

esybox pop

Translation of the original Italian instructions

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Note: All images within this document are for illustrative purposes only and may not fully reflect the characteristics of the product.

This document is supplemented and completed by the following attached documents, which must be referred to for specific details:

- quick guide
- safety booklet
- spare parts booklet
- disposal sheet (WEEE)
- declaration of conformity

1 SYMBOLS KEY

1.1 Safety signs

The use and maintenance manual includes the signs illustrated below (where relevant). These signs have been included to draw users' attention to possible sources of danger.

Failure to pay attention to the signs could result in personal injury, death and/or damage to the machine or equipment.

As a general rule, there are three types of symbols (Table 1).

Symbol	Shape	Type	Description
	Outlined triangle	Danger	Indicates present or potential dangers
	Circular outline	Prohibition	Indicates actions that are to be avoided
	Solid circle	Obligation	Indicates information to be read and complied with
	Circular outline	Information	Indicates useful information other than danger / prohibition / obligation

Table 1 Safety sign types

Depending on the information to be conveyed, the signs may contain symbols denoting the type of danger, prohibition or obligation.

The following symbols have been used in the discussion:



ATTENTION!
DANGER TO THE HEALTH AND SAFETY OF WORKERS.
Pay close attention to the instruction accompanied by this symbol.



ATTENTION!
DANGER OF ELECTROCUTION - DANGEROUS VOLTAGE.
The machine/equipment guards and protections marked with this symbol may only be opened by qualified personnel after disconnecting the machine/equipment's power supply.



ATTENTION!
DAMAGE TO THE MACHINE/EQUIPMENT
Indicates useful information other than danger, prohibition and obligation. Can be found in any chapter of the manual



OBLIGATION TO COMPLY WITH A SAFETY REQUIREMENT.



PROHIBITION OF DANGEROUS ACTIVITY.



INSTRUCTIONS MARKED WITH THIS SYMBOL INDICATE THE NEED TO:
Open the disconnect switch on the electrical control panel ("0/Off" position);
Lock it in open position with the appropriate system (e.g. padlock);
Follow the company's Lockout-Tagout procedures.



Indicates maintenance operations that can be carried out by the machine/equipment user.



Indicates operations and maintenance work that can be carried out by qualified technicians.



Notes and general information.
Please read the following instructions carefully before operating and installing the machine.

1.2 Danger



Generic hazard

This sign indicates dangerous situations that may harm people, animals or property. Failure to comply with the instructions associated with this sign may lead to danger.



Risk of electrocution

This sign indicates the risk of direct or indirect contact and electrocution arising from the presence of live machine/equipment parts. Failure to comply with the instructions associated with this sign may result in serious injury or death.



Risk of automatic start-up

This sign indicates the risk of the machine/equipment performing operations in automatic mode. Failure to comply with the instructions associated with this sign may result in serious injury or death.



Risk of crushing

This sign indicates the risk of crushing the hands or upper limbs by moving machine/equipment parts. Failure to comply with the instructions associated with this sign may result in the risk of crushing the hands or upper limbs.



Risk of cutting/severing

This sign indicates the risk of cutting/severing the hands by moving machine/equipment parts. Failure to comply with the instructions associated with this sign may result in the risk of cutting-severing the hands.



Risk of entanglement and crushing

This sign indicates the risk of entangling or crushing the hands or upper limbs in counter-rotating rollers. Failure to comply with the instructions associated with this sign may result in the risk of crushing the hands or upper limbs.



Danger explosive atmosphere

This sign indicates the danger of potentially explosive atmosphere. Failure to comply with the instructions associated with this sign may lead to explosions.



Danger magnetic field

This sign indicates the presence of strong magnetic fields and requires care to avoid exposure. Failure to comply with the instructions associated with this sign may interfere with pacemakers and cause injury to tissues and internal organs in the case of prolonged exposure.



Danger laser radiation

This sign indicates the risk arising from the presence of sources emitting artificial optical radiation. Failure to comply with the instructions associated with the sign may cause harm to the vision.



Danger, biohazard

Take care to avoid exposure to a biohazard.



Danger, hot surface

This sign indicates the risk of burning as a result of contact with hot surfaces (> 60 °C). Failure to comply with the instructions associated with this sign may lead to the risk of burns to the hand or upper limbs.



Danger, low temperature or frost

Take care to avoid exposure to low temperatures or freezing conditions.



Danger of ignition.

Take care not to cause a fire by igniting flammable and/or combustible material.



Slip hazard

This sign indicates the risk of slipping and falling as a result of damp and/or wet surfaces. Failure to comply with the instructions associated with the sign may result in the risk of serious injury or death caused by slipping and/or falling.

1.3 Prohibition



Generic prohibition

This sign indicates a manoeuvre, operation or behaviour that is prohibited. Failure to comply with the prohibitions associated with this sign may cause harm to persons, animals and property.



Do not touch

This sign indicates that the operator must not touch a certain part of the machine/equipment. Failure to comply with the prohibitions associated with this sign may cause harm to the hands.



Do not insert hands

This sign indicates that the operator must not insert the hands into a certain area. Failure to comply with the prohibitions associated with this sign may cause harm to the hands and/or upper limbs.



Do not alter the state of the switch

This sign indicates that altering the state of the switch and/or control device is prohibited. Failure to comply with the prohibitions associated with this sign may cause harm to persons, animals and property.



No smoking or open flames

This sign indicates that smoking and/or open flames are prohibited. Failure to comply with the prohibitions associated with this sign may cause explosions and/or fires.



Do not extinguish with water

This sign indicates that extinguishing flames and/or the incipient stage of a fire with water is prohibited. Failure to comply with the prohibitions associated with this sign may cause harm to persons, animals and property.

1.4 Obligation



Generic obligation

This sign indicates the operator's obligation to comply. Failure to comply with the instructions associated with this sign may cause harm to persons, animals and property.



Wear ear protectors

This sign indicates the obligation to use ear muffs or ear protectors during operations. Failure to comply with the instructions associated with this sign may lead to even permanent hearing loss.



Wear protective clothing

This sign indicates the obligation to wear appropriate clothing during operations. Failure to comply with the instructions associated with this sign may result in serious injury or death.



Use appropriate PPE

These signs indicate the obligation to use appropriate personal protective equipment during operations. Failure to comply with the instructions associated with these signs may result in serious injury or death.



Connect an earth terminal to the ground

This sign indicates the obligation to connect the machine/equipment to an efficient earthing system. Failure to comply with the instructions associated with this sign may cause harm to persons, animals and property.



Unplug from the socket

This signal indicates the obligation to unplug the power supply before carrying out any other operation. Failure to comply with the instructions associated with this sign may cause harm to persons, animals and property.



Disconnect the power supply before maintenance

This sign indicates the obligation to disconnect the equipment before carrying out any maintenance work. Failure to comply with the instructions associated with this sign may cause harm to persons, animals and property.



Check guards

This sign indicates the obligation to check the efficiency of the guards (removed during maintenance, repairs, cleaning, lubrication). Failure to comply with the instructions associated with this sign may cause harm to persons, animals and property.



Refer to instruction manual/booklet

This sign indicates the obligation to read the instructions (use and maintenance manual, data sheets, etc.) prior to installation, use or any other operation to be carried out on the machine/equipment! Failure to comply with the instructions associated with this sign may cause harm to persons, animals and property.

DAB Pumps makes every reasonable effort to ensure that the contents of this manual (e.g. illustrations, texts and data) are accurate, correct and up-to-date. Nevertheless, they may not be free of errors and may not be complete or up-to-date at any time. The company therefore reserves the right to make technical changes and improvements over time, even without prior notice.

DAB Pumps accepts no liability for the contents of this manual unless subsequently confirmed in writing by the company.

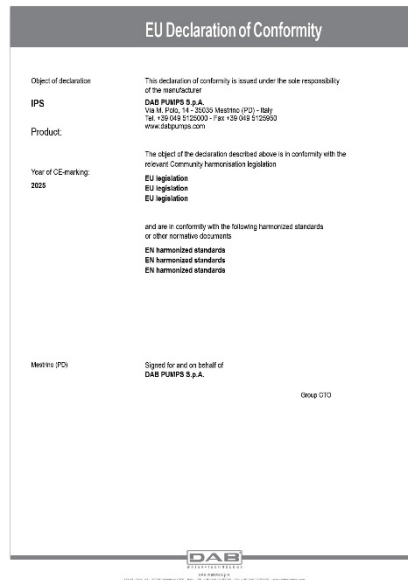
2 GENERAL

2.1 Declaration of conformity

For the product indicated in chapter 2.1, we declare that the device described in this instruction manual and marketed by us complies with the relevant European Union (EU) health and safety regulations.

A detailed and updated declaration of conformity is available with the product which can be viewed in the product configurator (DNA) on the Dab Pumps website, see par. 2.5.2 CE marking and minimum instructions for DNA.

If the product is modified in any way without our consent, this statement will become invalid.



Facsimile of EU Declaration of Conformity

2.2 Guarantee



DO NOT ALTER THE PERFORMANCE, CHARACTERISTICS, FUNCTIONALITY AND USE INTENDED BY THE MANUFACTURER

Any modification made without prior authorisation relieves the manufacturer of all responsibility.



The manufacturer is not liable for the proper functioning of pumps or any damage caused by them if they are tampered with, modified and/or operated outside the recommended working range or contrary to other provisions in this manual.

DAB undertakes to ensure that its Products comply with what has been agreed and are free from original defects and faults connected with their design and/or manufacture that make them unsuitable for the use for which they are normally intended.

For more details on the Legal Guarantee, please read the DAB Guarantee Conditions published on the website <https://www.dabpumps.com/en> or request a printed copy by writing to the addresses published in the “contact” section.

2.3 Product range

2.3.1 Product name

ESYBOX POP

2.3.2 Classification according to European Regulation

Booster

2.4 Field of application of pumpable liquids

The device is a built-in appliance for niches, undersinks and similar installations. It is designed and built to pump only water, free of explosive substances and solid particles or fibers, with a density of 1000 Kg/m³, kinematic viscosity equal to 1 mm²/s and non-chemically aggressive liquids. The use of other fluids is subject to the manufacturer's authorisation.

The water temperature must not exceed that stated in chapter A1 TECHNICAL DATA

DO NOT USE THE PUMP WITH OTHER TYPES OF LIQUIDS!

The pump is suitable for both indoor environments (e.g. under the sink, technical room, etc.) and outdoor with adequate protection from the weather (e.g. terrace, niche, etc.). The installation site must not be subject to flooding.

2.5 Description and intended use

The product is an integrated system consisting of a multistage centrifugal pump and an electronic circuit that controls it. The water-cooled rather than air-cooled motor means the pump is quieter and can thus be installed in non-ventilated recesses.

The pump can be fully configured using the H2D app available from stores.

See paragraph A4 APP, CLOUD AND SOFTWARE UPDATES

The pump integrates a variable frequency drive (VFD) that allows:

- energy and cost savings;
- simplified installation and lower system costs;
- less stress on the system and a longer lifespan;
- lower noise level;
- greater reliability

This appliance is also designed for use in commercial installations.



This appliance must not be used by children.

