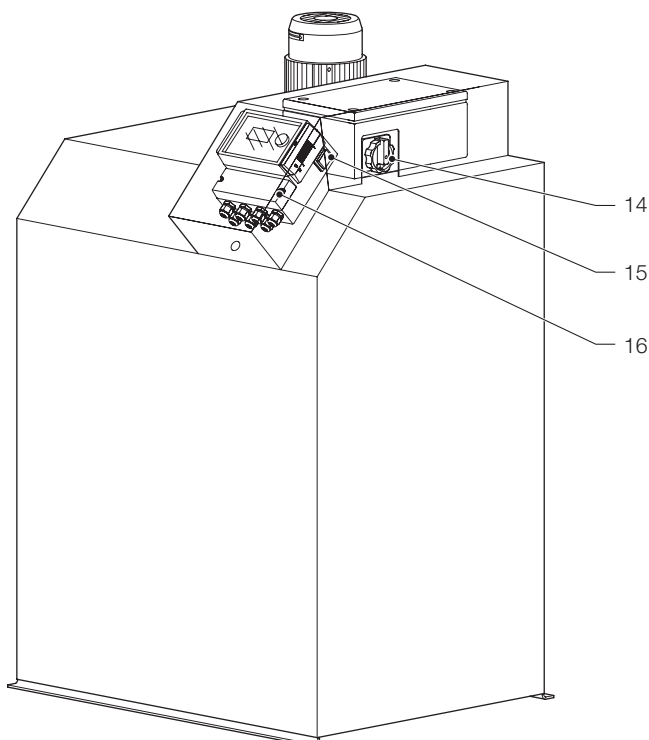


3. Description

3.1. Component overview



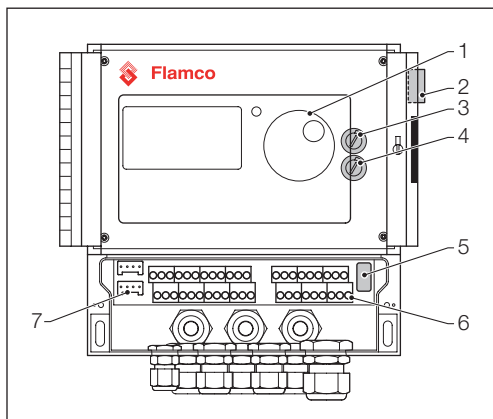
No.	Description
1	Deaeration pump
2	Vent. device
3	Pressure sensor
4	Outlet ball valve
5	Inlet ball valve
6	Power module
7	Vent. device
8	Deaeration tank
9	Pressure gauge
10	Dry-running sensor
11	Thermal cut-out (option)
12	Reducing regulator
13	Strainer
14	Main circuit switch
15	Line switch (for SCU controller)
16	SCU controller





Installation and operating instructions

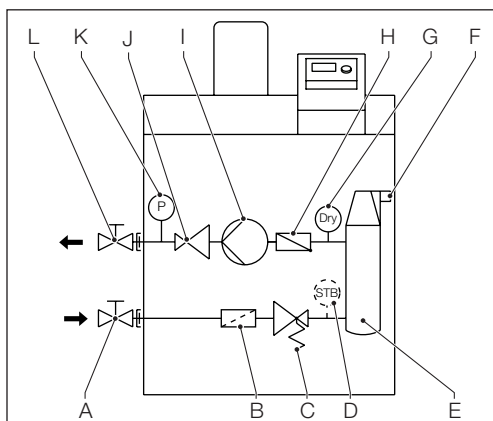
3.2. Controller SCU



No.	Description
1	Control panel for the controller, graphical display, LED for error display, selector switch (click and roll)
2	Power switch, ON: flashes red
3	Internal fuse F1: T 16 A 250 V
4	Internal fuse F2: T 3,5 A 250 V
5	Hardware release, service menu E2
6	Terminal bars for <ul style="list-style-type: none"> • Electric supply; • Sensors; • Impulse water counter; • External activation for refilling process; • Collective malfunction message; • Pump.
7	Interface RS485.

3.3. Working principle

The automat serves as an active deaerating device.



A	Inlet ball valve
B	Strainer
C	Pressure regulator
D	Thermal cut-out (STB) (optional)
E	Deaeration tank with ring packing
F	Vent. device
G	Dry-running protection
H	Check valve
I	Pump
J	Flow regulator
K	Pressure sensor
L	Outlet ball valve

3.3.1. Deaeration

For deaerating the water, the system water is drawn in via a bypass from the return line of the system (A).

The water is run through a strainer (B) and a pressure regulator (C) which reduces the pressure to approximately 0,5 bar into the deaeration tank (E). As a result of the lowered pressure, and the large surface of the ring packing, air dissolves from the water.

