
ISTRUZIONI PER L'INSTALLAZIONE E LA MANUTENZIONE (IT)
INSTRUCTIONS FOR INSTALLATION AND MAINTENANCE (EN)
INSTRUCTIONS D'INSTALLATION ET D'ENTRETIEN (FR)
ANWEISUNGEN FÜR INSTALLATION UND WARTUNG (DE)
INSTRUCCIONES DE INSTALACIÓN Y MANTENIMIENTO (ES)
INSTRUCTIES VOOR INSTALLATIE EN ONDERHOUD (NL)
INSTRUCȚIUNI DE INSTALARE ȘI ÎNTREȚINERE (RO)
POKYNY PRO INSTALACI A ÚDRŽBU (CS)
INSTRUKCJA INSTALACJI I KONSERWACJI (PL)
安装和维护说明 (ZH)
تعليمات التركيب والصيانة (AR)

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 warnings 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!
POSSIBLE 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 ($> 60\text{ }^{\circ}\text{C}$). 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.

EU Declaration of Conformity	
Object of declaration	This declaration of conformity is issued under the sole responsibility of the manufacturer DAB Pumps S.p.A. Via H. P.O.S. 14 - 20030 Masiglio (PO) - Italy Tel. +39 048 512000 - Fax +39 048 512000 www.dabpumps.com
Product:	
Year of CE-marking:	The object of the declaration described above is in conformity with the relevant Community harmonisation legislation EU legislation EU legislation EU legislation
2020	and are in conformity with the following harmonized standards or other normative documents EN harmonized standards EN harmonized standards EN harmonized standards
Masiglio (PO)	Signed for and on behalf of DAB Pumps S.p.A. Group CEO

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 unit for niches, under-sink areas and similar installations. The device is designed and made for pumping solely water, free from explosive substances and solid particles or fibres, with a density of 1000 kg/m³, a kinematic viscosity of 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 installation in both indoor environments (e.g. under a sink, technical room, etc.) and outdoor installation with adequate protection from the elements (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.



This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or poor experience and knowledge, unless they are supervised or instructed in the use of the appliance by a person responsible for their safety.

Children must be supervised to ensure that they do not play with the appliance.

2.5.1 Identification

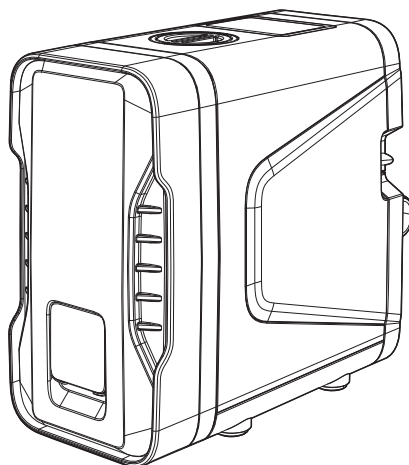


Fig. 1

2.5.2 CE marking and minimum instructions for DNA

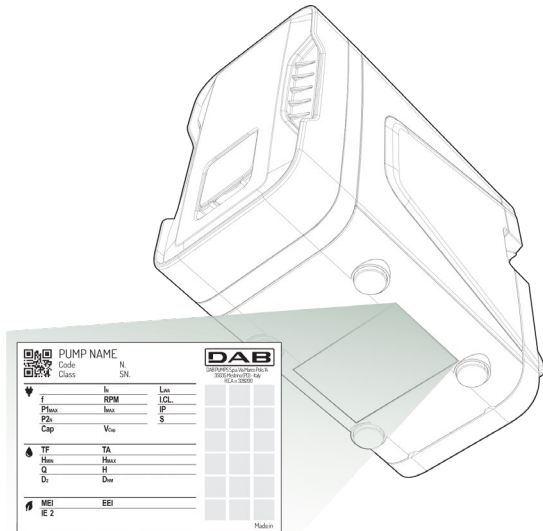


Fig. 2 Position of the CE Marking

PUMP NAME Code N. Class SN.			 DAB PUMPS S.p.A. Via Marco Polo, 14 35035 Montebelluna (TV) - Italy REA n. 325203	
	f	RPM	LWA	
	P1MAX	IMAX	ICL	
	P2N		IP	
	Cap	Vcap	S	
	TF	TA		
	HMIN	HMAX		
	Q	H		
	D2	DNM		
	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:

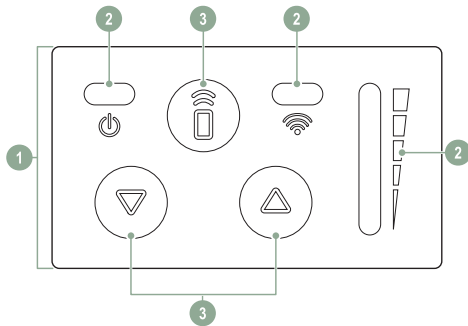


Fig. 5

1 – Graphical interface

2 – LED

Provides information on pump status.

On steady white: pump powered, motor stationary.

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

On steady green: pump enabled and running...

On steady, yellow: Pump enabled; an abnormal situation (warning) has occurred that has no effect on pump operation. Motor off. This status will be masked when the system is in fault, disabled or with Comfort Function active.

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

Flashing white: pump disabled

Flashing green/yellow: pump enabled; an abnormal situation (warning) has occurred that has no effect on pump operation. Motor on. This status will be masked when the system is in fault or disabled

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

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

Flashing orange: pump in update mode.

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

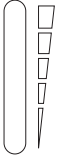
Flashing white/red: low suction pressure alarm. Only present in models with the low suction pressure detection function with the dedicated accessory. This status begins as soon as the problem is detected and automatically ends once correct conditions are restored.

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

Status
LED



IoT LED 	On steady green: local connection established – pump connected to the app.
	On steady blue: remote connection established – pump connected to the cloud
	Flashing green: local connection in progress – pump connecting to the app.
	Flashing blue: remote connection in progress – pump connecting to the cloud.
	Off: no remote connection active

Level Bar 	White: indicates the set-point values from 1 to 3 bar
	Blue: 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 sequential lighting of the LEDs from bottom to top indicates the progress status.
	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

Press the button (1s) to connect with a smartphone and App.



Press and hold the button (+1s) to start “**manual recovery mode**”, which allows you to update or reset the pump via the app if a previous update attempt was unsuccessful. This operation is permitted solely for Specialised Personnel.



Press to increase the set-point value.



To set setpoints above 3 bar, press and hold the button for at least 3 seconds.

In this configuration, the suction pressure must be sufficient to compensate for the flow rate not deliverable by the pump.

In the absence of adequate suction pressure, the system signals the warning that the pressure cannot be reached. See 7.3.6.8 Pressure cannot be reached [W0-036]



Press to decrease the set-point value.



Press the buttons together to enable or disable the pump.

Pressing and holding the buttons simultaneously (5s) allows the device to be reset.

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 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.



Carry out regular maintenance on the water supply network.



The maximum fluid inlet temperature is 50°C. In some cases (e.g. leaks and/or dripping taps), the device may increase the fluid inlet temperature by up to approx. 10°C. The overheated liquid is discharged in a few seconds and does not pose a risk of burns.



In the event of connections to hot water networks, temperatures of 60°C could be reached inside the product. Take care during maintenance work. Wait for the product to cool down before starting work.



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 blocking impurities.



Installing an inlet filter may reduce 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). If a suction filter is installed, care must be taken to carry out proper maintenance and cleaning (replace the cartridge and clean it according to the filter manufacturer's instructions). Cleaning at least once a year is recommended to prevent it from introducing additional pressure losses during use.

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!

Over head installation is not recommended.

It is advisable to install 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. See A3.3 Installation with expansion tank

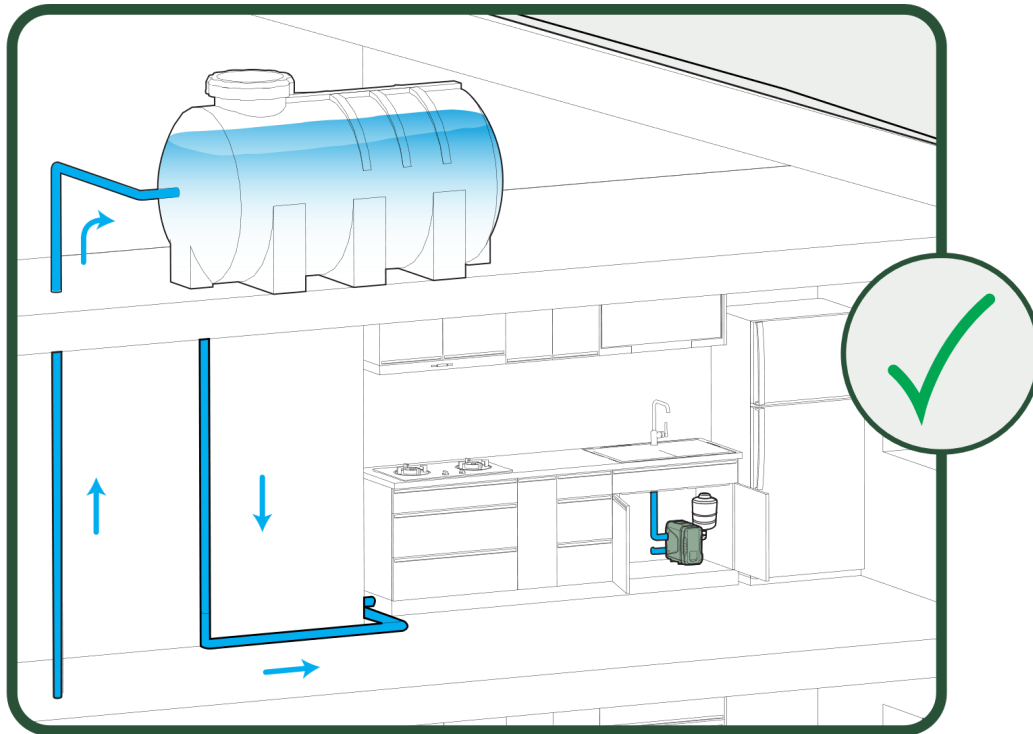


Fig. 6 Example of under-sink installation

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 rinsing the internal hydraulic circuits before first use and flushing the pump briefly with clean water before final installation, in order to remove any internal residues...
- 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 rated current of the protective circuit-breakers must be selected and sized, in compliance with the general rules of the installation country, according to the technical data indicated in Table 5. The characteristics of the residual current devices must be selected according to the general rules of the installation country and in accordance with the enclosed 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

