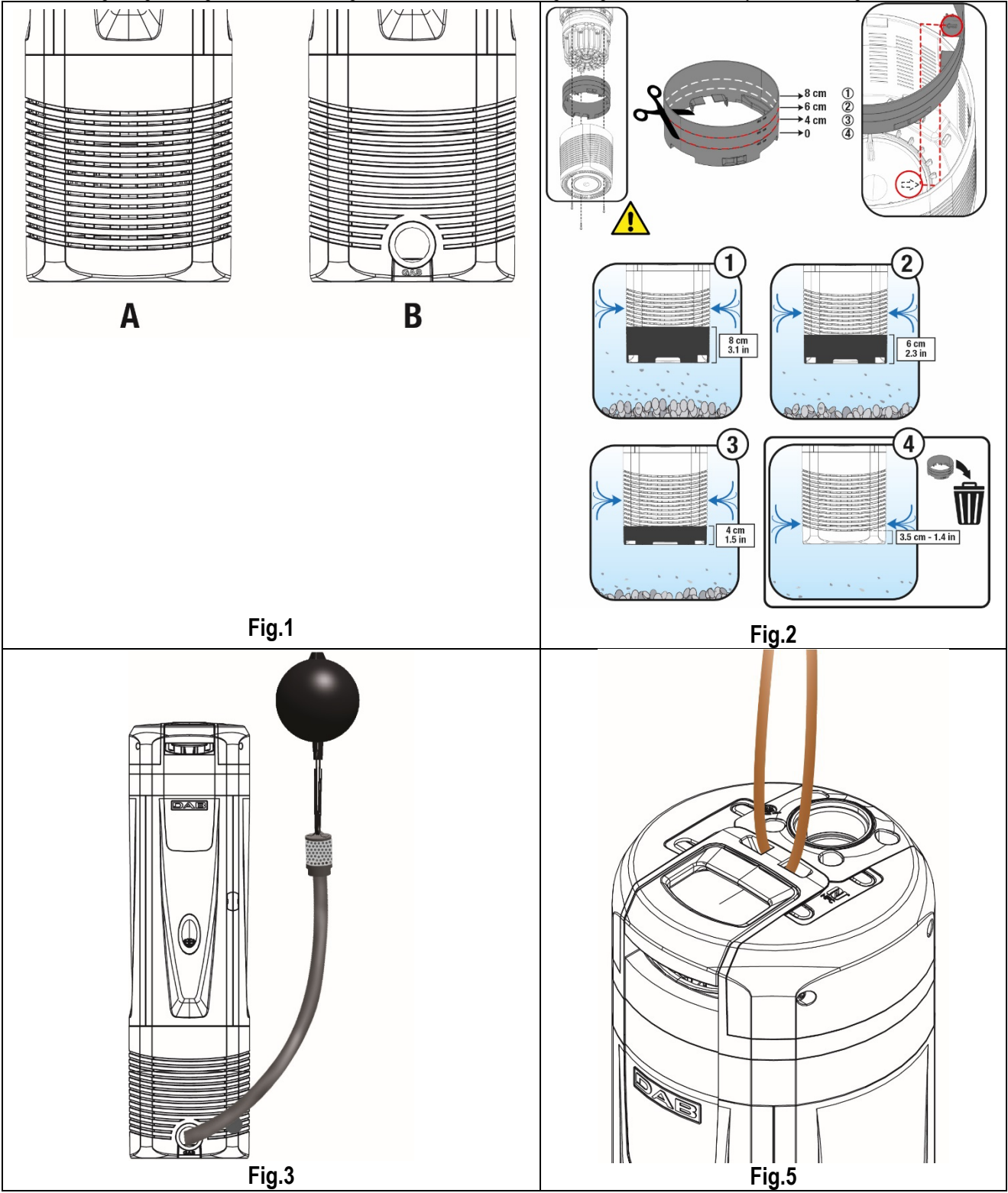
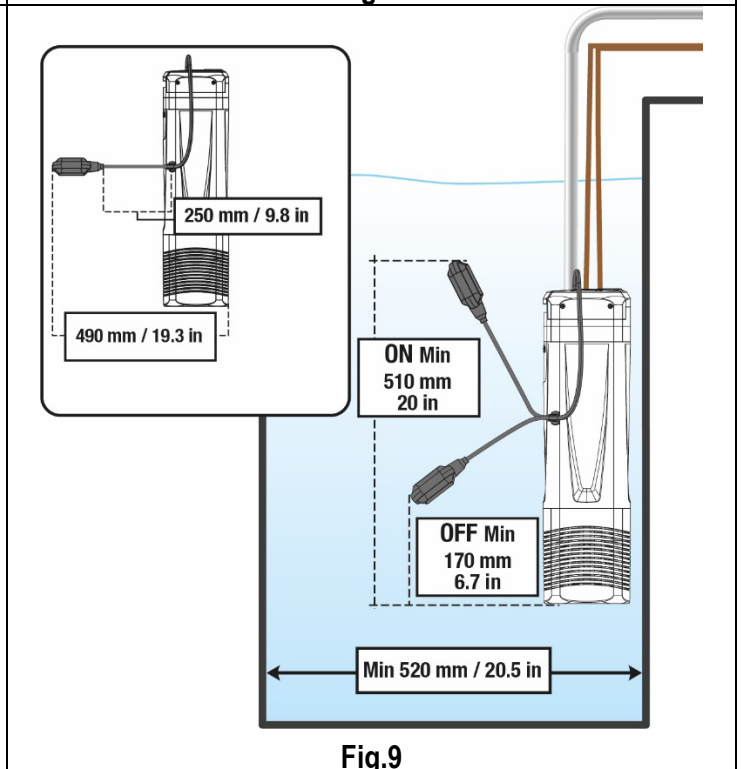
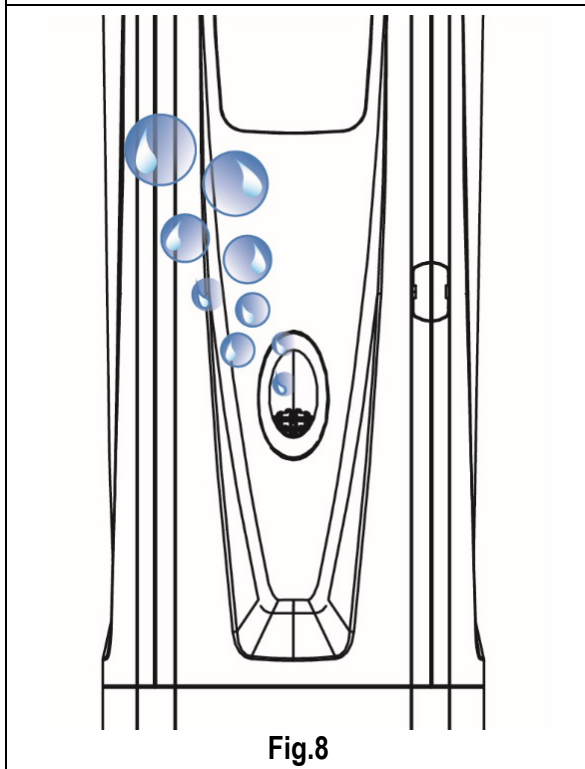
