ACV
EXCELLENCE IN HOT WATER

E-Tech M

36 Flex

Single and Three-phase Mobile Electric Boiler

INSTALLATION, OPERATION & MAINTENANCE

Instructions for the Operator and the Owner

A1010392 - 664Y8500 • B-draft

EN

DECLARATION OF CONFORMITY

ACV
EXCELLENCE IN HOT WATER
A BRAND OF GROUPE ATLANTIC

DECLARATION OF CONFORMITY TO STANDARDS

Product type:	**Mobile Electric Boiler**
Name and address of manufacturer:	**Groupe Atlantic Manufacturing Belgium** **Rue Henry Becquerel 1** **B-7180 Seneffe** **Belgium**

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Model:	**E-TECH M 36 FLEX**

We declare hereby that the appliance specified above is conform to the following standards:

ELECTRO-MAGNETIC COMPATIBILITY:

EN 55014-2: 2015	Electromagnetic compatibility- Requirements for household appliances, electric tools and similar apparatus Part 2: Immunity - Product family standard.
EN 55014-1: 2017	Electromagnetic compatibility- Requirements for household appliances, electric tools and similar apparatus Part 1: Emission
EN 61000-3-2: 2019	Electromagnetic compatibility (EMC) Part 3-2: Limits — Limits for harmonic current emissions equipment input current <= 16 A per phase.
EN 61000-3-3: 2013+A1:2019	Electromagnetic compatibility (EMC) Part 3-3: Limits — Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection.

ELECTRICAL SAFETY:

EN 60335-2-21:2021 + A1:2021 used in conjunction with EN 60335 1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019 + A15:2021 EN 62233:2008 + AC:2008 Household and similar electrical appliances - Safety - Part 2-21: Particular requirements for storage water heaters

The notified body, (KIWA Nederlands B.V., Wilmersdorf 50, PO Box 137, 7300 AC APELDOORN, The Netherlands [0063]) performed a Type Examination trough tests 315_22_02074_EMC and 22PP320-01_0 (LVD) and found the product compliant with the standards mentioned above.

Signed for and on behalf of
Groupe Atlantic Manufacturing Belgium

Seneffe, 01/01/2024

R&D Director
Céline Coupain

MEANING OF SYMBOLS

	Cold water inlet (return)
	Hot water outlet (supply)
	Presence of voltage
	Essential instruction for safety (of persons and equipment)
	Essential instruction for electrical safety (electrical hazard)
	Essential instruction for the correct operation of the appliance or the system
	General remark
	For the operator on site/the owner
	For the owner/specialist

	Pressure
	Temperature
	Empty weight
	Weight with water
	Touch
	Standard toolbox
	Discard packaging according to local recycling regulations
	End-of-life disposal of the product

Symbols and icons displayed on the appliance screen are described in *"Legend of Symbols" on page 8*

This manual contains important information with respect to the On-site Installation/tear-down, the starting up and the maintenance of the appliance.

This manual is an integral part of the appliance which it refers to. It must be provided with the appliance and kept safely with it at all times.

The end-user shall read it carefully before operating the appliance.

The manufacturer accepts no liability should any damage result from the failure to comply with the instructions contained in this technical manual.

Essential instructions for electrical safety

- Any operations performed on the wiring system and the power input lines must be carried out by qualified personnel, in compliance with the applicable regulations.
- Before carrying out any maintenance work on the appliance, make sure that all electrical supplies are isolated.
- When in operation, make sure that the appliance is earthed at all times.

Essential recommendations for safety

- It is prohibited to carry out any modifications to the appliance without the manufacturer's prior and written agreement.
- The product on-site Installation/tear-down must be performed by qualified personnel, in accordance with applicable local standards and regulations and with the instructions in this manual.
- The manufacturer declines all liability for any damage caused as a result of incorrect (on-site) installation or in the event of the use of appliances or accessories that are not specified by the manufacturer.
- Do not store any flammable or corrosive products, paint, solvents, salts, chloride products and other detergent products near the appliance. Do not place any object on the appliance or cover it, as it may lead to an increase of the internal temperature and overheating.
- This appliance is designated to produce hot water, up to 85°C. Hot water can scald. Be careful when draining the appliance; allow it to cool down before releasing the hot water.
- To prevent any risk of tripping and falling on piping and cables connected to the appliance, make sure to either secure them so that they are not loose and don't present a risk, or make the area secure, through markings on the floor or physical boundaries (e.g. poles with ropes or fences).
- This appliance must be inspected regularly to detect any loose connections and damages in electrical wires, cables or connectors, or hydraulic connections and piping. Any issue must be corrected and/or reported to the appliance supplier. Damaged components must be replaced by approved/genuine spare parts.
- Water leaking from hydraulic connections or valves can cause people to slip and fall. Make sure to remove any water/dirt present on the floor around the unit.
- Clear area from obstacles and obstructions if the appliance needs to be moved around. Obstacles can cause the cart to become wedged or to tip over.

Essential recommendations for the correct operation of the appliance

- In order to ensure that the appliance operates correctly, it is essential to have it serviced regularly according to the maintenance schedule provided in this manual.
- In case of anomaly, please call the appliance provider.
- Faulty parts may only be replaced by genuine factory parts.

General remarks

- The availability of certain models as well as their accessories may vary according to markets. Please contact your ACV representative for more information.
- In spite of the strict quality standards that ACV applies to its appliances during production, inspection and transport, faults may occur. Please immediately notify your appliance provider of any faults.
- The manufacturer reserves the right to change the technical characteristics and features of its products without prior notice.
  Please check for an updated version of this manual in the documentation page on the website www.acv.com.

PACKAGE CONTENTS

When receiving the appliance, check the integrity and completeness of the package contents. Report any damaged or missing item to the supplier of the appliance.

Standard delivery:

- An E-Tech M 36 Flex Mobile Electric Boiler
- A technical manual for the Installation, Operation and Maintenance of the unit
- Two wheels, an axle and hardware (washers, spacers, pins), to be installed.

ACCESSORIES - SOLD SEPARATELY

- A bumper frame and hardware, to be installed
- A power cable to be connected to the Flex socket at the front of the boiler - various models according to the mains voltage and power required:

Single phase (1 x 230 V) cables - 1,4 m (blue)	
3 kW (1x16A)	
6 kW (1x32A)	
12 kW (1x63A)	

Three phase 3x400V (+N) cables - 1,4 m (red)	
9 kW (3x16A)	
18 kW (3x32A)	
36 kW (3x63A)	

GENERAL DESCRIPTION

This versatile mobile electrical boiler is designed as a robust heat generator for closed heating systems. Water can be heated up to 85°C, for applications in both residential (e.g. back-up boiler) and industrial environments (e.g. screed drying on working sites).

The E-Tech M can operate in a single-phase or three-phase environment, with powers ranging from 3 to 36 kW.

It can be connected to a high-temp or low-temp heating system, to an external hot water tank (heated through primary circuit) or be used for screed drying.

The E-Tech M is equipped with an internal circulating pump and with temperature sensors on the supply and return circuits.

The standard built-in safety equipment are the following: safety valve, automatic air vent, pressure sensor, double high temp safety thermostats (60°C and 96°C), frost protection.

The operation parameters for heating and for screed drying can be set up using the user-friendly built-in touch control panel. Configurations can be saved and re-used indefinitely according to operating environment. Operation data and history are saved on an internal memory and can be exported to an external drive for analysis and survey purposes.

Thanks to its light weight, the E-Tech M can be easily moved around and transported from one location to another by one operator.

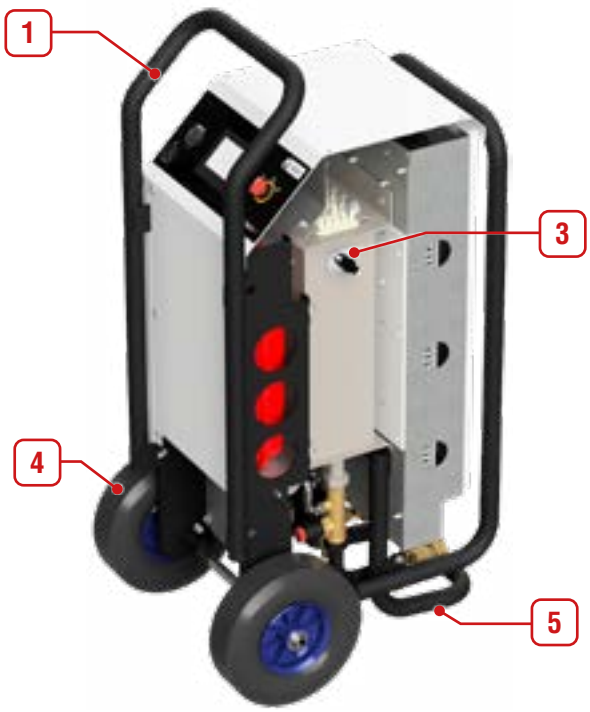
Maintenance and cleaning are also made easy through quick removal/installation of components and easy draining of the appliance.

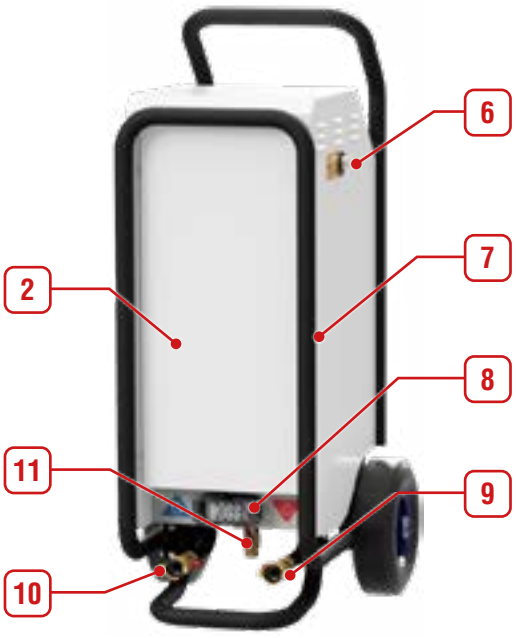
END OF LIFE AND DISPOSAL

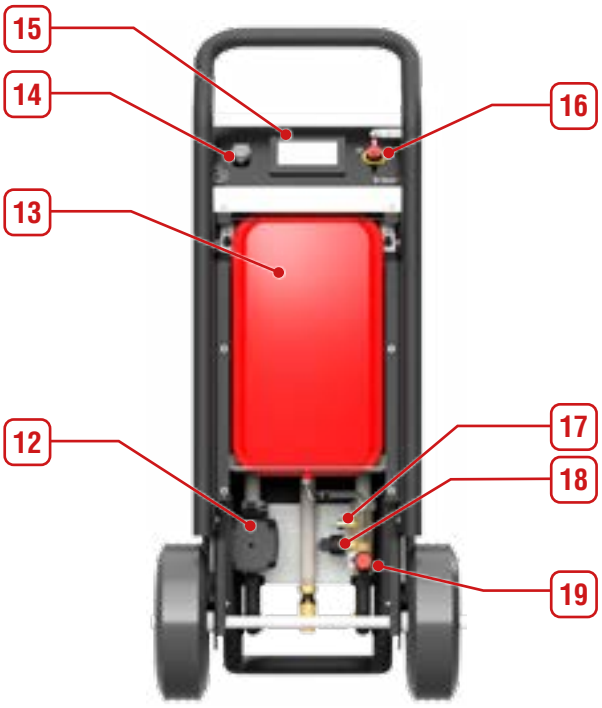
End-of-life devices contain substances that are to be recycled. Please comply with the local regulations with respect to waste processing when disposing of old and discarded devices.

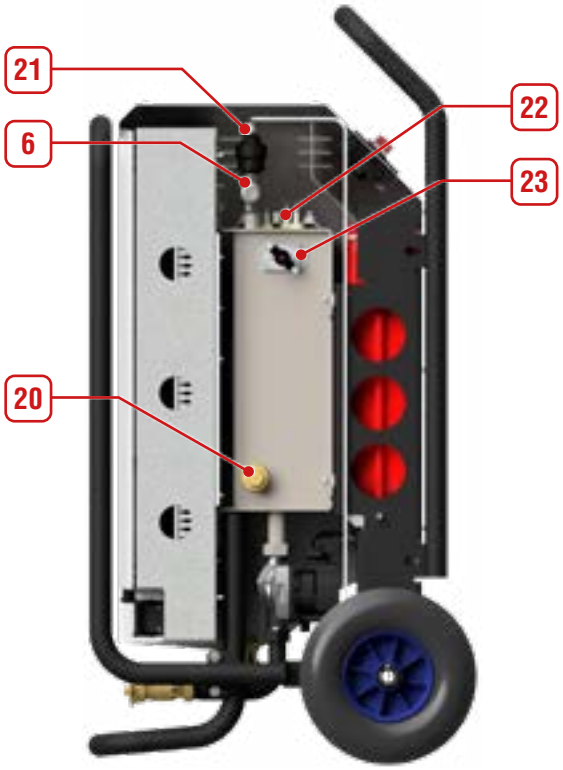
Never dispose of your old appliance through the domestic waste, but bring it to a local collection point for electric and electronic equipment. If necessary, ask your appliance supplier's customer support for information.

Some packaging material can be recycled. Please comply with the local regulations with respect to waste processing when discarding the packaging items.

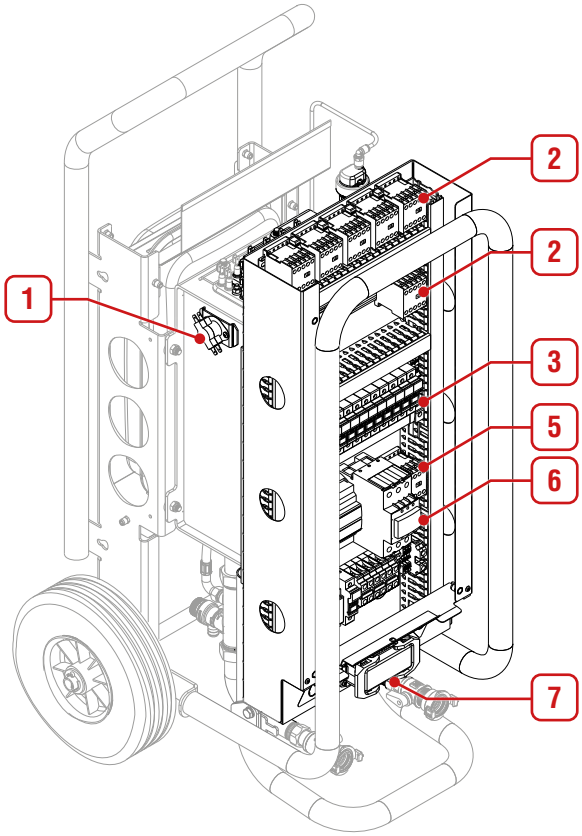


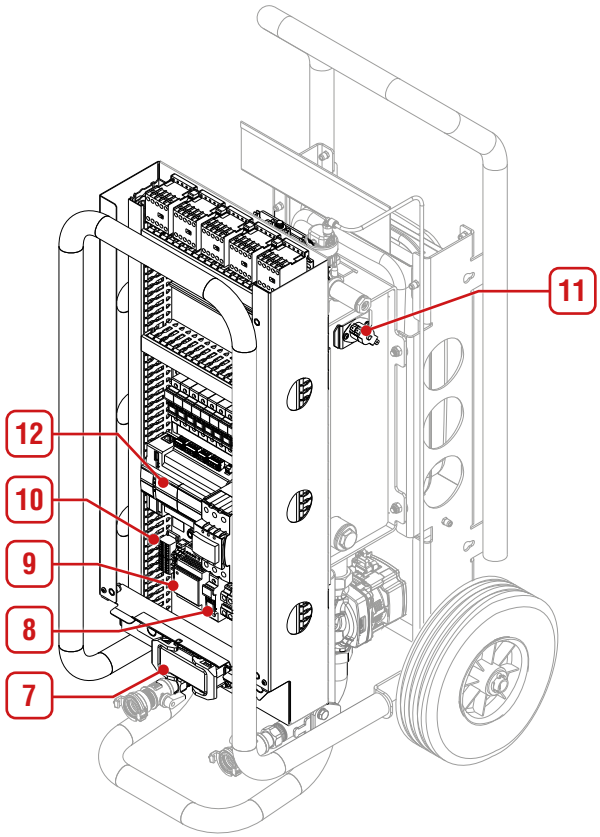


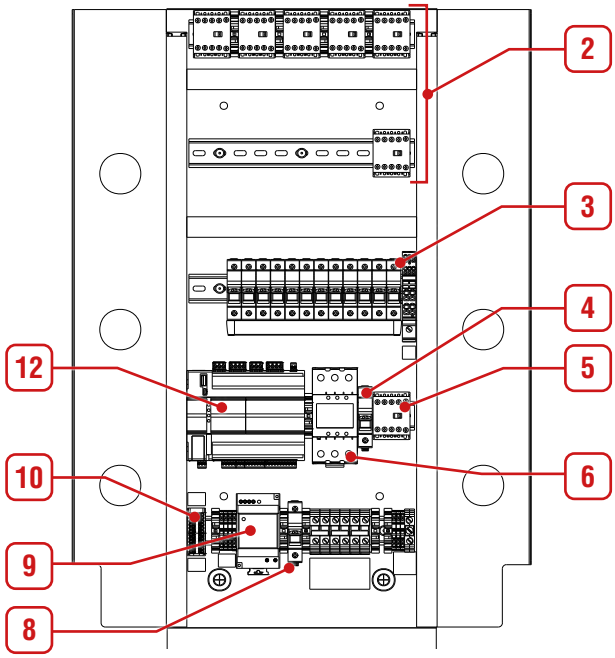




1. Transport handle
2. Removable access panel
3. 60°C High temp limit switch (auto reset)
4. Removable wheels with air tires
5. Support/transport bar
6. Manual air vent
7. Optional bumper
8. Flex power supply socket
9. Water supply connection
10. Water return connection
11. Filling/Drain valve
12. Circulating pump
13. 12L expansion vessel
14. USB socket
15. Control panel with LCD touch screen
16. On/Off Switch - Mode selector
17. Temperature sensor - return circuit
18. Pressure sensor
19. Safety valve
20. Inspection/cleaning connection (ø 1")
21. Automatic air vent with drain hose
22. Temperature sensor - supply circuit
23. 96°C high temp limit switch (manual reset)