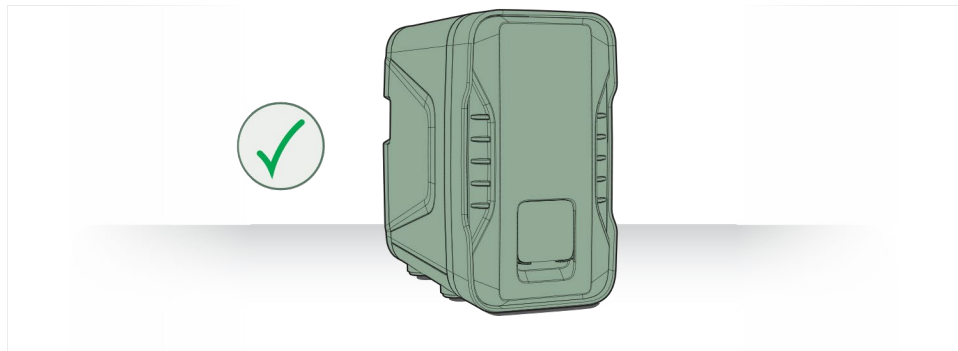


Fig. 7 permitted position

Prohibited positions

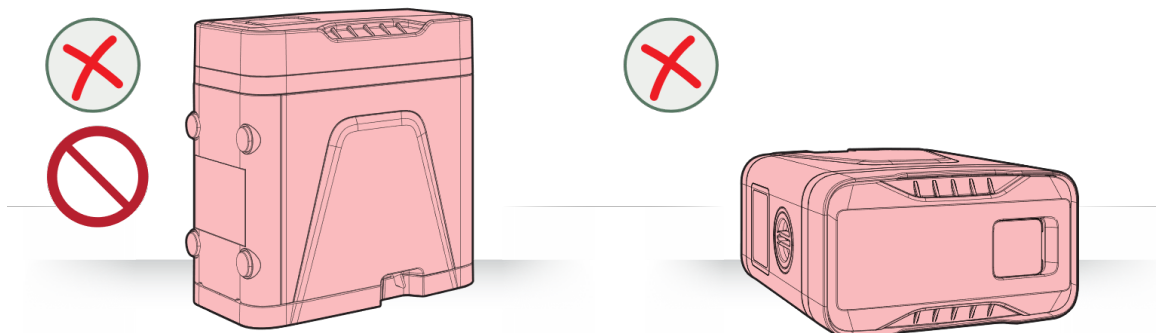


Fig. 8 prohibited positions

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

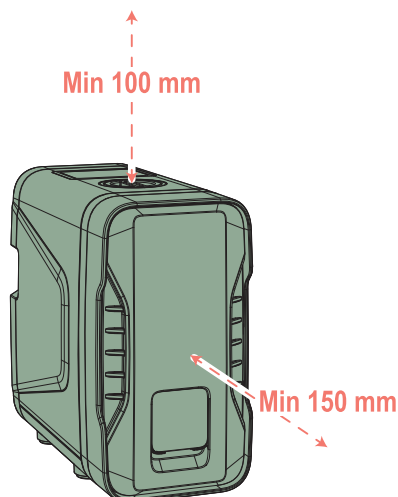


Fig. 9 Minimum clearances to be ensured



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 Installation with Quick Connection**.



To ensure continuity of service, the installation of a bypass pipe to the pump (with suitable control valves) is recommended to facilitate maintenance.

5.3 Prevention of non-potable water backflow

Drinking water distribution systems, water intended for human consumption (DIRECTIVE (EU) 2020/2184), must be constructed in accordance with good practice and protected from external contamination; see also the EN 806 series of standards.

Contamination in a drinking water supply system can occur due to:

- reverse siphonage: due to a partial vacuum (pressure drop) in the drinking water supply system (for example due to operation of a valve, a pipe rupture, operation of a water pressurization pump, excessive water demand in part of the system, or the drawing of water for emergency use from a firefighting hydrant);
- back pressure: originating in a non-potable water system in which the pressure exceeds that of the drinking water system;
- regrowth: contamination due to recontamination in drinking water;
- drinking water stagnation (e.g. due to interruptions in operation and disconnections, see EN 806 series) in systems can lead to a deterioration in water quality due to a significant concentration of substances released from materials or microbial growth.

The level of deterioration depends on the materials used, the water quality, the ambient temperature (e.g. drinking water piping in boiler rooms) and the duration of stagnation.



Insufficient or improper maintenance of the drinking water system, including backflow protection devices, can compromise water quality. For correct maintenance, see EN 806-5.



Before connecting to the public water supply, it is necessary to liaise with the water utility provider in order to assess any specific requirements. Ensure that all requirements of the water service provider, as well as applicable national regulations and standards, have been fulfilled before carrying out the final connections and system hook-up.



Once the requirements imposed by the water service provider have been fulfilled, verify that the minimum flow rate guaranteed by the mains/water supply at the equipment connection point is sufficient to meet the required flow rate and the downstream users intended to be operated simultaneously.



The following table lists the typical minimum flow rates for the anticipated downstream loads. Check with your installer to determine the actual anticipated simultaneous usage.

Sanitary appliance	Minimum flow rate (l/min)	Minimum flow rate (gpm)
Washbasin	6	1.58
Bidet	6	1.58
WC with cistern	6	1.58
WC with rapid refill	60	15.8
WC with flow meter	60	15.8
Bath	24	6.34
Shower	12	3.17
Kitchen sink	12	3.17
Washing machine	12	3.17
Dishwasher	12	3.17
Urinal (operated)	9	2.37
Garden tap	30	7.92
Drain DN 20	90	23.7



In the event of a branch off the household drinking water network for mixed and other uses, i.e. when the water could become contaminated, category 1 liquid could be altered according to the categories exemplified:



Fluid category	Description
Category 1	Water intended for human consumption coming directly from a drinking water distribution system.
Category 2	Fluid recognised as fit for human consumption, including that taken from a drinking water distribution system, that has undergone a change in taste, odour, colour, or an active change in temperature (heating or cooling).
Category 3	Fluid that presents a slight hazard to human health due to the presence of one or more harmful substances with low acute toxicity, to be determined using the LD ₅₀ method ≤ 200 mg/kg.
Category 4	Fluid that presents a significant hazard to human health due to the presence of one or more toxic or very toxic substances with high acute toxicity, to be determined using the LD ₅₀ method ≤ 200 mg/kg, or one or more carcinogenic, mutagenic and reprotoxic (CMR) substances.
Category 5	Fluid that presents a hazard to human health due to the presence of microbiological or viral elements.

Table 2

A backflow-prevention device must be installed between the user equipment with potential for contamination and the water network for human use, according to the following table:

- *Covers the risk*
- *Covers the risk if pressure equals atmospheric pressure*
- *Does not cover the risk*

Code	Protection unit	Category of fluids downstream of the pump			
		2	3	4	5
AA	Unrestricted air gap	●	●	●	●
AB	Air gap with non-circular overflow (unrestricted)	●	●	●	●
AC	Air gap with submerged inlet and air inlet + overflow	●	●	-	-
AD	Air gap with injector	●	●	●	●
AF	Air gap with circular overflow (restricted)	●	●	●	-
AG	Air gap with minimum circular overflow	●	●	-	-
BA	Backflow-prevention device with controllable reduced pressure zone	●	●	●	-
CA	Backflow-prevention device with non-controllable pressure zones	●	●	-	-
DA	In-line anti-vacuum valve	○	○	-	-
DB	Pipe interrupter with atmospheric vent and moving element	○	○	○	-
DC	Pipe interrupter with permanent atmospheric vent	○	○	○	○
EA	Testable anti-pollution non-return valve	●	-	-	-
EB	Non-testable anti-pollution non-return valve	●	-	-	-
EC	Testable anti-pollution double non-return valve	●	-	-	-
ED	Non-testable anti-pollution double non-return valve	●	-	-	-
GA	Mechanical disconnecter with direct actuation	●	●	-	-
GB	Mechanical disconnecter with hydraulic actuation	●	●	●	-

Table 3 Appropriate protection units for each fluid category

5.3.1 Typical connections - EXAMPLES

Symbols Key	
	Domestic drinking water connection.
	Safety device for the tank overflow.
	Protection unit as per Table 3.
	Esybox Pop pump.

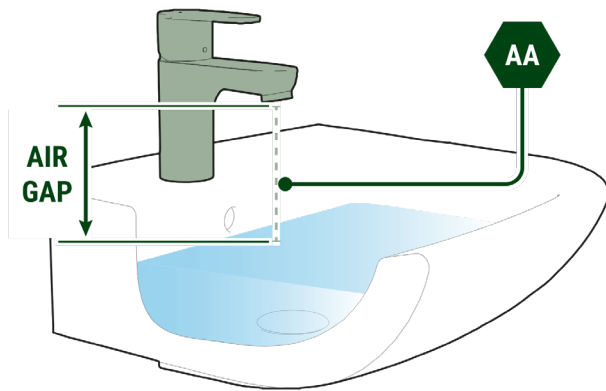
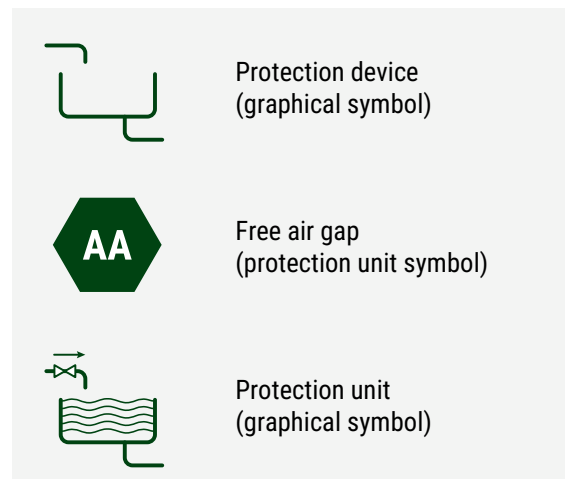
WASHBASINS, SINKS, LAUNDRY TUBS, SHOWERS, BIDEETS

In this series of applications, due to contact with biological elements, the contained fluid always reaches category 5.
At the connection point, a protection device compliant with Table 3 must be installed, for example a type AA protection unit.