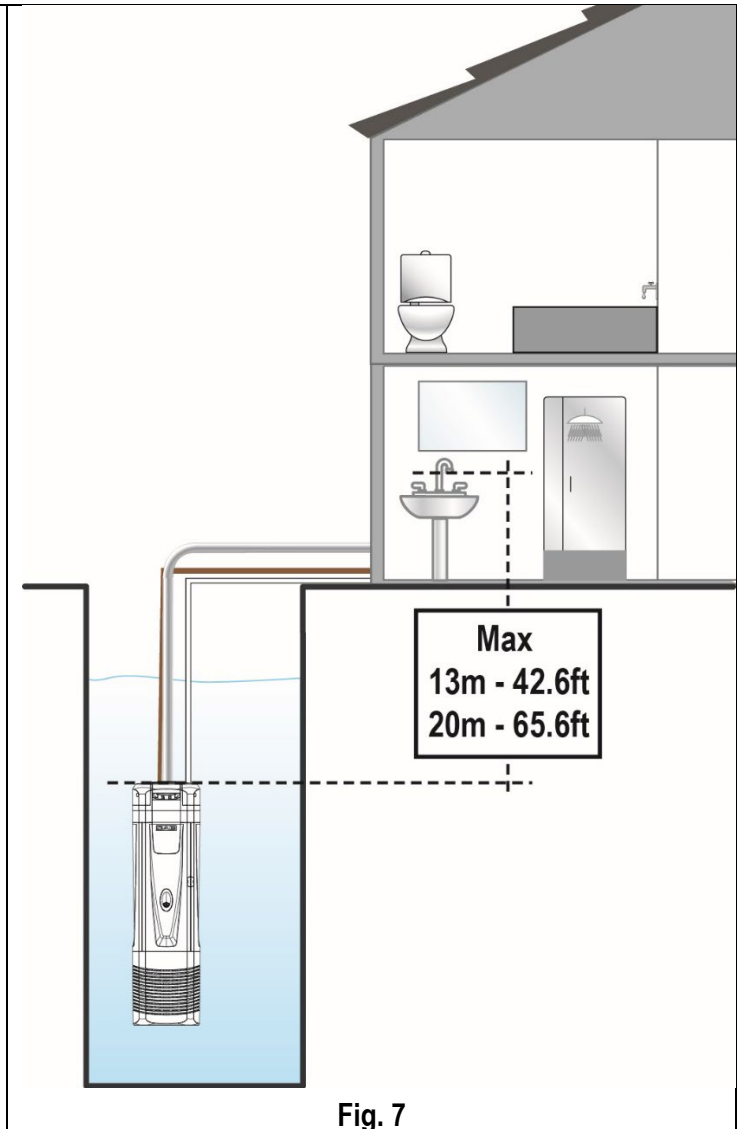
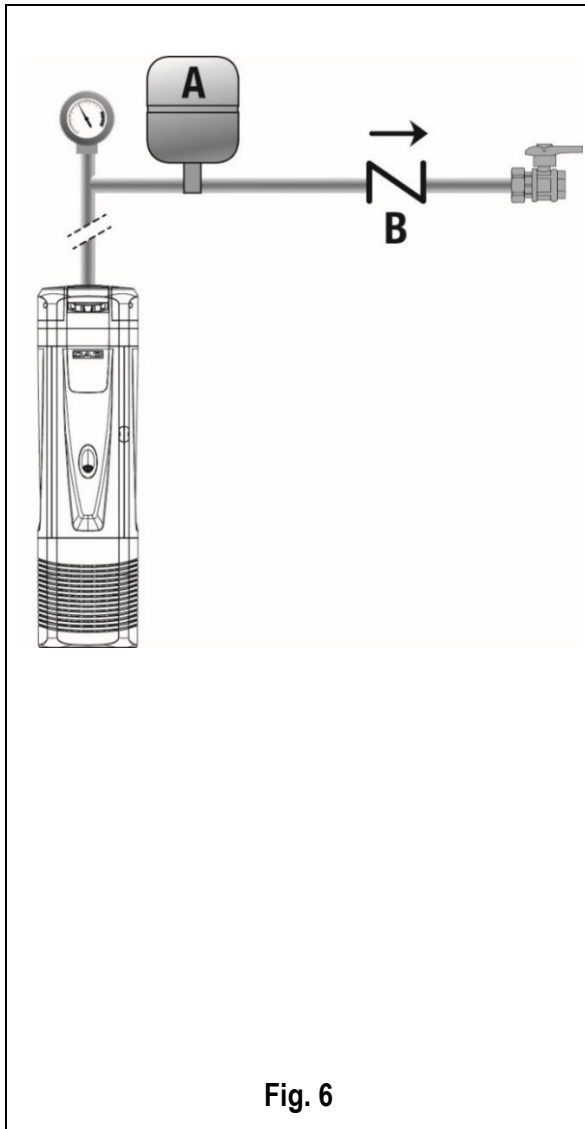