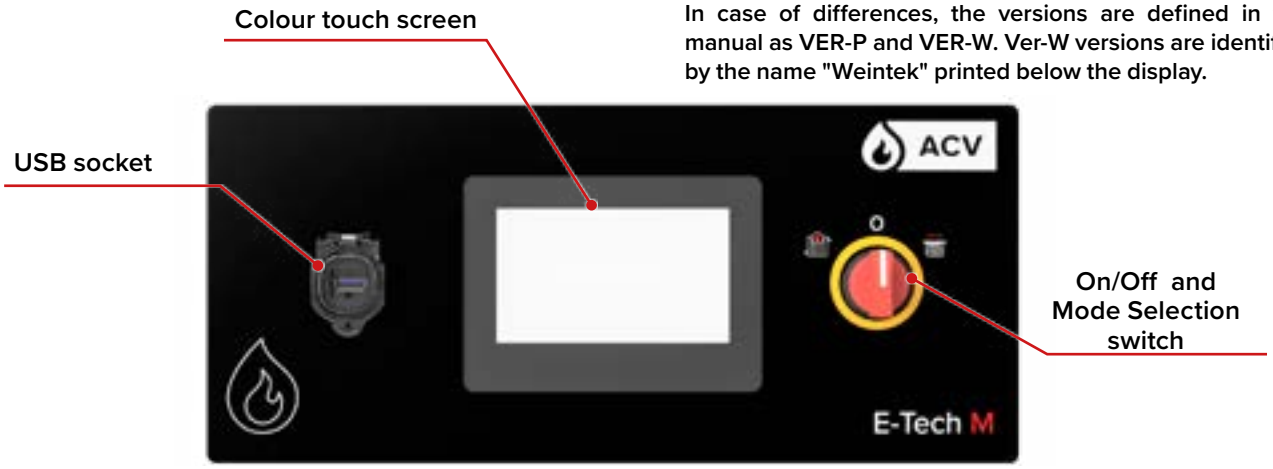




1. 60°C high limit switch (auto reset)
2. Heating element contactors
3. Cut-out fuses (heating elements)
4. Cut-out fuse (pump)
5. Pump contactor
6. General contactor
7. Flex power supply socket
8. 24Vdc power supply cut-out fuse
9. 24Vdc power supply
10. 24 Vdc power supply distribution
11. 96°C high limit switch (manual reset)
12. Controller (PLC)

CONTROL PANEL DESCRIPTION

The E-Tech M can be equipped with two alternative HMIs (displays). The main differences lie in the electrical connection details, which are shown in the wiring diagram. In case of differences, the versions are defined in this manual as VER-P and VER-W. Ver-W versions are identified by the name "Weintek" printed below the display.



On/Off and Mode Selection Switch - When the switch is turned to the left or to the right, the appliance is powered on in the selected mode :


Heating mode - to operate with a high temperature heating system (max. primary temperature of 85°C) and possibly an external DHW tank.


Screed drying mode - to operate with a low temperature heating system (floor heating or screed drying function - Max primary temp of 55°C).

Colour Touch Screen - The control panel offer direct access to the menus, functions and parameters through a user-friendly touch screen. See "Legend of Symbols" below for an explanation of the icons,, and to ***"Using the Controller" on page 10*** for access to the relevant functions and set up.

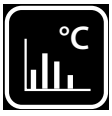
USB socket - Location where to plug in a USB stick, and save parameters. The socket is protected by a hinged cover that must be kept closed when no USB drive is installed.

LEGEND OF SYMBOLS

Main Screen	
	Indicates pump-related information (green: running, orange: stopped)
	The lit up sections indicate the power developed by the pump. The number of lit up bars indicates the flow rate from the lowest to the highest (55, 75 or 100%).
	Indicates the current water pressure in the primary circuit
	Access to the "Settings" menu

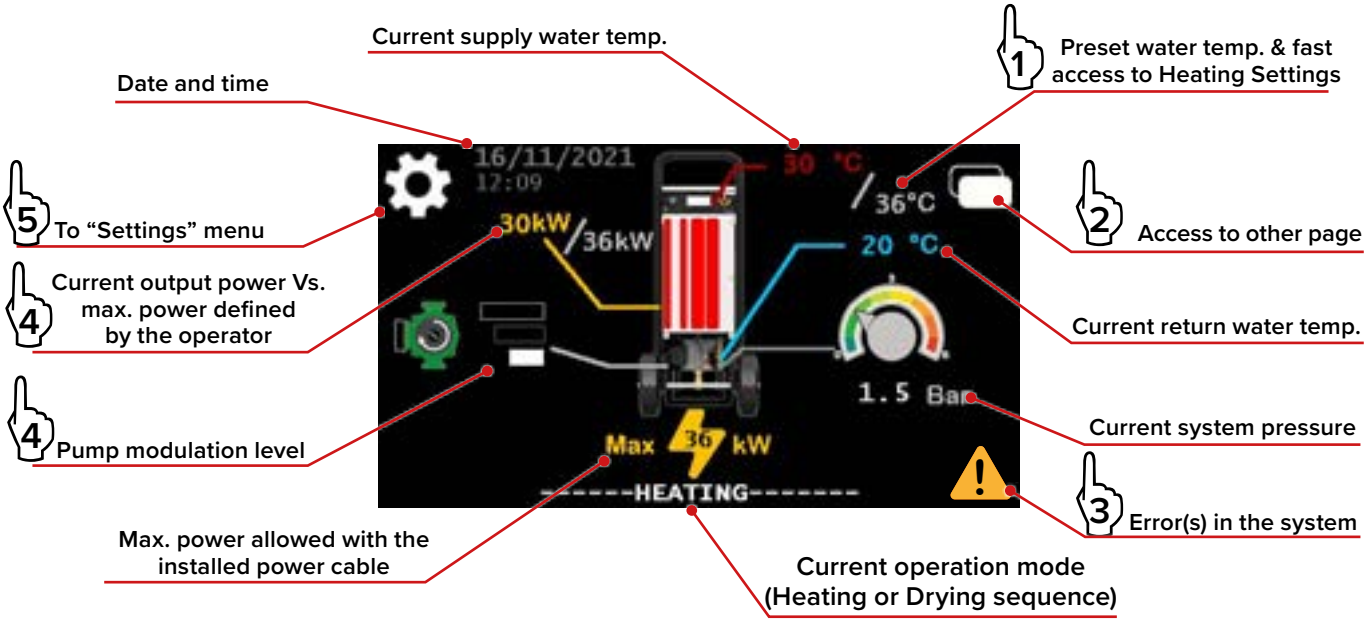
	Access to another page of information
	Display of the maximum power provided through the cable
	Notification of an error in the system

General	
	To zoom in
	To zoom out
	To validate a setting
	To cancel
	To go back to the previous screen
Settings	
	Heating Mode menu
	Screed Drying Mode menu
	To access the heating and pump modulation parameters
	To access the advanced operation parameters
	To access the time and date settings
	To access the log history
	To access the USB menu (save parameters in the form of ".csv" files)
	To access the advanced USB menu (save parameters in the form of .csv files)
	To save parameters manually to the internal memory

	Indicates that the internal memory is not available
	To access the Advanced parameters of the appliance - access locked by code
	Access to Advanced parameters after unlocking with access code
	Saved file(s) containing the error log of the appliance.
	Saved file(s) containing the sequence in Drying mode.
	File(s) generated automatically when a screed drying sequence is launched.
	Access to the statistics about the life and usage of the electrical components
	Access to the screed drying sequence parameters
	To save individual files to a USB stick
	To save all the files to a USB stick
	To delete an individual file from the internal memory
	To delete all the files from the internal memory
ALL 	To reset all the parameters
	To change the language (EN - FR - NL - DE - IT)
	To open the QR code screen and access the online manual

USING THE CONTROLLER

Touch the various icons marked below to access the relevant pages and functions.



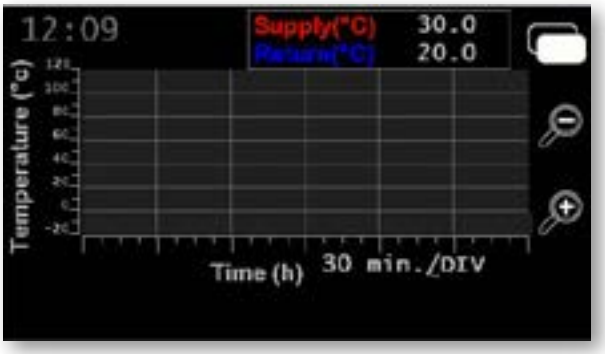
The basic screens presented in this section are for the Heating mode. For more information on the Screed drying mode, please refer to *"Using the Screed Drying Function" on page 29.*

1

HEATING SETTING

- Activation / Deactivation of the Heating function
- Definition of supply water setpoint from 15°C to max temp. - 3°C (Heating : 85°C), using the up/down arrows

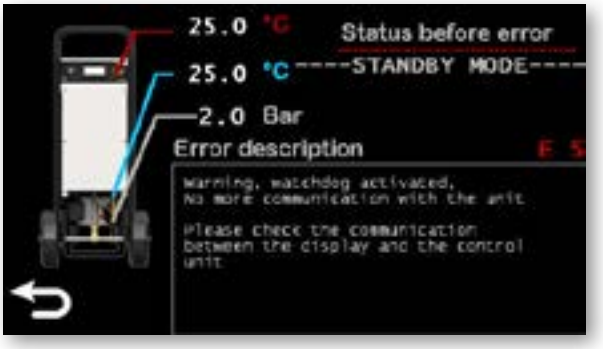
2



WATER TEMP. INFORMATION GRAPH

- Displays the supply and return temp. in a graph
- Possibility to zoom in / out for a clearer view on the time axis
- The value below the time axis indicates the time interval corresponding to each division of the axis. Each zoom in or out action changes the time interval defined for a division.

3



ERROR DESCRIPTION PAGE

- Displays the error code and a description of the problem
- Displays the boiler status before the error occurred.

In some cases, when the error is severe, a warning screen pops up (see example below).

ERROR POP UP MESSAGE

- Displays the error code and the explanation of the error
- Indicates the corrective action
- Also see *"Error messages, Problems and Solutions" on page 40* for more information.

4

OPERATION SETTINGS

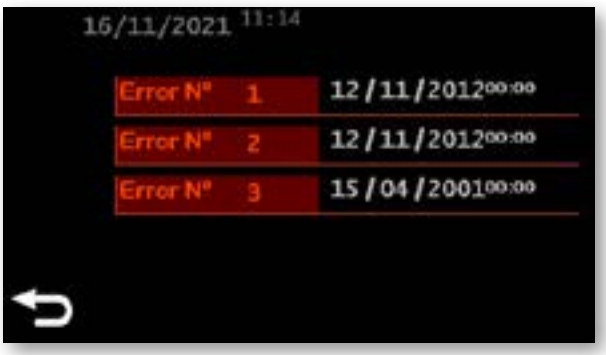
- Allows to define the pump flow rate (55%, 75% or 100%)
- Allows to set up the boiler power, in steps of 3 kW. The max. power depends on the connected power cable.
- Allows to define the duration of the pump pre-purge operation at boiler start-up, as well as post-purge, from 1 minute to max. 10 minutes. Default setting : 5 minutes

Validate by touching to save the changes.

5

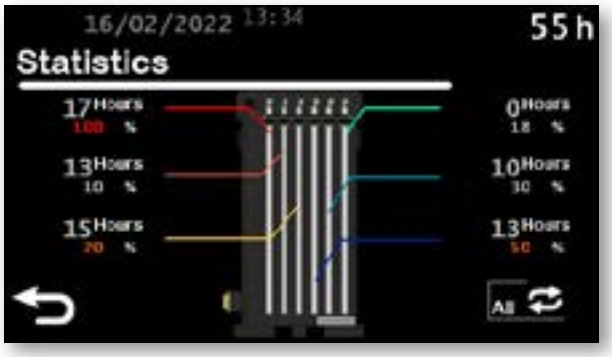
SETTING MENU

- Gives access to the following:
  - Language selection
  - To access functions related to the operation of the appliance (Pump and Power Setting screen, see above)
  - To access the USB Menu and save data to a USB drive (see *page 13*)
  - Statistics - to access the screen showing the usage/remaining lifetime of the appliance components (See opposite page)
  - To open the QR code screen and access the online version of this manual (see *page 14).*
  - Clock menu - to access the Date and Time Setting screen (see opposite page).
  - / Indicates if the internal memory is available or not
  - To access the Heating Setting screen (See page 10)
  - Log menu - opens the error log page (see below)
- FW:1.01 **Firmware version** - indicated on the right side of the screen.
- Touching the icon allows to access the "delete function" (for Drying files only) through the use of a code (only for). Refer to *"Advanced file management" on page 15*



ERROR LOG PAGE

- Displays the last 5 errors in the system
- Touching an error opens a specific error description page (see *"Error description page" on page 11*)
- The error code identifies the problem. See *"Error messages, Problems and Solutions" on page 40* for the list of codes.



STATISTICS

- Indicates the total running time (top right corner) of the appliance
- Indicates, for each heating element, the total heating time and % of used time compare to the total lifetime of the component. Clicking on it allow to reset the statistics.

The heating elements are represented as if the operator is facing the control panel.

Reset all the statistics using ALL .

DATE AND TIME SETTING

- Set the date using the up and down arrows
- Set the time using the up and down arrows

Validate by touching to save the changes.

USB MENU

- Gives access to the 3 file types:
  - File generated automatically when a screed drying sequence is launched. It contains the following data : Date-Time; supply T° ; preset T°
  - File(s) used to record the Drying sequences
  - File used to record all the error-related information
- Touching any of the icons opens the screen shown below.
- Touching the allows to access advanced functions through the use of a code (only for). Refer to *"Advanced functions" on page 14*

DRYING/SEQUENCE/LOGGING RECORDS

- Allows to scroll through the existing files, identified by their name, their date of creation and size. Number of files is max. 150, for all file types, except SEQ, limited to 4.
- Each file can be saved on a USB stick using the icon
- All the files can be saved on a USB stick using the ALL icon

ADVANCED FUNCTIONS

Touch ( ) to open the access page and advanced functions.

ADVANCED ACCESS PAGE

- Set the access code (**054**) using the up and down arrows above and under each position
- Validate by touching .

To cancel the operation, touch .

ADVANCED SETTING MENU

- Gives access to the following:
  - Language selection
  - To access advanced functions related to the operation of the appliance (Advanced Operation Settings, see page 15)
  - Advanced USB menu (see opposite page)
  - Statistics - to acces the screen showing the usage/remaining lifetime of the appliance components (See page 13)
  - To open the QR code screen and access the online version of this manual.
  - Clock menu - to access the Date and Time Setting screen (see page 13)
  - / Indicates if the internal memory is available or not
  - To access the Heating Setting screen (See page 10)
  - Log menu - opens the error log page (see page 12)
- FW:1.01 **Firmware version** - indicated on the right side of the screen.

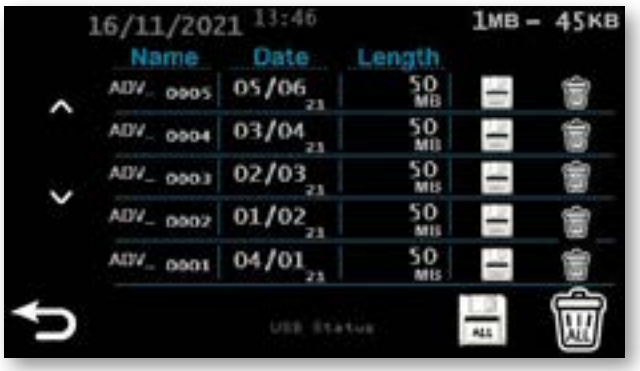
ADVANCED OPERATION SETTINGS

- Allows to define the pump flow rate (55%, 75% or 100%)
- Allows to set up the boiler power, in steps of 3 kW. The max power depends on the connected power cable.
- Allows to define the duration of the pump pre-purge operation at boiler start-up, as well as post-purge, from 1 minute to max. 10 minutes. Default setting : 5 minutes
- Allows to define the max. temperature settings (Heating, from 30 to 88°C, Drying, from 25 to 58°C)
- Allows to define the frost protection threshold temperature. It can be set between -10°C and 10°C. It is set by default at 5°C.

Validate by touching to save the changes.

ADVANCED USB MENU

- Gives access to the 3 file types that can be saved to the external USB drive.
- Touching any of the icons opens the Advanced file management screen (see below).