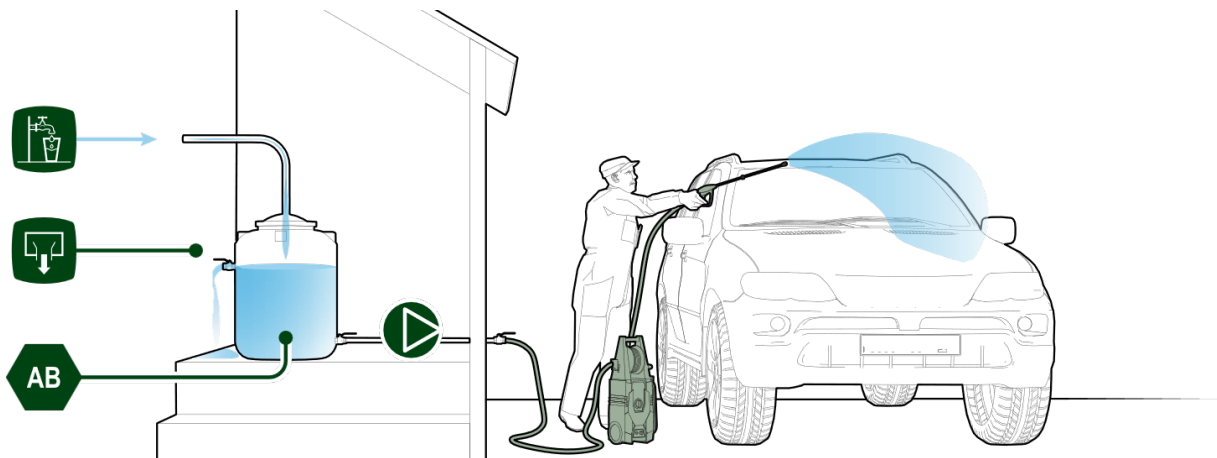


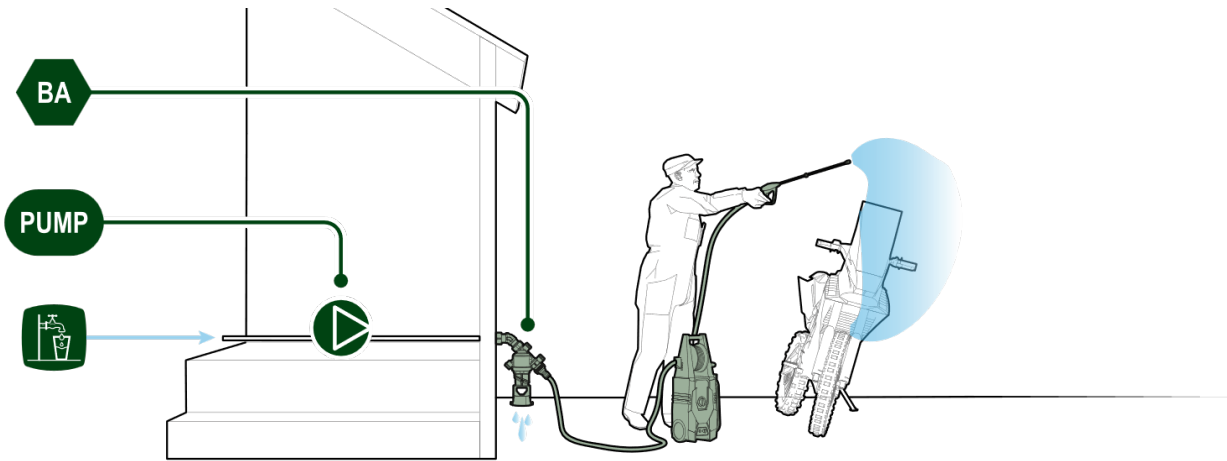
ATTENTION!

The presence of a suitable air gap downstream of the pump does not require any additional backflow prevention, disconnection or anti-pollution devices. Do not tamper with or alter the air-gap distance.



WASHING SYSTEMS – PRESSURE WASHERS and similar





In the case of portable pressure washers, including for domestic use, detergents containing hazardous additives are added to the fluid. In this case too, the fluid reaches category 4. At the connection point, a protection device compliant with Table 3 must be installed, for example a type AB or BA device. Always check the instructions for the connected equipment.



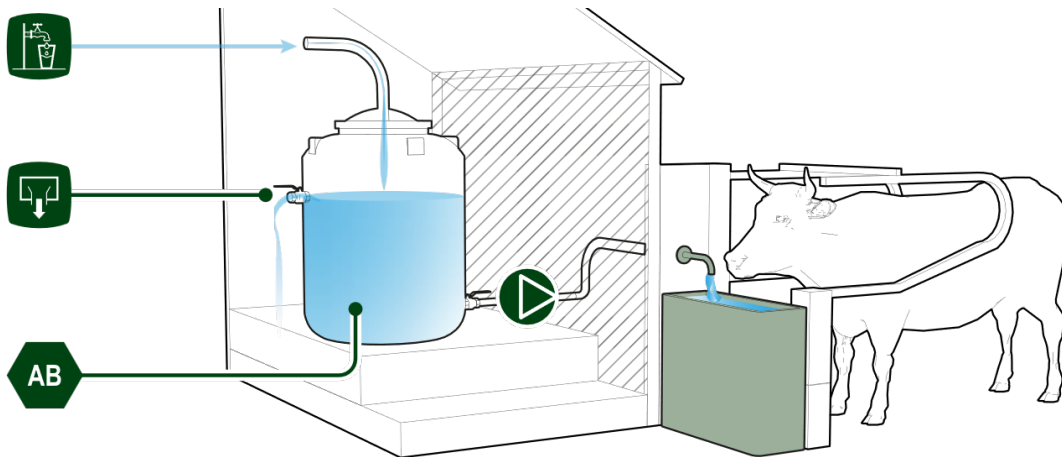
(ONLY FOR UK – National Requirements/National legislation – To be compliant with the Water Regulations Advisory Scheme (WRAS Guidance Clause G15.1) and the Water Supply (Water Fittings) Regulations 1999, in the presence of pumps with a flow rate greater than 12 l/min it is necessary to make a request and notification of connection (Notification of Proposed Work) and to install a break tank (with a proper air gap that depends on fluid category) in order to avoid excessive draw-off and cause backflow issues)

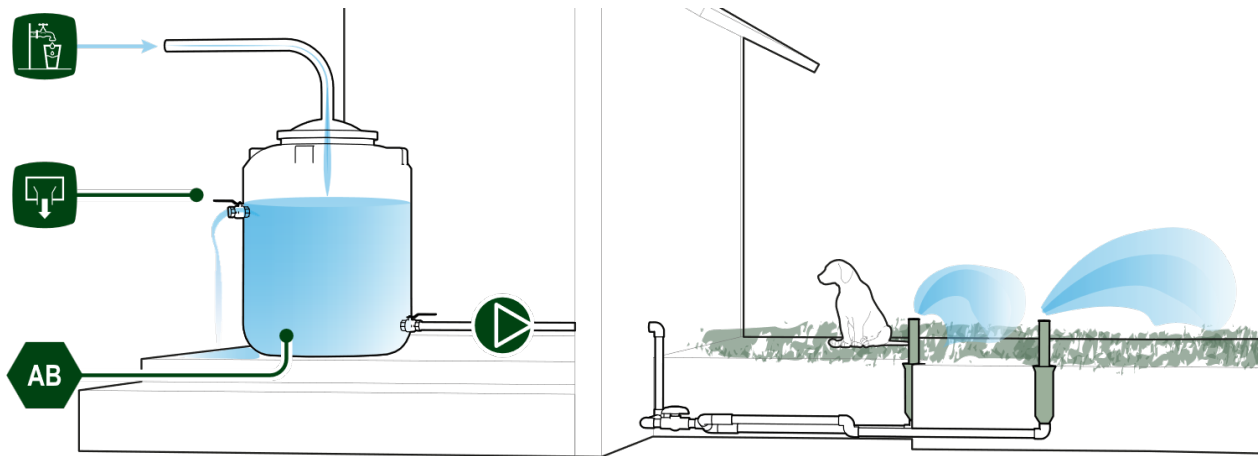
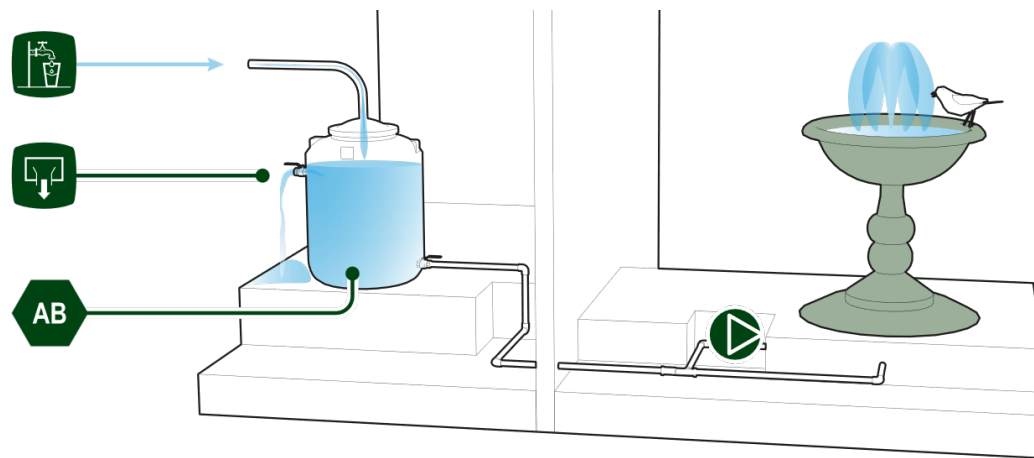


DRINKING SYSTEMS, FOUNTAINS and GREEN AREA IRRIGATORS

In this series of applications, due to contact with animals or biological elements, the contained fluid always reaches category 5.

At the connection point, a protection device compliant with Table 3 must be installed, for example a type AB protection unit/device.





5.4 Priming

Under Head Installation

Once installed in the system, 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.

Over Head Installation

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



ATTENTION!

Over head installation is not recommended.



Install a non-return valve on the suction line, positioned at the end of the pipe opposite the pump, in order to facilitate pump priming. If there is a risk of air becoming trapped in the suction pipe, vent it. The suction pipe must then be properly vented. Install a non-return valve (foot valve) on the suction line at the end of the pipe opposite the pump, in order to allow priming. The pump is not self-priming; therefore, installation of the valve is a necessary condition for priming. If there is a risk of air becoming trapped in the suction pipe, vent it. The suction pipe must 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