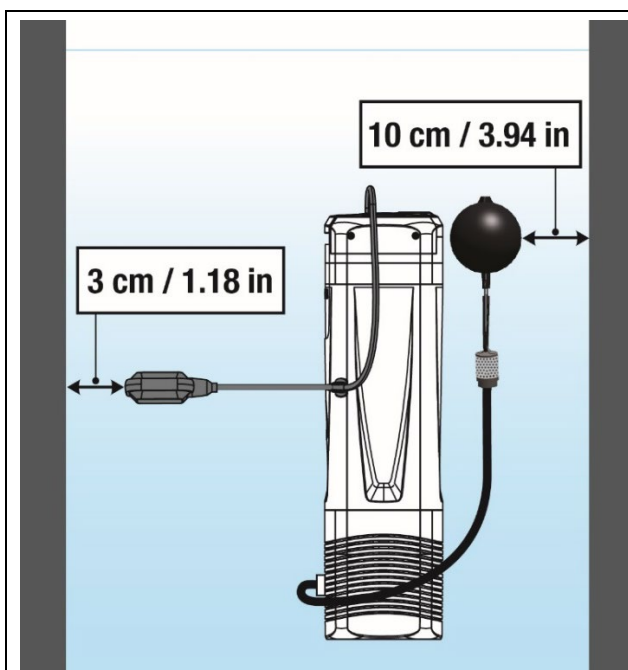


Fig.10

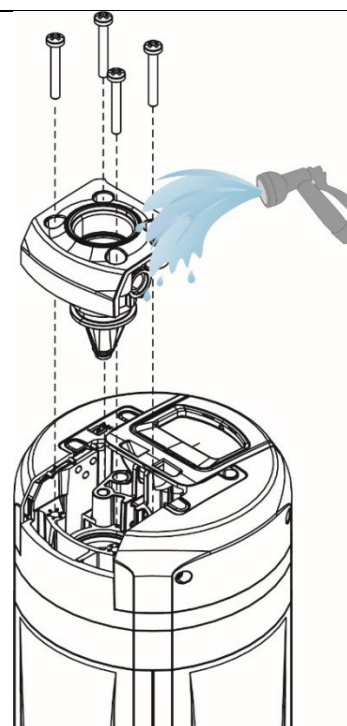


Fig.11

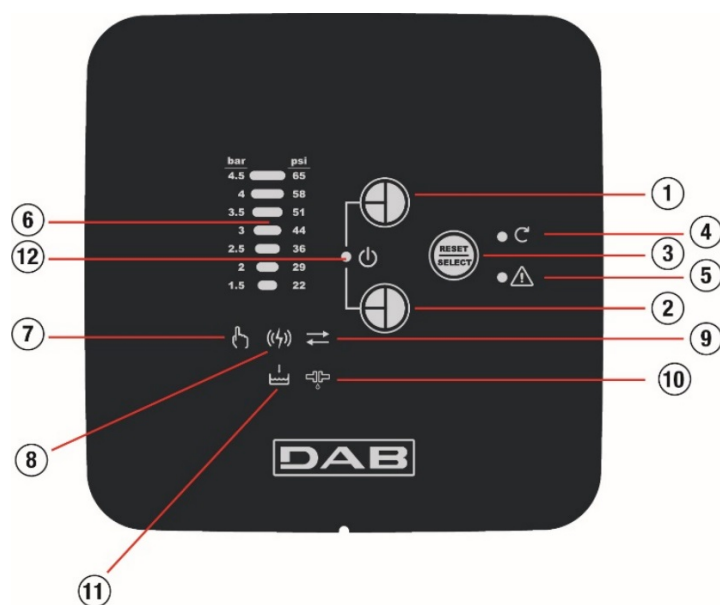


Fig. 12

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KEY

The following symbols have been used in the discussion:



SITUATION OF GENERAL DANGER.