2.5.1 Identification

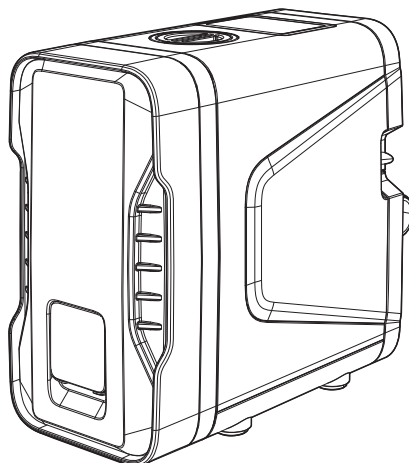


Fig. 1

2.5.2 CE marking and minimum instructions for DNA

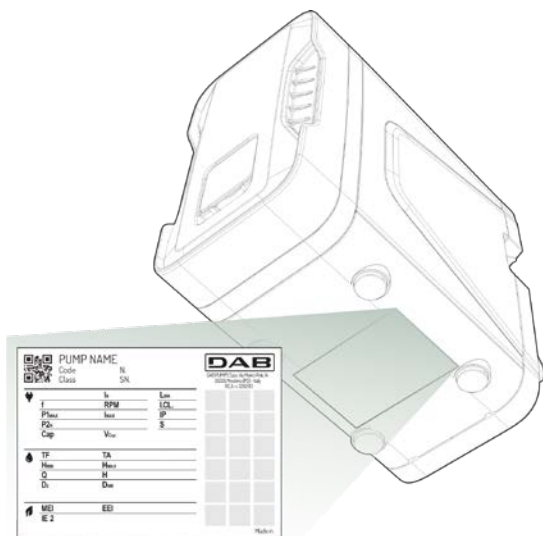


Fig. 2 Position of the CE Marking

PUMP NAME		DAB																															
Code	N.	DAB PUMPS S.p.A. Via Marco Polo, 14 36035 Meda (VI) - Italy REA n. 328200																															
Class	SN.																																
	In	LWA	<table border="1"> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </table>																														
f	RPM	I.C.L.																															
P1MAX	IMAX	IP																															
P2N		S																															
Cap	V _{cap}																																
	TF	TA																															
	H _{MIN}	H _{MAX}																															
Q	H																																
D ₂	D _{NM}																																
	MEI	EEI																															
IE 2																																	

Fig. 3 Facsimile of Esybox Pop CE Marking

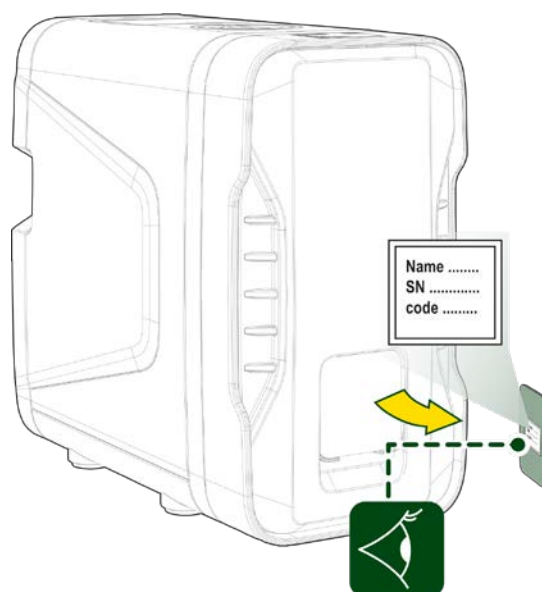


Fig. 4 Metal plate - Location of product information label

Consult the Product configurator (DNA) available on the DAB PUMPS website.

The platform allows you to search for pumps by hydraulic performance, model or article number. Technical data sheets, spare parts, user manuals and other technical documentation can be obtained.



<https://dna.dabpumps.com/>



2.6 Specific product references

For technical data, refer to the CE marking (data plate) and/or the dedicated chapter A1 TECHNICAL DATA.

2.7 Improper use

The equipment is designed to be used solely for the purposes described in the dedicated section of the manual (paragraph 2.4 Field of application of pumpable liquids). Uses other than those described in this manual are improper and do not therefore comply with safety regulations.



ATTENTION!

Improper use may result in personal injury, death and/or damage to the equipment or installations.

Below is a list of improper uses that could cause personal injury or damage to the machine or equipment for which DAB Pumps. S.p.A. shall not be held liable:

- Unauthorised changes to or replacement of equipment parts;
- Failure to follow safety instructions;
- Failure to follow instructions on installation, use, operation, maintenance, repairs or having such operations carried out by unqualified personnel;
- Use of improper and incompatible materials or auxiliary equipment;
- Failure to comply with workplace safety rules or relevant legal regulations.

Also refer to the Safety Booklet enclosed with the product.

2.8 Control panel

The user interface is made up of a keypad containing signalling LEDs (Status Led, IoT LED, Level Bar) and three buttons (IoT Button, increase and decrease).

The function of the LEDs and buttons is summarised below:

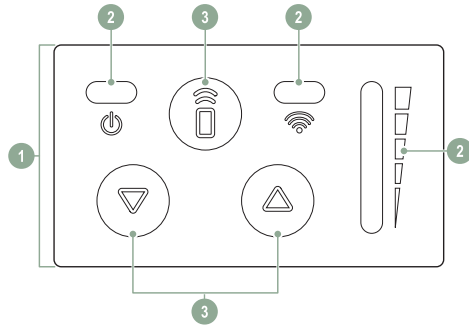


Fig. 5

1 – Graphical interface

2 – LED

Provides information on pump status.

On steady white: pump powered.

On steady red: pump powered but in error, preventing normal pump operation.

On steady green: pump enabled and running, an error may have occurred that does not prevent it from running normally.

On steady yellow: pump enabled, there is an abnormal situation (warning) that does not affect the operation of the pump. Engine off. This status will be masked by any system in fault, disabled or with active comfort function.

On steady blue: pump enabled, with at least one Comfort Function active.

Flashing white: pump disabled

Flashing green/yellow: pump enabled, there is an abnormal situation (warning) that does not affect the operation of the pump. Engine running. This status will be masked by any system that is faulty or disabled.

The pump has no blocking errors and is waiting for a manual start command.

Flashing green/blue: pump enabled, motor running, with at least one Comfort Function currently active.

Flashing orange: pump in update mode.

The pump has been forced into update mode and is waiting for a command.

Flashing white/red: low suction pressure alarm. Present only in models with low suction pressure detection functionality with dedicated accessory. This state begins as soon as the problem is detected and ends automatically when the correct conditions are restored.

Flashing red: retentive alarm, see 7.3.8 Retentive faults (faults automatically resettable after a certain time)

On steady green: local connection established - pump connected to the App. pump connected to the App.

On steady blue: remote connection established - Cloud-connected pump

Flashing green: local connection in progress - pump in connection to the App.

Flashing blue: remote connection in progress - pump in connection to the cloud.

Off: no remote connection active

White: indicates the set-point values from 1 to 3 bar

Purple: indicates the set-point values from 3.5 to 4.5 bar

Yellow: indicates the presence of active alarms

Red: indicates the presence of active blocks

Orange: indicates firmware update in progress. The lighting of the LEDs on the bar indicate its progress.

Flashing white: indicates the factory setting of parameters



If unused for 5 consecutive minutes, the LED bar switches off unless an error code with pump blocked is displayed. Pressing any button switches it back on in the correct status in accordance with the system.



If the system is in warning or fault status, the set-point can be displayed for up to 20 seconds by pressing

or  and adjusted if required by pressing the same buttons. The current fault is displayed again once this time has elapsed.

3 – Buttons

Short press of the button (1s) allows connection with smartphone and special App.



A long press of the (+1s) button allows you to start the **"manual recovery mode"** which allows you to update or reset the pump via the app, if a previous update attempt has failed. This operation is allowed only to Specialized Personnel.



Press to increase the set-point value.



Press to decrease the set-point value.



Press and hold the buttons (+1s) to enable or disable the pump.

3 MANAGEMENT

3.1 Storage

All pumps must be stored in a dry covered place with constant air humidity where possible, free from vibrations and dust. They are supplied in their original packaging where they must remain until installation. If this is not the case, carefully close the suction and delivery port.

3.2 Transport

Avoid subjecting the product to needless impacts and collisions.

Avoid placing material that could damage the pump on top of the packaging.

3.3 Handling

Handling must be carried out in accordance with company regulations.

For mechanical handling, check the weight stated on the label.

For manual handling of loads, check the presence of any dedicated markings on the packaging. Check the weight stated in the technical data before handling. See par. A1 TECHNICAL DATA



Use appropriate PPE when handling loads

4 WARNINGS AND RESIDUAL RISKS



This appliance must not be used by children.

Cleaning, checks and inspections to be carried out by the user must not be carried out in the presence of unsupervised children.



Before installation, check that all the internal parts of the panel (components, leads, etc.) are completely free from traces of humidity, oxide or dirt: if necessary, clean accurately and check the efficiency of all the components in the panel. If necessary, replace any parts that are not perfectly efficient.



The capacitor of the direct current intermediate circuit remains charged with dangerously high voltage even after the mains power has been turned off. Only firmly wired mains connections are admissible. The appliance must be earthed (IEC 536 class 1, NEC and other applicable standards).



Before working on the equipment, disconnect the power and make sure there are no fluid and/or gas leaks in the surrounding environment. Do not open and do not operate if powered.



NEVER OPERATE THE PUMP WITHOUT WATER AND WITH THE CAP NOT FULLY TIGHTENED.

Water also acts as a lubricant, coolant and seal protector: running dry can cause permanent damage to the pump and void the warranty.



- Protect the pump from weather.
- For long periods of inactivity or freezing, remove all caps and empty the pump body completely. Keep the caps!
- If leak testing the pipes at a pressure of more than 6 bar (0.6 MPa), exclude the pump (close the gate valves before and after the pump).



Some functions might not be available, depending on the software version.



Regular maintenance of the water system is recommended.



The maximum inlet fluid temperature is 50°C. In certain cases (e.g., leakage and/or faucet seepage), the device may increase the inlet fluid temperature by up to 10°C. The overheated liquid is discharged within a few seconds and does not pose a risk of burns.



In case of connection to hot water supply networks, the internal temperature of the device may reach up to 60 °C. Caution is advised during maintenance operations. Always allow the system to cool down before performing any service or maintenance activities.



Li

This product contains a button or coin battery. Ingesting or inserting a battery into any part of the body can cause serious harm or death in as little as two hours, as a result of chemical burns or a potentially perforated oesophagus.

Also refer to the Safety Booklet enclosed with the product.

4.1 Anti-impurities filter

If there is any doubt about the absence of foreign bodies in the water to be pumped, consider the installation of an inlet filter that is suitable for stopping impurities.



Installing an inlet filter reduces the hydraulic performance of the pump proportional to the pressure drop induced by the filter itself (generally, the greater the filtering capacity, the greater the drop in performance).

4.2 Powered parts

Refer to the Safety Booklet enclosed with the product.

4.3 Product disposal

This product or its parts must be disposed of according to the instructions in the WEEE disposal sheet included in the packaging.

5 INSTALLATION

Example of installation: single apartment for pressure boosting, e.g. in case of available pressure less than or equal to 0.5 bar (0.05 Mpa).



ATTENTION!

Overhead installation is not recommended.

Optionally, it is advisable to consider the installation of an expansion tank in the delivery circuit, to limit pump starts when drawing small amounts and/or to avoid leaks and to mitigate water hammer. The expansion tank, to be assessed in relation to the type of installation, must be appropriately sized according to the characteristics of the system.

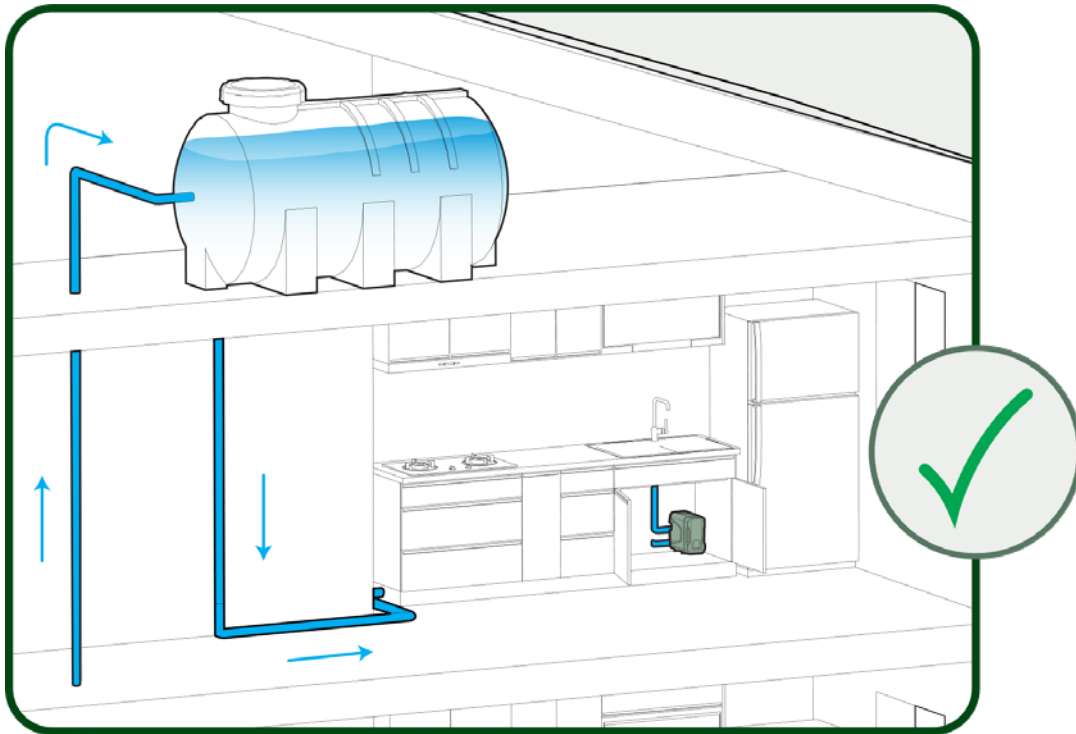


Fig. 6 Example of under-sink installation

The product must only be installed in technical locations and/or premises, accessible only to qualified, trained and experienced personnel.



Installation, electrical and hydraulic connections, testing and commissioning must only be carried out by qualified, trained and experienced personnel.



Installation, maintenance, repairs or transport must only be carried out by Specialised Personnel who must only follow operations and manoeuvres within their competence and of which they are fully aware



Wear protective clothing



Wear goggles and gloves



Installation is prohibited in areas that may be subject to flooding.