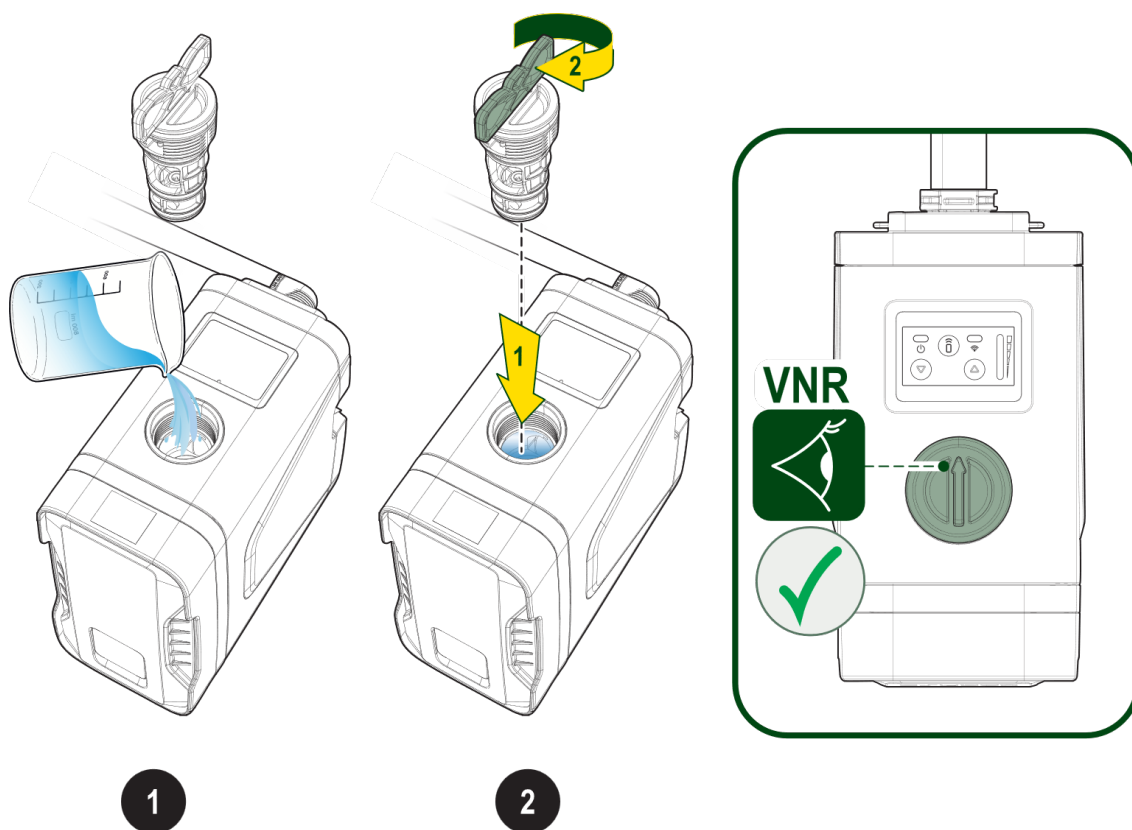


Fig. 10 Filling – Correct position of NRV cap

5.5 Installation configuration

Place the pump on a solid support base as it is not fitted with adjustable feet. During installation, take into account the distances indicated in section 5.1 Minimum clearances from fixed installations.



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.

5.6 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 $\frac{3}{4}$ " 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**

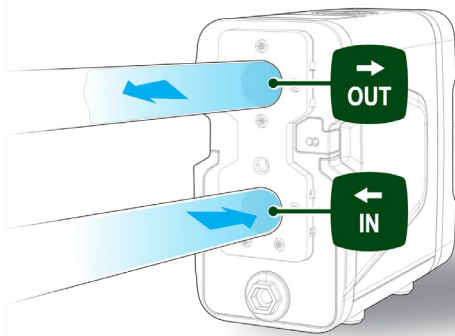


Fig. 11 Suction and delivery

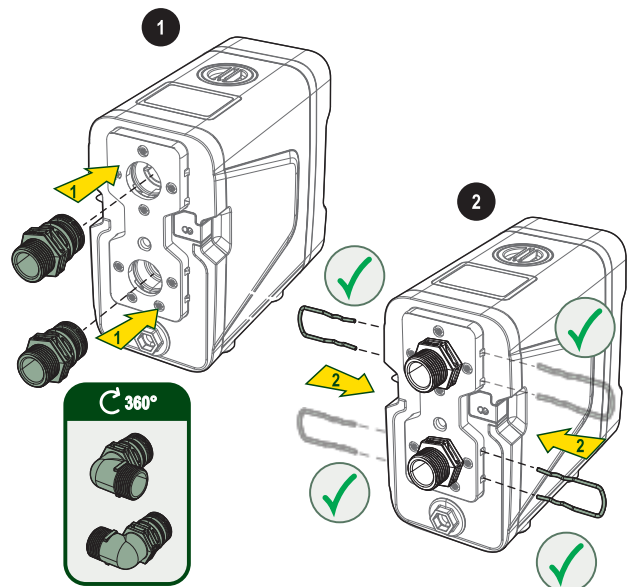


Fig. 12 Connectors and fork clamps

5.7 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 4



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.



For appliance with Y-type connection: if the power cable is damaged, it must be replaced by the manufacturer or authorised technical support service to avoid any danger. In the case of swimming pool pumps: the pump **MUST NOT** be used if there are people in the water.



Electronic pumps with an integrated variable frequency drive generate earth leakage currents higher than those of traditional motors, due to the presence of DC conversion, PWM modulation and high-frequency components. To ensure system safety and avoid nuisance tripping, residual current devices suitable for use with power electronic equipment must be adopted.

The electrical installation for the pumps must be equipped with a residual current device with $I_{\Delta n} \leq 30$ mA, an efficient earthing system, suitable equipotential bonding (EQP) and power supply with class II cable.



The appliance is equipped with a means of disconnection (plug)

Disconnect the power supply and wait 15 seconds when carrying out maintenance, removal, moving and cleaning operations.



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.

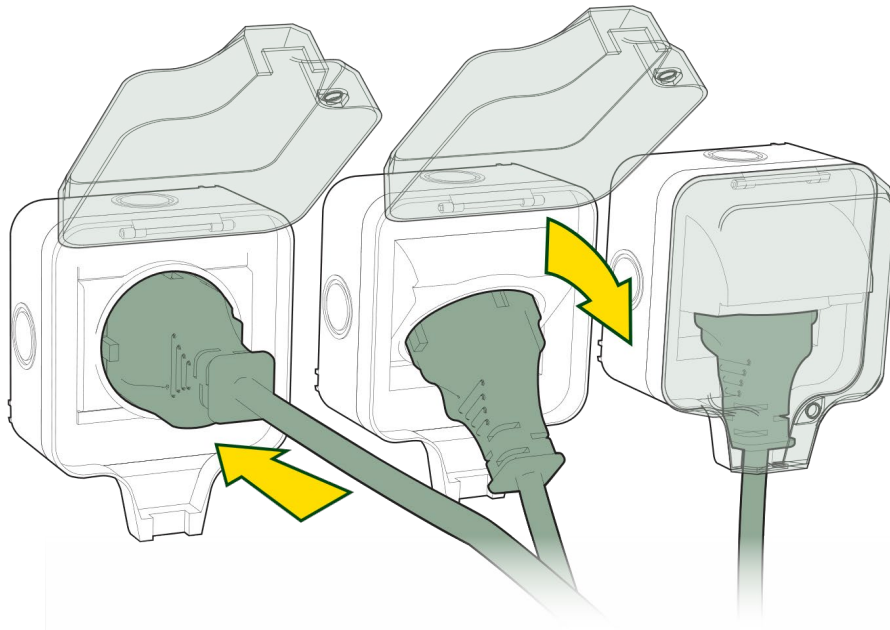


Fig. 13 Example of socket with guaranteed IP X5 even when plug inserted

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

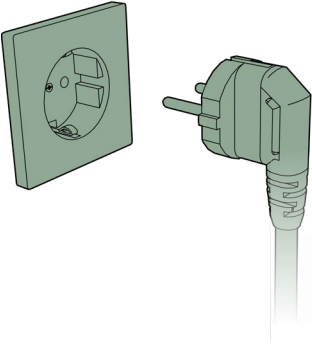
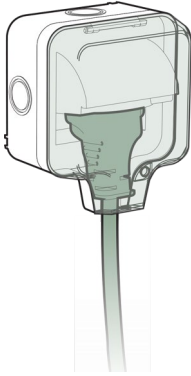
IPX4	IPX5
	
<p>P30 2P+E 16A 250 Vac socket. Indoor residential, garden or sheltered terrace.</p>	<p>P30 2P+E 16A 250 Vac socket with watertight cap, minimum IPX5 with plug inserted. Environments with heavy impacts, water jets, and stress and pulling on the cable.</p>

Table 5 IP rating in relation to the type of socket

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, consider draining the water system, including any incorporated accessories and equipment capable of holding water. See paragraph 8.2 Emptying 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 Emptying the product. 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 and make sure that the status LED is flashing white



De-energise the socket or, if this is not possible, make sure that the pump is de-energised by pressing the buttons simultaneously
Unplug the device.

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 = **0.5 bar (0.05 Mpa)**;
- Anticycling function: Default **Smart**
- Antiblock function: Default **Enable**
- Antifreeze function: Default **Enable**

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

$$P_{\text{START}} = SP - RP = 2.0 - 0.5 = 1.5 \text{ bar (0.15 Mpa)}$$

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

$$P_{\text{STOP}} = SP = 2.0 \text{ (0.2 Mpa)}$$

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 20m in height, due to the pressure exerted on the pump sensor by the overlying water column.

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 of time. 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 more than one comfort function is running in the same time interval, the system executes 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 (C1) 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 2.0 bar (0.2 MPa) and RP is 0.5 bar (0.05 MPa), the pump restarts at 1.5 bar (0.15 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

Indicates a pressure increase, as a percentage of the setpoint (SP) value, which is applied immediately before the pump shuts down (e.g. if SP = 1 bar and Smart Restart = 10%, the pump will maintain 1 bar during operation and, when shutting down, will increase the pressure to 1.1 bar).

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) Anticycling function enable

The Anticycling 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) Antiblock function enable

The Antiblock 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 antiblock cycle every 23 hours.

7.2.3.12 (AF) Antifreeze function enable

If activated, the antifreeze 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

It is possible to update the pump firmware via the H2D App or via cloud access, see A4 APP, CLOUD AND SOFTWARE UPDATES.

7.2.3.17 Restoring parameters to factory settings.

To restore factory settings, refer to chapter 7.1.7 Restoring Factory Settings

7.2.3.18 (EF) Expansion functionality

This function allows you to define the behaviour of the expansion connector and the mode in which the pump manages the accessories connected to this interface.

The parameter can be set to two different operating modes:

DW: default mode. At start-up, the pump automatically detects any suction pressure sensor, enabling its management if present.

Float: forces the system to monitor a digital float (ON/OFF) installed on an external tank, used to signal low water level.

When "Float" mode is active, the pump continuously monitors the float status. If a low water level condition is detected, operation is stopped immediately and the system enters "F1" lock state. This condition is indicated by the status LED flashing alternately white and purple, at a rate of half a second each.

Return to normal operation occurs automatically when the float stably indicates the presence of water for at least 10 seconds.

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 Anticycling (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 anticycling 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.



To avoid excessively frequent restarts due to leaks within the system, we recommend installing an expansion tank. The expansion tank, to be assessed in relation to the type of installation, must be appropriately sized according to the characteristics of the system. Dab recommends using an expansion tank with a minimum capacity of 1 litre and a recommended capacity of 2 litres. Expansion tanks suitable for contact with drinking water/water for human use must be used, suitable for the temperatures envisaged for use.

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

7.3.2 Antifreeze (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 Antifreeze 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.



The system could start spontaneously after the protection triggers and rearms. Close taps completely when unattended. Potential flooding hazards.

7.3.4 Antiblock

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 antiblock 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 Anti-drip (Drip protection)

The system is equipped with an integrated protection function called "Anti-drip", designed to limit overheating of the fluid due to close start/stop cycles, typical of small leaks in the system or dripping that causes a normal pressure drop. (If it is not possible to resolve these leaks, we recommend installing an expansion tank to limit their effect on system pressure), see A3.3 Installation with expansion tank.