Failure to respect the following instructions may cause damage to persons and property.



SITUATION OF RISK OF ELECTRIC SHOCK.

Failure to respect the following instructions may cause a situation of serious danger for personal safety.



Notes and general information.

WARNINGS



Read this documentation carefully before installation.

Installation and operation must comply with the local safety regulations in force in the country in which the product is installed. Everything must be done in a workmanlike manner.

Failure to respect the safety regulations not only causes risk to personal safety and damage to the equipment, but invalidates every right to assistance under guarantee.



Skilled personnel

It is advisable that installation be carried out by competent, skilled personnel in possession of the technical qualifications required by the specific legislation in force.

The term skilled personnel means persons whose training, experience and instruction, as well as their knowledge of the respective standards and requirements for accident prevention and working conditions, have been approved by the person in charge of plant safety, authorizing them to perform all the necessary activities, during which they are able to recognize and avoid all dangers (Definition for technical personnel IEC 364).

The appliance may be used by children over 8 years old and by persons with reduced physical, sensory or mental capacities, or

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who lack experience or knowledge, on condition that they are under supervision or after they have received instructions concerning the safe use of the appliance and the understanding of the dangers involved. Children must not play with the appliance. Cleaning and maintenance intended to be carried out by the user must not be performed by children without supervision.



Overload protection. The pump is equipped with a thermal motor protector. If the motor overheats, the motor protector switches the pump off automatically. The cooling time is about 15-20 min. after which the pump automatically switches on again. After the motor protector has tripped, it is absolutely necessary to find the cause and eliminate it. See Troubleshooting.



The power supply cable and the float switch must never be used to carry or lift the pump. Always use the pump handle.



Use is allowed only if the electric system is in possession of safety precautions in accordance with the regulations in force in the country where the product is installed (for Italy CEI64/2).



Never pull on the cable to detach the plug from the socket.



If the power cable is damaged, it must be replaced by the manufacturer or by their authorised technical assistance service, so as to avoid any risk.

Failure to observe the warnings may create situations of risk for persons or property and will void the product guarantee.

Particular warnings



Always switch off the mains power supply before working on the electrical or mechanical part of the system. Only firmly cabled mains connections are admissible. The appliance must be earthed (IEC 536 class 1, NEC and other applicable standards).



Mains terminals and motor terminals may still have dangerous voltage when the motor is stopped.



The appliance may only be used for the functions for which it was designed.

Under certain calibration conditions, the converter can start automatically after a power failure.

RESPONSIBILITY

The Manufacturer does not vouch for correct operation of the electropumps or answer for any damage that they may cause if they have been tampered with, modified and/or run outside the recommended work range or in contrast with other indications given in this manual.

The Manufacturer declines all responsibility for possible errors in this instructions manual, if due to misprints or errors in copying. The Manufacturer reserves the right to make any modifications to the products that it may consider necessary or useful, without affecting their essential characteristics.

1 GENERAL

1.1 Applications

Multistage submerged pump with integrated electronics, ideal for use in rainwater systems and irrigation networks, for pumping water from tanks, cisterns, wells, lakes and for other domestic applications requiring high pressure.

Thanks to their compact and handy shape, they are also used for particular applications as portable pumps for emergency situations such as for drawing water from tanks or rivers, draining swimming pools and fountains. Also suitable for gardening and general hobby activity.

The electronics automatically control starting and stopping (ON/OFF) of the application depending on the request for water by the user.

The ideal working situation is with the pump completely submerged; however, the motor cooling system allows its use up to the minimum suction height (110 mm).



These pumps cannot be used in swimming pools, ponds or basins where people are present, or for pumping hydrocarbons (petrol, diesel fuel, combustible oils, solvents, etc.) in accordance with the accident-prevention regulations in force. They should be cleaned before putting them away (See chapter "Maintenance and Cleaning").

1.2 Pumpable Liquids



Only use the pump in clean water.

The pump must not be used to pump salt water, sewage, inflammable, corrosive or explosive liquids (e.g. petroleum, petrol, thinners), greases, oils.



The temperature of the liquid to be pumped must not exceed 50°C (122°F).



If the pump is used for the domestic water supply, respect the local regulations of the authorities responsible for the management of water resources.



Maximum size of solid particles dispersed in the liquid: Diameter 1 mm (0.04 in)

1.3 Technical Data

DTRON3 pumps are equipped with a filter, which can be opened (see figure 1, A) or closed (called X) (see figure 1, B), depending on the application.

The open filter prevents the passage of suspended particles with a diameter greater than 2.5 mm.

Inside there is a splitter that prevents suction from the bottom, up to a level of 80mm. It is possible to cut or remove it to be able to suck water up to a minimum of 35mm from the bottom. (see figure 2).