- We recommend flushing the pump briefly with clean water before final installation.
- The pump must never be operated when exposed to the weather without protection.
- If the environment presents a potential risk of flooding, provide suitable devices or equipment such as drainage pumps.
- Prevent pipes from transmitting excessive stresses to the pump ports, so as not to create deformation or breakages.
- It is good practice to position the pump as close as possible to the liquid to be pumped.
- The pump must be installed under conditions appropriate to the specificities of the product.
- The pump must be installed as described in the manual, in compliance with the laws, directives and standards in force at the use site and in accordance with the application.

This pump contains a variable frequency drive within which there are DC voltages and currents with high-frequency components. The differential switch protecting the system must be correctly selected and sized as stated in Table 2 and the attached Safety Booklet.

Carefully follow the advice in this chapter to carry out correct electrical, hydraulic and mechanical installation. Before attempting any installation work, make sure that the power supply is switched off. Strictly respect the electric supply values indicated on the CE marking (data plate).



The pump must be connected to an efficient earthing system. Failure to comply with the instructions associated with this sign may cause harm to persons, animals and property.

5.1 Minimum clearances from fixed installations

Permitted positions

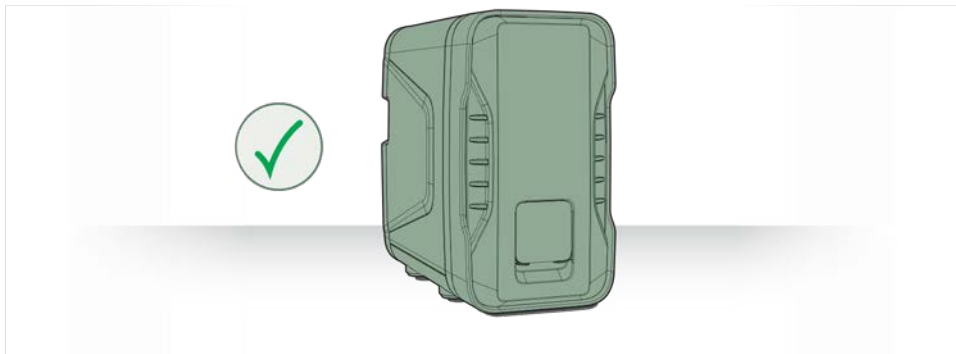


Fig. 7 permitted position

Prohibited positions

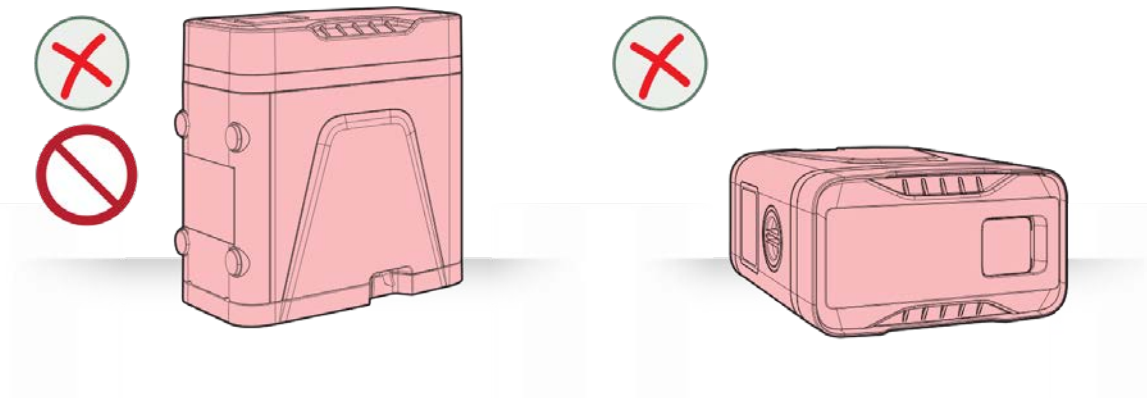


Fig. 8 prohibited positions

To ensure maintenance can be carried out correctly, the minimum clearances at the top and front must be left, as shown below.

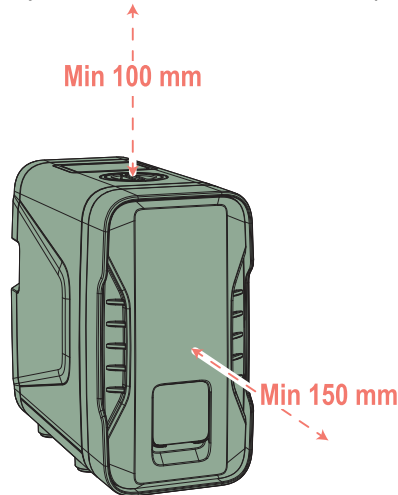


Fig. 9 Minimum clearances to be ensured



Where the installation is subject to direct solar radiation, opaque (non-transparent) UV protection is required

5.2 Setup

We recommend fitting gate valves upstream and downstream of the pump so that maintenance can be carried out without draining the system.

Proceed as follows to mount on a wall:

- This product may be wall-mounted using the DAB kit purchased separately, see A3.1 **Quick Connection Installation**.



If the pump is to be replaced, a bypass should be used to enable continuity of service.

5.3 Priming

Under Head Installation

Does not require any priming.

Over Head Installation

For the initial over head installation, fill with liquid using the access hole to the non-return valve.



ATTENTION!

Overhead installation is not recommended.



Install a non-return valve on the suction duct, positioned at the end of the hose, opposite the pump in order to facilitate priming of the pump. The suction hose must then be properly vented.

The fill cap must then be screwed back on carefully in the position shown below (see arrow on the cap).

See Fig. 10

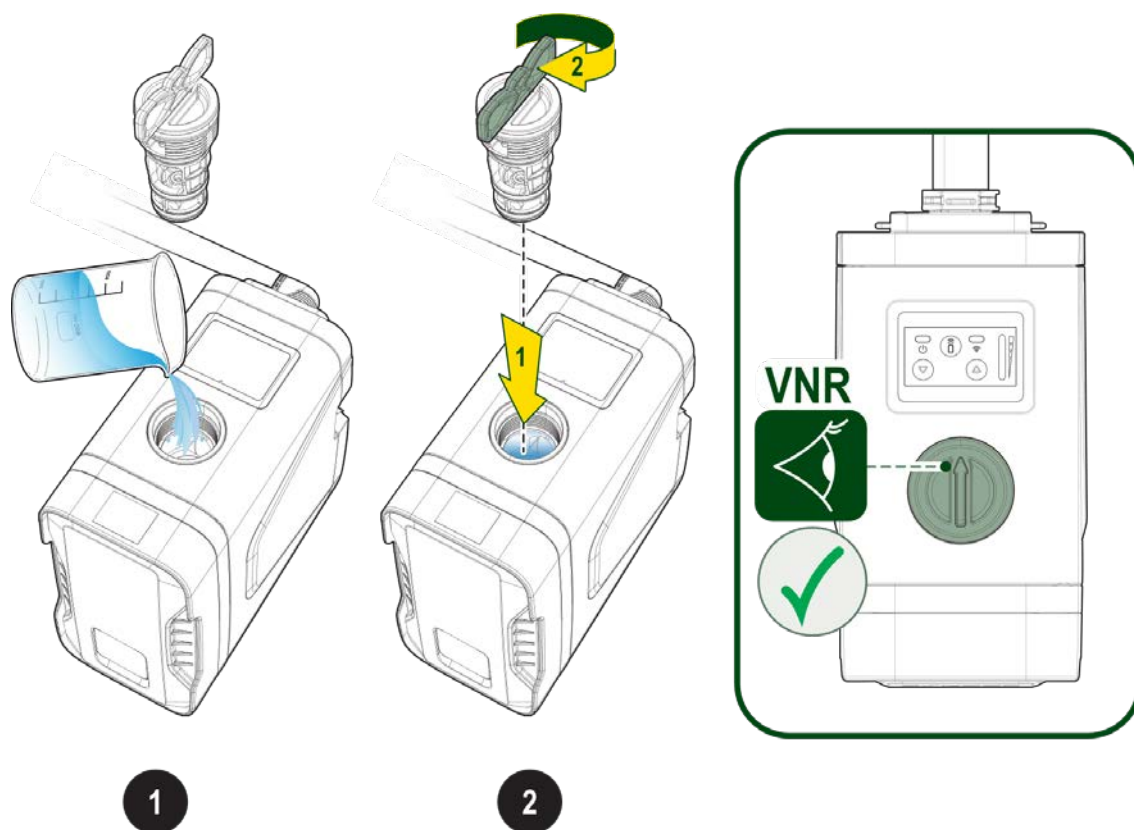


Fig. 10 Filling – Correct position of NRV cap

Once the system is installed, the pump primes autonomously. Simply open a delivery flow and the water automatically circulates inside the pump by pressure or gravity (under head installation).

Repeat the filling procedure if the pump is removed and reinstalled, a bypass is used and/or after extraordinary maintenance.

5.4 Installation configuration

Place the pump on a solid support base as it is not fitted with adjustable feet. During the installation, take into account the following dimensions:

- a minimum clearance of 10 cm above the pump to allow the non-return valve to be removed for cleaning (see **Fig. 9**).
- a minimum clearance of 15 cm in front of the pump to allow access to the motor shaft (see **Fig. 9**).



The pump must be installed in a safe, stable position: do not position the pump in a configuration other than those shown in **Permitted positions 5.1 Minimum clearances from fixed installations**.



It is mandatory to respect the minimum clearances indicated above when installing inside recesses and/or niches.

5.5 Water and pipe connections



Mandatory: fill for priming as described in 5.3 **Priming** before connecting the water supply.

Two aligned ports on the back of the pump are for connecting to pipes: suction below and delivery above, see **Fig. 11 Suction and delivery**. The pump is supplied with two kits of 3/4" threaded connectors to be used depending on the installation: one with straight connectors, one with elbow connectors that can be adjusted as needed. Depending on the configuration to be created, use a combination of two of the four connectors provided.

The threaded end of each of the two chosen connectors must be connected to the suction and delivery pipes, at a centre distance compatible with the pump; the other end must be sealed with the supplied O-Ring, inserted into the corresponding port of the product and secured with the supplied fork clamp. See **Fig. 12 Connectors and fork clamps**

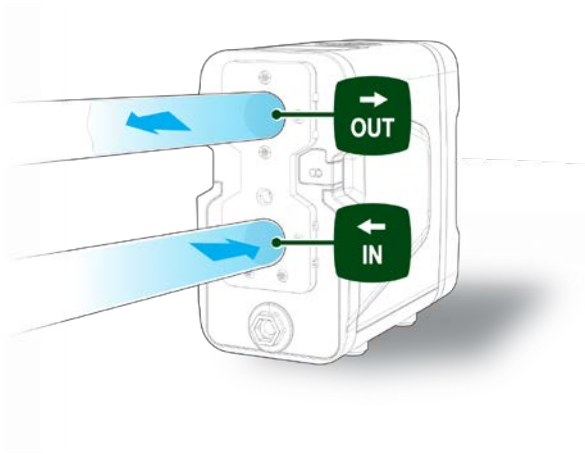


Fig. 11 Suction and delivery

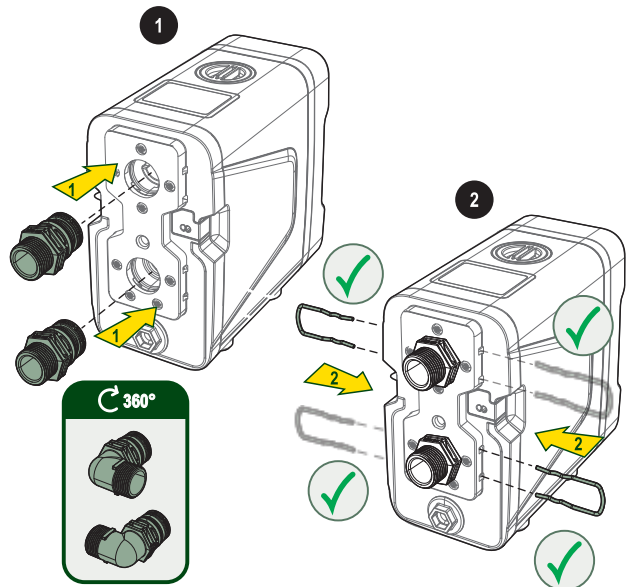


Fig. 12 Connectors and fork clamps

5.6 Electrical connection



Attention: always respect the safety regulations!



A device must be provided in the power supply network to ensure complete disconnection under the conditions of overvoltage category III. When the switch is in open position, the distance between contacts must comply with that shown in the table below:

Minimum distance between power switch contacts		
Power supply range (V)	> 127 and ≤ 240	> 240 and ≤ 480
Minimum distance (mm)	> 3	> 6

Table 2



Ensure that the mains voltage corresponds to that stated on the product's CE marking (data plate) and with the unit at full speed, check that the current drawn by the motor does not exceed that on the data plate.