The air is discharged via the vent. device (F). Through the pump (I), the water is brought back into the system. While the pump is running, permanent deaeration takes place.

Fast deaeration mode (Fast = Turbo): The pump runs continuously and automatically for a maximum duration of 99 hours. Upon expiry of the Fast deaeration time, the system changes to the Normal deaeration mode, which then takes place continuously.

Normal deaeration mode: The normal deaeration mode is interrupted by a selectable pause (by default 06.00 p.m. - 08.00 a.m.). The beginning of the next deaeration cycle in the normal deaeration mode is indicated via a countdown in the Process menu.



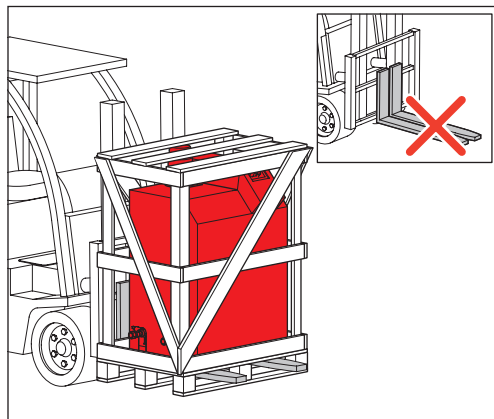
4. Transport and storage

4.1. Transport

The shipping papers list all the items, such as equipment and documentation. Ensure that the delivery is complete and not damaged. The automat is packed horizontally on disposable pallets and are fully assembled.



Identify the items that are missing or not correctly delivered. Read the general terms and conditions in the shipping papers.

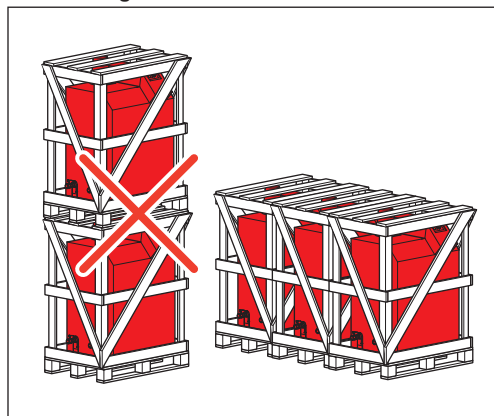


- Transport the pallets horizontally.
- Lift the automat just slightly.



Make sure that the lifting device can support the automat. For weight and dimensions, refer to chapter 9: Technical specifications.

4.2. Storage



Make sure that the storage space meets the ambient conditions. Refer to section 6.2.

- Take care of an even floor.



Do not stack up.



5. Installation

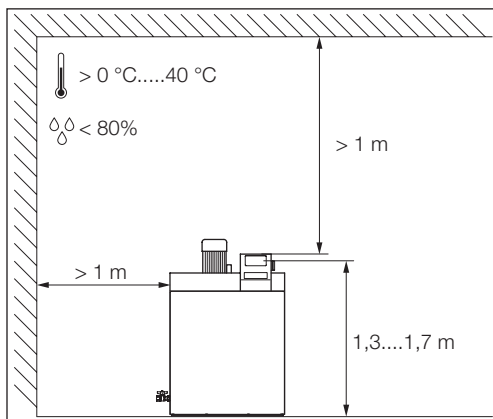
5.1. Prepare for installation



Make sure that the surface can support the maximum weight of the automat, including the water. Refer to chapter 9: Technical specifications.

- The automat may not be affected by external forces.
- No dirt may get into the automat and its accessories.
- Install shut-off devices to the drinking water net on-site.
- Plan enough free space around the automat for maintenance work.
- Note the effective regulations regarding the use and the installation location and, if necessary, inform the responsible testing and certification bodies prior to the launch of the system.

5.2. Ambient conditions



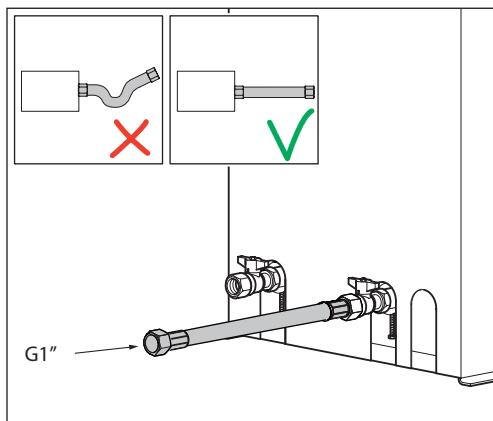
Make sure

- that the automat is level;
- that the automat is installed in a closed, dry and frost-free room;
- to maintain the minimum distances as indicated;
- that the atmosphere does not contain electrically conducting gases or high concentrations of dust and vapors. Risk of explosion when there are combustible gases;
- that the vicinity is clean and well lit.
 - Relative humidity: not condensating.
 - Free of vibrations.
 - Free from heat- and solar radiation.
- that the automat is free from additional loads.