Products with filter X are characterized by the X next to the pump name.

The filter X is characterized by a base, which is not watertight, with a 1" female connection. The filter X is designed to be used with the KIT X : suction kit with float (see figure 3).

DTRON3 pump models are identified as below (Table 1):

	P1 [W]	Q MAX [l/min – m3/h – gpm]	H MAX [m – psi]
35/90	750	100 – 6 – 26.4	37 – 52.6
45/90	930	105 – 6.3 – 27.7	45 – 64
35/120	900	125 – 7.5 – 33	38 – 54

Table 1

All technical data are marked on the technical label on the pump.
The various items are explained below (Fig. 4):

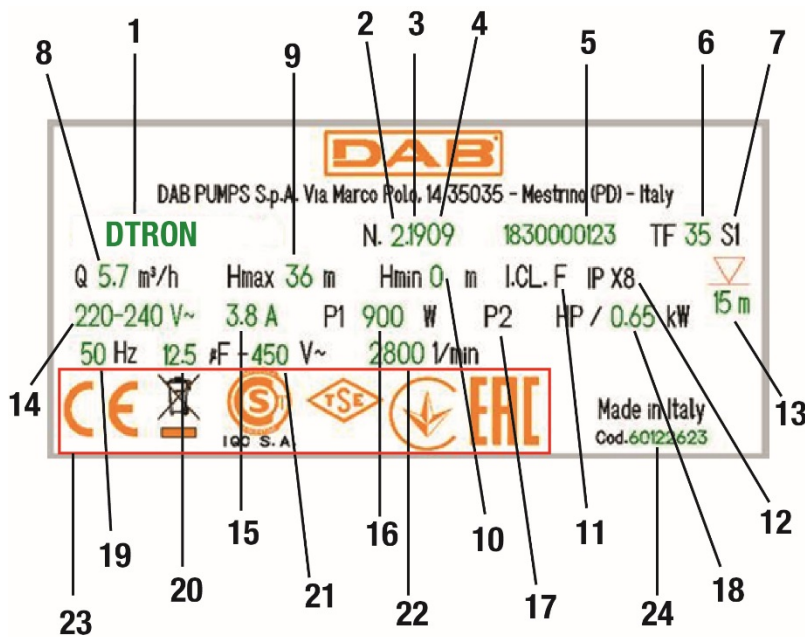


Fig.4 Data plate

Pos.	Description
1	Description
2	Revision
3	Year
4	Week
5	Serial number
6	Maximum liquid temperature
7	Use
8	Flow rate
9	Maximum head
10	Minimum head
11	Insulation class
12	Degree of protection
13	Submersibility
14	Rated voltage
15	Ampere
16	P1
17	P2 HP
18	P2 kW
19	Frequency
20	Condenser capacity
21	Voltage
22	Rated number of revolutions
23	Logos
24	Pump code

2 INSTALLATION

Before starting up the pump, check that:



The voltage and frequency on the pump's technical data plate correspond to the values of the power supply system.
The pump's power cable or the pump is not damaged.
The electrical connection must be made in a dry place, far from any possible flooding.
The electrical system is provided with a residual-current circuit breaker with $I_{\Delta n} \leq 30$ mA and that the earth system is efficient.
Any extension cables comply with the regulations in force.

2.1 Mechanical Installation



Install the pump in a location that is not exposed to freezing.
When the pump remains inactive at a temperature lower than 0°C , it is necessary to ensure that there is no water residue which could freeze and damage it.



Hang the pump by passing the rope through the hole provided (see figure 5). Do not hang the pump by the handle.



Do not install check valves near the pump delivery (distance less than 1 metre (3.28ft)). The pump already has a built-in check valve on delivery.

The DTRON3 pumps already contain a small expansion tank, calibrated for water hammer and small leaks.
In order to reduce the number of pump starts, an auxiliary tank (Figure 6, A) with a capacity of 2 litres can be installed.
If you want to install an additional non return valve (Figure 6, B), it is recommended to position it downstream from the auxiliary tank.

Do not subject the motor to excessive starts per hour. It is strictly recommended not to exceed 60 starts per hour.

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It is advisable to use pipes having a minimum diameter of 1", to avoid the decrease of pump performance.

The pump is suitable for vertical or horizontal installations.

Connect a rigid or flexible pipe to the 1¼" delivery of the pump.

The maximum submersibility of the pump depends on the length of the power cable: 12m (39.4 ft) in the case of a cable 15m (49.2 ft) long; 7m (23 ft) in the case of a cable 10m (32.8 ft) long. Check the details on the technical data plate, as shown in figure 4.

In order to always guarantee a good water flow, it is advisable not to exceed the following heights between the service taps and the pump (see figure 7).

45/90	35/120	35/90
20 m (65.6 ft)	13 m (42.6 ft)	13 m (42.6 ft)



To facilitate installation in the tank, it is possible to remove the power cable and/or pass it through another passage hole. To remove it, follow the instructions on the product's quick guide. The electrical cable has a quick connection. Have this operation carried out by qualified personnel. Check the earth connection before commissioning the product.