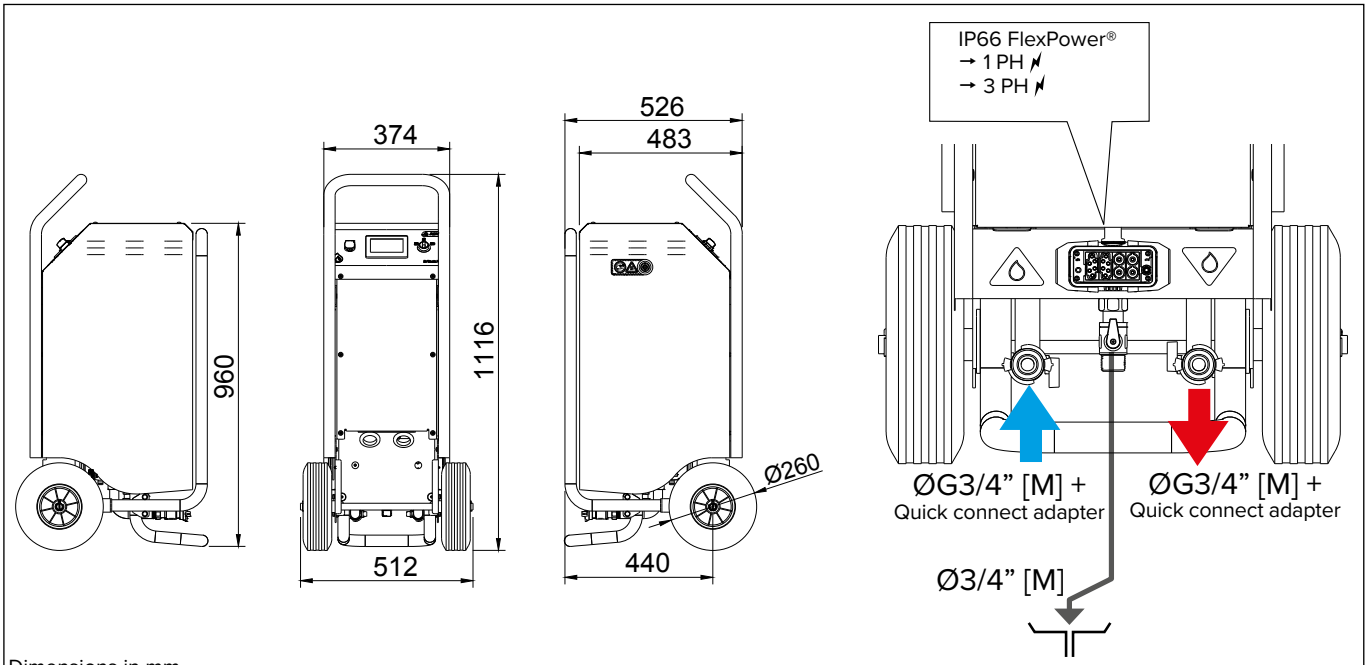


ADVANCED FILE MANAGEMENT

- Allows to scroll through the existing files, identified by their name, their date of creation and size. Number of files is max. 150, for all file types, except SEQ, limited to 4.
- Each file can be saved on a USB drive using the icon.
- All the files can be saved on a USB drive using the icon.
- allows to delete the chosen file from the internal memory
- allows to delete all the files from the internal memory.

Only the Drying-related files can be deleted from the internal memory.

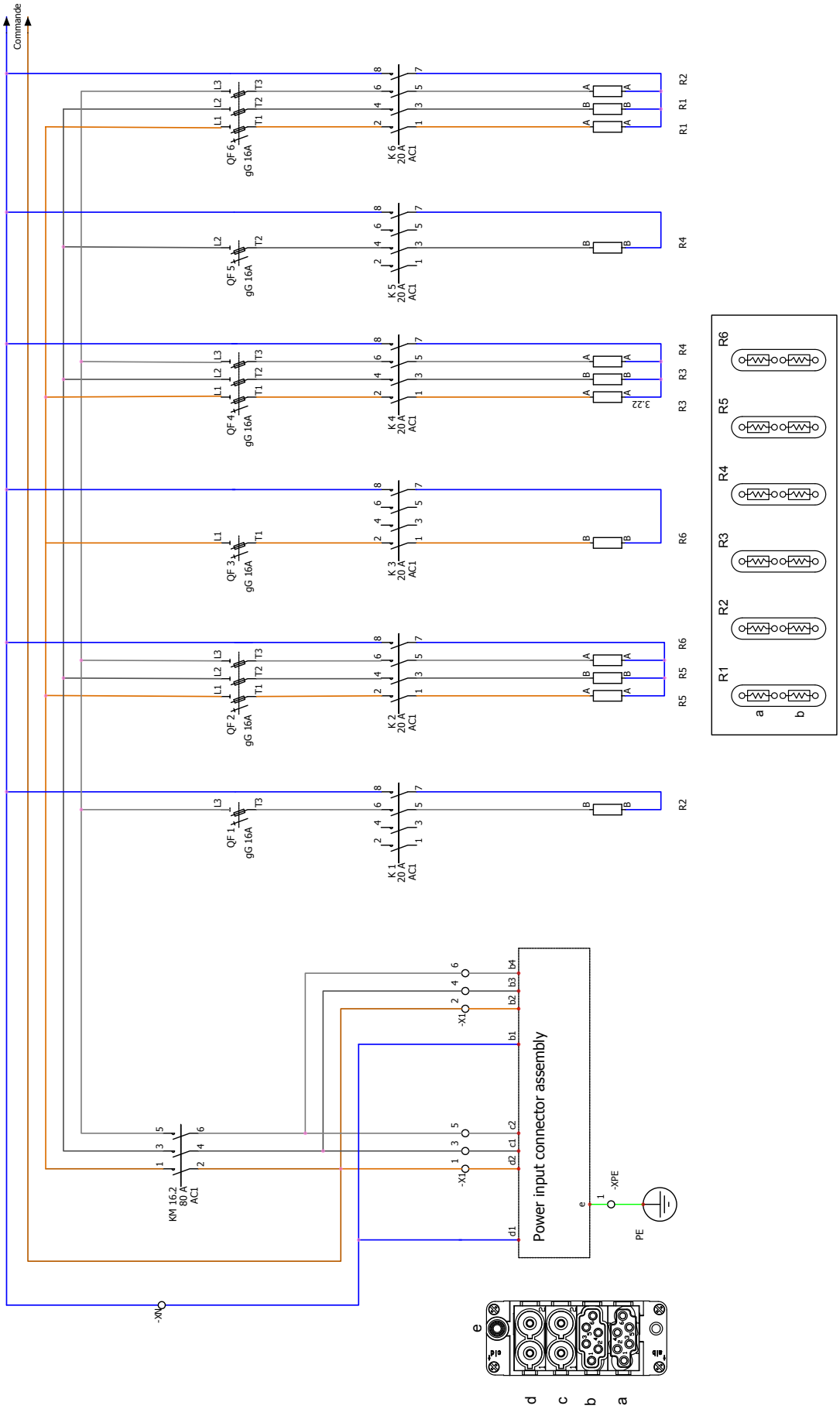
DIMENSIONS & CHARACTERISTICS



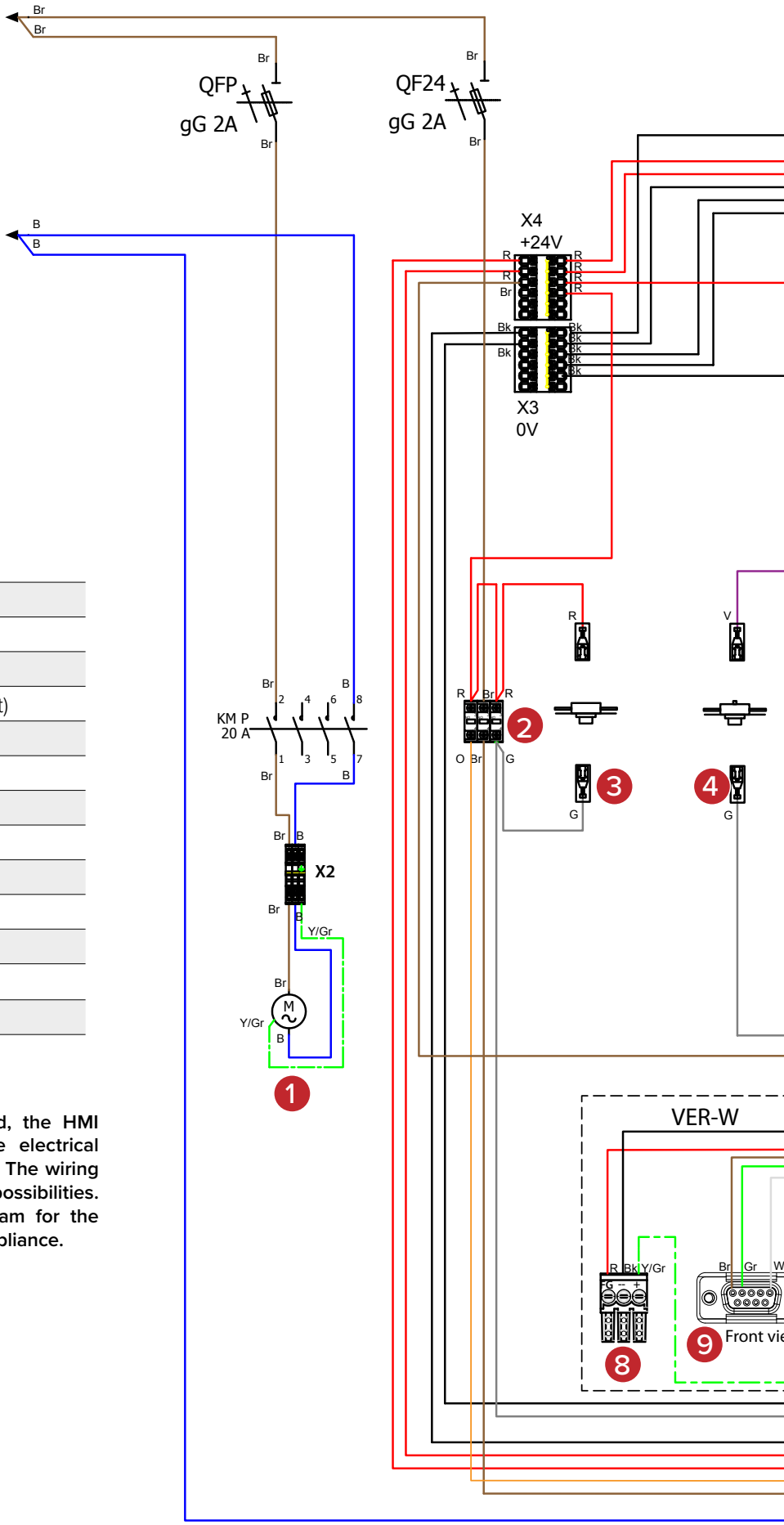
Dimensions in mm

(primary)		L	13
Primary circuit expansion vessel volume		L	12
	Max KPa (bar)		250 (2,5)
	Min KPa (bar)		70 (0,7)
	Nominal KPa (bar)		100 to 150 (1,0 to 1,5)
	Test KPa (bar)		300 (3,0)
		°C	85
		°C	55
		kg	60
		kg	80
Max Power		kW	36
Rated voltage of the power supply		V	1x230 V / 3x400 V
Rated voltage of the control circuit		V	230 V
Rated frequency		Hz	50
Ohmic resistance of element		Ohm	17,6
Heating element type		kW	6 (2x3 kW)
Number of heating elements			6
Electric protection		IP	22

POWER WIRING DIAGRAM

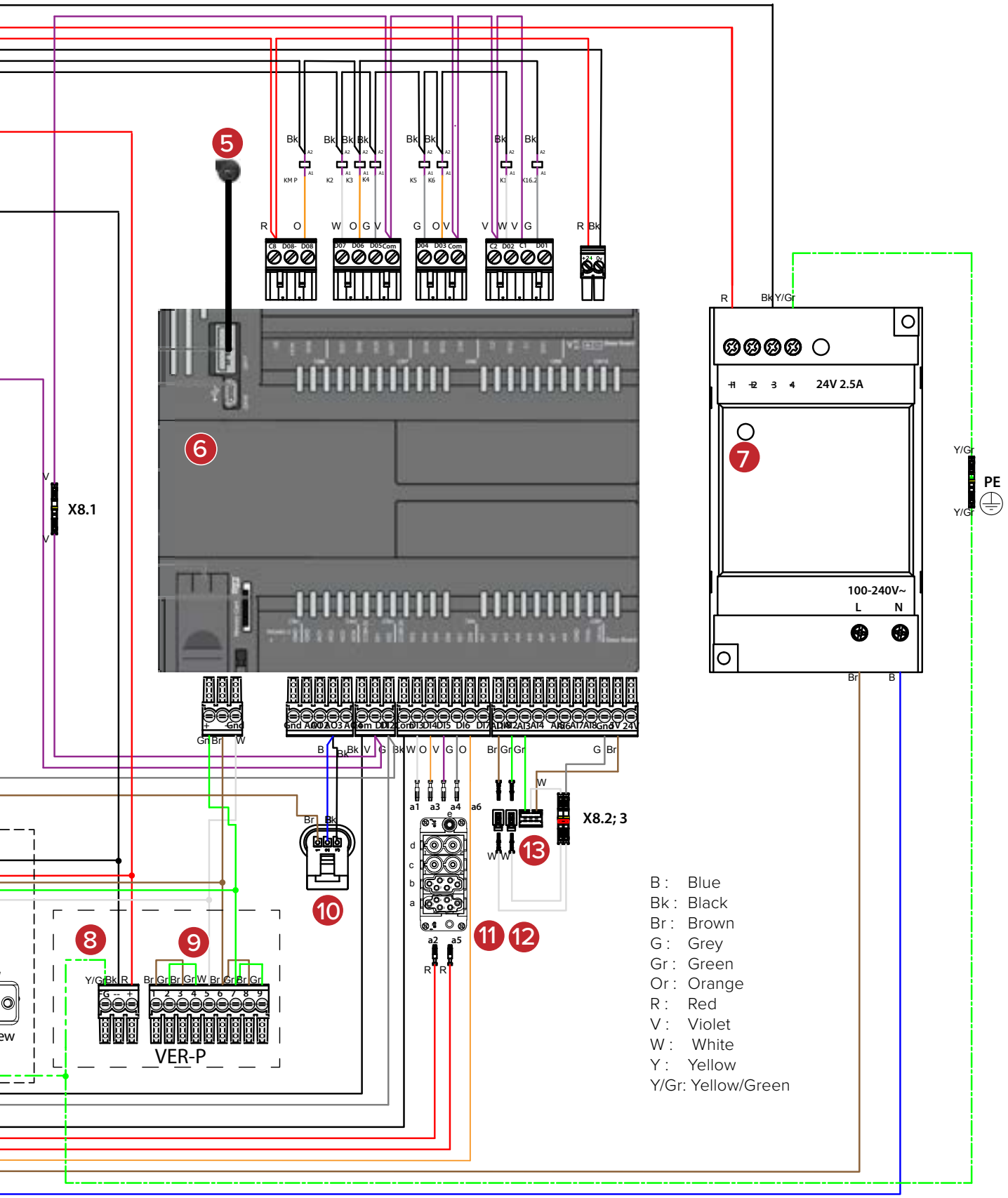


CONTROL WIRING DIAGRAM



1.	Pump
2.	Power switch/Mode selector
3.	60°C high limit switch (auto reset)
4.	96°C high limit switch (manual reset)
5.	USB socket
6.	Controller
7.	24V transformer
8.	HMI power supply
9.	HMI Modbus
10.	Pump PWM
11.	Return temp. sensor
12.	Supply circuit temp. sensor
13.	Water pressure sensor

Depending on the product build, the HMI (display) version can differ. The electrical connections are slightly different. The wiring diagram on the right shows both possibilities. Please refer to the wiring diagram for the connection information of your appliance.

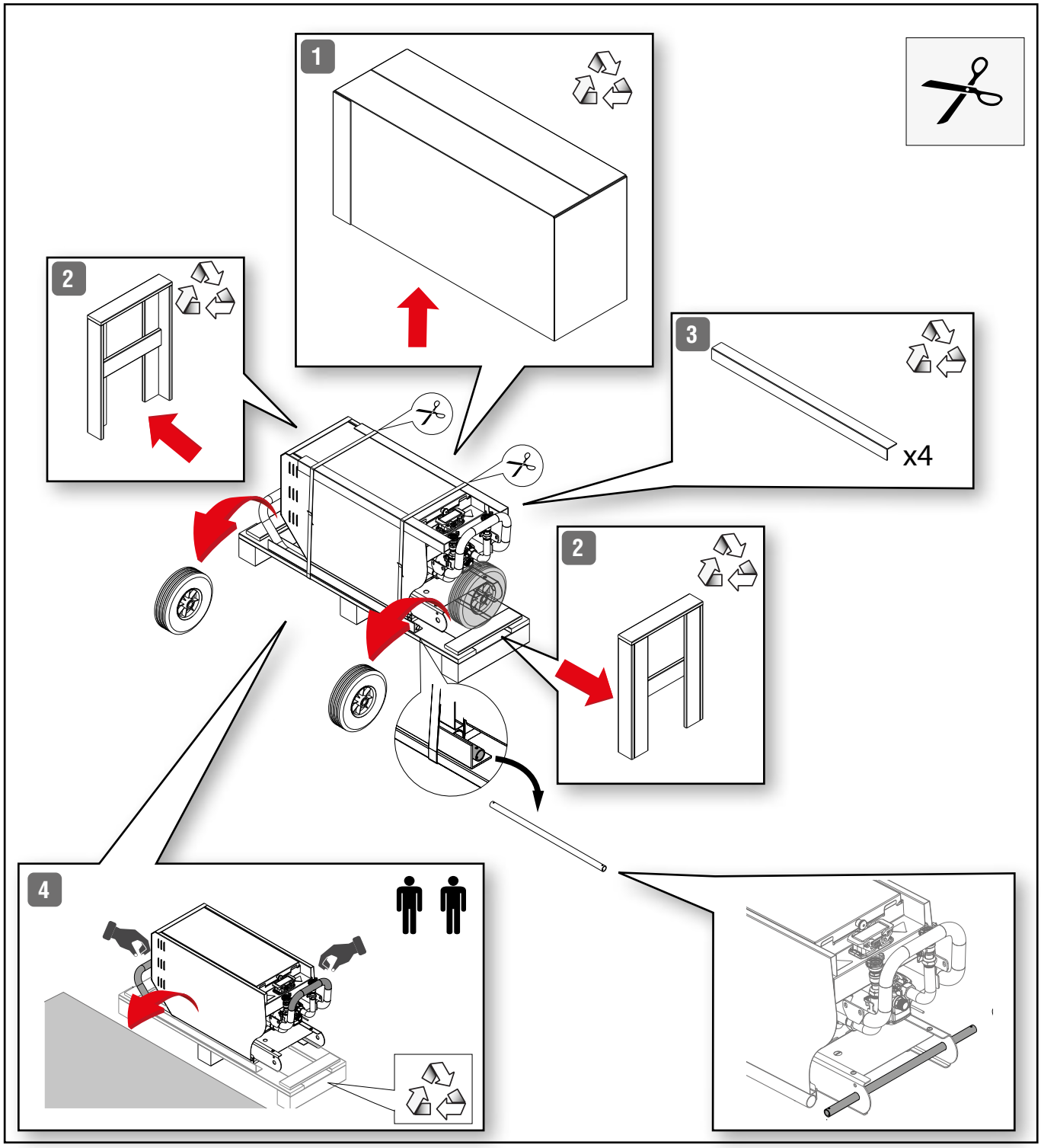

5
6
7
8
9
10
11
12
13
X8.1
X8.2; 3
PE
24V 2.5A
100-240V~
L
N
VER-P
B : Blue
Bk : Black
Br : Brown
G : Grey
Gr : Green
Or : Orange
R : Red
V : Violet
W : White
Y : Yellow
Y/Gr: Yellow/Green

HANDLING INSTRUCTIONS

- The weight of the packaged boiler is 70 Kg, which could present a risk of injury when lifting the package. Ask for help to lift it or handle it, or use an appropriate lifting means.
- Bring the appliance to a clean, level and unobstructed location before removing the packaging.