In order to improve immunity to radiated noise to other equipment, we recommend using a separate electrical duct to supply the product.



In humid environments and/or in outdoor installations, connect the S31 2P+E 16A plug to a fixed connection socket with a protection degree of at least IP X5, guaranteed even with the plug inserted and connected, as shown in the example below.

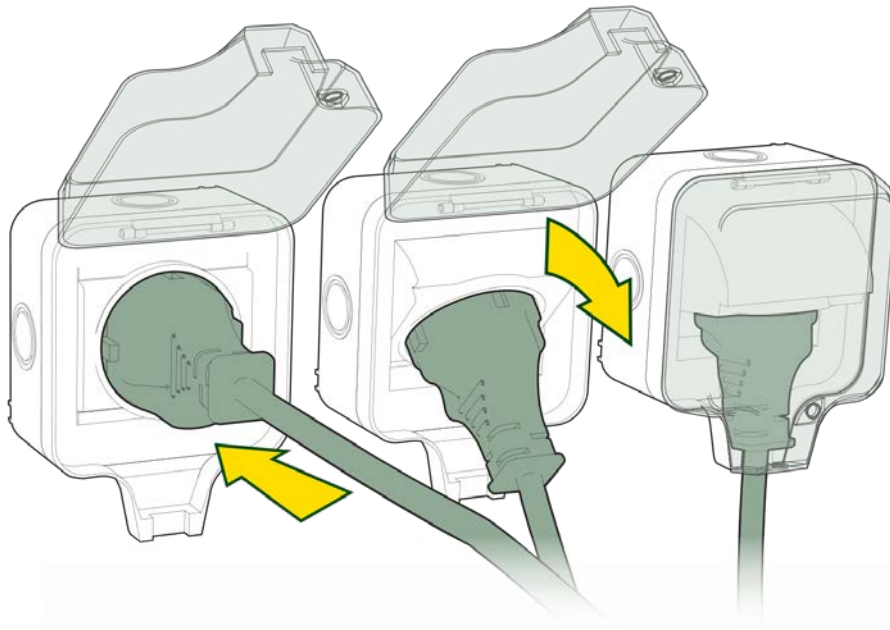


Fig. 13 Example of socket with guaranteed IP X5 even when plug inserted

The IP rating of the installation depends on the type of socket: IPX4 with schuko socket and IPX5 with watertight cap when plug inserted.

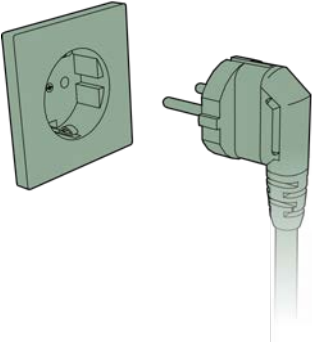
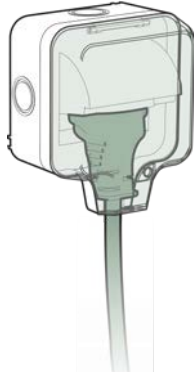
IPX4	IPX5
	
Socket P30 2P+T 16A 250 Vac. Residential indoor, garden or sheltered terrace.	P30 2P+E 16A 250 Vac socket with IP X5 watertight cap at least when the plug is inserted. Environments with high impacts, water jets, stresses and pulls to the cable.

Table 3 IP rating in relation to socket type

6 COMMISSIONING

On the piping, fully open the valve on the suction line and then power the pump.

6.1 Start-up

For the first start-up, follow the steps below:

- For correct start-up, make sure you have followed the instructions given in 5 INSTALLATION and 6 COMMISSIONING and the respective subsections;
- Check water is present;
- Provide electric power supply;
- Set the desired set-point
- Enable the pump, see par. 7.1.2 Enabling and disabling the pump.

6.2 General precautions relating to the water system

On at least a weekly basis, ensure that the domestic hot water system is flushed regularly, even minimally. Check the requirements and implement the preventive actions against bacterial proliferation in accordance with local and/or national regulations and in accordance with the design of the domestic hot water system.

In the event the system is unused for a prolonged period (about seven days), consider draining the water system, including any incorporated accessories and equipment capable of holding water. See paragraph 8.2 Draining the product



Follow local regulations and system design instructions.



Risk of freezing: when the system is expected to remain inactive for a long time at a temperature below or close to 0°C, the pump body must be completely drained through the drain cap to avoid cracks in the hydraulic components. This operation is also recommended in the event of prolonged inactivity at normal temperatures.

EMPTYING IN THE PRESENCE OF RISK OF FREEZING: To empty the system, see the dedicated chapter 8.2 Draining the

Check that the draining liquid does not harm persons or property, especially in systems using hot water.

Do not close the drain cap until the pump is used again.

When starting up after a long shutdown period, the operations listed in 6.1 **Start-up** must be repeated.

6.3 Stopping



The pump must be switched off whenever a malfunction occurs (see chap. A7 **TROUBLESHOOTING**).



To disable the pump, press simultaneously.

To stop the pump, unplug it.

7 PRODUCT OPERATION

The electronic control integrated into the pump is of the variable frequency drive type and uses flow, pressure and temperature sensors, which are also integrated into the pump. By means of these sensors, the pump switches on and off automatically as required, and is also able to detect, prevent and signal malfunctions. The control via variable frequency drive ensures various functionalities, the most important of which, for pumping systems, are the maintenance of a constant delivery pressure and energy savings. The variable frequency drive is able to:

- maintain a constant pressure in a hydraulic circuit by varying the pump's rotation speed. Without the operation of a variable frequency drive, the pump will not be able to vary the rotation frequency and, as the required flow rate increases, the pressure necessarily decreases, or vice versa; resulting in excessively high pressures at low flow rates or excessively low pressures as the flow rate demand increases.
- limit the power delivered to the pump to the minimum necessary to ensure the demand is met, also varying the rotation speed according to the instantaneous utility demand. Operating without a variable frequency drive means that the pump runs all the time and only at maximum power.

The pump is configured by the manufacturer to meet most installation cases, namely:

- Set-Point [SP]: desired constant pressure value. Default **SP = 2.0 bar (0.2 Mpa)**;
- Restart Pressure: pressure reduction for restart. Default **RP = 0.3 bar (0.03 Mpa)**;
- Anti-cycling function: Default **Disable**
- Anti-lock function: Default **Enable**
- Anti-Freeze function: Default **Enable**

Considering the default configuration, the pressure at which the pump starts can be calculated as follows:

$$P_{\text{START}} = \text{SP} - \text{RP} = 2.0 - 0.3 = 1.7 \text{ bar (0.17 Mpa)}$$

Whereas the pressure at which the pump switches off can be calculated as follows:

$$P_{\text{STOP}} = \text{SP} + \text{RP} = 2.0 + 0.3 = 2.3 \text{ bar (0.23 Mpa)}$$

The pump does not start if the utility is located at a height greater than the equivalent in metres of water column of P_{START} (consider 1 bar = 10 m.w.c.): for the default configuration, the pump does not start if the utility is at least 30m in height.

Once the pump is primed, the system begins its regular operation according to the configured parameters: it automatically starts when the tap is opened, provides water at the set pressure (SP), maintains a constant pressure even when other taps are opened, and automatically stops after time T2 once the shutdown conditions are met (T2 is user-configurable).

7.1 Basic controls

Although the device can be fully controlled from the H2D app (see chap. A4 **APP, CLOUD AND SOFTWARE UPDATES**), some basic controls are available on the pump's on-board interface.

7.1.1 Changing the set-point



Press  or  to change and immediately save the SP parameter.

7.1.2 Enabling and disabling the pump

Under normal operating conditions (no faults and no comfort function active), pressing and then releasing both   buttons locks/releases the motor (retentive following a shutdown). If an alarm fault has occurred, the above operation resets the alarm. When the motor is disabled, this status is highlighted by the white status LED flashing.

7.1.3 Manually resetting a fault

Under fault conditions, the status LED is steady red. Pressing and then releasing both   buttons resets the alarm. If the procedure is not successful, the pump will stay in error state signalling the identification code of the fault on the LED bar. See paragraph 7.3.6

Alarms identified by the system to identify the problem.

7.1.4 Disabling comfort functions

If a comfort function is active (see dedicated chapter), the status LED will be blue. Pressing and releasing both   buttons disables the function.

7.1.5 Enabling communication with H2D app

To be able to interact and therefore change the pump's parameters via the app, press the central button  for 3 seconds. On releasing it, the green LED on the right will flash: the pump is now ready to interact with the H2D app.

7.1.6 Restarting the system

To reset the pump, hold down the 2   buttons simultaneously for 5 sec. The system will confirm the command by switching off all LEDs and will reset on releasing the buttons. This operation is equivalent to cutting the power supply, waiting for complete shutdown and restoring the power supply. The reset does not delete the user's stored settings.

7.1.7 Restoring Factory Settings

To restore the product's factory settings, press the   buttons while the product is off and not powered and hold down the buttons until the product powers on. The product will confirm the command by flashing the LED bar and signalling to the user the need to release the buttons. On releasing the buttons, the product will reset and resume normal operations with the factory settings.

7.2 Advanced Controls

The product's advanced controls are available via the H2D app or the Cloud. The pump can be run and fully controlled through it.

7.2.1 Comfort functions

7.2.1.1 Power Shower

Increases the delivery pressure for a limited time. It allows the user to boost the pressure in the system without having to change the SP parameters and then restore them to the old values. It is activated by the user as required. It deactivates automatically after the set time. If a new Start command is issued or the duration time is changed during the period in which the function is active, the timer resets and the time count restarts.

7.2.1.2 Holiday Mood

For setting a period of time in which the pump uses less energy by lowering the pressure for the entire period in which the pump is not used, such as during holidays.

7.2.1.3 Good night

Decreases the delivery pressure for a period. This function reduces the number of pump starts, meaning it generates less noise and uses less energy at night. Once set, it automatically activates and deactivates every day in the desired time slot.



If multiple Comfort Functions are active within the same time interval, the system will execute the one with the highest priority:

Power Shower → High;
Holiday Mood → Medium;
Good Night → Low

7.2.2 Advanced pump monitoring

The app can be used to monitor the pump's status and change its settings. The parameters that can be viewed are listed below.

7.2.2.1 Status

Displays the pump's status.

7.2.2.2 (VP) View pressure

Pressure measured on the system.

7.2.2.3 (VF) View flow

Displays the instantaneous flow.

7.2.2.4 (RS) View rotation speed

Rotation speed achieved by the motor in rpm.

7.2.2.5 (PO) Power consumption

Power consumption from the power supply line.

7.2.2.6 (CI) View current

Motor phase current in [A].

7.2.2.7 (SV) Supply voltage

7.2.2.8 (TE) View pumped fluid temperature

7.2.2.9 Number of starts

7.2.2.10 Saving

Saving compared to ON/OFF type pump

7.2.2.11 This month energy consumption**7.2.2.12 Last month energy consumption****7.2.2.13 This month flow produced****7.2.2.14 Last month flow produced****7.2.2.15 Firmware version****7.2.2.16 View errors****7.2.2.17 Display of errors that occurred during pump operation.****7.2.3 Advanced pump settings**

In addition to displaying parameters, the app also allows you to change the pump's configuration to adapt it to your needs. The parameters that can be set are shown below.

7.2.3.1 (SP) set-point pressure

Pressure at which the system is to be pressurized.

The pump's restart pressure is linked not only to the set SP but also to RP.

RP is the pressure reduction, compared to "SP", that causes the pump to start.

Setting an excessively low SP, which does not allow the water to overcome the height difference between the pump and the point of use, can cause false dry run (BL) errors. In these cases, increase SP.

7.2.3.2 (RP) Pressure reduction for restart

The pressure reduction, compared to SP, that causes the pump to restart. For example, if SP is 3.0 bar (0.3 MPa) and RP is 0.5 bar (0.05 MPa), the pump restarts at 2.5 bar (0.25 MPa). RP can be set between a minimum of 0.3 (0.03 MPa) and a maximum of 1 bar (0.1 MPa). Under particular conditions (for example if SP is lower than RP), it may be automatically limited.

7.2.3.3 Smart Restart

It expresses an increase in pressure as a percentage compared to the setpoint value (SP) that is implemented in the instant before the pump is switched off (e.g. if SP= 1bar and Smart Restart= 10%, the pump will maintain the pressure of 1bar during operation and when the pump is switched off, it will increase the pressure to 1.1bar).

7.2.3.4 (OD) System type

Possible values: rigid and elastic. The default setting is rigid, which is suitable for most systems. In the presence of pressure oscillations that cannot be stabilised through parameters GI and GP, switch to elastic mode.