The pump has:

- An air vent valve (see figure 8). This valve allows the pump to prime in a very short time. If the water level is lower than the valve level, some water may escape from the vent valve.
- A small spring and diaphragm expansion tank (in the case of DTRON3 pumps). This limits the number of pump restarts and compensates for small system losses. The tank protects the pump in case of water hammer. The tank does not require any refilling or maintenance.
- An overpressure valve, which prevents water hammer. In case of ice in the delivery pipe with a submerged pump, this valve protects the pump from breakage.

Installation in a well.

Install the pump so that the pump suction is at least 1 m (3.28ft) above the bottom of the well to prevent the intake of sand and impurities. Use rigid metal pipes to hang the pump and secure the pipes with brackets at the top of the well.

Installation in a tank

The minimum dimensions for the pump passage in the collecting tank are 180x185 mm (7.09x7.28 in).

Hold the pump slightly up from the bottom so as to avoid possible noises/vibrations transmitted to the tank.

The pump will make noise if it is placed on the bottom of the tank.



To avoid obstruction of the suction passages, it is recommended to check periodically that no dirt has accumulated in the collection trap (leaves, sand, etc.).

Installation with FLOAT KIT (accessory)

In the case of DTRON3 pumps, an NFC level float can be added.

This accessory, once placed in the appropriate seat in the pump, communicates with the electronic board without the aid of electrical connections.

The minimum overall dimensions of the pump with float inside a well or tank are as follows:

- The minimum recommended distance between the end of the pump float and the wall is 3cm (1.18 in) (see figure 10).
- The minimum recommended distance between the float of the suction pipe and the wall (in the case of version X) is 10cm (3.94 in) (see figure 10).

3 FIRST INSTALLATION



The pump and the control panel, if present, must be connected to the same power mains, avoiding their being galvanically separated, as for example due to the presence of open isolation transformers or switches, even single-phase ones. In particular condominium or industrial contexts, where single-phase users can be connected to different phases of the three-phase distribution provided by the public operator, the control panel and the pump might not be able to communicate.

4 FUNCTION

The electronics automatically control starting and stopping (ON/OFF) of the pump depending on the request for water.

The electronics protect the pump from faults in the Non Return Valve (NRV) in the pump casing, which are generally caused by dirt or sand deposits. The deposits may prevent the NRV from closing, even in the absence of water. Adequate maintenance of the NRV is therefore recommended.

The pump is automatically switched off every hour; if everything is normal, the user only notices a very slight drop in pressure lasting a few seconds. If the NRV is blocked, the pump will go into alarm and can be restarted after removing the causes of the obstruction, preferably by disconnecting and reconnecting it to the power supply. However, the alarm stops if the valve is released mechanically.

The electronics protect the pump from dry running, that is without water (see anti-DRYRUN function).

The electronics protect the pump from false starts in the event of water bubbling (see anti-burping function).

For DTRON3, the electronics protect the pump from leaks in the system, which would cause continuous restarts (see ANTICYCLING function).

4.1 Pump start and stop conditions

When water is consumed in the water supply network, the pump starts when the starting conditions are met. This is done, for example, by turning on a tap and lowering the pressure in the system. The pump stops again when the water consumption stops, that is when the tap is turned off.

Start conditions

The pump starts when one of the following conditions is met:

- The flow rate is higher than the minimum flow rate of 2 l/min (0.53 rpm).
- The pressure is lower than the starting pressure (CUT-IN). The cut-in is factory set at 2.4 bar (34.8 psi).

If the pump is equipped with a control panel, the cut-in is variable.

Stop conditions

The pump stops with a delay of 10 seconds when:

- The flow rate is lower than the minimum flow rate with pressure above the CUT-IN.
- The pump stops even when there is no water, safeguarding the motor (see ANTI DRYRUN function).
- Various alarms.

4.2 Pump On – OFF

The pump motor is powered by the electronic control board, located inside the pump body, with an alternating voltage equal to that of the electrical power mains.

The pump power supply is supplied to the motor according to the evolution of the user's requirements and the hydraulic conditions of the system, as described below.

CUT-IN / Flow – Normal operation

Normally (in the absence of alarms and when the pump has been primed) the motor is switched on immediately if the pressure is lower than the cut-in (see paragraph 4.1) or if there is flow. The motor is switched off if the pressure is greater than the CUT-IN and the flow is absent (however, after 10 seconds of permanence in this condition).

Connection to the power mains - first priming of the pump

After connecting the pump to the mains, the pump motor is switched off and the non-return valve is at rest: if this is not the case, the pump stops and the motor will never start (see ANTIFLOOD paragraph).

In the normal case, however, the pump behaves as follows:

- If the hydraulic circuit upstream from the pump has a pressure higher than CUT-IN, the pump motor does not start, the priming is finished regularly.
- If the circuit is not under pressure ($P < \text{CUT-IN}$), the pump motor is started. In this case:
 - If the hydraulic circuit goes under pressure ($P > \text{CUT-IN}$) and there is no flow, for example because the delivery tap is closed, the motor is switched off 10 seconds after starting: the pump is primed.
 - If there is no flow or pressure for 20 seconds ($P < \text{CUT-IN}$), the pump goes into DRYRUN alarm and is switched off: the pump is not primed.
 - Finally, if there is flow, the pump is primed and runs normally.