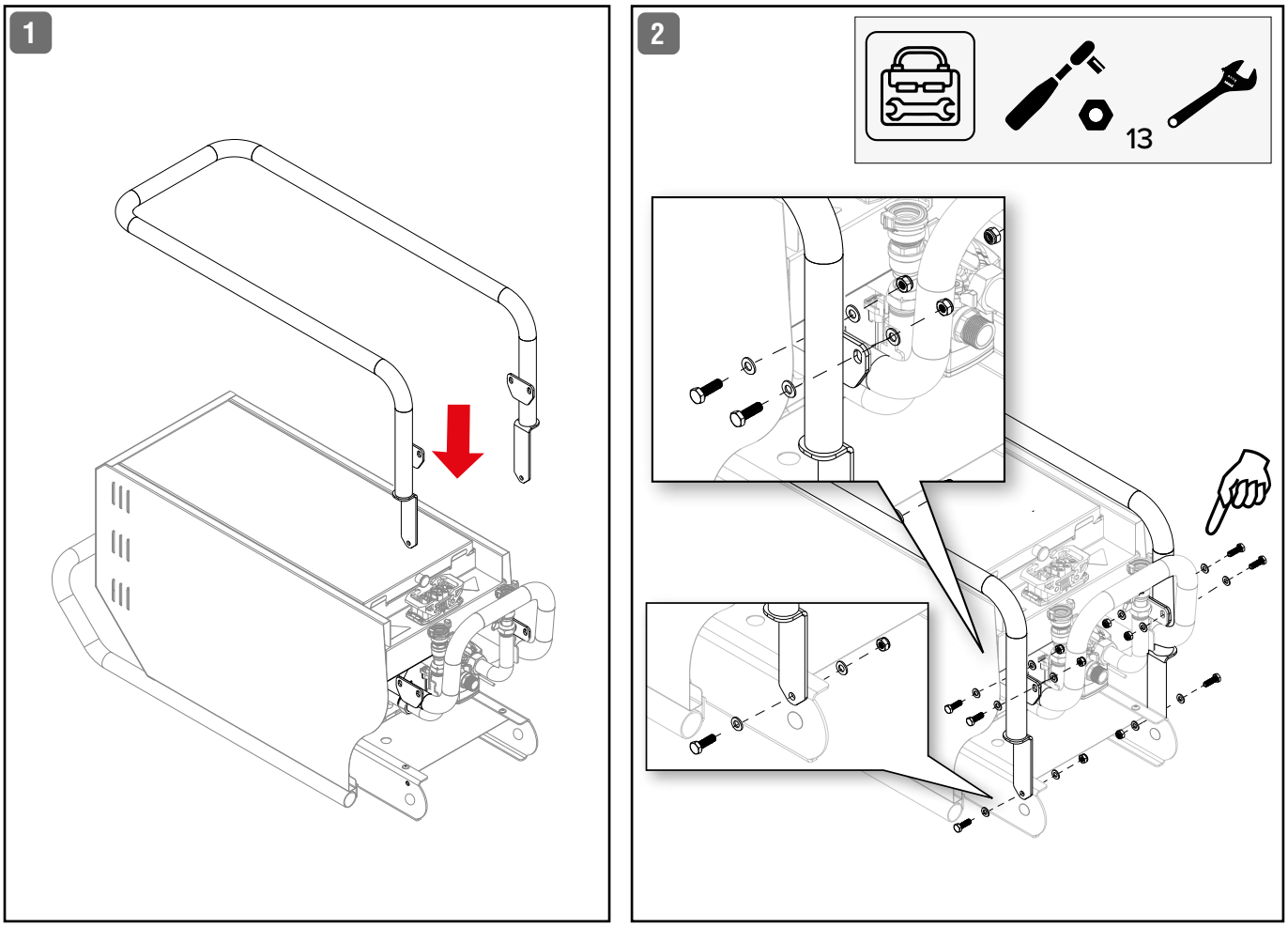
REMOVING THE APPLIANCE FROM THE PACKAGING

- Before lifting the boiler out of the packaging, ensure that the installation area is level and clean and that it is free of obstacles that would make the preparation tasks difficult or unsafe.
- To prevent the appliance covers from being damaged during preparation, it is recommended to place a clean covering (plastic, cardboard, fabric, etc.) on the floor.

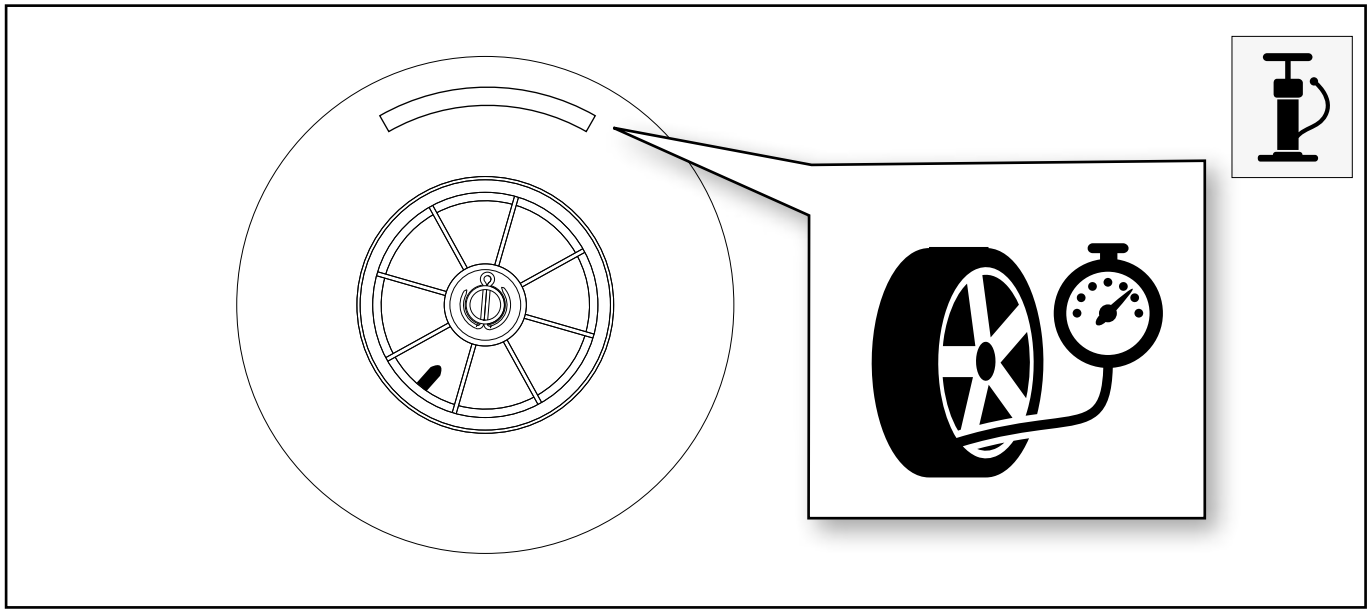


INSTALLING THE OPTIONAL PROTECTION BUMPER

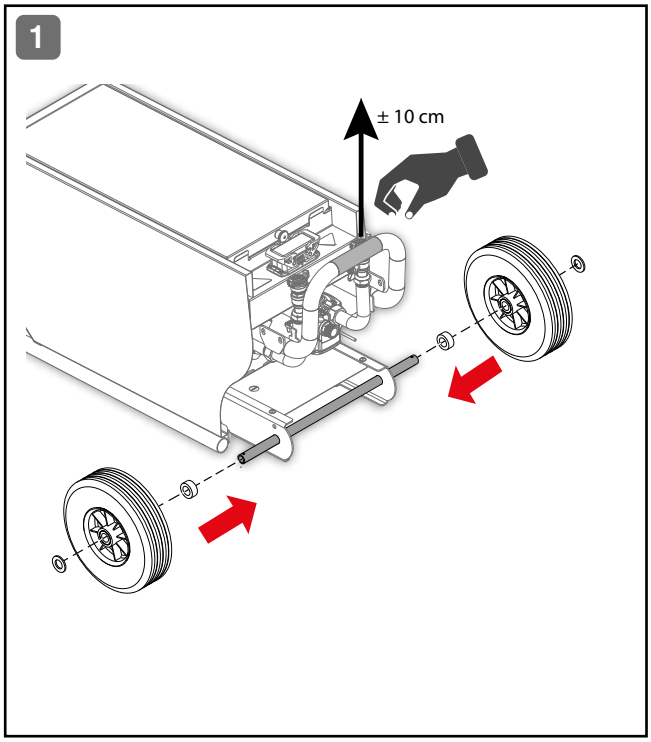
- For ease of operation, the optional protection bumper should be installed before installing the wheels.
- To install the optional protection bumper, the appliance must lie on the floor, as shown below.

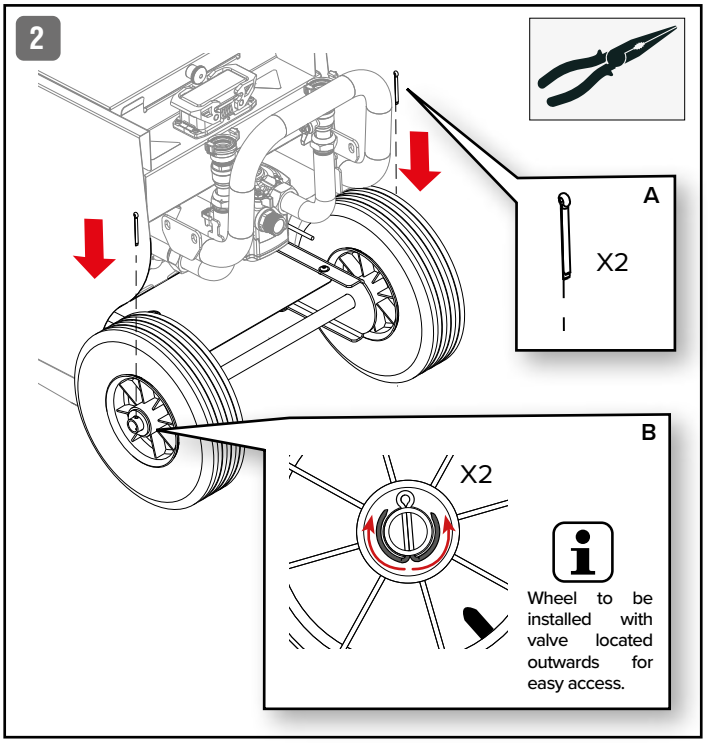


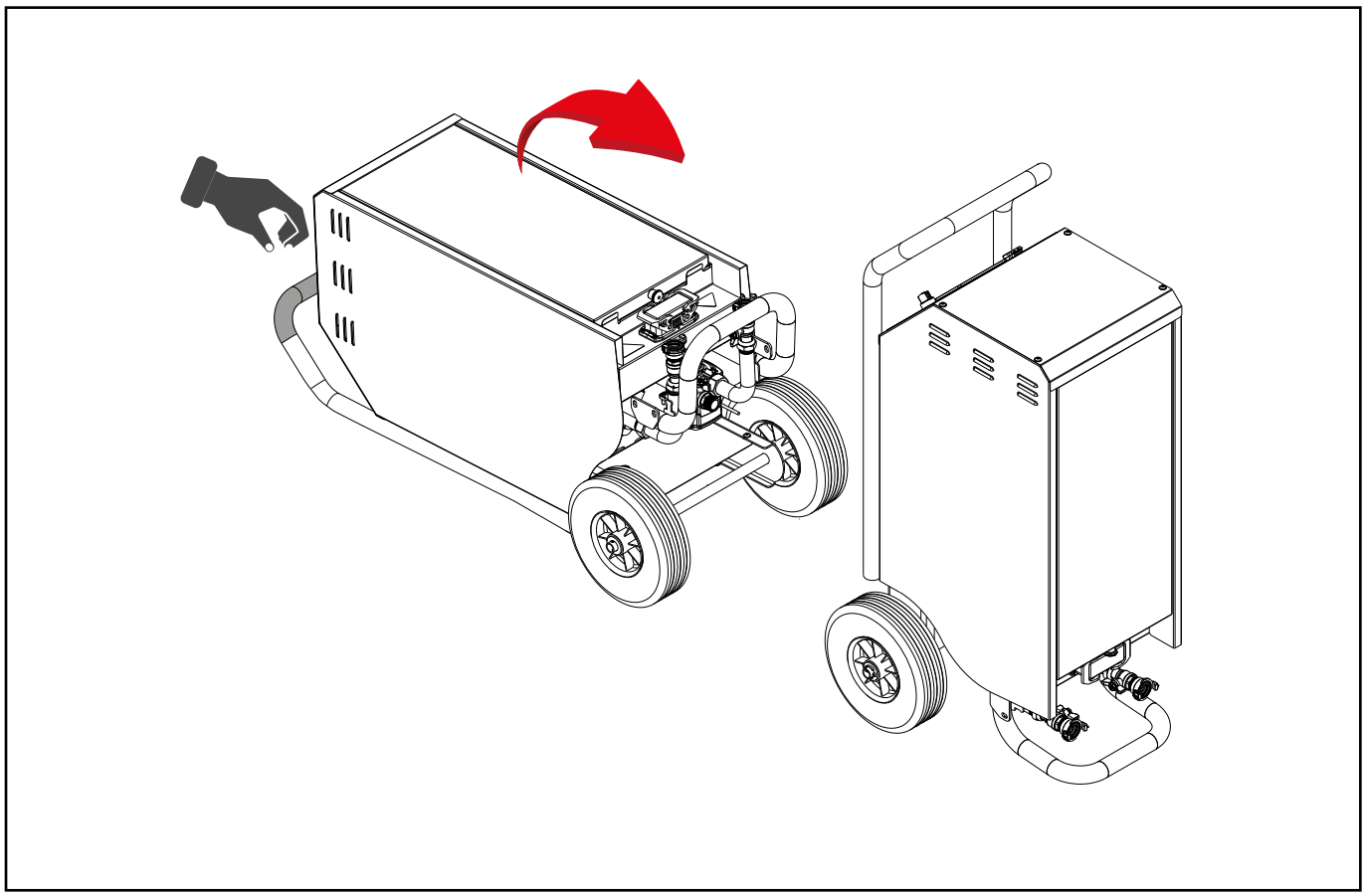
INFLATING THE TIRES



INSTALLING THE WHEELS







SAFETY INSTRUCTIONS FOR THE INSTALLATION

General remarks

- The connections (electrical, hydraulic) must be carried out in accordance with current applicable standards and regulations.

Essential recommendations for the correct operation of the appliance

- The boiler must be installed in a dry and protected area, with an ambient temperature comprised between 5°C and 45°C, and a relative humidity between 20% and 70%.
- Make sure that the ambient air is not contaminated with hydrocarbon vapours, high concentration dust or continuous high humidity.
- Install the appliance to ensure easy access at all times.
- When moving the appliance around from one location to the other, allow the appliance to cool down and adapt to the new environment if ambient conditions differ by more than 20% (temperature and/or humidity).

Essential recommendations for safety

- Do not install the appliance close to combustible materials.
- Do not use or store any flammable, explosive or corrosive products, such as paint, solvents, salts, chloride products and other detergent products near the appliance
- This appliance is not built for outdoor use.

Essential recommendations for the electrical safety

- When deployed on site, the appliance must be connected to the mains using the appropriate power cable.
- The mains socket must be protected by a 2-way switch and a fuse or circuit breaker of the recommended rating, so as to be able to shut power down when servicing the appliance or before performing any operation on it.
- Isolate the external electrical supply of the appliance before performing any operation on the electrical circuit and disconnect the power cable from both the mains and the appliance.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless supervised or unless they have been given instruction concerning the use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.

SAFETY INSTRUCTIONS FOR THE ELECTRICAL CONNECTION

Essential recommendation for electrical safety

- As far as the power input to the boiler is concerned, the installation must comply with standard EN60364-1 that defines the applicable levels of insulation, and with all provisions applicable to installation conditions.
- For protection against electrical hazard, it is always recommended to install a differential cut-out device (Ground Fault Isolator) on the power supply circuit, upstream of the boiler.
- The default electrical safeties integrated in the boiler protect the internal parts of the boiler.
- Any additional electrical safety device must be installed outside the boiler.

SAFETY INSTRUCTIONS FOR THE HYDRAULIC CONNECTION

Essential recommendations for safety

- If the quick connect adapters are not used when installing the boiler, use a two-wrench method when tightening field piping onto the boiler connections. Use one wrench to prevent the boiler connections from turning and the second to tighten field piping. Failure to support the boiler piping connections could damage piping or cause a leak.