7.2.3.5 (GP) Proportional gain

The proportional term generally needs to be increased for systems characterised by elasticity (e.g. PVC pipes) and reduced in the case of rigid systems (e.g. iron pipes).

To maintain a constant pressure in the system, the variable frequency drive performs a PI control on the measured pressure error. Based on this error, the variable frequency drive calculates the power to be supplied to the motor. The behaviour of this control depends on the setting of parameters GI and GP. To accommodate the different behaviours of the various types of hydraulic systems where the pump may operate, the variable frequency drive allows for the selection of parameters different from those set by the manufacturer. For almost all systems, the default settings for parameters GI and GP are optimal. If adjustment problems occur, however, these settings can be changed.

7.2.3.6 (GI) Integral gain

If the pressure drops sharply due to a sudden increase in flow or a slow response from the pump, increase the GI value. If pressure oscillations around the set-point value occur, decrease the GI value.

IMPORTANT: Both GP and GI should be adjusted in order to achieve optimal pressure adjustments.

7.2.3.7 (TB) Dry run lock time

Latency in seconds between detecting a lack of water and generating the error.

7.2.3.8 (T2) Shutdown delay

Latency in seconds between detecting shutdown conditions and the pump actually stopping.

7.2.3.9 (RM) Maximum speed

Sets a maximum limit on the number of pump revs.

7.2.3.10 (AY) Anti-cycling function enable

The anti-cycling function prevents the pump switching on/off frequently in the event of leaks. The function can be enabled in two different modes: normal and smart. In normal mode, the electronic control blocks the motor after N identical start stop cycles. In smart mode, the RP parameter is adjusted to reduce the negative effects of the leaks. If set to "Disabled", the function does not operate.

7.2.3.11 (AE) Anti-lock function enable

The Anti-lock function prevents mechanical locks during prolonged inactivity by running the pump at regular intervals. When the function is enabled, the pump runs a 1-minute anti-lock cycle every 23 hours.

7.2.3.12 (AF) Anti-freeze function enable

If activated, the anti-freeze function automatically starts the motor when the temperature reaches values close to freezing to prevent the pump from breaking.

7.2.3.13 Disable pump manually

Prevents the pump from starting.

7.2.3.14 (RF) Reset errors

Clears the Faults and Warnings.

7.2.3.15 Reset error conditions manually

Forces the reset of the current error.

7.2.3.16 Firmware update

7.2.3.17 Restore parameter factory settings.

7.3 Protection systems

The device is equipped with protection systems designed to safeguard the pump, the motor, the power line, and the variable frequency drive. If one or more protections triggers, the interface immediately displays the highest priority signal. Depending on the type of error, the motor may stop, but when normal conditions are restored, the error status may automatically clear immediately or after a certain time following an automatic reset.

7.3.1 Anti-Cycling (Protection against continuous cycles with no utility demand)

If leaks occur in the delivery section of the system, the pump will start and stop cyclically even if no water is being drawn: even a small leak (a few ml) causes a drop in pressure, which in turn causes the pump to start.

The pump's electronic control is able to detect the presence of a leak based on its frequency. The anti-cycling function can be excluded or activated in Basic or Smart mode.

In Basic mode, when a frequent leak is found the pump stops and waits for a manual restore. The red "Alarm" LED switches on to signal this condition to the user. After removing the leak, the restart can be manually forced by pressing and releasing the   buttons simultaneously. In Smart mode, when a leak is found the RP parameter increases to reduce the number of starts over time.

See paragraph 7.3.6 Alarms identified by the system for more information on the specific alarm signal.

7.3.2 Anti-Freeze (Protection against water freezing in the pump)

Water increases in volume when it freezes. The pump should therefore not be full of water when the temperature is close to freezing to prevent it breaking. This is why any pump should be drained when unused during the winter period. However, this system is equipped with protection to prevent the formation of ice by activating the pump if the temperature drops close to freezing. This heats the water inside the pump and prevents it freezing.



The Anti-Freeze protection only works if the pump is properly powered: it cannot work if the pump is unplugged or a power failure occurs.

It is still advisable not to leave the pump charged during long periods of inactivity: drain the pump completely using the drain cap and store it in a sheltered place.

See paragraph 7.3.6 Alarms identified by the system for more information on the specific alarm signal.

7.3.3 Dry-Run (Protection against dry run)

If there is a lack of water, the pump stops automatically after time TB. See 7.2.3.7 (TB) Dry run lock time.

After restoring the correct flow of water, try manually exiting the protection lock by pressing and releasing the   buttons simultaneously. If the alarm state continues, i.e. the user does not restore the flow of water and reset the pump, the automatic restart attempts to restart the pump.

7.3.4 Anti-lock

This function prevents mechanical locks during prolonged inactivity by running the pump at regular intervals. When the function is enabled, the pump runs a 1-minute anti-lock cycle every 23 hours.

See paragraph 7.3.6 Alarms identified by the system for more information on the specific alarm signal.

7.3.5 Antidrip (Protection against dripping)

In certain usage conditions, when the pump operates at very low flow rates, the internal temperature of the liquid can remain quite high. If this situation continues for a while, it may lead to limescale forming on the internal surfaces, which over time can reduce the system's efficiency.

To help prevent this, the Antidrip function was introduced. It activates automatically when two things happen at the same time: the flow meter doesn't detect any water passing through (meaning the flow is below 1.5 liters per minute), and the pump has been running continuously for at least two minutes.

When this happens, the system goes into a kind of pause for two minutes. After that, it briefly turns the pump on for about a second and a half to check if water is flowing again. If you want to check immediately, you can also press two specific buttons at the same time to trigger the check manually.

The system will go back to normal operation as soon as it detects a continuous water flow for at least 15 seconds, or if no new activations occur for about two and a half hours.



Regular maintenance of the water system is recommended.



The system may start automatically following the intervention and restoration of the Antidrip protection. Do not leave taps open unattended. Potential flooding hazards.



The maximum inlet fluid temperature is 50°C. In certain cases (e.g., leakage and/or faucet seepage), the device may increase the inlet fluid temperature by up to 10°C. The overheated liquid is discharged within a few seconds and does not pose a risk of burns.



In case of connection to hot water supply networks, the internal temperature of the device may reach up to 60 °C. Caution is advised during maintenance operations. Always allow the system to cool down before performing any service or maintenance activities.



To avoid excessively frequent restarts caused by leaks within the system, it is recommended to install an expansion vessel. The expansion tank, to be assessed in relation to the type of installation, must be appropriately sized according to the characteristics of the system.

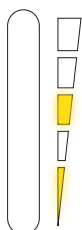
See paragraph 7.3.6 Alarms identified by the system for more information on the specific alarm signal.

7.3.6 Alarms identified by the system



The errors below are also identified via the App with extended explanation, it is advisable to check them on the product App.

7.3.6.1 Alarm warning of Lock due to Hot Fluid

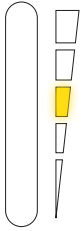


LEDs 1 and 3 yellow, on.

If the device detects an excessively high liquid temperature, the pump is locked.

The error status begins as soon as the problem is detected and automatically ends once the liquid temperature falls within permitted values.

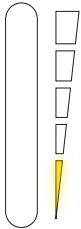
7.3.6.2 *Alarm signalling anomalous temperature recorded on Low Voltage board*



LED 3 yellow, on.

If the device detects an anomalous temperature on the Low Voltage board. The error status begins as soon as the problem is detected and automatically ends once the temperature falls within permitted values.

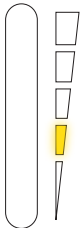
7.3.6.3 *"Anti Cycling Smart" function running*



LED 1 yellow, on.

When the Anti Cycling Smart function is running.

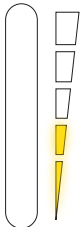
7.3.6.4 *"Anti Lock" function running*



LED 2 yellow, on.

When the Anti Lock function is running.

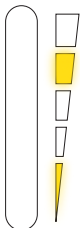
7.3.6.5 *"Anti Freeze" function running*



LEDs 1 and 2 yellow, on.

When the Anti Freeze function is running.

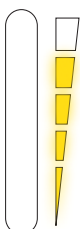
7.3.6.6 *Battery flat*



LEDs 1 and 4 yellow, on.

When the device detects that the backup battery is no longer sufficient to guarantee system operation in the event of a power failure. Replace, see par. A8 **REPLACING INNER BUFFER BATTERY**.

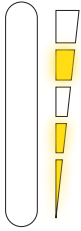
7.3.6.7 *Motor overheat power limitation*



LEDs 1, 2, 3, 4 yellow, on.

Power limitation implemented by the HV board against motor overheating.
May trigger in the event of very frequent restarts over a long period of time.
Once the safety protection triggers, the limitation is maintained for 6 minutes.
After this time, normal operating conditions are restored.

7.3.6.8 Pressure not achievable

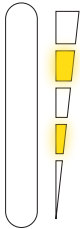


LEDs 1, 2, 4 yellow, on.

The pump, set to relaunch, reports the condition of "Pressure not reachable" when it fails to reach the setpoint pressure due to insufficient suction pressure.

The pump restarts when a domestic user requests a water supply again (e.g. opening a tap) or after manually restarting the device. The "Pressure not reachable" warning remains active until the setpoint is reached or the system is restarted, see par. 7.1.6 Restarting the system. In the event of an alarm, the cause of the lack of suction pressure must be checked.

7.3.6.9 Internal error



Yellow LEDs 2 and 4, lit.

The pump reports an internal error when it fails to save the set configurations. In this condition, the system no longer stores settings and learns new values, while continuing to function. If the alarm is activated, contact the customer support immediately.

7.3.7 System anomalies (Locks)



The locks below are also identified via the App with extended explanation, it is advisable to check them on the product App.

For some malfunctions and lock conditions, the pump attempts to reset automatically.

The auto reset system works with the following:

(F0-021) Lock due to lack of water

(F1-035) Lock due to out-of-spec line voltage ⁽²⁾

(F1-033) Lock due to power terminals overheating

(F1-032) Lock due to liquid temperature too high

(F0-005) Lock due to anomaly on delivery pressure sensor

(F0-006) Lock due to anomaly on suction pressure sensor

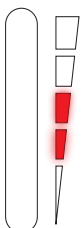
For example, if the pump locks due to lack of water, the device automatically starts a test procedure to check if the machine/equipment has definitively and permanently run out of water. If an attempt to reset is successful during the sequence of operations (e.g. the water has come back on), the procedure stops and normal operations resume. **Table 4: Auto reset of locks** shows the sequences of operations carried out by the device for the various types of lock.

Automatic resets on error conditions	
Description	Automatic reset sequence
Lock due to lack of water	An attempt after a fixed time waiting that progressively doubles to the number of attempts made: a.e first attempt after 1 minute of waiting, second attempt after 2 minutes of waiting, third attempt after 4 minutes, up to 60 minutes between attempts.
Lock due to out-of-spec line voltage	Resets when in-spec voltage is restored
Lock due to power terminals overheating	Resets when the temperature of the power terminals returns within specifications
Lock due to power terminals overheating	If the device detects an excessively high liquid temperature, the pump is locked and "F1-032" is signalled. The error status begins as soon as the problem is detected and automatically ends once the liquid temperature falls within permitted values.

Table 4: Auto reset of locks

Signalling of Locks

7.3.7.1 Lock due to water temperature overheat



LEDs 2 and 3 red, on.

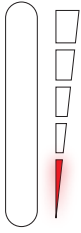
1- Temperature above permitted threshold.

Automatic reset on reaching the permitted temperature.

2- Hot fluid.

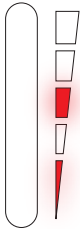
Automatic reset on reaching the permitted temperature.

7.3.7.2 Lock due to water temperature sensor error



LED 1 red, on.
Fault on the water temperature sensor.

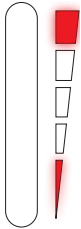
7.3.7.3 Lock due to Low Voltage Board Overheating



LEDs 1 and 3 red, on.

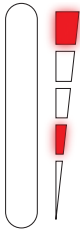
- 1- *Temperature above permitted threshold.*
Automatic reset on reaching the permitted temperature.
- 2- *Ambient temperature too high.*
Automatic reset will occur once the permitted temperature is reached.

7.3.7.4 Lock due to reading error on delivery pressure sensor



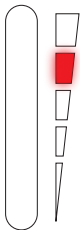
LEDs 1 and 5 red, on.
If the device detects an anomaly on the delivery pressure sensor, the pump is locked and the error is signalled by the LEDs shown on the left. This status begins as soon as the problem is detected and automatically ends once correct conditions are restored.

7.3.7.5 Lock due to reading error on suction pressure sensor



LEDs 2 and 5 red, on.
Anomaly on the suction pressure sensor. Only present in models with the low suction pressure detection function with the dedicated accessory. This status begins as soon as the problem is detected and automatically ends once correct conditions are restored.

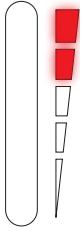
7.3.7.6 Lock due to out-of-spec power voltage (HV HARDWARE)



LED 4 red, on.