5.3. Hydraulic installation



- Install the shut-off devices on-site in front of the tube joints.
- Only work on non-pressurised and cooled-down pressure joints.
- Make sure that the system temperature of 90 °C will not be exceeded. You can use an optional thermal cut-out for this purpose (to be ordered together with the unit for installation at our works). If a thermal cut-out/STB is used, note that this device is set to 93 °C (overshoot temperature).

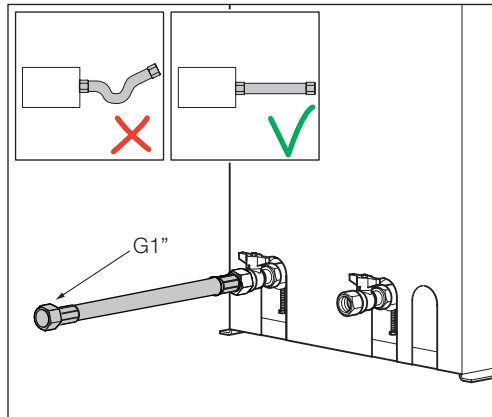


- Connect the return line of the system to the inlet of the ENA.
- The minimum nominal diameter for the installation line of the system and the supply line is DN 25.
- The pressure reducer must only be used at the factory-set settings with the adjusting knob fully screwed in.
- Similarly, the screw plugs on the breather caps in the unit must be open (as they have been set before shipped from the factory).



Flamco

Installation and
operating instructions

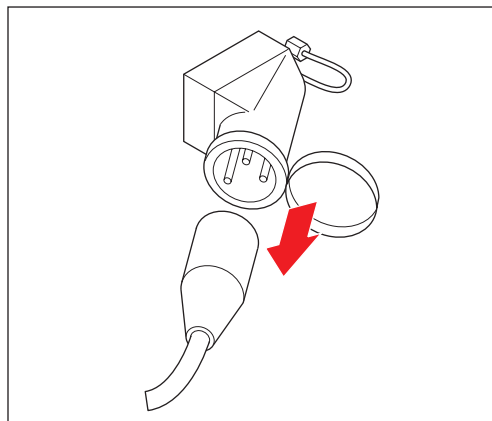


- Connect the supply line of the system to the pressure side of the ENA.

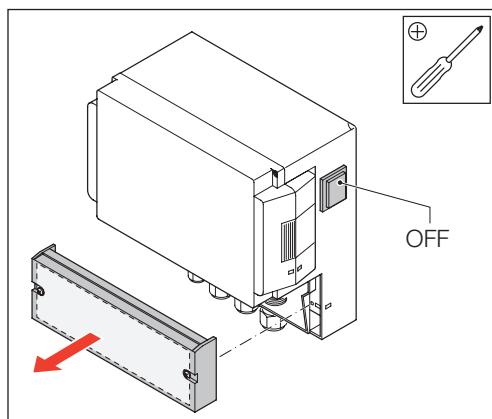
5.4. Electrical installation



There can be life voltage on the terminal bars even when the main power supply is disconnected. Make sure all external power supplies (e.g. external refill equipment) are also disconnected from the automat.



- Switch off the power switch on the controller SCU.
- Pull the power plug or switch off external separators and secure these against a restart.