Essential recommendations for the correct operation of the appliance

- Make sure that the size of the hose is at least that of the boiler connections, and that they are approved for a service pressure above 300 KPa (3 bar) and a water temperature of at least 90°C.
- Ensure that all required safety devices are installed, in compliance with applicable standards and regulations.
- Before filling the system, thoroughly flush it to remove any residues.
- Check the general condition of hoses, pipes and connections. Correct any defect.

General remark

- The circuit illustrations are basic principle diagrams only. Not all required safety devices and accessories are represented.

RECOMMENDATIONS TO PREVENT CORROSION AND SCALING

Prevention Principles

1. Flush the existing system before installing the appliance
2. Limit the fill frequency
3. Limit the presence of oxygen and sludge in the water
4. Limit the carbonate concentration in the water

The fill water must be softened if its hardness is higher than 20° fH (11,2° dH).

Water hardness table :

Water hardness	°fH	°dH	mmolCa(HCO3)2 / l
Very soft	0 - 7	0 - 3.9	0 - 0.7
Soft	7 - 15	3.9 - 8.4	0.7 - 1.5
Fairly hard	15 - 25	8.4 - 14	1.5 - 2.5
Hard	25 - 42	14 - 23.5	2.5 - 4.2
Very hard	> 42	> 23.5	> 4.2

5. Control the water parameters

Acidity	6,6 < pH < 8,5
Conductivity	< 400 µS/cm (at 25°C)
Chlorides	< 125 mg/l
Iron	< 0,5 mg/l
Copper	< 0,1 mg/l

Using demineralised water is also possible and will limit the formation of scale in the appliance.

MOVING THE APPLIANCE AROUND

If the appliance was in operation, perform tear-down procedure before moving it around. Refer to *"Tear-Down" on page 31*

To move the appliance around, make sure that :

- The tire pressure is sufficient (the required pressure is stamped on the tire side). Inflate the tire(s) if required
- The passages are wide enough,
- There are no obstacles or obstructions on the path. If there are and the appliance needs to be lifted, use an appropriate lifting means or ask for help (at least 2 people are required to lift the appliance).

DEFINING THE ON-SITE INSTALLATION LOCATION

- The On-site Installation location complies with the requirements in the safety instructions.
- The On-site Installation location has a hard and level surface.
- The appliance can be easily connected to the water source and electrical supply,

ON-SITE INSTALLATION PROCEDURE

Set-up conditions

- External power supply isolated.
- Appliance disconnected from the water mains and empty.
- All boiler valves closed.
- Manual air vent closed.

Procedure

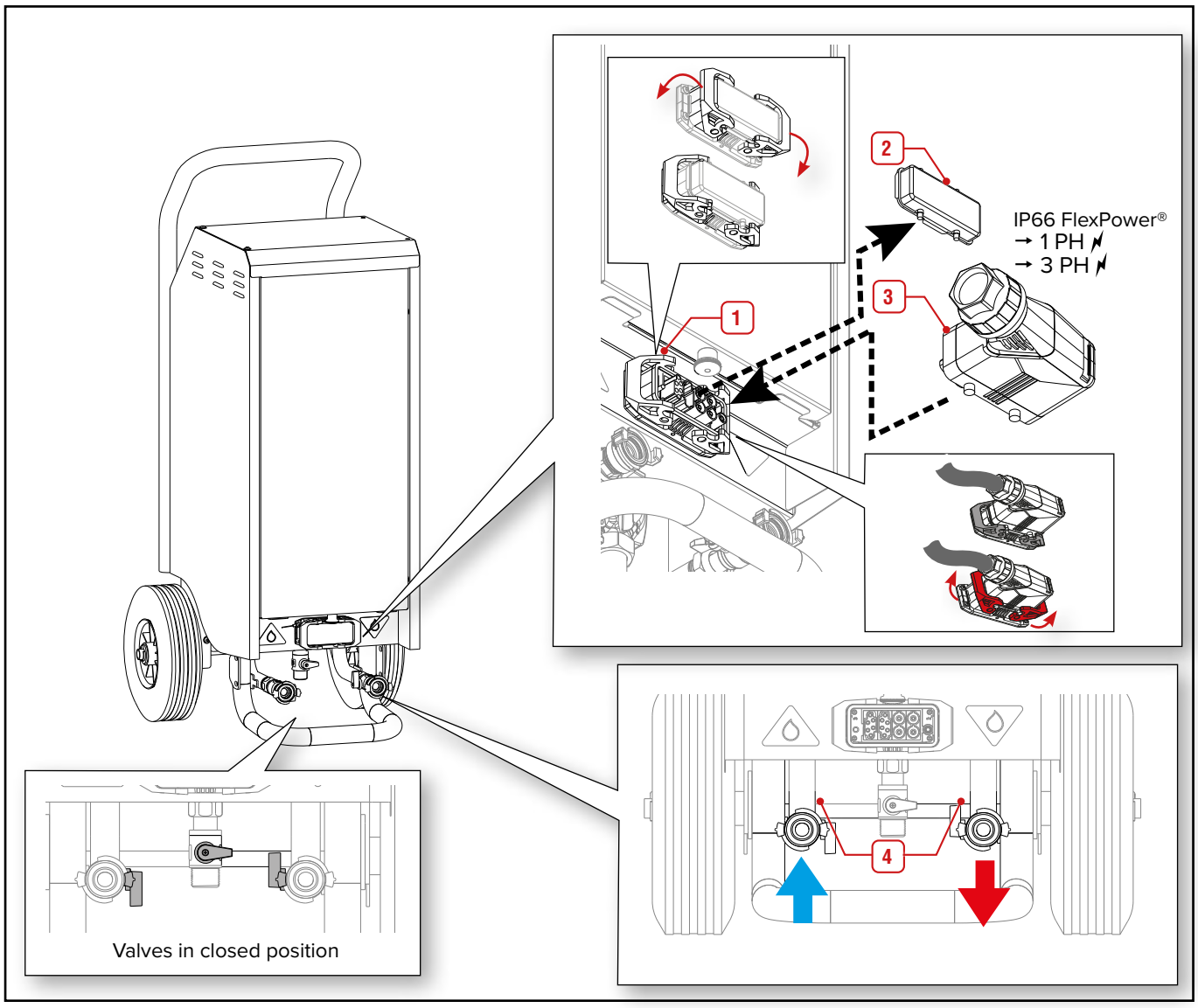
1. Bring the appliance to the On-site Installation location.
2. Place it vertically, on a flat surface, ensuring easy access to the electrical and hydraulic connection points.
3. Unlock side safety latches (**1**) and remove Flex socket cover (**2**). Retain the cover (**2**) for later reinstallation.
4. Connect the appropriate power cable plug (**3**) to the Flex socket and lock in position with side safety latches (**1**).

   - **Install the heating piping system before connecting to the boiler.**
   - **The quick connect adapters can be removed in order to carry out a typical hydraulic connection.**

5. Connect the water supply and return circuits using the quick connect adapters (**4**).

Follow-on tasks

1. Fill the system refer to *"Filling the System" on page 26*.



FILLING THE SYSTEM

Set-up conditions

- External power supply isolated
- Temporary filling hose installed, equipped with specific check valve and stop valve.

Filling procedure

1. Connect the filling hose (**3**) to the boiler connection (**1**).
2. Open the isolating valves (**2**).
3. Open the valve of the filling hose (**3**) then slowly the valve of the boiler connection (**1**).

Before starting the boiler, make sure that the air is bled from the heating circuit using the manual air vent located on the right side of the boiler.

4. Open the manual air vent (**4**) located on the right side of the appliance until water comes out.
5. Close the valve of the filling hose (**3**).

Follow-on tasks

- Check there is no leak.
- Connect the other end of the power cable to the electrical supply from the mains.
- Start up the appliance

STARTING UP THE APPLIANCE

Essential recommendations for safety

- Before powering on the appliance, make sure that the side safety latches of the power supply connector are fully raised and locked in place. Failure to comply can result in damages to the equipment.
- Set the water temperature in accordance with usage and local plumbing codes.
- Make sure that the heating circuit filling valve is closed once the starting up process is complete.
- Make sure that all connections are made and tight.
- Check that the cables, wires, piping and connections are undamaged.

Set-up conditions

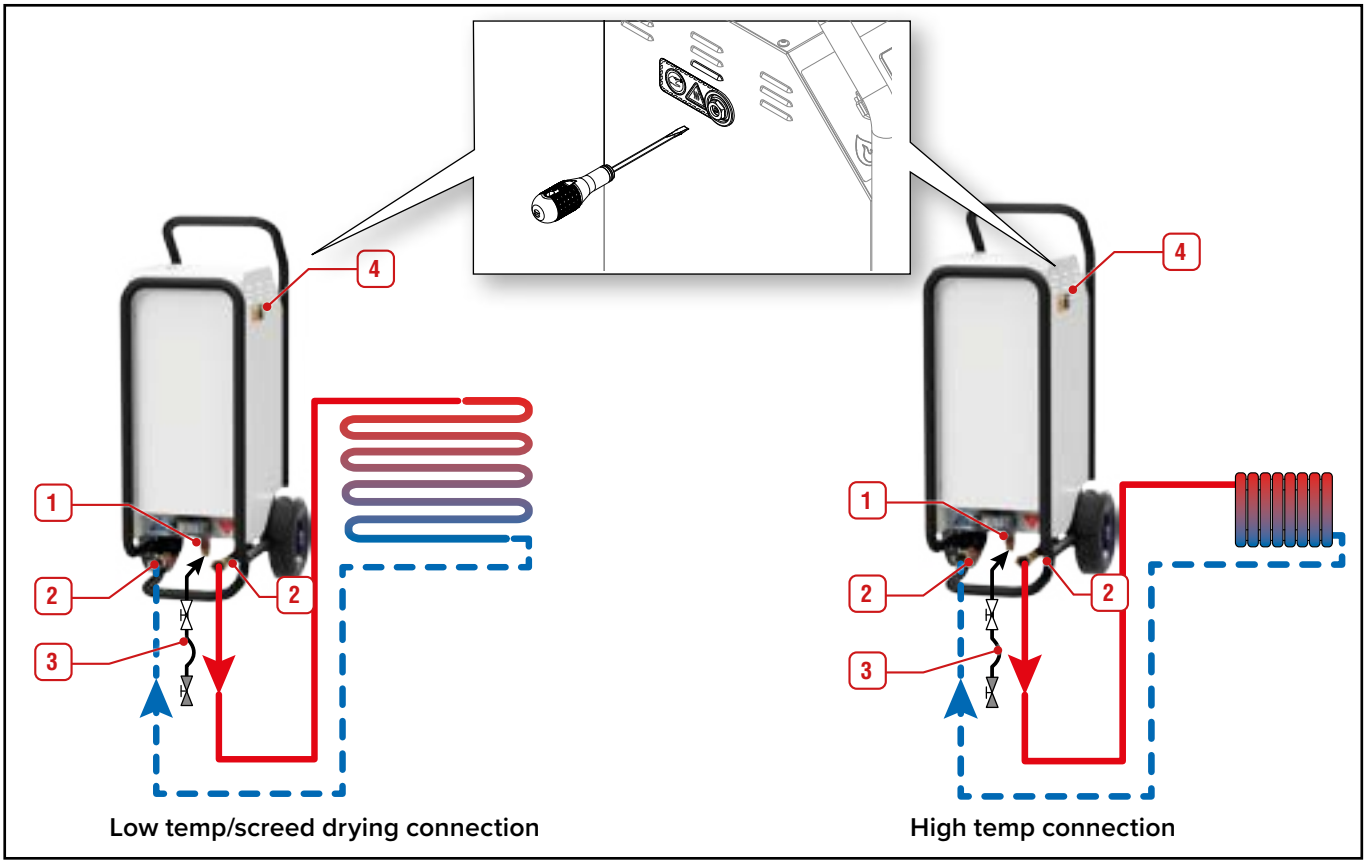
- Hydraulic and electric connections made
- External power supply provided
- System filled with water

Start-up procedure

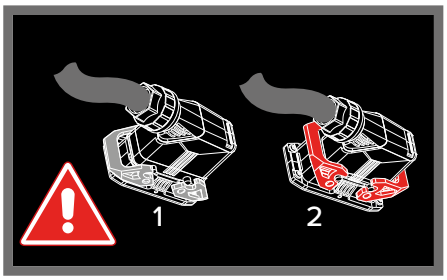
1. Turn boiler on using the main switch and rotate:
   - to the left (Heating mode),

   OR
   - to the right (Screed drying mode).

Do not switch rapidly between the modes, as it will generate an error. Wait for a few seconds.



2. The start-up screen is displayed for 5 seconds
3. Make sure that the latches are up and locked. Start-up sequence will resume after 3 seconds.



4. The wizard starts up.
5. Touch the language icon to select the correct language (EN-FR-NL-DE-IT) as required, then "***YES***" or "***NO***":

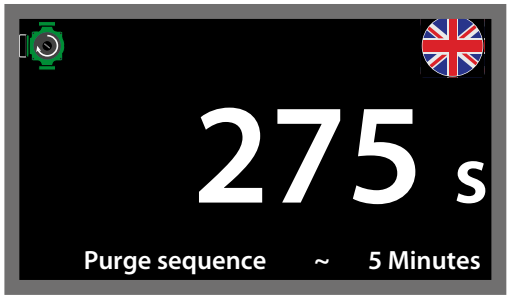
- Select "***YES***" for a full start-up process (check of pressure, a few min. stabilisation and manual air bleed request)
- Select ***"NO"*** for pressure check only, and confirm the choice.

If the boiler has not been operated for some time (e.g. long-term storage), the pump might be blocked. Unblock as explained in *"Unblocking the Pump" on page 38*.

6. After the pump has run for a few minutes, the screen displays the system pressure. The pressure in operation should be between 100 and 150 KPa (1,0 to 1,5 bar).

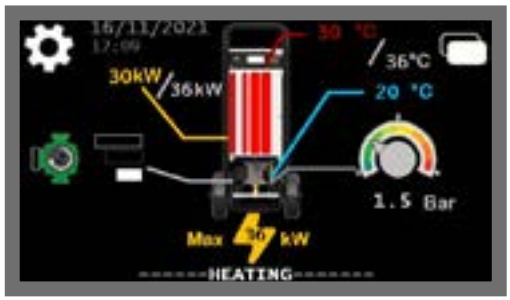
The pump purge sequence is set at 5 minutes by default, but can be adjusted between 1 and 10 minutes. Refer to *"Operation settings" on page 12*.

7. Adjust the system pressure if needed:
   - **Increase the pressure** by adding water - slowly open the valve of the filling hose
   - **Reduce the pressure** by actuating the manual air vent.
8. Once the pressure is adjusted, the pump starts running. for a few minutes to bleed the air from the system.



9. At the controller request, bleed the air from the system by actuating the manual air vent. Stop as soon as water comes out.

10. When finished, Touch "***Done***".
11. The main screen is displayed.



12. Close the valve of the filling hose (**3**).
13. Close the valve of the boiler connection (**1**).
14. Disconnect and remove the temporary filling hose assembly.

Follow-on tasks

1. Using the touch screen of the control panel, perform all required settings. Refer to ***"Using the Controller" on page 10*** for detail of menus and settings.
2. Install USB drive as required. Refer to ***"Saving Parameters to an External Drive" on page 28***.

If no USB drive is installed, make sure that the socket cover is closed to prevent dust, dirt or water from entering.

SAVING PARAMETERS TO AN EXTERNAL DRIVE

Set-up conditions

- Appliance in operating condition

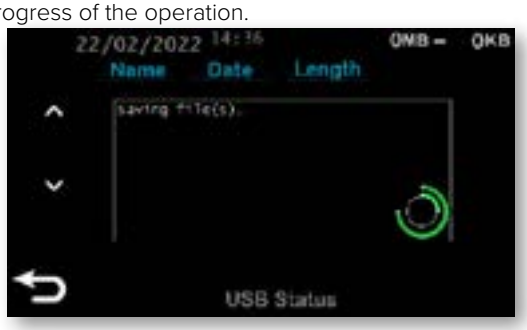
Installation and Operation

Make sure to use a USB stick of the "USB 2.0" type, max size of 32 Go, FAT32 format, or it will not be recognised by the appliance.

1. On the control panel, lift the USB socket cover (1).
2. Insert the USB stick into the socket.
3. Touch the icon on the home page to access the Setting page.
4. Touch the or icon to access the USB menu (see *page 13).*
5. Touch the required icon depending on the parameters that need to be exported. Refer to *page 13* for more information about this function.

The data will be exported as ".CSV" files.

6. A confirmation screen will be displayed while the data is written on the external drive. A green circle indicates the progress of the operation.



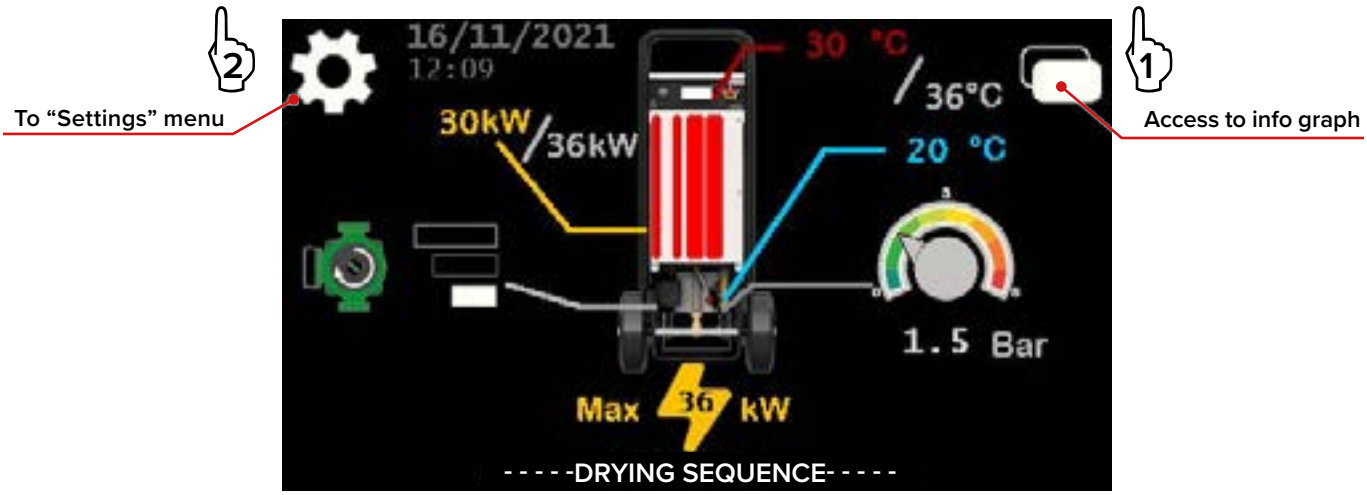
Do not remove the USB stick from the socket while this screen is displayed. Doing so may damage the files and/or drive.