- 1- *Out-of-spec pump supply voltage.*
Resets automatically when the voltage returns within permitted values
- 2- *Out-of-spec internal DC voltage.*
Resets automatically when the voltage returns within permitted values
- 3- Motor disconnected.
Automatic reset
- 4- *Out-of-spec internal voltage.*
Resets automatically when the voltage returns within permitted values

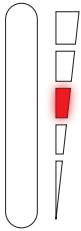
7.3.7.7 Lock due to overheat or short circuit



LEDs 4 and 5 red, on.

- 1- Excessive temperature at power terminals.
Automatic reset on reaching the permitted temperature.
- 2- Motor overcurrent.
Automatic reset
- 3- Short circuit between motor phases.
Manual reset by pressing buttons, which will not take effect until 10 seconds have elapsed since the short circuit occurred.
- 4- Short circuit to earth.
Manual reset by pressing buttons.
- 5- Generic internal error.
Automatic reset once permitted conditions are restored.

7.3.7.8 Lock due to cyclical anomaly detected on system

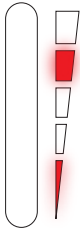


LED 3 red, on

Triggering of the anti-cycling protection (Basic mode) due to excessive cyclical starts.

Manual reset by pressing buttons.

7.3.7.9 Lock due to overheating from dry-run

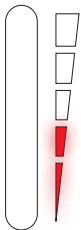


LEDs 1,4 red, on.

Activation of protection for overheating caused by dry-run.

Automatic reset after 6 minutes with pump powered.

7.3.7.10 Lock due to dry-run

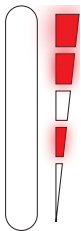


LEDs 1,2 red, on.

Activation of protection against dry-run.

Automatic reset as described in paragraph 7.3.3 Dry-Run (Protection against dry-run).

7.3.7.11 Lock due to "Anti-Drip" function



LEDs 2,4,5 red, on.

Activation of Anti-Drip protection.



To avoid excessively frequent restarts caused by leaks within the system, it is recommended to install an expansion vessel. The expansion tank, to be assessed in relation to the type of installation, must be appropriately sized according to the characteristics of the system.



For more details on the type of error, see the H2D app or the H2D Desktop web portal.

7.3.8 Retentive faults (faults automatically resettable after a certain time)



Status LED flashing red

In the event of a lock due to one of the internal errors that are only visible on the H2D app or H2D Desktop web portal (E18, E19, E20, E21), wait at least 6 minutes with the machine/equipment powered for the lock status to reset automatically.



If the error does not recur, contact the service center.

8 MAINTENANCE



Maintenance, testing and subsequent re-commissioning must only be carried out by qualified, trained and experienced personnel.



Disconnect and padlock the power supply before starting any work on the system.



Disconnect the pump from the power supply (electrical and water) before carrying out any maintenance work.



Wear protective clothing



Wear goggles and gloves



In case of connection to hot water supply networks, the internal temperature of the device may reach up to 60 °C. Caution is advised during maintenance operations. Always allow the system to cool down before performing any service or maintenance activities.



Li

This product contains a button or coin battery. Ingesting or inserting a battery into any part of the body can cause serious harm or death in as little as 2 hours, as a result of chemical burns or a potentially perforated oesophagus.

Legal provisions for the disposal of any harmful liquids must also be observed. After a prolonged period of use it may become difficult to remove parts in contact with the water: for this purpose use a suitable solvent found on the market and where possible a suitable extractor. It is recommended not to apply force on the various parts with unsuitable tools.



Installation, maintenance, repairs or transport must only be carried out by Specialised Personnel (see definition in safety booklet) who must only follow operations and manoeuvres within their competence or of which they are fully aware. Cleaning, checks and inspections to be carried out by the user must not be carried out in the presence of unsupervised children.

8.1 Periodic checks

Checks may be carried out by the equipment operator, whereas maintenance work must be carried out by trained, experienced and authorised personnel.

Monthly checks and inspections:

- Clean the pump body regularly;
- Integrity of the casing and controls;
- Integrity of the power supply;
- Functionality of the residual current device (monthly RCD test) protecting the equipment;
- No chemicals in the immediate vicinity of the equipment;
- No dirt, dust and build-up on the hidden parts of the equipment;
- No degradation or wear of the covering and power cables;
- No water leaks;
- No abnormal noise;
- No functional or performance faults on the equipment and/or pump;



Routine maintenance, to be carried out if common problems are detected:

- Tighten pipes and replace seals where necessary;
- Replace fuses and/or protective devices when tripped;
- Regularly check the current absorption, the manometric head with the port closed and the maximum flow rate, which will enable faults or wear to be detected early.
- Clean mechanical components.



Other generic regular checks are outlined below.

MAINTENANCE, CHECKS, INSPECTIONS, CLEANING AND PERIODIC REPLACEMENT OF PARTS	FREQUENCY
General cleaning General cleaning of the line (especially dust) and surrounding areas.	-
Electrical cables Check the protective covering on the electrical cables for cuts, stripping, crushing, etc. and replace them if necessary.	Yearly
Electric control devices Check that there is no cracking or deformation, and check the condition of the connecting cables. Check the efficiency of the cooling systems, connectors and piping. Check the lettering and symbols are legible and in good condition and restore them if necessary.	Six-monthly
Electric motors Check that there is no cracking or deformation. Check that there are no breakages. Check the tightness of cables, seals, screws and bolts on parts that are subject to vibration and loads during operation. Check the power cables for cuts, stripping and crushing.	Yearly
Safety signs Check the safety signs are legible and in good condition.	Weekly
Abnormal noise Check for vibrations and malfunctions.	-



The pump may only be disassembled by specialised and qualified personnel who meet the requirements of the relevant regulations. In any case, all repairs and maintenance work must only be carried out after disconnecting the pump from the power supply.

8.2 Draining the product

Proceed as follows to drain the water out of the pump:

1. disconnect the electric power supply;
2. shut off the suction duct as close as possible to the pump (it is good practice to have an on/off valve immediately before the pump) so that the entire suction system is not also drained;
3. close any on/off valve after the pump to prevent returns between the first utility and the pump
4. where there is no on/off valve after the product, open a utility (tap, sink, etc.) supplying the system closest to the pump (to depressurize and drain it);
5. pre-empty it through the crankshaft access cap by carefully unscrewing it (see **Fig. 21 Access to motor shaft**);
6. disconnect the pump hydraulically from the pipes or from the dock;
7. Proceed to completely empty the pump by carefully unscrewing and removing the drain plug (see **Fig. 14 Drain cap**). If the fill cap (NRV) is removed or sufficiently loosened during the operation, see **Fig. 10 Filling – Correct position of NRV cap**, the pump and the entire delivery duct will drain more easily;
8. Repeat the filling procedure if the pump is removed and reinstalled, a bypass is used and/or after extraordinary maintenance. See 5.3 Priming

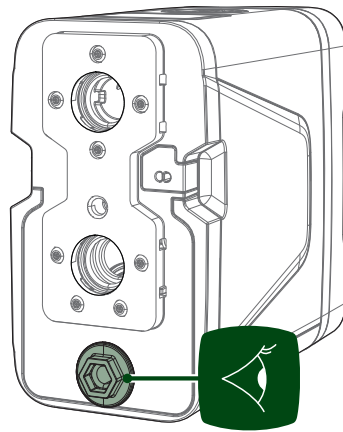


Fig. 14 Drain cap

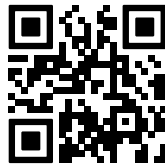


RISK OF FLOODING Water trapped in the delivery system after the non-return valve installed on the product may flow out when the product is disconnected. Keep equipment handy to collect the drained water. Where possible, provide a container to collect the water flowing out of the drain hole.

Whilst essentially empty, the product cannot expel all the water inside it. A little water is likely to come out of the product while it is being handled after draining.

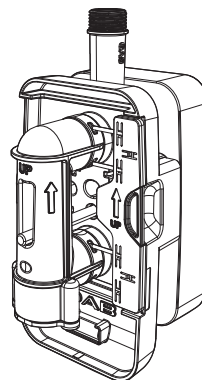
8.3 Spare parts

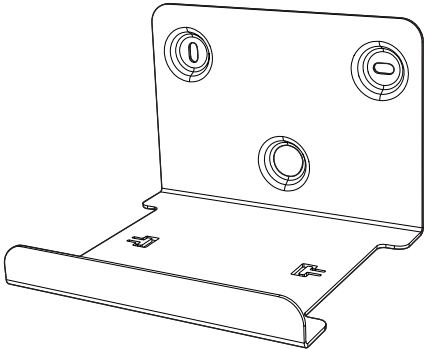
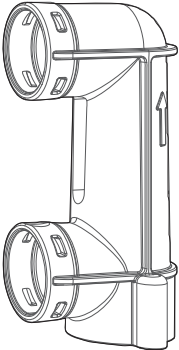
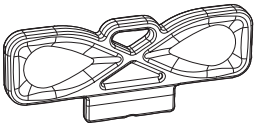
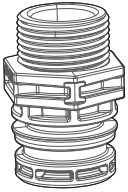
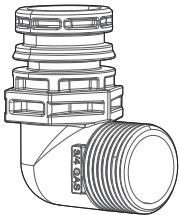
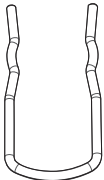
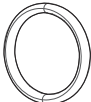
Refer to the Spare Parts Booklet available and framed by QR-Code, of the product.



8.4 List of Interchangeable Accessories / Equipment

Esydock Pop



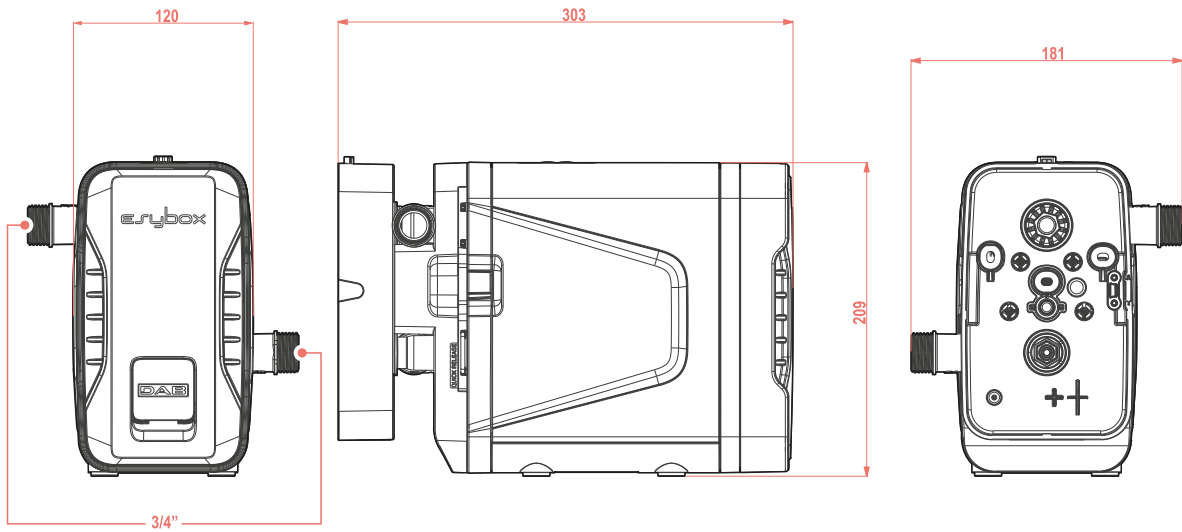
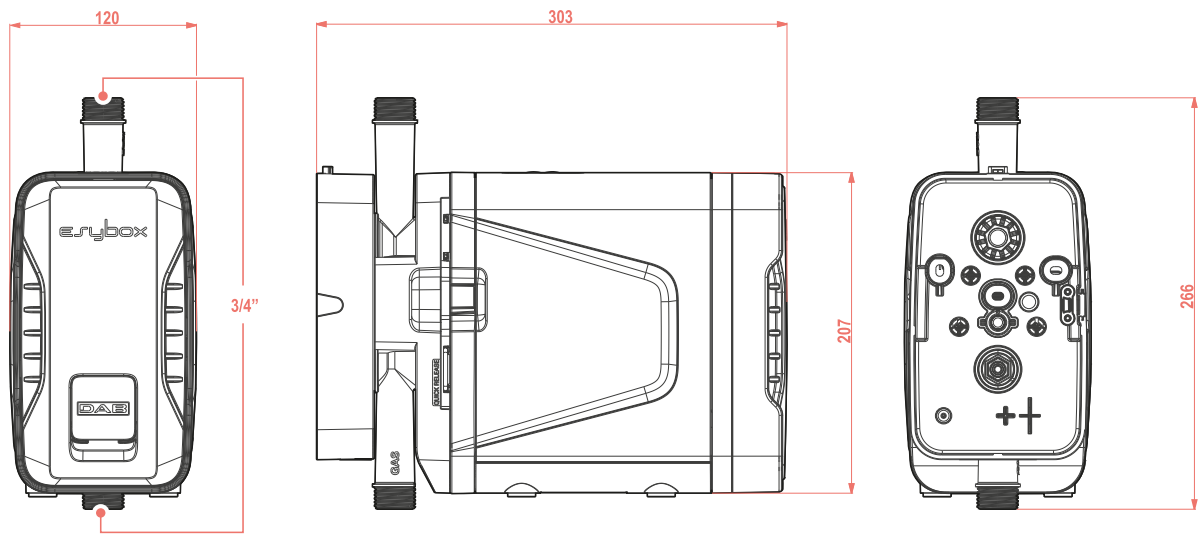
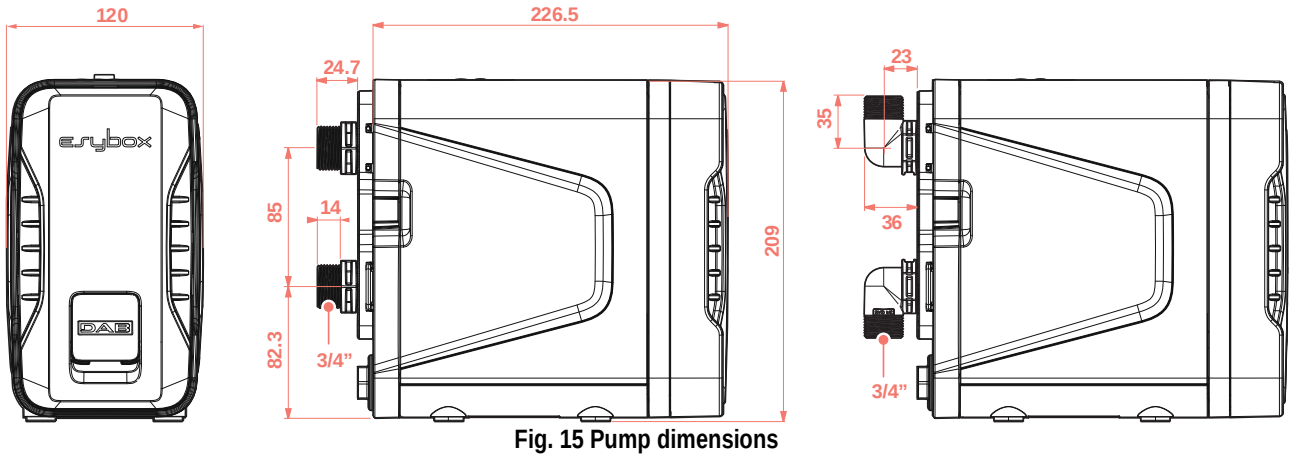
Esywall Pop	
Bypass	
Key for NRV cap	
Straight connector (2pcs)	
Elbow connector (2pcs)	
Clammer (2pcs)	
O-ring (2pcs)	