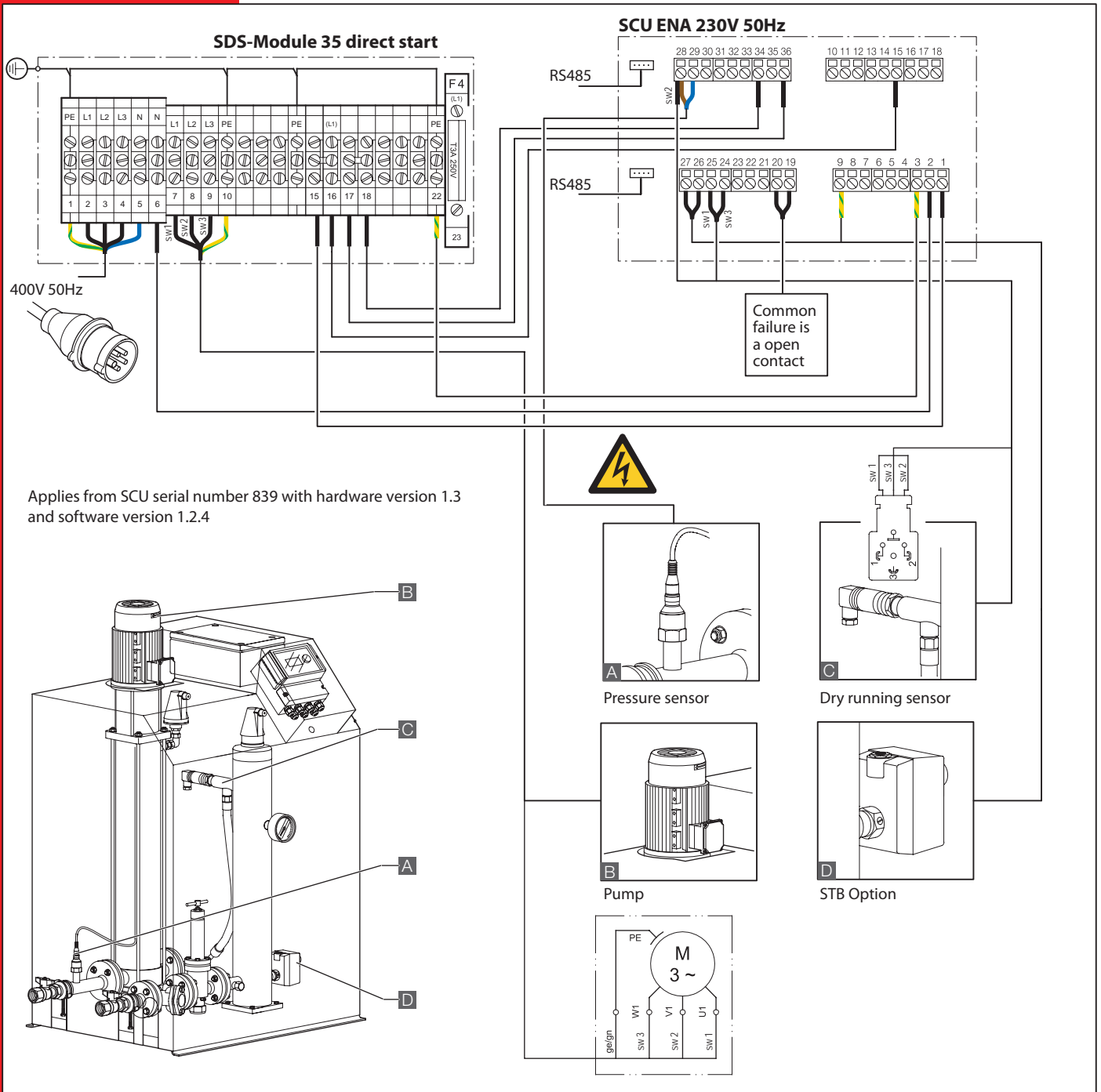
- Unscrew the protective cover of the terminal box.
- The descriptions of the terminal bars are on the inside of the protective cover.

Installation and
operating instructions

5.5. Basic electrical connections

Electrical specifications	ENA 50	ENA 60
Electrical connection	380-415 V; 50 Hz	380-415 V; 50 Hz
Amperage	A Y 5.03	A Y 6.25
Fusing of main connection	A C 16 A (slow)	A C 16 A (slow)
Protection type	IP54	IP54
Interface	RS 485	RS 485
Contact rating centralised fault alarm - floating contact	230V 50Hz 3A AC	230V 50Hz 3A AC

SELV: Safety Extra Low Voltage
* Recommended value; Line safety switch (C).