In this mode, the system behaves as follows:

1. **Stop and Stand-by:** The pump stops and the display indicates the Anti-drip lockout; see 7.3.7.11 Lockout for "Anti-drip" function. The system remains in stand-by for 2 minutes.

Note: In this phase the pump is stopped; therefore, system pressure could drop to zero.

2. **Restart test:** At the end of stand-by, or following a manual restart*, the pump makes a brief start attempt (approx. 1.5 seconds) to check for any water demand from the system by reading a minimum flow rate.
3. **Exiting the mode:** If during the test (or at any time during stand-by) the sensor detects a water flow, the system deactivates the Anti-drip protection and resumes normal operation. If the flow does not continue for at least 3–4 seconds, the cycle repeats.

* **Manual Restart:** During the waiting phase, it is possible to force a restart attempt by pressing the   buttons simultaneously

To restore operation or prevent lockout:

- **Check system:** Inspect the hydraulic system to identify and eliminate any leaks.
- **Install expansion tank:** to ensure optimal operation and avoid frequent triggering of the protection, we recommend eliminating any micro-leaks. If this is not possible, we suggest installing a suitable expansion tank on the delivery side (see section A3.3 Installation with expansion tank).



Carry out regular maintenance on the water supply network



The system could start spontaneously after the protection triggers and rearms. Close taps completely when unattended. Potential flooding hazards.



The maximum fluid inlet temperature is 50°C. In some cases (e.g. leaks and/or dripping taps), the device may increase the fluid inlet temperature by up to approx. 10°C. The overheated liquid is discharged in a few seconds and does not pose a risk of burns.



In the event of connections to hot water networks, temperatures of 60°C could be reached inside the product. Take care during maintenance work. Wait for the product to cool down before starting work.



To avoid excessively frequent restarts due to leaks within the system, we recommend installing an expansion tank. The expansion tank, to be assessed in relation to the type of installation, must be appropriately sized according to the characteristics of the system. Dab recommends using an expansion tank with a minimum capacity of 1 litre and a recommended capacity of 2 litres. Expansion tanks suitable for contact with drinking water/water for human use must be used, suitable for the temperatures envisaged for use.

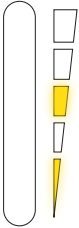
See paragraph **7.3.6 Alarms identified by the system** for more information on the specific alarm signal.

7.3.6 System alarms



The errors listed below are also identified via the App with an extended explanation; we recommend checking them in the product App.

7.3.6.1 Alarm signalling abnormal temperature [W0-018]

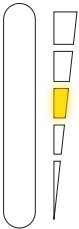


LEDs 1 and 3 yellow, on.

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.

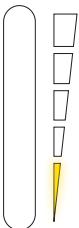
7.3.6.2 Alarm signalling abnormal temperature [W0-016]



LED 3 yellow, on.

If the device detects an abnormal 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.

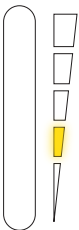
7.3.6.3 "Anticycling" function running [W0-023]



LED 1 yellow, on.

When the Anticycling Smart function is running.

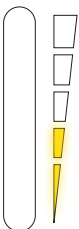
7.3.6.4 "Antiblock" function running [W0-001]



LED 2 yellow, on.

When the Antiblock function is running.

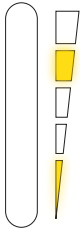
7.3.6.5 "Antifreeze" function running [W0-024]



LEDs 1 and 2 yellow, on.

When the Antifreeze function is running.

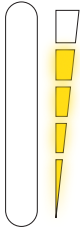
7.3.6.6 Abnormal voltage [W0-015]



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 [W1-001]



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

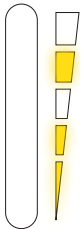
Power limitation implemented by the HV board against motor overheating.

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.

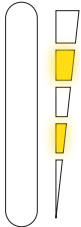
7.3.6.8 Pressure cannot be reached [W0-036]



LEDs 1, 2 and 4 yellow, on.

The pump, set for boosting, signals "*Pressure cannot be reached*" when it cannot reach the setpoint pressure due to insufficient suction pressure. The pump restarts when water flow is requested again by a domestic user (for example, opening a tap) or following a manual restart of the device. The "*Pressure cannot be reached*" warning remains active until the setpoint is reached or the system is restarted; see 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 EEPROM write error/warning [W0-032]



LEDs 2 and 4 yellow, on.

The pump signals an internal error when it is unable to save the set configurations. In this condition, the system no longer stores settings and does not learn new values, while continuing to operate. If this alarm triggers, contact technical support immediately.

7.3.7 System locks



The locks listed below are also identified via the App with an extended explanation; we recommend checking them in 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 dry run*

(F1-035) *Lock due to abnormal voltage* ⁽²⁾

(F1-033) *Lock due to abnormal temperature caused by overheating of the power terminals*

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

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

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

(F0-043) *Lock due to water system anti-drip function - pump inhibited by excessive restarts*

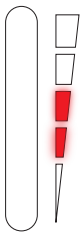
For example, if the pump locks due to lack of water, the device automatically starts a test procedure to check if the machine/equipment has definitively and permanently run out of water. If an attempt to reset is successful during the sequence of operations (e.g. the water has come back on), the procedure 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 waiting time that progressively doubles with the number of attempts made: e.g. first attempt after a 1-minute wait, second attempt after a 2-minute wait, 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 6: Auto reset of locks

Signalling of Locks

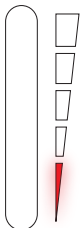
7.3.7.1 Lock due to abnormal temperature [F1-032]



LEDs 2 and 3 red, on.

- 1- *Liquid temperature above permitted threshold.*
Automatic reset on reaching the permitted temperature.
- 2- *Hot fluid.*
Automatic reset on reaching the permitted temperature.

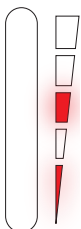
7.3.7.2 Lock due to fluid overheating [F0-015]



LED 1 red, on.

Fault on the water temperature sensor.

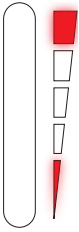
7.3.7.3 Lock due to abnormal temperature [F0-012]



LEDs 1 and 3 red, on.

- 1- *Low voltage board temperature above permitted threshold.*
Automatic reset on reaching the permitted temperature.
- 2- *Ambient temperature too high.*
Automatic reset on reaching the permitted temperature.

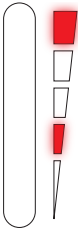
7.3.7.4 Lock due to reading error on delivery pressure sensor [F0-005]



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.

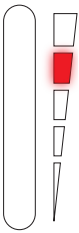
7.3.7.5 Lock due to reading error on suction pressure sensor [F0-006]



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.

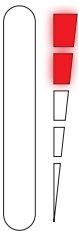
7.3.7.6 Lock due to abnormal voltage (HV HARDWARE) [F0-008]



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

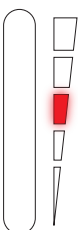
7.3.7.7 Lock due to current overload or HV internal error [from F1-013 to F1-020]



LEDs 4 and 5 red, on.

- 1- *Excessive temperature at power terminals.*
Automatic reset on reaching the permitted temperature.
- 2- *Motor current overload.*
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 anticycling [F0-022]

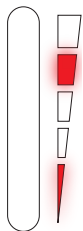


LED 3 red, on

Triggering of the anticycling protection (Basic mode) due to excessive cyclical starts.

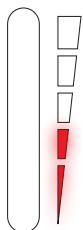
Manual reset by pressing   buttons.

7.3.7.9 Lock due to dry run [F1-027 and F1-028]



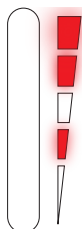
LEDs 1 and 4 red, on.
Triggering of the dry run overheating protection.
Automatic reset after 6 minutes with the pump powered.

7.3.7.10 Lock due to dry run [F0-021]



LEDs 1 and 2 red, on.
Triggering of the dry run protection.
Automatic reset as per 7.3.3 Dry-Run (Protection against dry run).

7.3.7.11 Lock due to water system anti-drip - pump inhibited by excessive restarts [F0-043]



LEDs 2, 4 and 5 red, on.
Triggering of the Anti-drip protection.

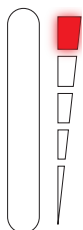


To avoid excessively frequent restarts due to leaks within the system, we recommend installing an expansion tank. The expansion tank, to be assessed in relation to the type of installation, must be appropriately sized according to the characteristics of the system. Dab recommends using an expansion tank with a minimum capacity of 1 litre and a recommended capacity of 2 litres. Expansion tanks suitable for contact with drinking water/water for human use must be used, suitable for the temperatures envisaged for use.



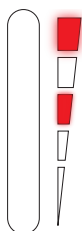
For more details on the type of error, see the H2D app or the H2D Desktop web portal, or refer to section 7.3.5 Anti-drip (Drip protection) in this manual.

7.3.7.12 Lock due to invalid product [F0-017]



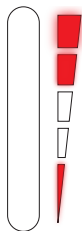
LED 5 red, on.
Lock due to software not valid for the product. Contact technical support.

7.3.7.13 Lock due to power supply out of range [F0-026, F0-027 and F0-030]



LEDs 3 and 5 red, on.
Lock due to Abnormal voltage on Low Voltage board. Contact technical support.

7.3.7.14 Lock due to HV internal error [F1-021 and F1-022] or communication error [F0-018]



LEDs 1, 4 and 5 red, on.
Lock due to invalid High Voltage configuration or communication error between Low Voltage and High Voltage boards. Contact technical support.

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 F1-025, F1-026, F1-027, F1-028, wait at least 6 minutes with the machine/equipment powered for the lock status to reset automatically.



If the error does not reset, contact technical support.

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 the event of connections to hot water networks, temperatures of 60°C could be reached inside the product. Take care during maintenance work. Wait for the product to cool down before starting work.



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 and waiting at least 5 minutes to ensure that any residual charge in the electronic components has dissipated.

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. carry out a pre-drain via the access cap to the motor shaft by carefully unscrewing it (see **Fig. 21 Access to motor shaft**);
6. disconnect the pump hydraulically from the pipes or from the dock;
7. fully drain the pump by carefully unscrewing and removing the drain cap (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.

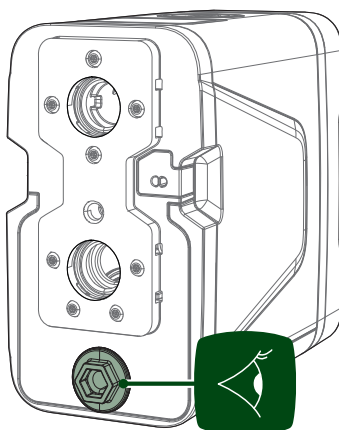


Fig. 14 Drain cap



RISK OF FLOODING. If the pump's delivery system has not been isolated, the 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.