Anti DRYRUN

If no pressure and flow is detected during normal operation (or during pump start-up) for 20 seconds, the pump will go into DRYRUN alarm and the motor will be switched off.

The pump control electronics will try to restart the pump until the dry running condition, i.e. the absence of flow and pressure, is no longer detected.

These restart attempts will be scheduled as follows:

- From the 1st to the 48th attempt: 1 restart every 30 minutes for 20 seconds each
 - From the 49th attempt: 1 restart every 24 hours for 20 seconds each
- The DRYRUN alarm can be reset manually: if after this reset the pump still does not detect flow and pressure, attempts will last 20 seconds.
 - The pump electronics have an anti-burping system that prevents false priming due to possible water bubbles.

ANTICYCLING

Slight hydraulic leaks in the system downstream from the pump, when the system is under pressure and without flow, can lead to a gradual drop in pressure. This will cause the pump to start up periodically, causing damage to the motor, especially when starting at a short distance. In this case, the electronics recognise the condition and activate the ANTICYCLING alarm. The alarm will prevent the pump motor from starting. The alarm can be removed manually. The alarm will still be removed automatically after 12 hours.

5 COM BOX

In the case of the DTRON3 model, after having connected the COM BOX to the power mains, all the LEDs of the interface are on to allow the user to verify its operation.

The DTRON 3 pump can work in "Auto" mode (default) or in "MANUAL MODE".

5.1 Manual Mode



The user may require the pump motor to be switched on constantly. Attention: as in the case of pumps without electronics, any control and protection (Anti DRY RUN, Anti Cycling etc.) is excluded and the pump can only be stopped by pressing buttons 1 and 2 at the same time (see image 12).

Forced motor shutdown

The user can force the motor to be shut down, which in any case prevents the motor from starting. The shutdown described here is also effective if starting is set to "Manual" mode.

5.2 Auto mode

In this mode, the pump power supply is supplied to the motor according to the evolution of the user's requirements and the hydraulic conditions of the system, as described below.

ANTICYCLING

In the case of the DTRON3 model, the anticycling function is disabled by default. It can be enabled using the COM BOX (see function Figure 12, 11)

5.3 COM BOX – DTRON3 Connection

The pump is connected to the COM BOX by means of the Power Line Communication protocol, from now on indicated in the manual as PLC. Through this communication COM BOX is able to show the user a lot of information about the status and operation of the pump. The user can also actively interact with the pump by giving it several commands, as described below.

In order to communicate, DTRON3 and COM BOX must be associated.

The DTRON3 and COM BOX in the package are already associated in the factory;

If the two units are already associated, the connection is made within 30 seconds after the COM BOX and the DTRON3 are switched on, the two units will be connected (blue PLC LED on with steady light).



The quality of the PLC connection can be influenced by many factors:

- Power mains topology
- Reactive loads present on the line
- Connection length
- Cable cross section

If there are communication problems, reduce the distance (and therefore the length of the electrical connection) between the two devices. The two devices must be connected to the same single-phase power supply and must have a common phase and neutral.

5.4 How to associate DTRON3 and COM BOX

As described in the previous chapter, the DTRON3 and COM BOX in the package are already associated in the factory.

If one of the two devices has to be replaced, it will be necessary to make a new association between COM BOX and DTRON 3, according to the following procedure:

- 1) Disconnect DTRON3 from the power mains
- 2) Delete any previous associations on COM BOX (9.3.)
- 3) Put COM BOX in the association phase (9.3.)
- 4) Connect DTRON3 to the power mains
- 5) Check the status of the PLC LED on COM BOX; if it is on with a steady light, the association has been successful.

6 CLEANING STORAGE MAINTENANCE

The pump does not require any maintenance. Frost can damage the pump. In very cold temperatures, remove the pump from the liquid, empty it and store it away from frost. Before any cleaning work is carried out, the pump must be disconnected from the power mains.

Once the pump has been removed from the liquid, it is advisable to clean the following parts with a simple jet of water:

- Filter (open, see figure 1A)
 - Suction filter with float, in case of version X (see figure 3)
 - Non-return valve. In this case, remove the part concerned as shown in figure 11.
- Be sure to reassemble all parts correctly.

7 TROUBLESHOOTING



Before starting to look for faults it is necessary to disconnect the power supply to the pump (take the plug out of the socket). If the power cable or any electrical part of the pump is damaged, the repair or replacement must be carried out by the manufacturer or by their technical assistance service, or by a person with equivalent qualifications, so as to prevent any risk.