7. Once the data is saved, remove the USB stick, as required.

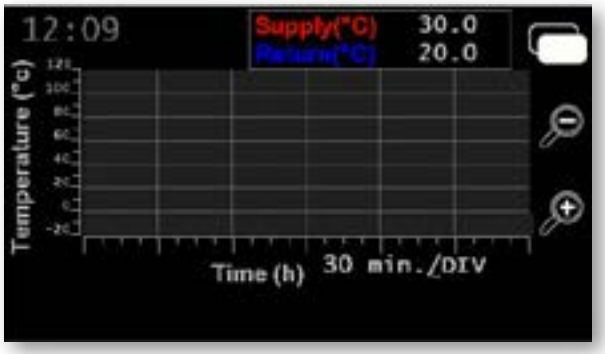
Follow-on tasks

Close the USB socket cover after removal of the USB stick to prevent dust, dirt or water from entering.

USING THE SCREED DRYING FUNCTION



1



WATER TEMP. INFORMATION GRAPH

- Displays the supply and return temp. in a graph
- Possibility to zoom in / out for a clearer view on the time axis
- The value below the time axis indicates the time interval corresponding to each division of the axis. Each zoom in or out action changes the time interval defined for a division.

Touching the icon allows to open the Screed Drying Information page (see below).

SCREED DRYING INFO

This screen provides the following information about the screed drying sequence:

- The start/end dates and time of the screed drying program
- The actual temperature Vs. temperature setpoint
- The current position in the program through the yellow line positioned in the graph and the current day/total number of days.

2

SETTING MENU

All the main functions are identical to those described on page 12.

- gives access to *“Screed Drying Definition” on page 30*
- Touching the icon allows to access advanced functions (i.e. adjustment of screed drying parameters) through the use of a code (only for). Refer to *“Advanced setting menu” on page 30*

Defining a screed drying sequence

SCREED DRYING DEFINITION

- Activation / deactivation of the screed drying sequence
- Selection of one out of four screed drying programs using the auto mode icon.
- Display at the top of the screen of the total number of days in the sequence, while the daily sequence is represented in a graph.
- Each vertical line in the graph corresponds to one day in the sequence, its length corresponds to the temperature setpoint.
- The vertical axis represents the range of temperatures

Validate by touching to save the changes.

ADVANCED SETTING MENU

All the main functions are identical to those described on page 14.

Touching the icon gives access to the screed drying definition screen (see above).

Touching the icon allows to access the screed drying sequence programmation screen (see below)

SCREED DRYING PROGRAMMATION

This screen allows to change the parameters of the selected screed drying program :

- Definition of a temperature setpoint per day
- Increase/decrease of the daily setpoint by steps of 5°C/1°C
- Copy of previous day setpoint for easy adjustment
- Definition of total number of days in the sequence
- Touching the icon allows to save the updated parameters of the screed drying sequence.

TEAR-DOWN PROCEDURE

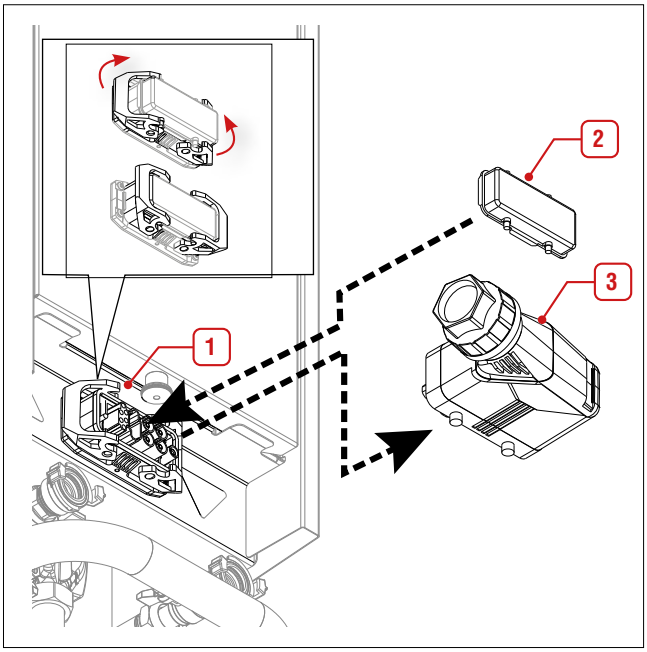
Set-up conditions

- Bring the system temperature down, around 30 °C.

Shut down procedure

1. Turn boiler off by bringing the main switch back to the center position.

2. Deactivate the electrical supply from the mains through the external fuse or circuit breaker.
3. Disconnect the cable plug from the mains.
4. Lower the safety side latches (**1**) from the Flex plug (**3**) and remove the plug from the Flex socket.
5. Reinstall the Flex socket protective cover (**2**) and lock with side safety latches (**1**).



6. Check the condition of the Flex power cable and the plugs at both ends. If damaged, perform the required repairs or replace with a undamaged one.
7. Store for next use.
8. Drain the appliance if required. Refer to *"Draining the Appliance and the System" on page 32*.
9. Close the supply and return circuit stop valves on the boiler.
10. Disconnect the supply and return pipes from the boiler. Be aware that some water may still flow out of the system pipes.

Follow-on tasks

Perform *"Conditioning for Moving around" on page 31* or *"Appliance storage" on page 31*.

CONDITIONING FOR MOVING AROUND

Set-up conditions

- Boiler shut down using the main switch
- External power supply disconnected (through the external electrical box)
- Power cable removed
- Boiler cooled down < 30°C (if it was in operation).

Procedure

1. Drain the water from the boiler if required. Refer to *"Draining the Appliance and the System" on page 32*.
2. Disconnect all hydraulic piping and electrical connections. Refer to Tear-down procedure on the left.
3. If the appliance is dusty/dirty, clean it. Refer to *"Cleaning the Appliance" on page 37* for the cleaning instructions
4. Check the pressure of the tires. Inflate them as required. Refer to *"Inflating the Tires" on page 21*

Follow-on Task(s)

None

APPLIANCE STORAGE

Conditions for Short Term Storage (max 7 weeks):

- The protective cover is securely installed on the electrical socket.
- The appliance is empty of water.
- The stop valves of the hydraulic connections are open.
- All the access covers are closed.
- The appliance is free of dust/dirt (refer to *"Cleaning the Appliance" on page 37.*
- Store the appliance in a dry and protected place.

Conditions for Long Term Storage (more than 2 months)

- The electrical socket is free of dirt/dust and the protective cover is securely installed on the electrical socket
- The appliance is empty of water and dry to prevent all risks of corrosion.
- The stop valves of the hydraulic connections are open.
- All the access covers are closed
- The appliance is free of dust/dirt (refer to *"Cleaning the Appliance" on page 37*
- Store the appliance in a dry and protected place (temperature between 5 and 45° C, relative humidity below 70%.
- When returning to service, check that the pump is running. If required, perform *"Unblocking the Pump" on page 38.*

DRAINING THE APPLIANCE AND THE SYSTEM

Set-up conditions

- Boiler shut down using the main switch
- External power supply disconnected (through the external electrical box)
- Power cable removed
- Boiler cooled down < 30°C (if it was in operation)

Procedure

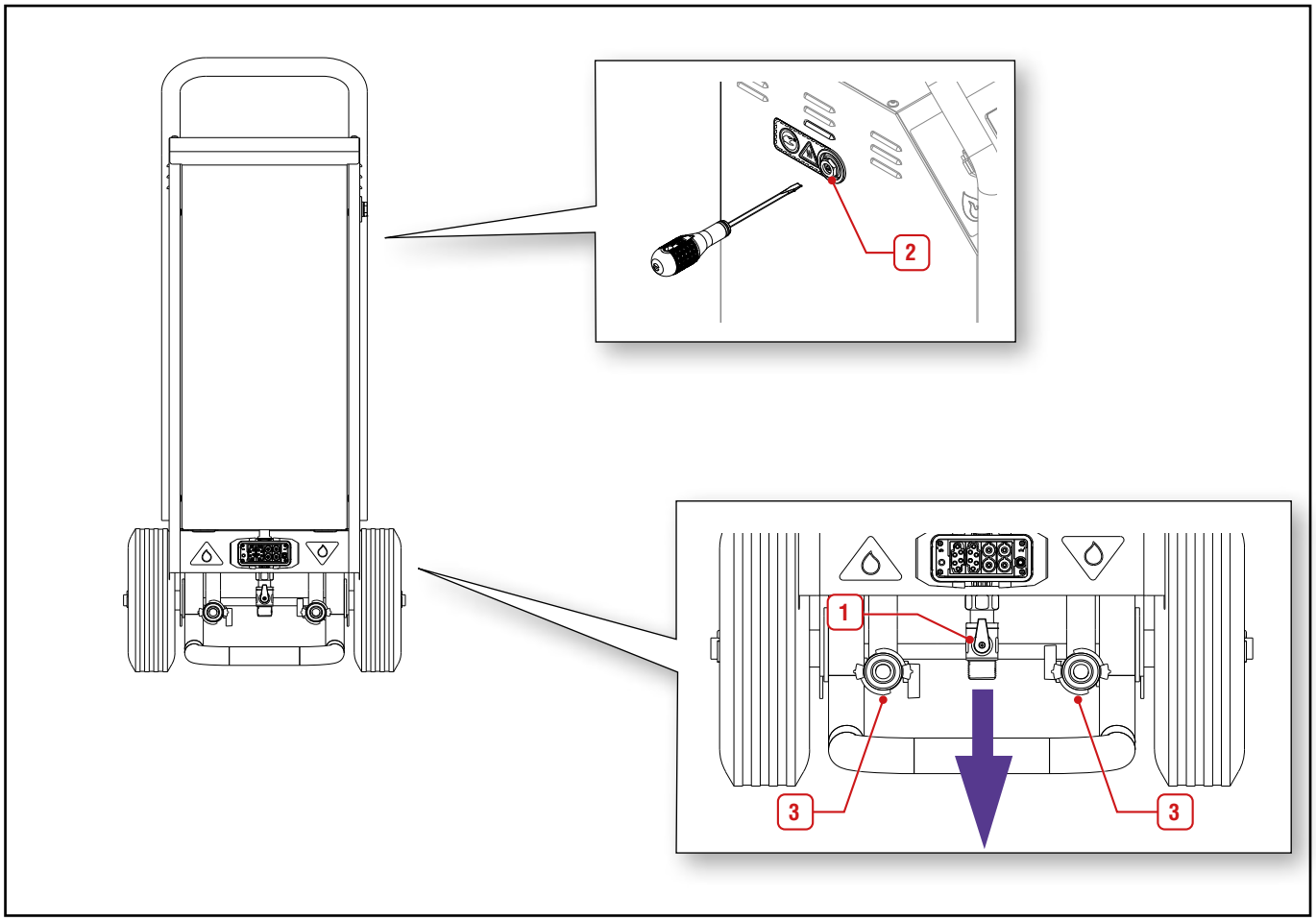
1. Connect a draining hose to the center connection (**1**) and place the other extremity of the hose to the sewer.

To empty the appliance only, but not the system, close the supply and return valves on the boiler before proceeding to the following step. Also isolate the system circuits.

2. Open the draining valve (**1**) and allow the water to flow out
3. Actuate the manual air vent (**2**).
4. Once the water stops flowing, close the boiler draining valve (**1**) and both stop valves (**3**).
5. Close the manual air vent (**2**).

Follow-on Task(s)

None



INSTRUCTIONS FOR THE APPLIANCE MAINTENANCE

Essential recommendations for the electrical safety

- Before opening for maintenance, turn off the boiler by placing the power switch to OFF (center position).
- Isolate the external power supply to the appliance (e.g. by disconnecting the power cable) before performing any operation, unless it is required to take measurements or perform system setup.

Essential recommendations for safety

- Water flowing out of the drain valve may be extremely hot and could cause severe scalding.
- Do not use solvents to clean any of the components. The components could be damaged, resulting in unreliable or unsafe operation.

Essential recommendations for the correct operation of the appliance

- It is recommended to have the boiler serviced at least once a year by a qualified professional. More frequent servicing may be required depending on boiler use. Please consult the maintenance table in this manual.
- The boiler maintenance will be carried out by a qualified professional, and the defective parts may only be replaced by genuine factory parts.
- Make sure to replace any gaskets or seals on the removed components before reinstalling them.
- To ensure maximum efficiency and reliability of the unit, it is recommended that the operator perform the periodic checks mentioned in the maintenance table of this manual.

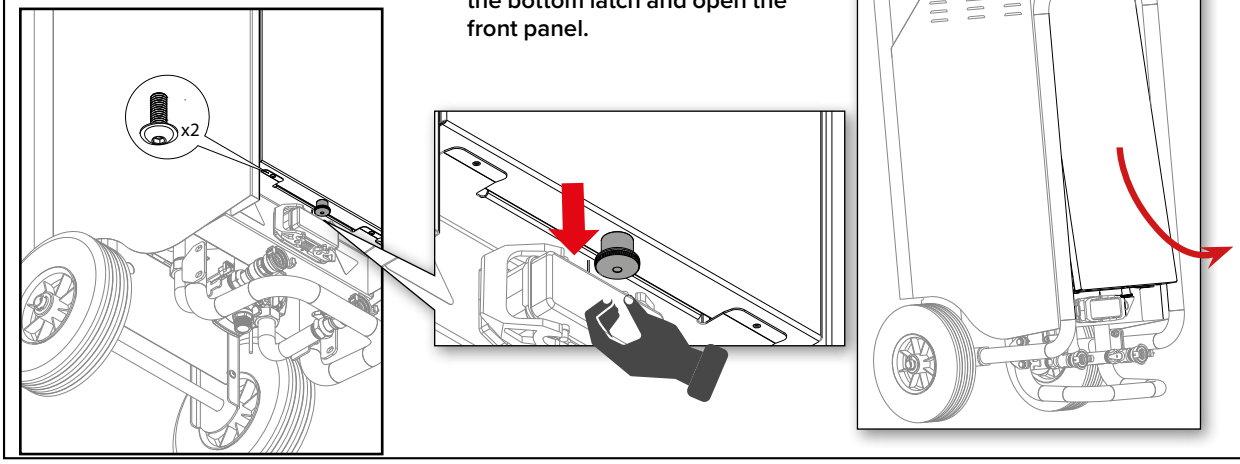
MAINTENANCE TASKS

Task	Freq.		
Make sure that the system water pressure is at least 100 KPa (1 bar) when cold. Top up the system if necessary, adding small quantities of water at a time.	Regularly, during operation	X	
Check that there is no water on the floor under the boiler.	Regularly, during operation	X	
Check that no error code is displayed on the control panel. Solve the problem using the Troubleshooting section of this manual or call your appliance supplier.	Regularly, during operation	X	X
Check the pressure and condition of the tires. Inflate the tires as required or repair/replace as required. Refer to *"Inflating the Tires" on page 21* and *"Replacing the Wheels" on page 37*	Regularly, during operation/Before & after storage	X	X
Check visually the appliance body: no evidence of corrosion, deposits of dirt or damages. Carry out all required cleaning tasks, repairs and replacements that might be required.	Regularly, during operation/Before & after storage	X	X
Check that all hydraulic connections are correctly fastened and tight. Tighten as required.	Regularly, during operation	X	
Actuate the pressure relief device regularly to remove lime deposits and check that it is not blocked	Regularly, during operation	X	
Check the general condition of the hoses/pipes. Repair/replace if damaged.	Regularly during operation/ Before & after storage	X	X
Check the general condition of the power cable. Repair or replace if damaged.	At On-site Installation and tear-down/Before & after storage	X	X
Check that all electrical connections are correctly fastened. Secure as required.	Regularly during operation /Before & after storage		X
Check the cleanliness of the boiler. Clean if dusty/dirty. Refer to *"Cleaning the Appliance" on page 37*	At tear-down/before & after storage	X	X
Check the condition of the heating elements, replace as required. Refer to *"Removing/Installing the Heating Elements" on page 36*	Every year/before storage		X
Check the condition of the internal electrical components. Replace as required.	Every year/before storage		X

REMOVING AND INSTALLING THE ACCESS PANELS

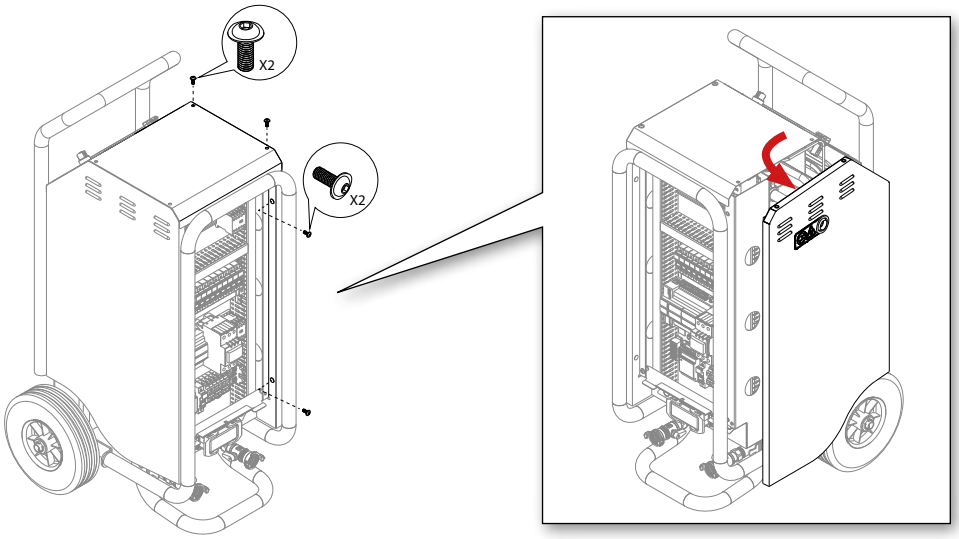
1 Front Panel

The power cable must be disconnected from the appliance to be able to actuate the bottom latch and open the front panel.