APPENDIX SECTION

A1. TECHNICAL DATA

	ESYBOX POP
Supply voltage (V)	220-240 110-127
Radio network protocols	Operating frequencies*: ▪ Wi-Fi: (802.11 b/g/n/ax) ▪ Bluetooth: Bluetooth 5 (BLE) ▪ IEEE 802.15.4 Transmission power: ▪ Wi-Fi: 20.5 dBm ▪ Bluetooth: 19 dBm ▪ IEEE 802.15.4: 19 dBm *in accordance with national regulations where the product is installed The device includes radio equipment with related software designed to guarantee correct operation as envisaged by DAB Pumps S.p.A.
Frequency (Hz)	50/60
Pumps maximum rated current (A)	1.5
Pumps maximum rated power (W)	300
Motor insulation class	F
Minimum head (m)	0
Maximum head (m)	30
Maximum flow rate (l/min)	XX 60 at minimum head
Protection degree	IP X4 / IP X5 (see Table 3)
Ambient operating temperature range (°C)	min 4 to max 50
Liquid temperature range (°C)	min 5 to max 50
Storage temperature (°C)	-
Storage humidity	50 - 70%
Maximum suction pressure (bar / MPa)	3 / 0.3
Minimum suction pressure (bar / MPa)	0 / 0 with no air in suction line
Sound pressure dB(A) @20m-15l/min	48
Maximum altitude (m a.s.l.)	2000
Pump Weight (kg)	4.360
Weight Pump + Dock Base (kg)	4.826 (4.360 + 0.466)
Weight Pump + Dock with Suction Sensor (kg)	4.940 (4.360 + 0.580)
Pump Sizes (mm)	See Fig. 15
Pump + Dock Sizes (mm)	See Fig. 16 and Fig. 17
Type of service	S1 (continuous)
Nominal pressure	PN 6
Recommended water hardness (°f)	6-10

Table 5: Technical data



A2. FACTORY SETTINGS

The device leaves the factory with a series of preset parameters that can be changed according to user requirements. Each change to the settings is automatically saved in the memory and factory settings can be restored whenever required, see 7.1.7 Restoring Factory Settings.



Once the factory settings have been restored, all system parameters (gains, set-point pressure, etc.) must be reset as during the first installation.

Factory settings				
Page	Description	International default	US customary default	Installation Reminder
SP	Set-point pressure	2.0 bar (0.2 Mpa)	29 psi	
OD	System Type	1 (Rigid)	1 (Rigid)	
RP	Pressure reduction for restart	0.3 bar	4 psi	
MS	Measurement system	0 (International)	0 (International)	
EK 	Enabling Suction Pressure	0 (Disabled)	0 (Disabled)	
PK 	Low suction pressure threshold	0.5 bar (0.05 Mpa)	7 psi	
TB	Time of lock due to lack of water	15 s	15 s	
T1 	Low pr. delay	8 s	8 s	
T2	Shutdown delay	10 s	10 s	
GP	Proportional gain coefficient	0.5	0.5	
GI	Integral gain coefficient	1.2	1.2	
RM	Maximum speed	4700 rpm	4700 rpm	
AE	Anti-lock function	0 (Disabled)	0 (Disabled)	
AF	Anti-freeze	0 (Disabled)	0 (Disabled)	
AY	Anti-cycling function	2 (Smart)	2 (Smart)	

Table 6



A3. SPECIAL INSTALLATIONS



Installation with the dock is an alternative to installation with the bracket and vice versa, for support purposes.

A3.1 Quick Connection Installation (ESYDOCK POP)

Basic Version Dock

DAB provides an accessory kit, called a **ESYDOCK POP**, for quick system connection. It is a quick-connect base on which to make connections to the system and to/from which the pump can be easily connected/disconnected. It is a quick-connect base on which to make connections to the system and from which the pump can be connected/disconnected easily and without the need for additional supports.

Advantages:

- possibility of setting up the system on-site for testing, removing the pump until system delivery and/or activation, thereby avoiding possible damage, accidental impact, dirt, theft, etc.;
- assistance service makes it easy to replace the pump with another spare Esybox Pop pump in case of extraordinary maintenance.

Fig. 18 shows the pump mounted on the dock.

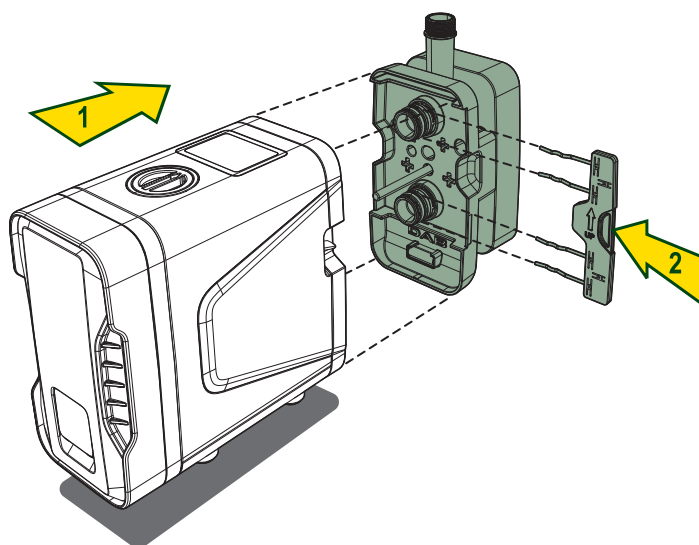


Fig. 18 Quick connection with Dock

Dock versione con sensore di pressione in aspirazione

DAB provides an accessory kit, called a **ESYDOCK POP**, for quick system connection. It is a quick-connect base on which to make connections to the system and to/from which the pump can be easily connected/disconnected. It is a quick-connect base on which to make connections to the system and from which the pump can be connected/disconnected easily and without the need for additional supports.

Advantages:

- possibility of setting up the system on-site for testing, removing the pump until system delivery and/or activation, thereby avoiding possible damage, accidental impact, dirt, theft, etc.;
- it is equipped with a pressure sensor, located in the suction port, which provides a function used to monitor low pressure/lack of water conditions and automatically stops the pump, preventing dry running and cavitation; in this way, it is avoided to draw water from the aqueduct when the network pressure is insufficient; the system can generate an alarm and, when normal conditions are restored, allow restarting according to the set logics (delay, attempts, configurable thresholds);
- assistance service makes it easy to replace the pump with another spare Esybox Pop pump in case of extraordinary maintenance.

Fig. 19 shows the pump mounted on the dock.

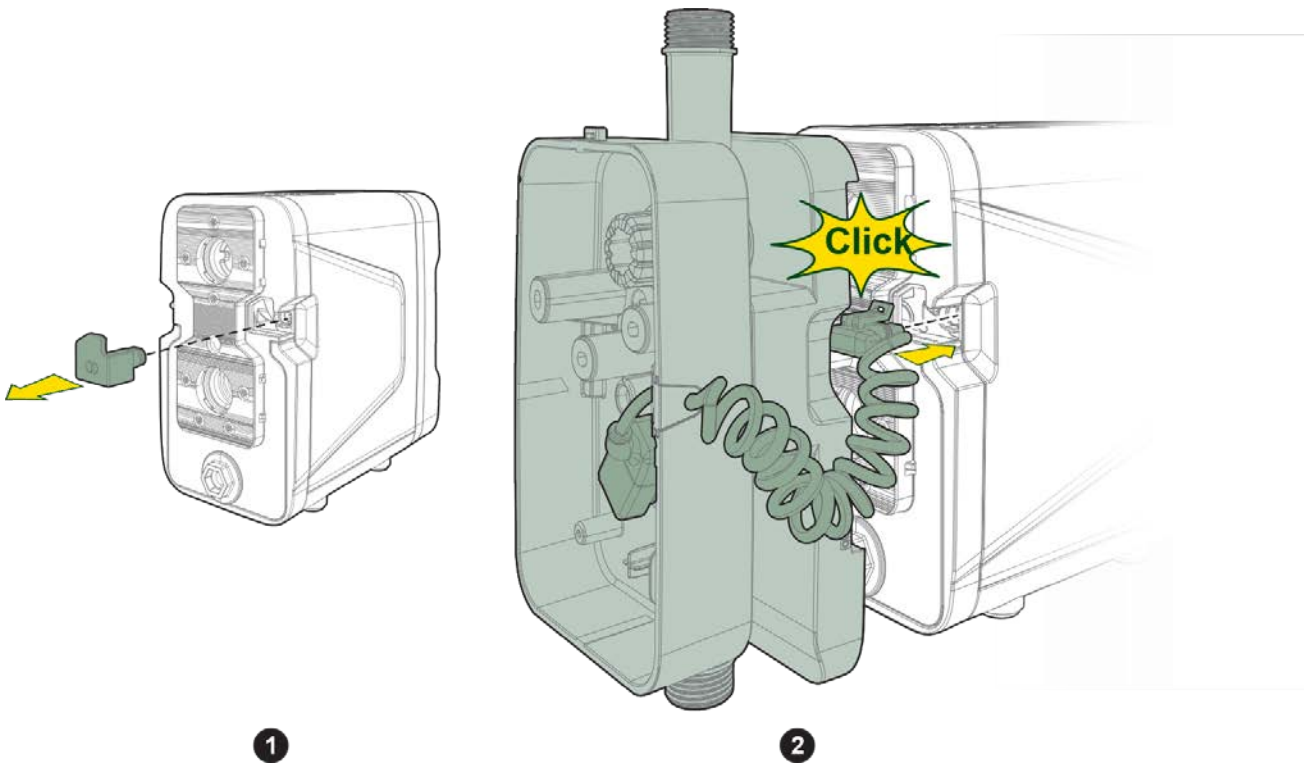


Fig. 19 Pressure sensor connection from the dock base to the pump

A3.2 Installation with ESYWALL POP

DAB provides a bracket accessory kit, called ESYWALL POP, as an optional support for the pump. The anchoring bracket allows the pump to be mounted at any desired height above the floor. It is recommended to place the bracket in close proximity to the plumbing connections and the power outlet, ideally within a radius of 1 meter, to ensure proper connection and operation of the device.