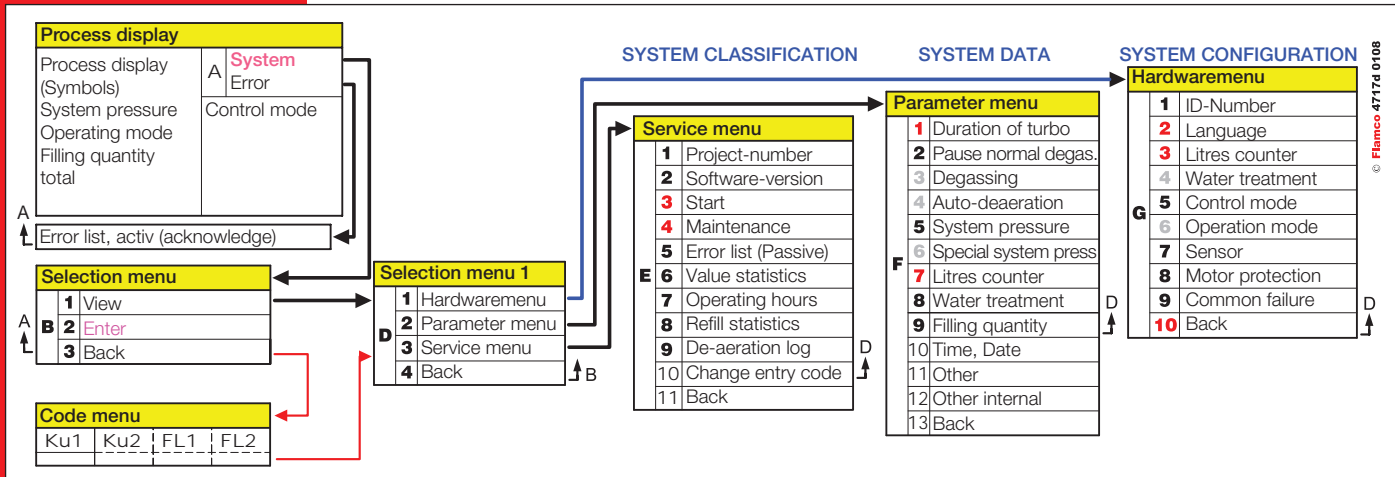




Installation and operating instructions

6. Startup controller

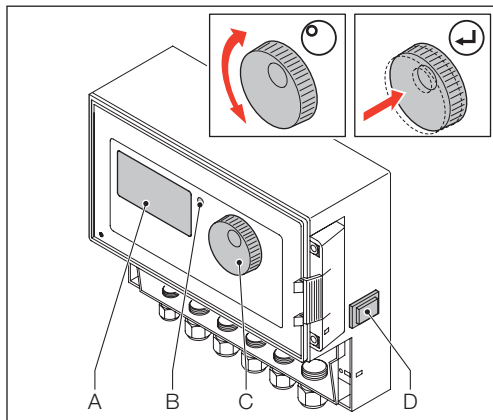
6.1. Controller menu structure



6.2. Menu symbols

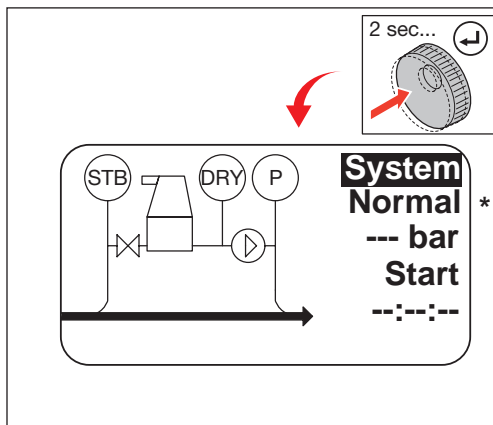
	No ID number available. Controller not configured.		Test mode.
	Denied, not installed. Outside parameter limits.		Warning.
	Code required.		Save error. Settings not saved.
	No intervention possible.		Wait.
	Operating mode, view only.		Deaeration tank.
	Pump.		Pressure regulator
	Entry confirmed.		Thermal cut-out (optional)
	Programming mode, enter.		Dry-running sensor

6.3. Working principle controller

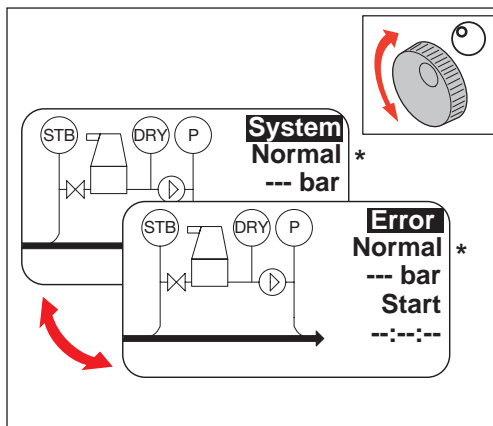


Start up
Switch on the controller (D).
A Display
B Error LED
C Navigation wheel
D ON/OFF switch controller

Use the navigation wheel (C) to navigate through the menus and to confirm the input. The display (A) shows the menus. In case of errors the error LED (B) is on.