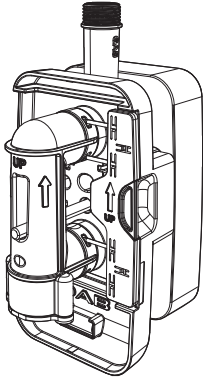
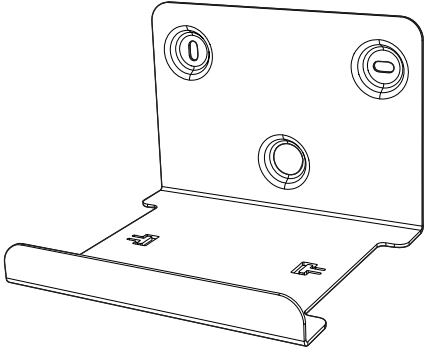
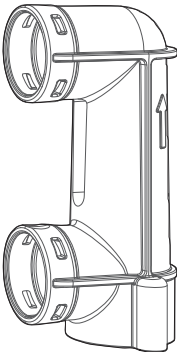
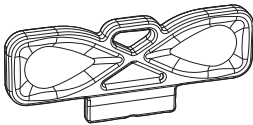
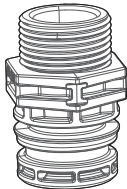
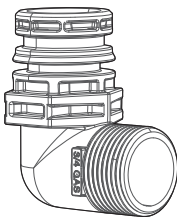
Whilst essentially empty, the product cannot expel all the water inside it. A little water is likely to come out of the product while it is being handled after draining.

8.3 Spare parts

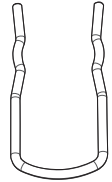
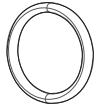
Refer to the product's Spare Parts Booklet, available and accessible via QR code.



8.4 List of Interchangeable Accessories / Equipment

<p>Esydock Pop</p>	
<p>Esywall Pop</p>	
<p>Bypass</p>	
<p>Key for NRV cap</p>	
<p>Straight connector (2pcs)</p>	
<p>Elbow connector (2pcs)</p>	

ENGLISH

Clammer (2pcs)	
O-ring (2pcs)	

APPENDIX SECTION

A1. TECHNICAL DATA

	ESYBOX POP	ESYBOX POP 115
Supply voltage (V)	220-240	110-127
Frequency (Hz)	50/60	
Pumps maximum rated current (A)	1.4	5
Pumps maximum rated power (W)	300	
Motor insulation class	F	
Minimum head (m / ft)	3 / 9.8	
Maximum head (m / ft)	33 / 108.3	
Maximum flow rate (l/min)	64 at minimum head	
Protection degree	IP X4 / IP X5 (see <i>Table 3</i>)	E.Type 2R
Earth leakage current	<1.5mA	< 1 mA
Ambient operating temperature range (°C / °F)	4 min to 50 max / 39.2 min to 122 max	
Liquid temperature range (°C / °F)	5 min to 50 max / 41 min to 122 max	
Storage temperature (°C / °F)	-	
Storage humidity	50 - 70%	
Radio network protocols	<p>Operating frequencies*:</p> <ul style="list-style-type: none"> ▪ Wi-Fi: (802.11 b/g/n/ax) ▪ Bluetooth: Bluetooth 5 (LE) ▪ IEEE 802.15.4 <p>Transmission power:</p> <ul style="list-style-type: none"> ▪ Wi-Fi: 20.5 dBm ▪ Bluetooth: 19 dBm ▪ IEEE 802.15.4: 19 dBm <p>*in accordance with national regulations where the product is installed</p> <p>The device includes radio equipment with related software designed to guarantee correct operation as envisaged by DAB Pumps S.p.A.</p>	
Maximum suction pressure (bar / MPa / psi)	3/0.3 / 43.5	
Minimum suction pressure (bar / MPa / psi)	0 / 0 with no air in suction line	
Sound pressure dB(A) @20m-15l/min	40 dB at 1 bar 10 l/min with "Sleep Mode" active	
Maximum altitude (a.s.l.) (m / ft)	2000 / 6561	2300 / 7546
Pump Weight (kg / lbs)	4.360 / 9.6	
Weight of Pump + basic Dock (kg / lbs)	4.826 (4.360 + 0.466) / 10.6 (9.6 + 1)	
Weight of Pump + Dock with suction sensor (kg / lbs)	4.940 (4.360 + 0.580) / 10.8 (9.6 + 1.2)	
Pump dimensions (mm)	See Fig. 15	
Pump + Dock dimensions (mm)	See Fig. 16 and Fig. 17	
Type of service	S1 (continuous)	
Nominal pressure	PN 6	
Recommended water hardness (°f)	6-10	

Table 7: Technical data

Product and fitting dimensions

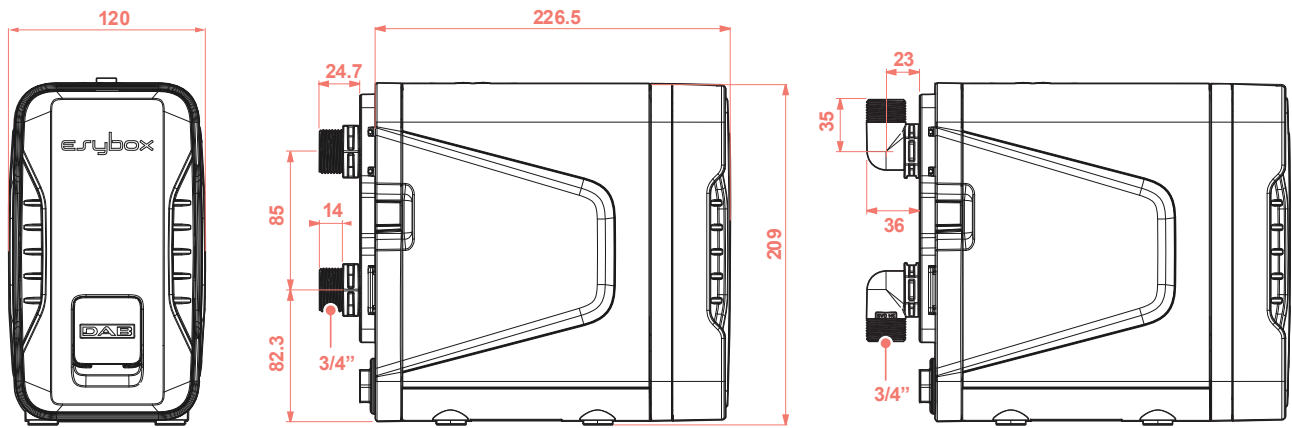


Fig. 15 Pump dimensions

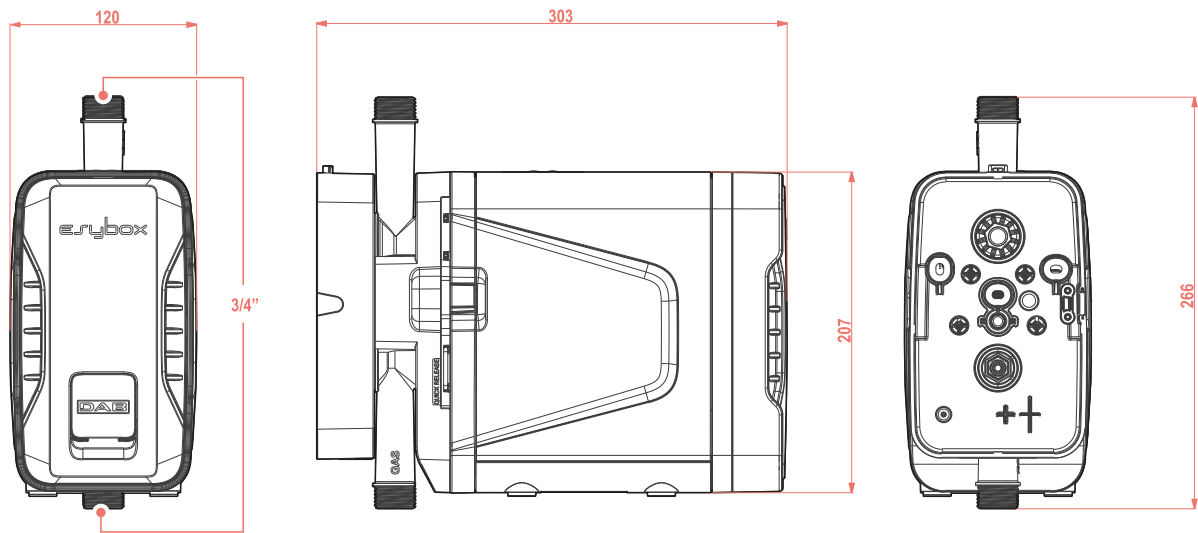


Fig. 16 Pump + Esydock Pop dimensions including vertical fitting clearances

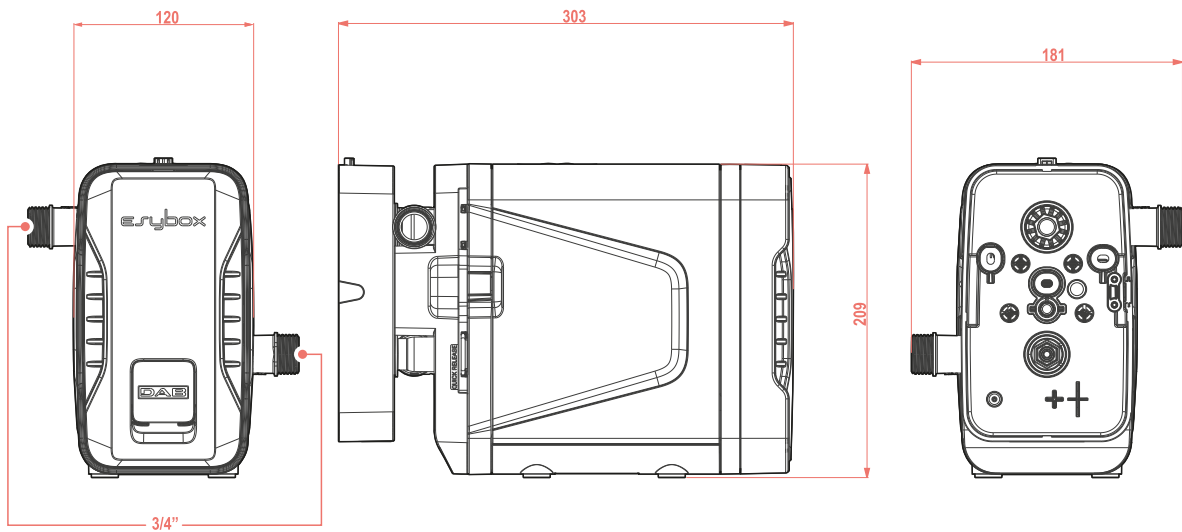


Fig. 17 Pump + Esydock Pop dimensions including horizontal fitting clearances

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 	Suction pressure enable	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	Antiblock function	0 (Disabled)	0 (Disabled)	
AF	Antifreeze	0 (Disabled)	0 (Disabled)	
AY	Anticycling function	2 (Smart)	2 (Smart)	

Table 8



DW version: parameters only available in combination with low suction pressure dock (Low Pressure Suction)

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 connected/disconnected.