Advantages:

- Installation flexibility: the bracket allows the pump to be installed anywhere in the system.

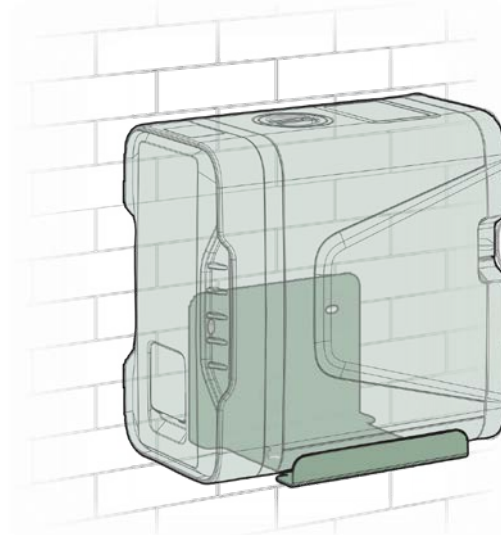


Fig. 20 ESYWALL POP bracket accessory

A4. APP, CLOUD AND SOFTWARE UPDATES

The H2D app or the H2D Desktop web portal can be used to update the product's software to the latest available version.

H2D app requirements for smartphone

- Android ≥ 8
- IOS ≥ 12
- Internet access

PC requirements for accessing H2D Desktop web portal.

- WEB browser with JavaScript support (e.g. Microsoft Edge, Firefox, Google Chrome, Safari)
- Internet access

Internet requirements for accessing the Cloud

- Active and permanent direct Internet connection on site.
- Wi-Fi Modem/Router.
- Good quality, powerful Wi-Fi signal where the pump is installed.



If the Wi-Fi signal deteriorates, a Wi-Fi Extender is recommended.



We recommend using DHCP despite the possibility of setting a Static IP.

Firmware Updates/Upgrades

Before starting to use the device, make sure the pump is updated to the latest available SW version.

It is possible to update via the H2D APP or, if the pump is already connected to the internet and registered on the DAB cloud, also from the H2D web portal.

Updates ensure users get the best out of the services offered by the product.

For optimal pump use, also refer to the online manual and watch the demo videos.

All the necessary information is available on the *dabpumps.com* website or on: *h2d.com* for topics concerning the APP and H2D web portal.

Update term.

Firmware updates are guaranteed for the entire lifespan of the product, technical support and spare parts.

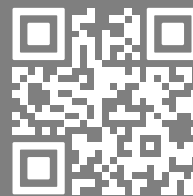
A4.1 Downloading and installing the app

The product can be set up and monitored using the app available at the main stores.

If in doubt, go to *h2d.com* for further information, such as video tutorials, direct app download links or access to the portal.

- Download the H2D app from Google Play Store for Android devices or from App Store for Apple devices.
- Once downloaded, the H2D app icon will appear on your device's home screen.
- For optimal app operation, accept the terms of use and all permissions for interacting with the device, particularly Bluetooth and location access.
- All instructions given in the H2D app must be read and followed carefully in order to initially set up and/or register the pump correctly.

download the app from
h2d.com



A4.2 Registering on H2D

If you do not yet have an account on the H2D app or H2D Desktop web portal, register by clicking the appropriate button. Enter a valid e-mail address where a confirmation link will be sent.

Enter all required data marked with an asterisk. Agree to the privacy notice and complete the required information.

The basic registration on H2D enables you to receive information on using DAB products.

A4.3 Product configuration

The pump can be set up and monitored using the app available at the main stores. If in doubt, go to *h2d.com* for further information.

The app guides the installer through the initial set-up and installation of the product. The app also provides access to pump updates and DAB digital services. See the H2D app to complete the operation.

A5. MOTOR SHAFT

The system's electronic control ensures smooth starts to avoid excessive strain on the mechanical parts and ensure the product lasts longer. This characteristic, in exceptional cases, could cause a problem in starting the pump: after a period of inactivity (e.g. one month), perhaps with the system drained, the salts dissolved in the water may have deposited to form calcifications between the rotating part (motor shaft) and the fixed part of the pump, thus increasing the resistance to starting. In this case, it may be sufficient to manually assist the motor shaft in dislodging from the calcifications. In this system, the operation is possible by ensuring access to the motor shaft from the outside by providing a keyway at the end of the motor shaft itself. Proceed as follows:

- unplug the pump;
- drain the pump, see 8.2 **Draining the product**;
- remove the magnetic plate, see **Fig. 4 Metal plate - Location of product information label** covering access to the motor shaft;
- remove the access cap from the motor shaft using a 6 mm Allen key (see **Fig. 21 Access to motor shaft**)
- insert a flathead screwdriver into the motor shaft keyway and turn in both directions;
- if it turns freely, the pump can be started once the cap and cover are repositioned;
- if the blockage cannot be removed manually, contact technical support.

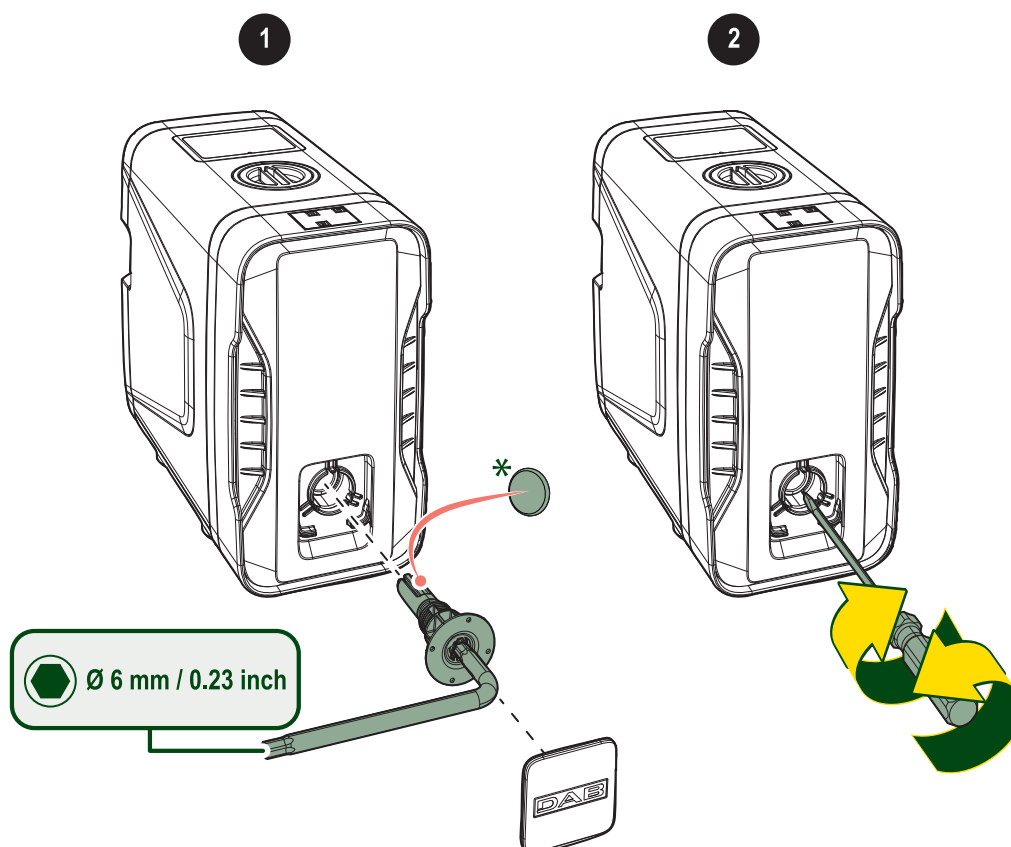


Fig. 21 Access to motor shaft



In hard water areas (> 15°fr) optional polyphosphate cartridges may be fitted to the cap (see above *). If the water hardness is above 25°fr use a water softener.

A6. NON-RETURN VALVE

The pump is fitted with an integrated non-return valve (NRV) that is required for proper operation. Solids or grit in the water may cause the valve and therefore the system to malfunction.

Although we recommend using clean water and fitting inlet filters, if faults occur on the non-return valve (such as frequent restarts with taps closed), it can be removed from the system and cleaned and/or replaced as follows:

- unplug the pump;
- drain the pump, see 8.2 **Draining the product**;
- using the key accessory, remove the cap (see **Fig. 22 Cleaning non-return valve**);
- remove the valve
- clean the valve under running water, check for damage and replace it if necessary;

If any O-rings are lost or damaged during non-return valve maintenance, they must be replaced. Otherwise, the pump cannot operate correctly.

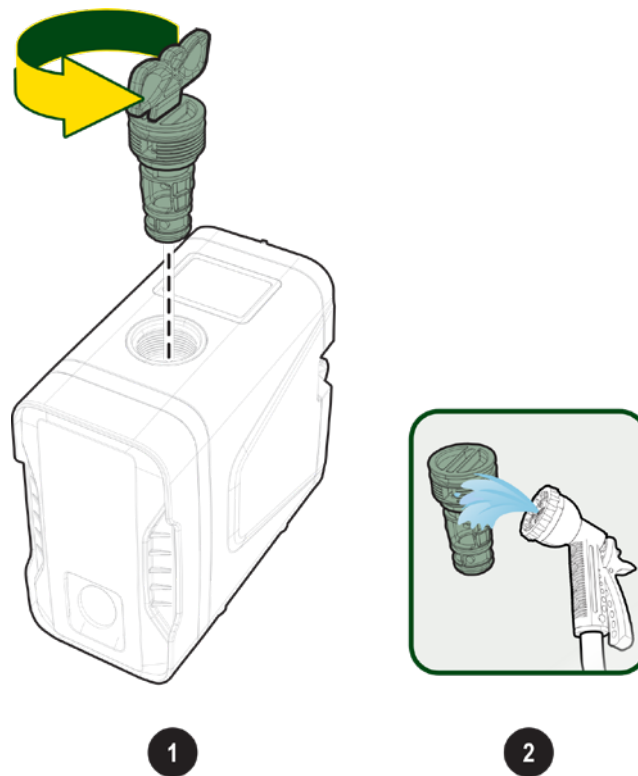


Fig. 22 Cleaning non-return valve

A7. TROUBLESHOOTING



Before troubleshooting, the pump must be disconnected from the power supply (unplugged from the socket).

FAULT	Status LED	POSSIBLE CAUSES	SOLUTIONS
The pump does not start.	Off	No power supply	Check the power supply reaches the socket and plug in again.
The pump does not start.	Red	Blocked shaft	See par. A5 (motor shaft maintenance).
The pump does not reach the set-point	Yellow	The pressure to the user does not reach the level higher than that equivalent to the restart pressure of the system (par. 3.2).	Lower the restart pressure value of the system by decreasing SP or increasing SP or decreasing RP.
The pump does not stop.	Flashing yellow and green or Green	1. Leak in the system. 2. Air ingress into suction pipe. 3. Faulty flow sensor	1. Check the system, locate the leak and eliminate it. 2. Check the suction duct, identify the cause of the air ingress and eliminate it. 3. Contact technical support.
Insufficient delivery	N.A.	1. Suction depth too high. 2. Suction duct blocked or insufficient duct diameter. 3. Blocked impeller or hydraulics.	1. As suction depth increases, product hydraulic performance decreases (par. Description of the Pump). Check if the suction depth can be reduced. Use a suction pipe with a larger diameter (never less than 1 1/4" for a single pump, larger diameters for groups). 2. Check the suction duct, identify the cause of the choking (blockage, kinked pipe, counter-slope, etc.) and eliminate it. 3. Disassemble the pump and remove the blockages (technical support).
The pump starts with no utility demand	N.A.	1. Leak in the system. 2. Faulty non-return valve.	1. Check the system, locate the leak and eliminate it. 2. Maintain the non-return valve as per paragraph A6.

The app shows F0-021 (dry run error)	Red	1. Lack of water. 2. Pump not primed.	1-2. Prime the pump and check there is no air in the piping. Check the suction line or any filters for clogging.
The display shows F0-005	Red	1. Faulty pressure sensor.	1. Contact technical support.
The display shows F0-006	Red	1. Inlet pressure sensor failed.	1. Contact technical support.
The app shows F1-035	Red	1. Low supply voltage. 2. Excessive voltage drop on the line.	1. Check the line voltage is correct. 2. Check the cross-section of the power cables.
The app shows "WARNING – BAT" while pump running		1. Display battery low	1. Replace the display battery (see paragraph A8)

A8. REPLACING INNER BUFFER BATTERY

When the fault indicated in paragraph **7.3.6.6 Battery flat** occurs, the inner buffer battery must be replaced.



The battery must be replaced solely by specialist personnel authorised by Dab Pumps. Contact Dab Pumps customer service.