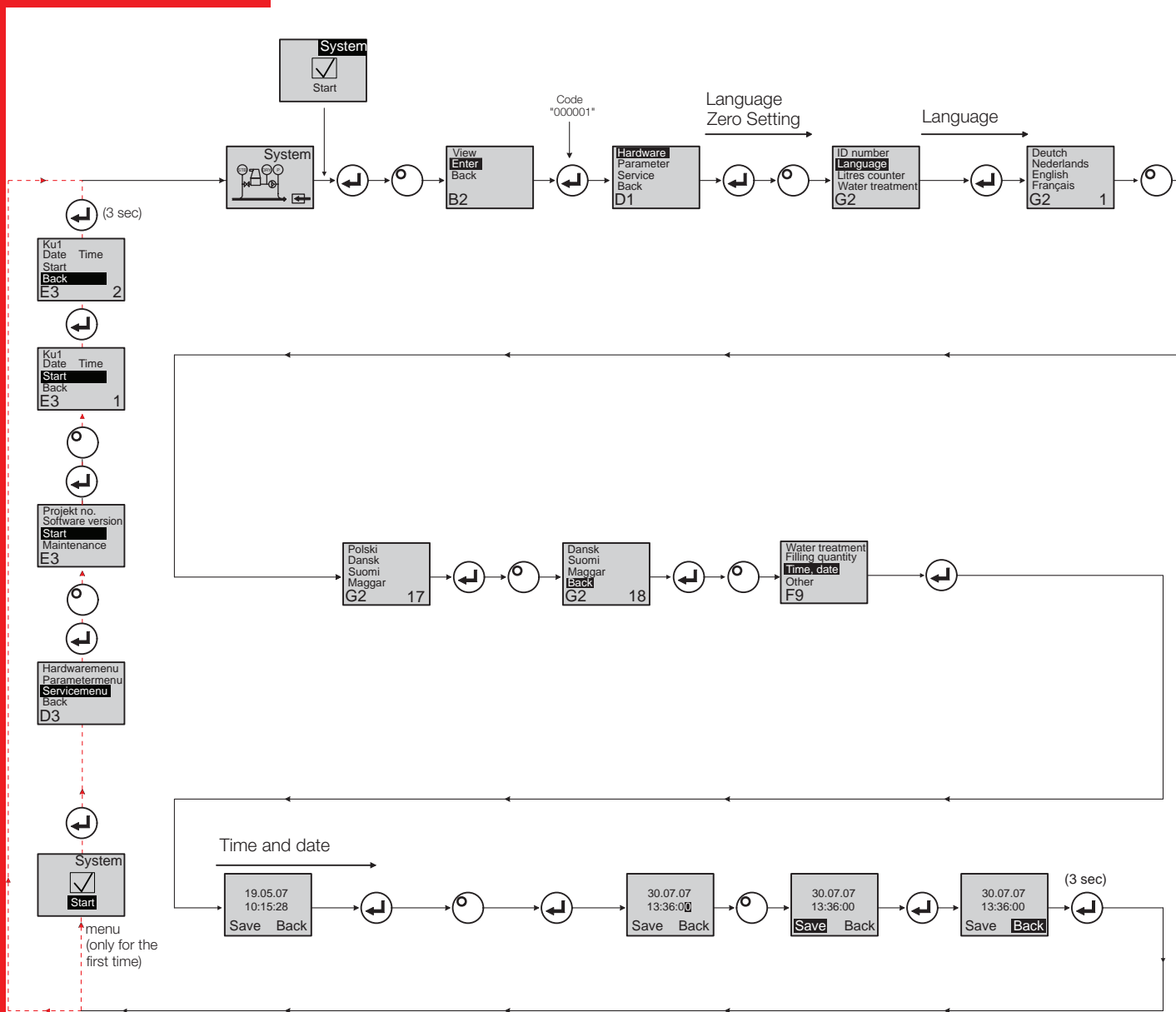


- Hold down the navigation wheel for two seconds to go to the process display, whatever the cursor position.
- * Turbo = Fast



- In case of errors the process display switches from [SYSTEM] to [ERROR] and the LED is on.
- The error messages, minimum water level, minimum pressure alarm are consistent by the first start of operation.
- It is possible to turn the wheel to switch between [SYSTEM] and [ERROR].
- When [ERROR] is displayed, press the wheel to go to the error list. In case of more than one error, scroll through the errors. All errors are shown in accordance of appearance.
- When [SYSTEM] is displayed, press the wheel to go to the option menu.
- * Turbo = Fast

6.4. Controller inputs



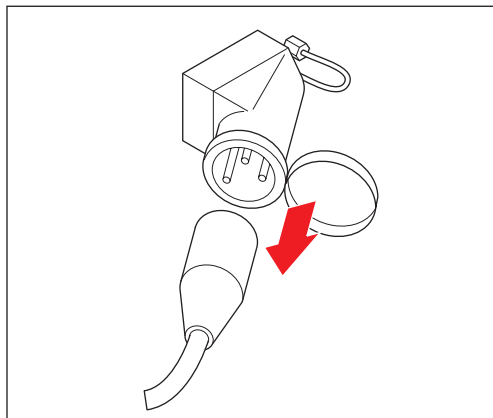
- When entering the program mode, the control for pressure maintenance is active.
- The code will be active 5 minutes after latest input.
- Remove all unpermitted loads, supported objects or lateral loads from the basic automat.
- When the programming procedure is completed, the electrical parts of the ENA are ready for operation.