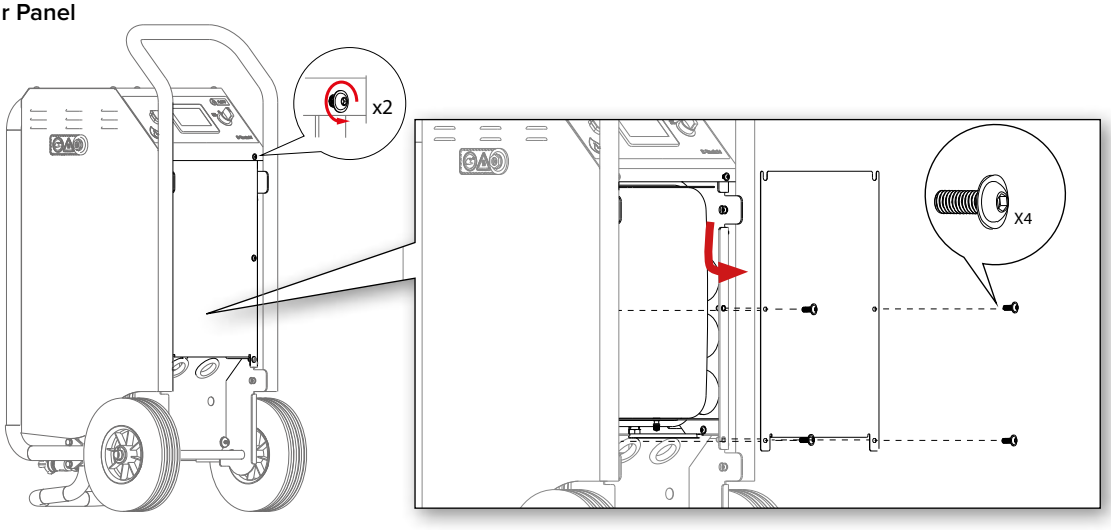


2 Right Side Panel

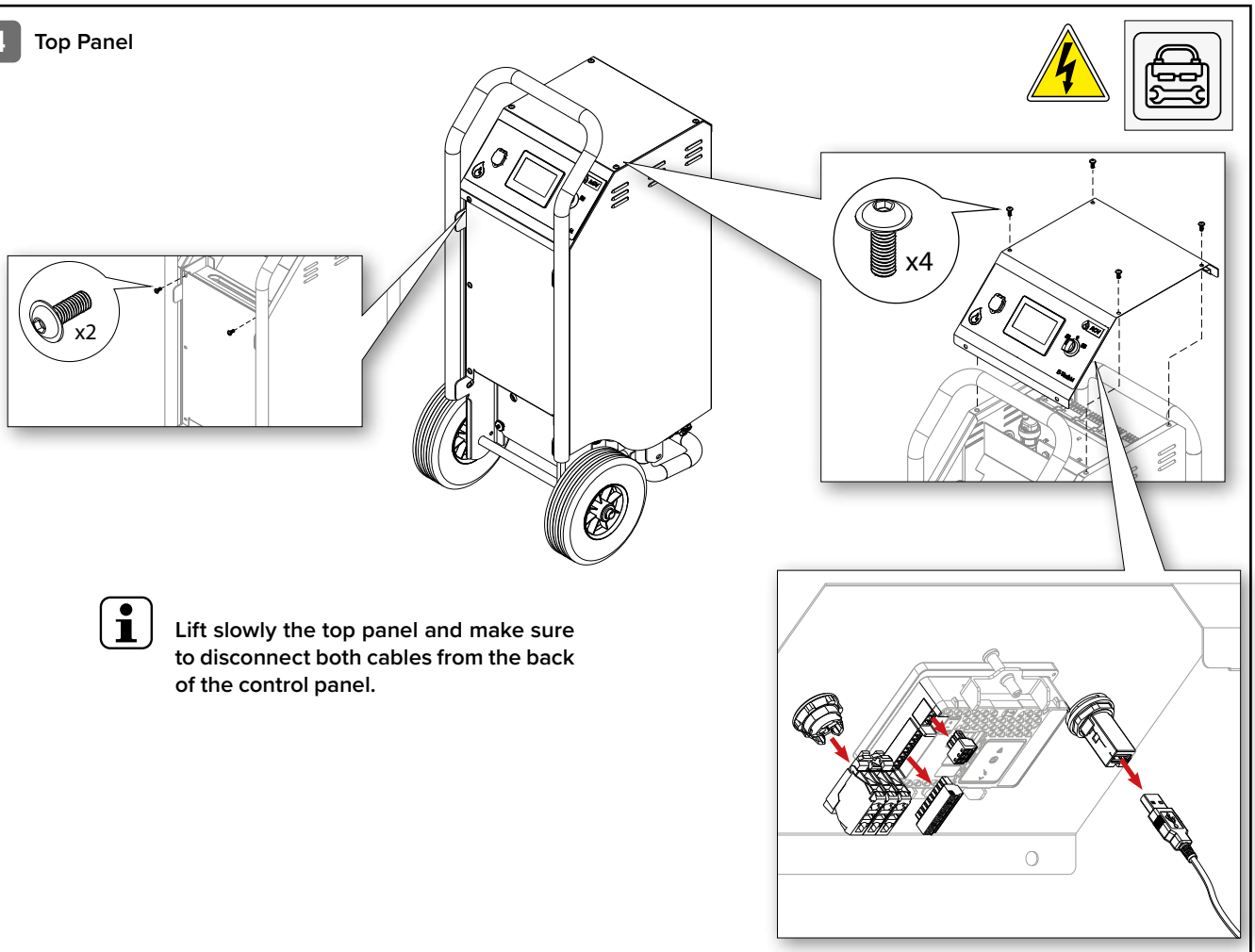
Right side panel is shown here as example. The removal process is the same for both sides. For installation of panels perform the process in reverse order.



3 Rear Panel

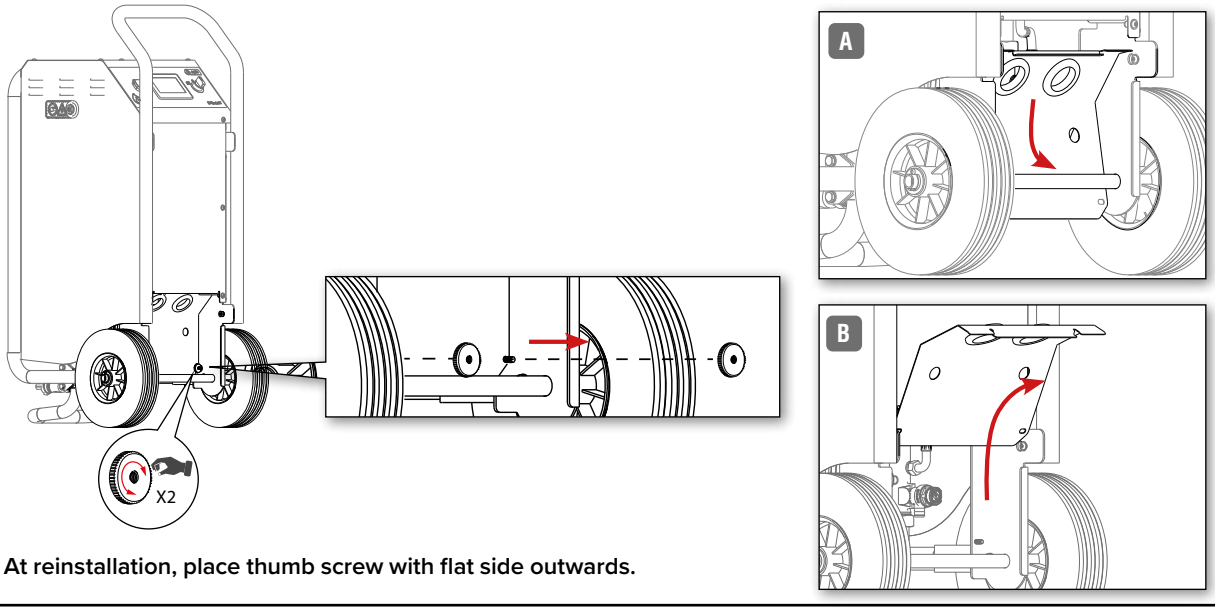


4 Top Panel



Lift slowly the top panel and make sure to disconnect both cables from the back of the control panel.

5 Protection cover



At reinstallation, place thumb screw with flat side outwards.

REMOVING/INSTALLING THE HEATING ELEMENTS

Set-up conditions

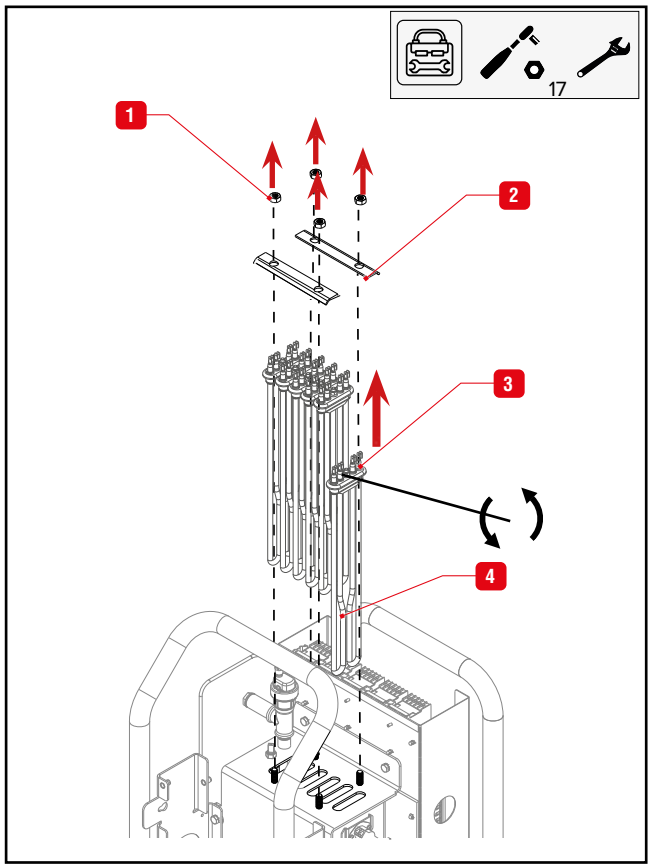
- Boiler shut down using the main switch
- Power cable removed
- Boiler cooled down (if it was in operation)
- Top panel removed (see *"Removing and Installing the access Panels" on page 34*).

Removal Procedure

1. Release four M10 nuts (**1**). Retain for reinstallation.
2. Remove two holders (**2**). Retain for reinstallation.
3. Release the center nut (**3**) of the heating element (**4**) to be removed.
4. Remove heating element (**4**). Discard according to local regulations.

Installation Procedure

1. Install the new heating element (**4**) in position. Do not tighten the center nut (**3**) at this stage.
2. Install two holders (**2**) and tighten with two retained nuts (**1**).
3. Tighten the center nut (**3**) of the heating element (**4**).



Follow-on Task(s)

1. Check that all nuts are tight.
2. Reinstall the top panel. See *"Removing and Installing the access Panels" on page 34*)..
3. Restart the boiler as required, refer to *"Starting Up the Appliance" on page 26*.

RESETTING THE HIGH TEMP LIMIT SWITCH

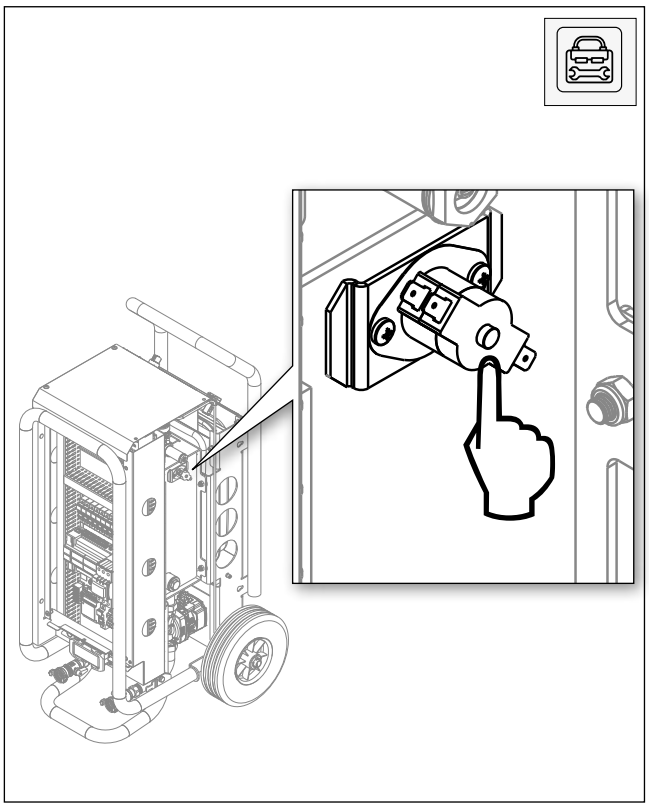
Set-up conditions

- Boiler shut down through the main power switch
- External power supply isolated (through the external electrical box)
- Boiler cooled down to < 60°C (or reset is not possible)

Procedure

1. Open the left access panel. Refer to *"Removing and Installing the access Panels" on page 34*.
2. Push on the safety thermostat button (**1**) to reset. A "click" sound should be heard.

In case no "click" sound is heard, the safety device is not the cause of the shut-off. Troubleshooting should be performed by a qualified service engineer.



3. Reinstall the left access panel, refer to *"Removing and Installing the access Panels" on page 34*..

Follow-on task(s)

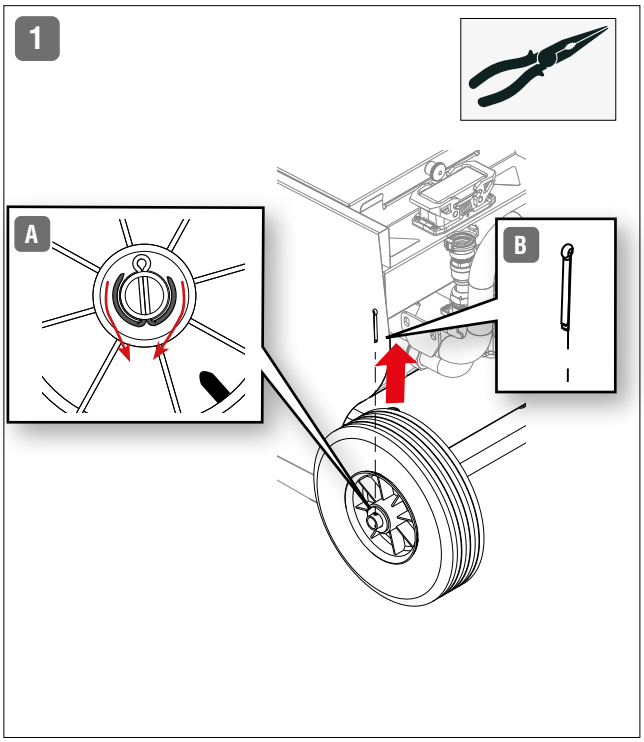
1. Connect the power cable to the mains and to the boiler.
2. Activate electrical power through the external electrical box, as required.
3. Turn the boiler on using the main power switch. Refer to *"Starting Up the Appliance" on page 26.*
4. Check that the boiler restarts correctly and that the error message has disappeared from the screen.

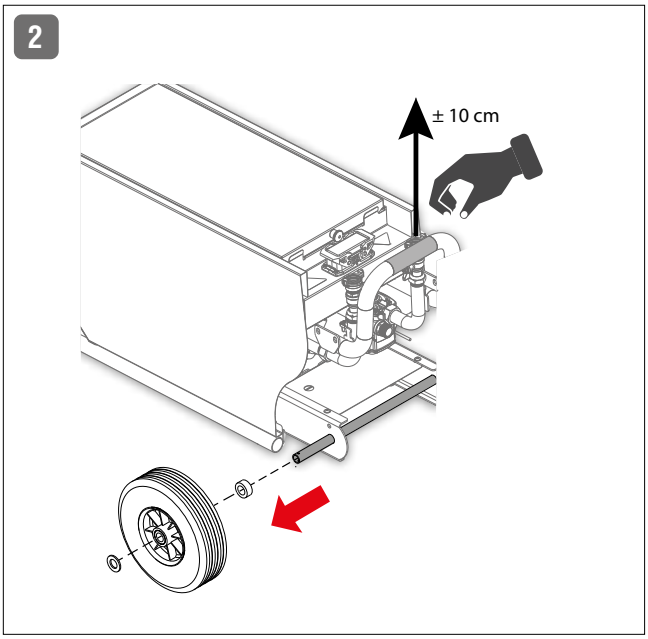
REPLACING THE WHEELS

Set-up conditions

- Boiler shut down using the main switch
- Power cable removed
- Boiler disconnected from water circuits

Procedure





Follow-on task(s)

- Install new wheel, refer to *"Installing the wheels" on page 22*.
- Check the pressure of the tires and inflate as required. Refer to *"Inflating the Tires" on page 21*

CLEANING THE APPLIANCE

Set-up conditions

- Boiler shut down through the main power switch
- Power supply cable disconnected from the mains and the boiler
- Boiler empty if the heat exchanger needs to be flushed.