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.;
- easy for technical support to replace with a spare ESYBOX POP pump for extraordinary maintenance.

Fig. 18 shows the pump mounted on the dock.

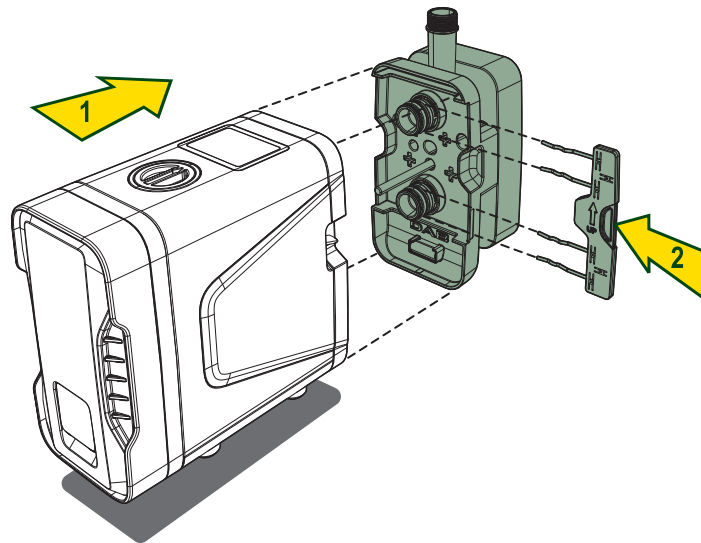


Fig. 18 Quick connection with Dock

Dock version with suction pressure sensor

DAB provides an accessory kit, called **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 connected/disconnected.

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 at the suction port, which provides a function designed to monitor low-pressure/no-water conditions and automatically stops the pump, preventing dry running and cavitation; in this way, it avoids drawing water from the water mains when the network pressure is insufficient; the system can generate an alarm and, when normal conditions are restored, allow restart according to the set logic (delay, attempts, configurable thresholds);
- easy for technical support to replace with a spare ESYBOX POP pump for extraordinary maintenance.

Fig. 19 shows the pump mounted on the dock.

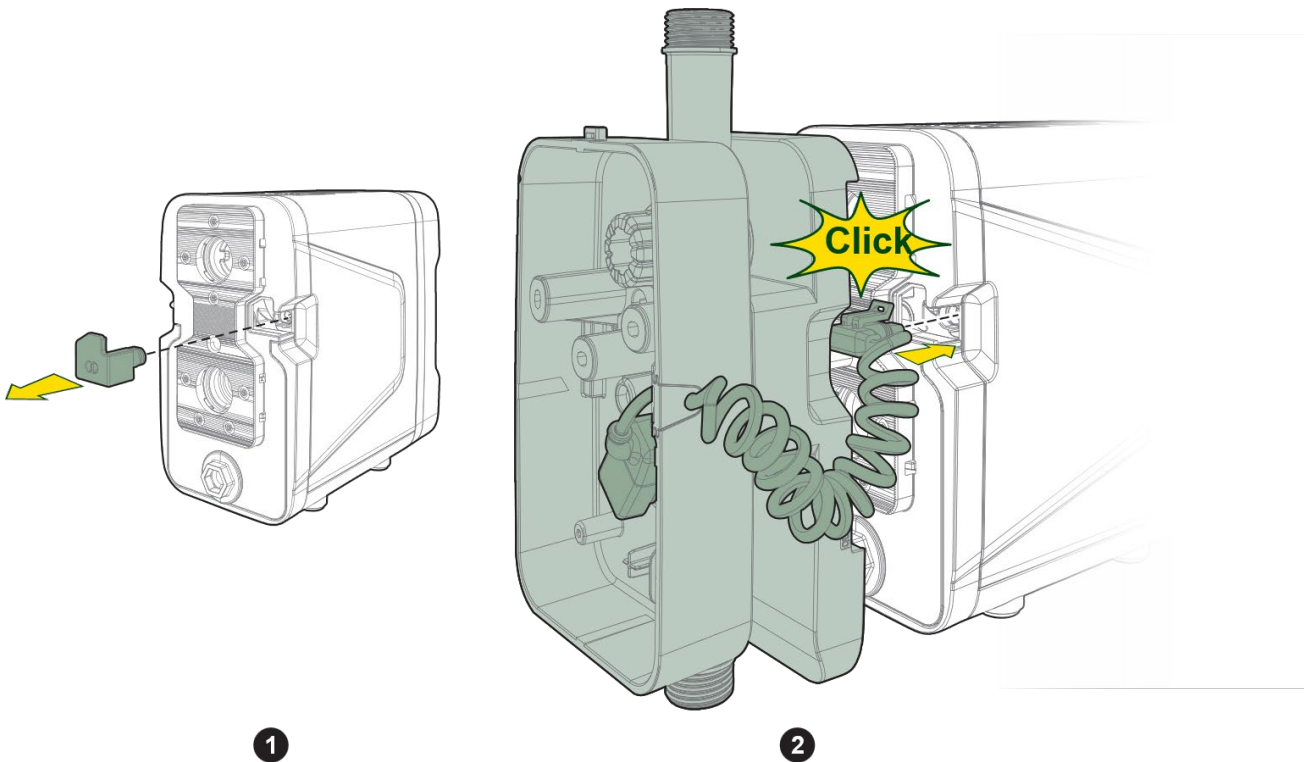


Fig. 19 Pressure sensor connection from Dock base to pump

A3.2 Installation with ESYWALL POP

DAB provides a bracket kit, called **ESYWALL POP**, as an optional mount for the pump. The bracket allows the pump to be mounted at any height off the floor. We recommend positioning the bracket near the water connections and power socket, ideally within 1 metre, to ensure the device connects and operates properly.

Advantages:

- Flexible installation: the bracket allows the pump to be installed at any point in the system.

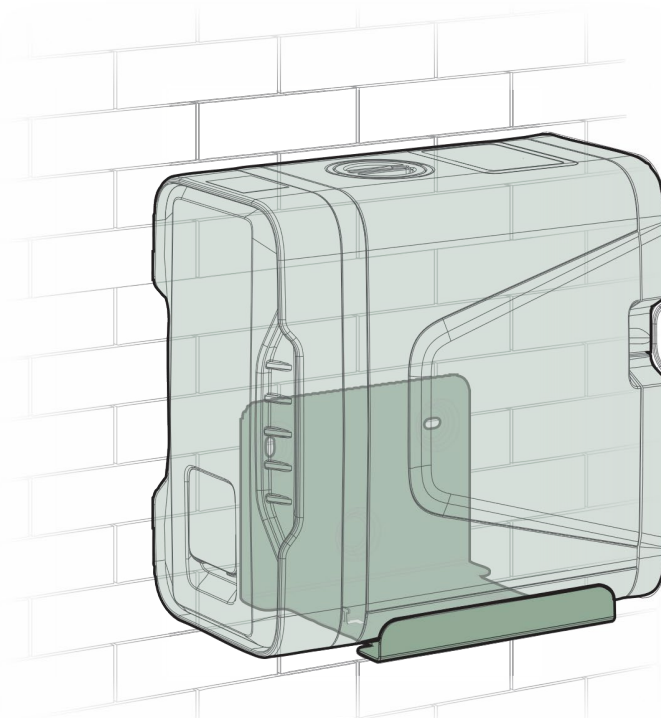


Fig. 20 Bracket accessory ESYWALL POP

A3.3 Installation with expansion tank

The expansion tank helps to make the hydraulic circuit elastic, reducing water hammer by damping pressure variations. In the presence of small leaks (signalled by Anti-drip and/or Anticycling), fitting an expansion tank in the delivery circuit helps to damp the pressure variation, spacing out pump restarts and increasing comfort when a user opens a tap during the pump start-up time. If the system suffers from water hammer, installing a tank near the pump is particularly effective in preventing it, and also in damping vibrations, knocks or annoying noises.

The tank must not be sized to act as a water reserve with the aim of reducing user interventions, as this is not necessary thanks to the electronic operation of the pump.

In addition, expansion tanks are very effective in preventing water hammer in water systems, reducing vibrations, knocks and unwanted noise.

Expansion tanks suitable for contact with drinking water/water for human use must be used, suitable for the temperatures envisaged for use. Dab also recommends using an expansion tank with a minimum capacity of 1 litre and a recommended capacity of 2 litres. Before commissioning, check the air precharge and, if necessary, adjust it in accordance with the system setpoint and restart parameters, following the product instructions.

Air precharge and calibration relationship

The tank's air precharge pressure must comply with the following relationship: $P_{air} = SP - RP - 0.7 \text{ bar}$ where:

- **SP = Setpoint**
- **RP = Pressure reduction for restart**
- **P_{air} = tank precharge pressure**

Calibration examples

- With the system default values: $SP=2.0 \text{ bar}$, $RP=0.3 \text{ bar}$ $\Rightarrow P_{air}=2.0-0.3-0.2=1.5 \text{ bar}$
- If $SP=2.0 \text{ bar}$ and $RP=0.3 \text{ bar}$ are set $\Rightarrow$ adjust the precharge to $P_{air}=1.5 \text{ bar}$

Checking/adjustment procedure

1. Depressurise the system: disconnect the pump power supply and open the nearest user until the flow is exhausted.
2. Measure P_{air} at the tank's **precharge valve**. With **small** volumes (**1–2 L**), connect the **manometer quickly** to avoid air leaks and incorrect readings.
3. **Adjust** the precharge (air inlet or outlet) until the relationship $P_{air}=SP-RP-0.2 \text{ bar}$ is complied with
4. Restore the power supply and check pressure stability during the start-up cycle.

Technical notes

- The **quantity of water delivered** by the tank depends on the set **SP** and **RP** parameters as well as on its nominal volume (1–2 L).
- **Failure to comply** with the calibration relationship may cause system **malfunctions** or **premature failure** of the tank membrane.
- In the event of membrane failure, replace **the entire tank** and contact **authorised personnel**.
- Check the expansion tank setting every 6 months.