7. Maintenance and troubleshooting

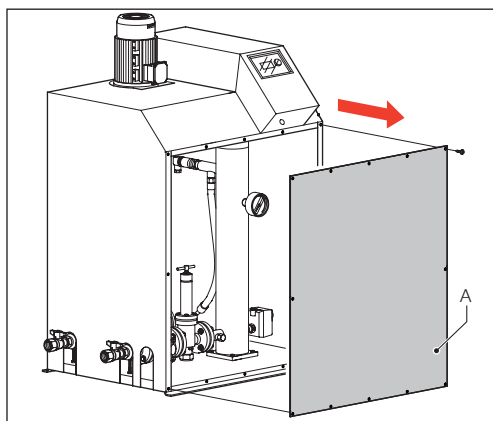


- The water and the contact surfaces can be 70 °C or more.
- Wear the required protective clothing.
- The floor can be wet or greasy. Wear protective shoes.

7.1. Before maintenance



- There can be life voltage on the terminal bars even when the main power supply is disconnected. Make sure all external power supplies (e.g. external refill equipment) are also disconnected from the automat.
- Release the pressure of deaeration tank before maintenance.



Remove the side cover (A) to gain access to the internal parts. Both left and right covers can be removed.

7.2. After a power failure

The programmed parameters of the controller do not change after a power failure.



- Check the condition of the automat for integrity after a power failure.

7.3. Maintenance interval

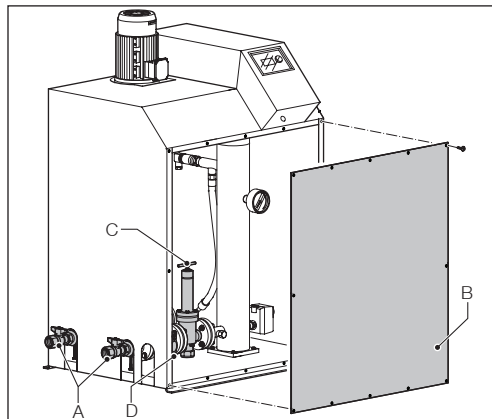
Confirm maintenance in the service menu.

Interval	Component	Activity
Annually	ENA 50/60	Check leak tightness of joints, pumps and screw connections. If necessary, seal or tighten the screw connections.
Every year before the peak period	On-site dirt trap in the feed line Vent. device	Clean the guards Clean the strainer Check the functions

If the visual inspection of the unit shows other maintenance operations than listed, these operations must be carried out by skilled specialist personnel only.



7.4. Clean the strainer



- After isolating the unit from the power supply, slowly close the two ball valves (A). Make sure that the valves are closed completely before continuing with further maintenance activities. (If necessary, secure the ball valves by removing the actuating lever)
- Open the panel (B) at the front of the unit (screw it off).
- Allow the unit to cool down so that there is no longer any risk of scalding.
- Place a suitable drain to safely drain any residual water from the unit (the maximum quantity of water in the unit is 8 litres).
- Turn out the secured knob of the pressure regulator (C) to this point that it is just kept in the thread (to prevent backflow from the deaeration tank).



- It is possible that part of the water in the deaeration tank leaks out.
- It is also possible that still existing residual pressure in the tank will be released when the strainer (D) is opened. Therefore, before opening the strainer, read the pressure value indicated on the pressure gauge of the tank.
- Loosen the screws plugs on the strainer (D) slowly.
- Clean the strainer in a suitable way. Take care not to damage the strainer basket cartridge.
- Close the strainer, and turn the knob fully in into the thread of the pressure regulator. Secure this setting.
- Slowly open the ball valves, and visually check for leakage. (The pressure indicated of the gauge should not exceed 2 bar. If it does so, please contact the Flamco after-sales service.)
- Put the unit back into operation. To do so, reconnect it to the power supply, and switch on the power module and the SCU controller.



7.5. Error messages

Nr.	Message	Description	Reset	Possible cause	Troubleshooting
1	Pressure too low	System pressure too low, is outside working pressure range	B	Leakage Pressure-holding value wrongly set Wrong admission pressure Filling pressure too low	Eliminate leakage Set correct pressure-holding value Increase filling pressure up to working pressure range
2	Pressure too high	System pressure too high, is outside working pressure range	B	Filling pressure too high	Lower filling pressure to working pressure range
11	Low mA P-sensor	Interruption of current loop of pressure sensor	A	Sensor defective Terminal/cable defective	Replace sensor Check/exchange terminal/ cabling
12	High mA P-sensor	Short-circuit in current loop of pressure sensor	A	Sensor defective Terminal/cable defective Short circuit	Replace sensor Check/exchange terminal/ cabling
16	Dryrun protection 1	Level switch has tripped during pump running phase	B	Deaeration unit defective Not all shut-off valves completely opened Knob on pressure reducer not completely screwed in	Replace deaeration unit Open shut-off valves (increase flow rate) Screw in knob of pressure reducer
17	Thermal cut-out	Thermal cut-out (option) has tripped	A	Temperature at hydraulic tie-in point (system return line) too high (>90°C)	Lower temperature Unlock thermal cut-out in unit by hand
18	Next maintenance	Next maintenance due	A	Maintenance date reached	Carry out maintenance and enter „Maintenance done“ (Service menu)
19	TP motor	Motor protection signal (bimetal contact of pump) is active (open)	A	Pump overheated	Check temperatures Check free running pump
20	Voltage sensor	Sensor voltage too low	B	Printed circuit board defective	Replace control unit
21	No date/time	RTC has no valid time information	A	Time setting has got lost after prolonged disconnection from power supply	Enter time and date again
22	Flash error	Read error Flash	B	Hardware/software problem	Get in contact with service department
23	Flash error	Write error Flash	B	Hardware/software problem	Get in contact with service department
24	Flash error	Reprogramming error Flash	B	Hardware/software problem	Get in contact with service department