Procedure

This should be performed when the appliance is used in a dusty/dirty environment, and before & after short/long term storage, as required.

1. Remove the required access panels, refer to *"Removing and Installing the access Panels" on page 34.*
2. Using compressed air, blow away the dirt from the body of the boiler.
3. To clean the inside of the heat exchanger:
   - Open the cleaning connection on the right side and insert water hose.
   - Open drain valve at the bottom of the boiler
   - Flush the inside of the heat exchanger with water to remove all deposits of sludge and scale.
   - Once the water draining out of the boiler is clear, close the water supply and remove hose.
   - Make sure that all the water flows out of the boiler.
   - Close the cleaning connection and the draining valve.
4. Reinstall the access panels, refer to *"Removing and Installing the access Panels" on page 34.*
5. Using a clean soft cloth and clear water, wipe the exterior of the boiler.

Follow-on task(s)

None

REPLACING THE EXPANSION VESSEL

Set-up conditions

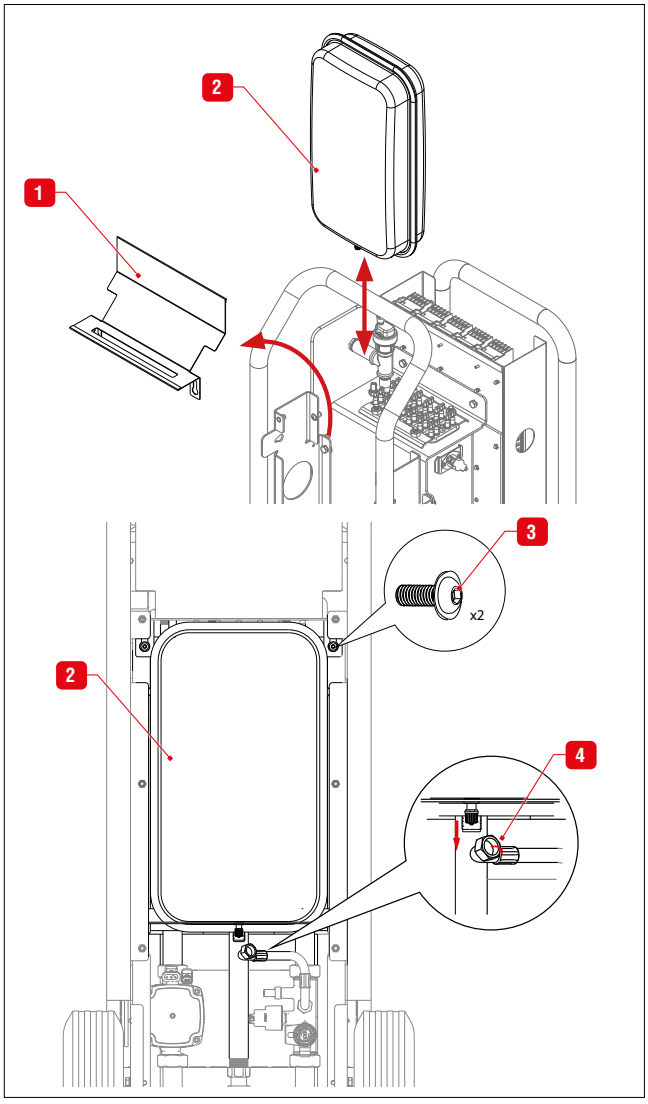
- Boiler shut down through the main power switch
- Power supply cable disconnected from the mains and the boiler
- Boiler empty and stop valves closed

Procedure

1. Remove the bottom protection cover and the top and rear panels, refer to *"Removing and Installing the access Panels" on page 29.*
2. Release two screws (**3**) and remove the protection cover (**1**) located above the expansion vessel (**2**).
3. Release the bottom connection (**4**) and uncouple from the expansion vessel connection.
4. Turn the pipe to the side and lift the expansion vessel (**2**) out of the frame.
5. Position the new expansion vessel and perform the previous steps in reverse order to reinstall it.

Follow-on task(s)

1. Fill the boiler, refer to *"Filling the System" on page 26.*
2. Check the absence of leaks.
3. Restart the boiler as required, refer to *"Starting Up the Appliance" on page 26.*



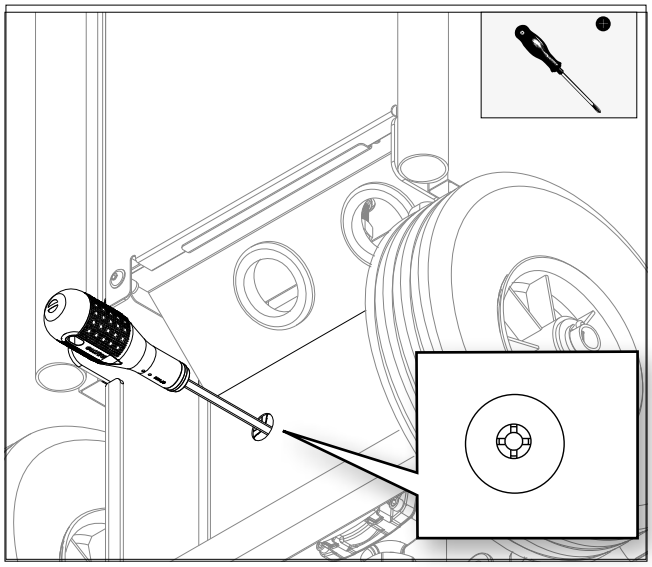
UNBLOCKING THE PUMP

Set-up conditions

- Boiler shut down using the main switch

Procedure

1. Insert a cross-head screwdriver through the left opening of the bottom protection panel (pump access opening) to access the pump screw.
2. Turn counterclockwise until the pump unblocks.



Follow-on task(s)

1. Restart the boiler as required. Refer to *"Starting Up the Appliance" on page 26*

REPLACING THE PUMP

Set-up conditions

- Boiler shut down through the main power switch
- Power supply cable disconnected from the mains and the boiler
- Boiler empty and stop valves open.

Procedure

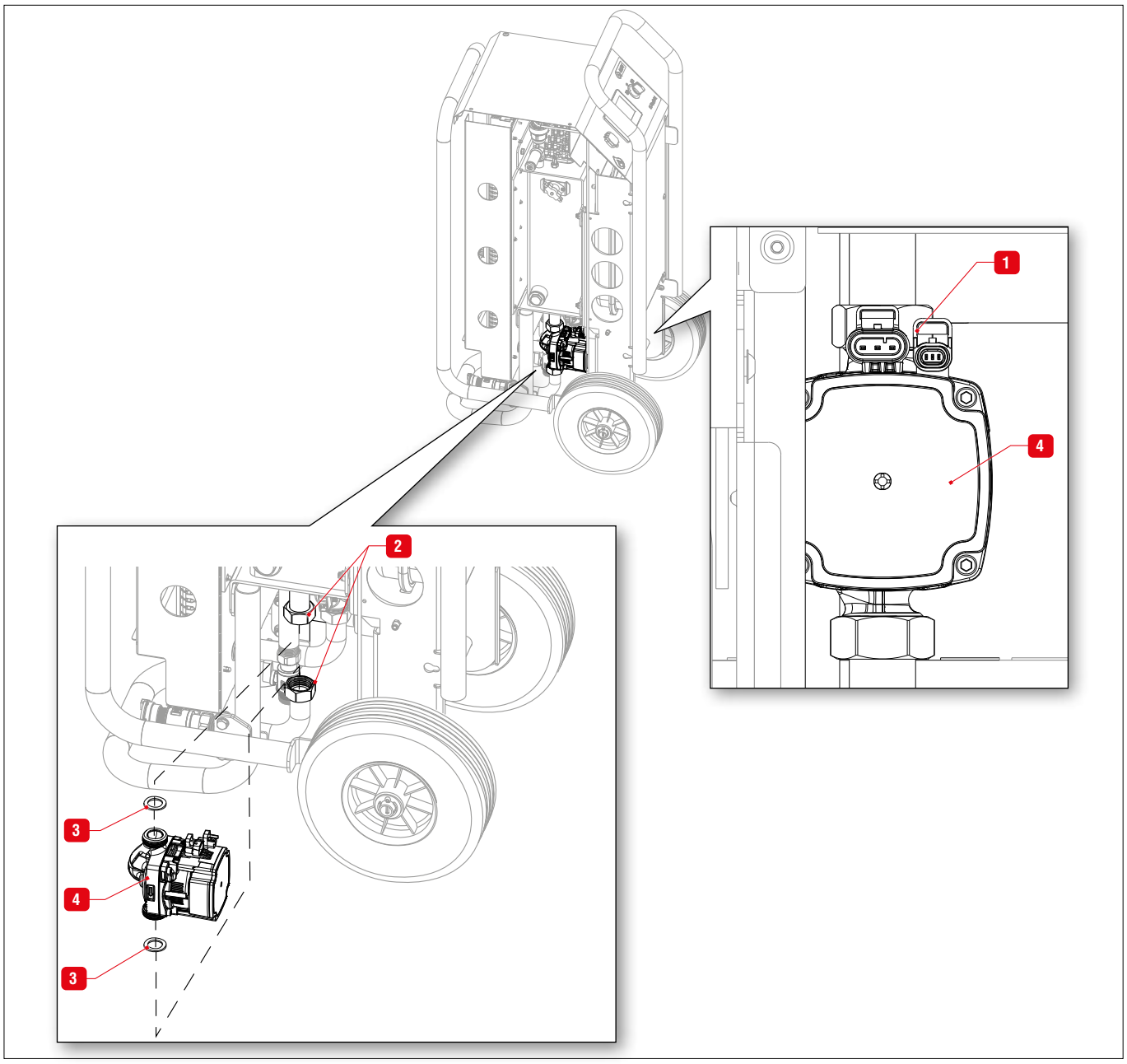
1. Remove the right side panel and the protection cover. See *"Removing and Installing the access Panels" on page 34*
2. Disconnect the power and control cables (**1**) from the pump (**4**).
3. Disconnect the upper and lower connections (**2**).
4. Remove the pump (**4**) and discard the seals (**3**).

Some water may still come out of the water circuit when removing the pump.

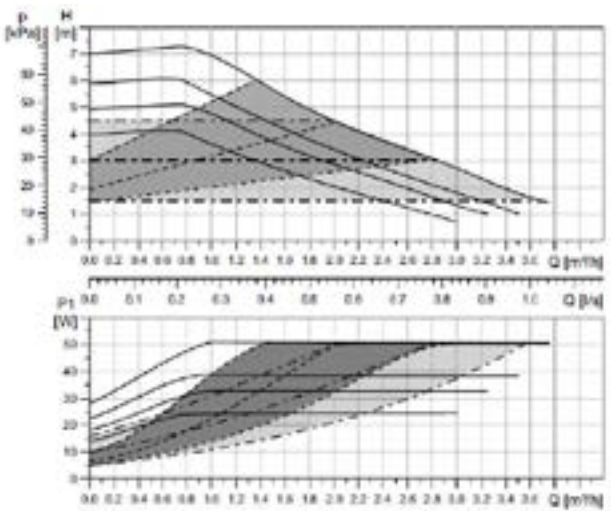
5. Install a new pump (**4**) and seals (**3**) on the boiler connections (**1**).
6. Reconnect all cables (**1**) to the pump (**4**).
7. Make sure that all connections are tight.

Follow-on task(s)

1. Fill the boiler, refer to *"Filling the System" on page 26.*
2. Check the absence of leaks.
3. Restart the boiler, refer to *"Starting Up the Appliance" on page 26.*



PUMP PERFORMANCE CURVES



Line type	Description
———	Constant Curve
----------	Proportional Pressure
– – – – –	Constant Pressure

Electrical data, 1 x 230 V, 50 Hz

Speed	P_1 [W]	$I_{1/1}$ [A]
Min.	5	0.07
Max.	52	0.52

Setting	Max. head $_{max}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7 m

Setting	Max. $P_{1\ max}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	52 W

Settings

PWM A	PWM C	PP	CP	CC
-	-	3/AA	3/AA	4

ERROR MESSAGES, PROBLEMS AND SOLUTIONS

Code	Popup Message	Reason
E01	EEPROM error, the boiler can't save the parameters Please restart the boiler	While writing in EEPROM (PLC memory), the PLC returns an error if the writing operation is defective.
E02	The connector is not recognized by the boiler Please connect the correct connector.	Checks if the code of the connected cable corresponds to one of the defined cables. Each cable has a defined maximum power level.
E03	The connected power connector allows more power than the boiler can supply Please, plug a correct cable	Checks if the power of the cable connected to the boiler is equal to or less than the maximum power of the boiler
E04	The system has counted too many errors Please restart the boiler	Acknowledging too many errors in a short period puts the boiler in error mode (10 errors in 15 minutes)
E05	Warning, watchdog activated, No more communication with the unit Please check the communication between the display and the control unit	The PLC and the DSP send information to each other. If one or the other detects a loss of information, then the watchDog intervenes and shuts down the boiler.
E06	The system detected an inversion of the temperature sensors Please check the condition of the pump	Checks the temperature difference between the inlet and the outlet (DELTA_T = T_OUT-T_IN) at the start of a mode (HT or DR). If the temperature (DELTA_T) is < 0, the error pops up.
E07	The internal temperature delta is too high Please check the condition of the pump	Checks the temperature difference between the inlet and the outlet (DELTA_T = OUT-IN) at the start of a mode (CH or DR). If the temperature (DELTA_T) is > DELTA_SETPOINT (40°C by default), the controller blocks the rise in temperature for 2 minutes. If the temperature (DELTA_T) has not decreased, the boiler stops heating and displays an error. The boiler will restart heating as soon as the temperature drops below DELTA_CONSIGNE-5°C.
E08	The system detected a loss of power The temperature does not reach the setpoint Please check the equipment	Each time the regulation is started, the boiler checks whether there is a rise of temperature. If after 5 minutes the temperature has not risen by one degree (1°c) then an error is displayed. If after 3 attempts the boiler does not rise to temperature, then the boiler is blocked.
E10	The system must restart before changing the operating mode Please restart the boiler correctly	Error hardware : Changing Mode while boilers ON. The boiler must switch OFF and restart to set Heating mode or Drying mode
E11	The supply temperature sensor returns an error Please check the sensor	If the temperature is outside the physical limits of -20°C and 150°C, the boiler switches off.
E12	The input temperature sensor returns an error Please check the sensor	If the temperature is outside the physical limits of -20°C and 150°C, the boiler switches off.
E13	Pressure sensor returns an error Please check the sensor	Check whether the values are within the operating range of the sensor
E14	Hydraulic system pressure is too high	Water pressure > 270 KPa (2.7 Bar)

Explanation
Warns of possible memory storage errors
Each connector has its own code, if the code is not recognized or if the code socket is defective, the boiler blocks all possible action
The plug is recognized but allows a higher power compared to what the boiler can provide.
Prevents multiple errors from happening too quickly. It forces the user to handle the boiler correctly
Allows error detection in the communication between the PLC and the display. Defective equipment or cable
There is a pump flow inversion or an inversion of the temperature sensors at the PLC level
This makes it possible to protect against big differences in temperature between the input output. It also makes it possible to detect an anomaly at the level of the pump
This helps prevent power supply problems, faulty/not present fuses.
If you switch quickly between CH and DR mode, the boiler (PLC + DSP) does not propelly switch off. Depending on the start-up, the boiler does not initialise in the same way. The boiler must return to an OFF state
Checks whether the NTCs are in the correct temperature range
Checks whether the NTCs are in the correct temperature range
Allows to limit the use of the pressure switch set at 300 KPa (3 bar)

Code	Popup Message	Reason
E15	Hydraulic system pressure is too low The pump is stopped until the problem is fixed	Water pressure < 30 KPa (0.3 Bar)
E16	The temperature measured by the output sensor is too high The boiler is in safety mode	Protection boiler: NTC SUPPLY> MaxT° security (default : 88°C)
E17	The temperature measured by the output sensor is too low Boiler is in anti-frost mode	Protection boiler : NTC SUPPLY< MinT° security (default : 5°C)
E18	The temperature measured by the input sensor is too high The boiler is in safety mode	Protection boiler: NTC return> MaxT° security (default : 88°C)
E19	The temperature measured by the input sensor is too low Boiler is in anti-frost mode	Protection boiler : NTC return< MinT° security (default : 5°C)
E20	The high limit thermostat of the appliance has triggered (>90°) Switch off the boiler Troubleshoot the error Then reset the thermostat manually	Hardware Protection : Error TOD 96°C
E21	The high limit thermostat of the appliance has triggered (>60°) Switch off the boiler Troubleshoot the error	Hardware Protection : Error TOD 60°C
E22	The number of files on the internal memory has exceeded the limit. Please free up memory	Too many files in the internal memory, please free up some space
E23	The supply sensor is defective Please replace it	Supply sensor is cracked, check if the sensors have a high temperature variation. (30°C in 0.5 seconds)
E24	The return sensor is defective Please replace the sensor	Return sensor is cracked, check if the sensors have a high temperature variation. (30°C in 0.5 seconds)
E25	The sensors is defective Please replace the sensor	In the case of a deviation, the delta temperature (deltaT) between the input and output sensor is checked over a period of 5 minutes in stand-by mode during a complete period of one hour. If during this hour the deltaT values exceed 5°C AND if the difference between the deltaT value at the beginning and the end of the 5 minute period is > than 3°C Then we have a deviation.

Explanation
Allows the pump to be protected
Prevents hardware activation (TOD) of the system and protects equipment
Prevents the system from freezing and protects the equipment
Prevents hardware activation (TOD) of the system and protects equipment
Prevents the system from freezing and protects the equipment
Hardware safety device to prevent the boiler from going above 96°C, and to prevent the water from boiling. This protects the system.
Hardware safety to prevent the boiler from going above 60°C, this protects the system and the concrete floor.
Check whether the NTCs are in the correct temperature range, to protect the equipment
Check whether the NTCs are in the correct temperature range, to protect the equipment
Check whether the NTCs are in the correct temperature range, to protect the equipment

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