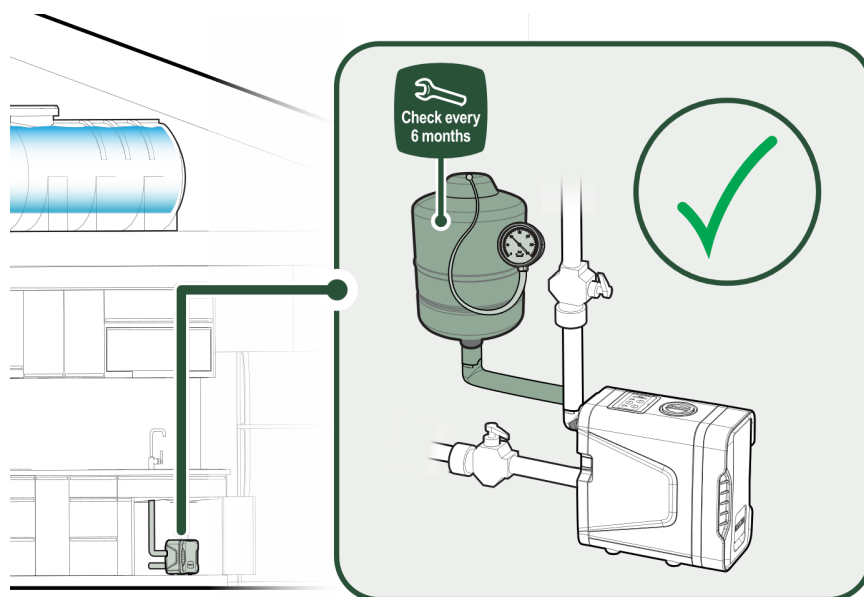


Fig. 21 Expansion tank

A4. APP, CLOUD CONNECTION 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 FW version.

If the pump is connected to the Internet, the firmware can be updated via the H2D APP or the H2D Desktop portal. The H2D APP also supports local updating via a point-to-point connection. 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 on the H2D app and web portal is available at dabpumps.com or h2d.com.

Update term.

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

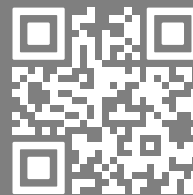
A4.1 Downloading and installing the app

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 already have a DAB account to access the H2D APP or the 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.

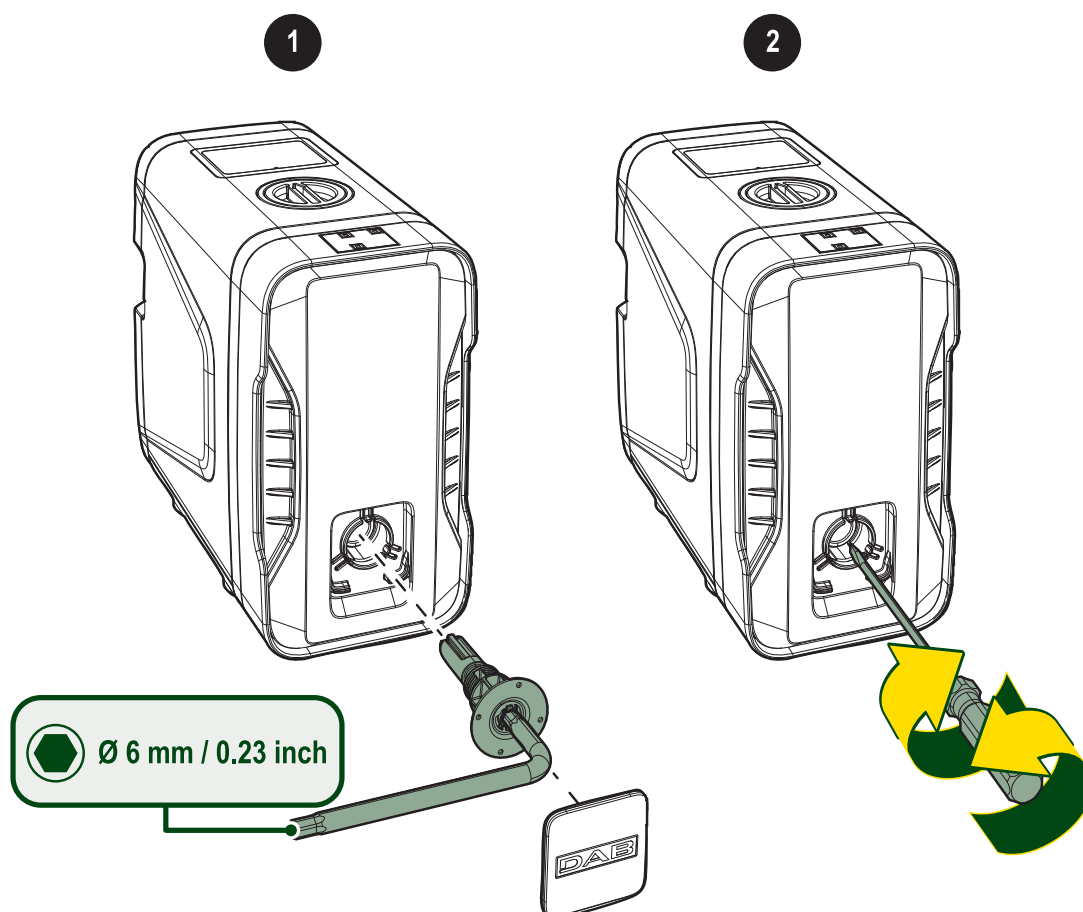


Fig. 22 Access to motor shaft



In hard water areas (> 15°f)
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.

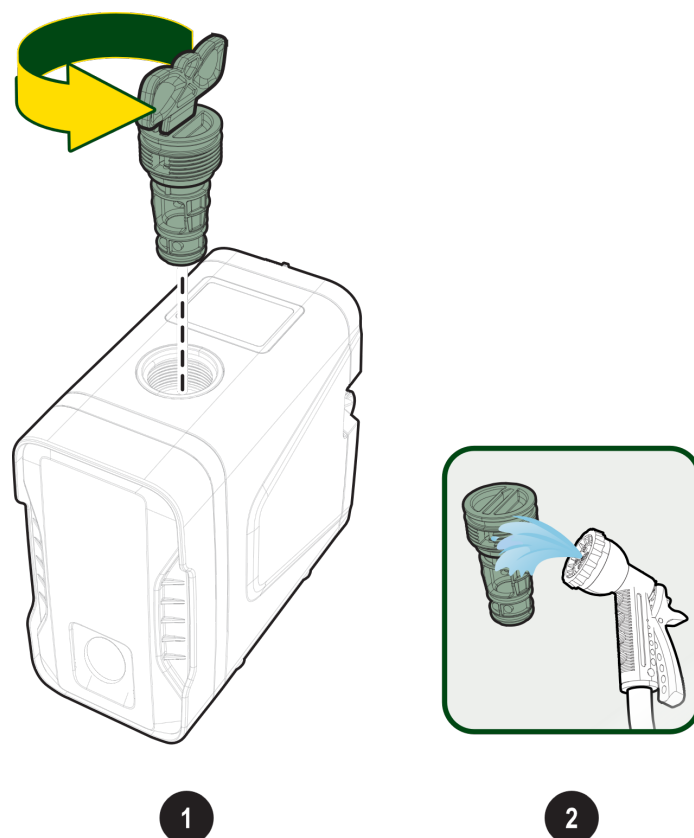


Fig. 23 Cleaning non-return valve

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. 9.4 (motor shaft maintenance).
The pump does not reach the set-point	Yellow	The pressure at the user does not reach the level equivalent to the system restart pressure (par. 3.2).	Lower the system restart pressure by decreasing SP or increasing 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 duct blocked or insufficient duct diameter. 2. Blocked impeller or hydraulics.	1. 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 app shows F0-005	Red	1. Faulty pressure sensor.	1. Contact technical support.
The app shows F0-006	Red	1. Faulty suction pressure sensor.	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 error F0-043	Red	1. Dripping caused by a leak in the system	1. See section 7.3.5 for an explanation of the error 2. Check for leaks in the system and resolve them 3. Install a suitable expansion tank
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.

DAB PUMPS LTD.

6 Gilbert Court
Newcomen Way
Severalalls Business Park
Colchester Essex
C04 9WN - UK
salesuk@dwtgroup.com
Tel. +44 0333 777 5010

DAB PUMPS BV

'tHofveld 6 C1
1702 Groot Bijgaarden - Belgium
info.belgium@dwtgroup.com
Tel. +32 2 4668353

DAB PUMPS INC.

3226 Benchmark Drive
Ladson, SC 29456 - USA
info.usa@dwtgroup.com
Tel. 1- 843-797-5002
Fax 1-843-797-3366

DAB PUMPS POLAND SP. z.o.o.

Ul. Janka Muzykanta 60
02-188 Warszawa - Poland
polska@dabpumps.com.pl

DAB PUMPS (QINGDAO) CO. LTD.

No.10 Xindong Road Jiulong Town, Jiaozhou
City 266319, Qingdao (Shandong) - China
mailto:info.china@dabpumps.com

DAB PUMPS OCEANIA PTY LTD

426 South Gippsland Hwy,
Dandenong South VIC 3175 - Australia
info.oceania@dwtgroup.com
Tel. +61 1300 373 677

PT DAB PUMPS INDONESIA

Satrio Tower lantai 26 unit C-D,
Jl. Prof. Dr. Satrio Kav. C4,
Kel. Kuningan Timur, Kec. Setiabudi, Kota Adm.
Jakarta Selatan, Prov. DKI Jakarta. - Indonesia
Tel. +62 2129222850

DAB PUMPS CANADA

300 Kennedy Road South Unit B, Brampton, ON,
L6W 4V2, Canada
JOB 2H0 Montreal (QC) - CA
tel: 1-833-322-7867 e-mail: orders@dwtgroup.ca

DAB PUMPS IBERICA S.L.

Calle Verano 18-20-22
28850 - Torrejón de Ardoz - Madrid
Spain
Info.spain@dwtgroup.com
Tel. +34 91 6569545 Fax: + 34 91 6569676

DAB PUMPS B.V.

Statenlaan 4
5223 LA 's Hertogenbosch - Nederlands
Dservice.nl@dabpumps.com
Tel. +31 416 387280

DAB PUMPS SOUTH AFRICA

Twenty One industrial Estate,
16 Purlin Street, Unit B, Warehouse 4
Olifantsfontein - 1666 - South Africa
info.sa@dwtgroup.com
Tel. +27 12 361 3997

DAB PUMPS GmbH

Am Nordpark 3
41069 Mönchengladbach, Germany
info.germany@dwtgroup.com
Tel. +49 2161 47 388 0
Fax +49 2161 47 388 36

DAB PUMPS HUNGARY KFT.

H-8800
Nagykanizsa, Buda Ernő u.5
Hungary
Tel. +36 93501700

DAB PUMPS DE MÉXICO, S.A. DE C.V.

Av Amsterdam 101 Local 4
Col. Hipódromo Condesa,
Del. Cuauhtémoc CP 06170
Ciudad de México
Tel. +52 55 6719 0493

DAB PUMPS FRANCE

Tour Ariane, Paris la Défense 9,
5 PL de la Pyramide,
92800 Puteaux France
info.fr@dabpumps.com

**DAB PUMPS S.p.A.**

Via M. Polo, 14 - 35035 Mestrino (PD) - Italy
Tel. +39 049 5125000 - Fax +39 049 5125950
www.dabpumps.com