A: Necessary, reset possible within normal use (control restarts after resetting).
B: No duty, automatic reset within normal use.



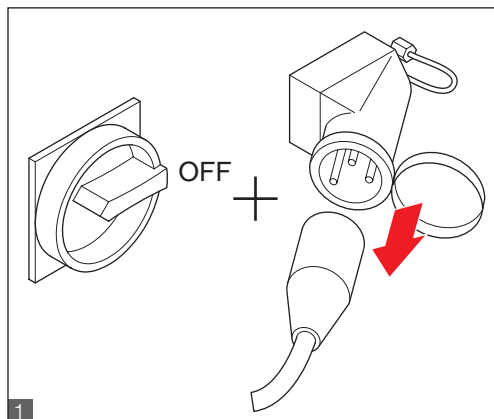
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Installation and
operating instructions

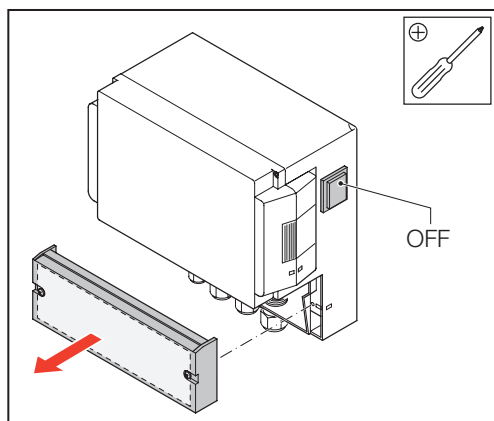
8. Disposal



Comply with local legislations.



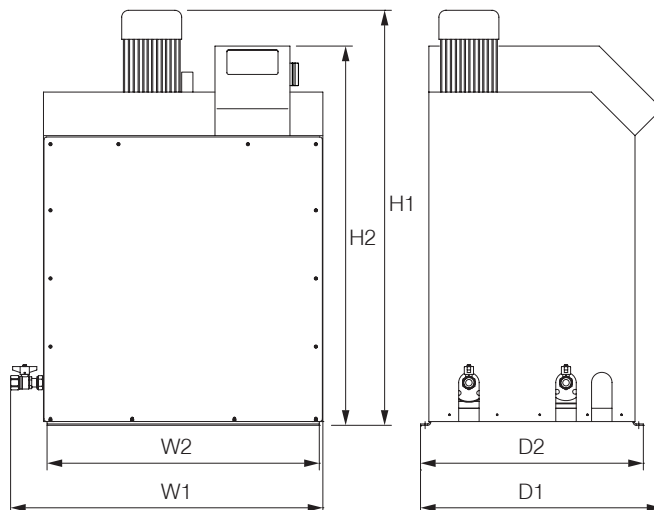
- Make sure the system power switch is OFF.
- Disconnect the power supply.



- Make sure the main power switch is OFF.
- Drain the water.



9. Technical specifications



	ENA 50	ENA 60
Article number	17040 / +STB: 17061	17060 / +STB: 17061
For system volume up to [m3]	190	190
System working pressure range [bar]	7.5 - 15	10 - 22.5
Max. pressure in system [bar]	25	25
Max. flow temperature [°C]	3 - 105	3 - 105
Max. deaeration temperature [°C]	3 - 90	3 - 90
Ambient temperature [°C]	3 - 40	3 - 40
Noise level [dB(A)]	<68	<70
Connected loads of pump [kW]	2,2	3
Connections, dimensions, weights	ENA 50	ENA 60
W x H x D [mm]	920 x 1230 x 710	920 x 1230 x 710
Connection from system	Rp 1" (internal)	Rp 1" (internal)
Connection to system	Rp 1" (internal)	Rp 1" (internal)
Weight [kg]	151	160

Nominal diameter	Maximum line length system installation
DN25	10 m
DN32	20 m
DN40	30 m