FAULTS	PROBABLE CAUSES	REMEDIES
The pump does not turn on or does not stay on.	1. Pump is not powered	1. Check power supply
	2.. No water	3. Restore the water level
The pump does not deliver water	1. The suction grid or the pipes are blocked	1. Remove the obstructions
	2. The impeller is worn or blocked	2. Replace the impeller or remove the blockage
	3. The head required is higher than the pump's characteristics	
The flow rate is insufficient	1. The suction grid is partly blocked	1-2 Remove any obstructions
	2. The impeller or the delivery pipe are partly blocked or encrusted	
Pump stops (possible tripping of the thermal safety switch)	1. The liquid to be pumped is too thick and overheats the motor.	1-2-3-4 Disconnect the plug and remove the cause that caused the overheating, wait for the pump to cool down and reinsert the plug.
	2. The water temperature is too high	
	3. A solid body is blocking the impeller	
	4. Power supply not in accordance with data plate values	

8 DESCRIPTION OF COM BOX INTERFACE

The interface of the DTRON3 pump is presented with the COM BOX unit, the panel of which is shown in the following figure:

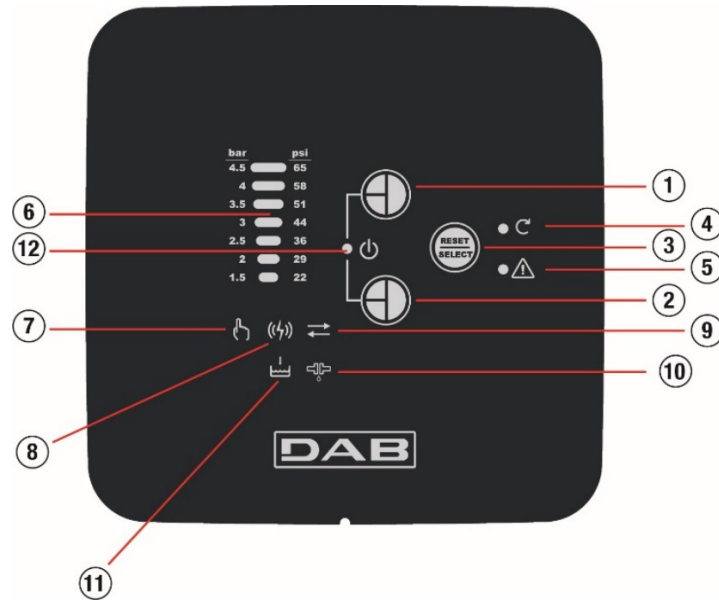


Figure 12: panel of the COM BOX device

8.1 Description of operating mode

COM BOX can operate in two modes, *Monitor* mode and *SETUP* mode.

MONITOR mode

The following information is available in MONITOR mode:

- pressure on the delivery of the DTRON3 pump (6)
- motor power status (4)
- DISABLE status of the pump (XX)
- current faults/alarms (5, 8, 10, 11)
- connection status of the COM BOX with the DTRON(s) (8)

The following controls are available in MONITOR mode:

- Reset any alarms present
- Disable/enable pump operation

SETUP mode

In SETUP mode the user can:

- Vary the CUT-IN pressure
- Manually activate the pump motor
- Enable/disable the connection between COM BOX and DTRON
- Activate/deactivate recognition of the ANTICYCLING condition
- Disable/enable pump operation

8.2 Description of LEDs / buttons

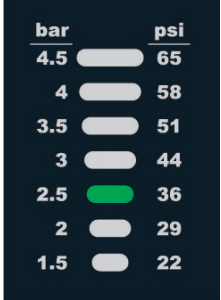
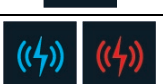
See Figure 12	LED	Function	Explanation
6		CUT-IN	The lit LED indicates the CUT-IN value
12		ON/OFF	System status: on or off
4		MOTOR STATUS	Indicates whether or not the pump is operating
5		ALARM	Indicates that there is a general alarm
7		MANUAL MODE	Indicates manual operation
8		PLC	Indicates correct communication between pump and COM BOX
11		ANTI DRYRUN	Indicates that there is a DRY RUN alarm
10		ANTI-CYCLING	Indicates that there is an ANTICYCLING alarm and/or that the ANTICYCLING activated status has been detected
1 - 2	-	+ / -	
3	-	RESET/SELECT	

Table2

9 INTERFACE OPERATIVITY

9.1 Passage from Monitor to SETUP mode and vice-versa

To pass **from Monitor mode to SETUP mode**, hold down the buttons “+” (Figure 12, 1) and “Reset/Select” (Figure 12, 3) simultaneously for at least 3 seconds. To pass **from SETUP mode to Monitor mode**, hold down the buttons “-” (Figure 12, 2) and “Reset/Select” (Figure 12, 3) simultaneously for at least 3 seconds or wait for 1 minute without touching any button on the interface. When switched on, the COM BOX is in Monitor mode by default.

9.2 Monitor mode

Motor status (Fig 12, 4)

If the green “Motor Status” LED is lit, the motor is powered.

Alarm reading (Fig 12, 5)

If the “Alarm” LED is lit, it indicates that an alarm has been activated. The lighting of the ANTICYCLING or DRYRUN LED indicates which alarm is active.

MANUAL MODE function (fig.12, 7)

The active “MANUAL” mode is indicated by the lit LED. To activate/deactivate this mode, see the chapter “SETUP Mode”.

PLC connection (Fig 12, 8)

If the LED is lit, the PLC connection is active or the COM BOX is available for connection to a pump.

If the LED is lit with a steady light, the connection is active.

If the LED is flashing slowly (1 second ON; 1 second OFF) it indicates that the connection is not active, but COM BOX is associated with the pump.

If the LED is flashing rapidly (0.5 seconds ON; 0.5 seconds OFF), it indicates that COM BOX and DTRON3 are associating.

PUMP BLOCK function

By simultaneously pressing and releasing the "+" and "-" buttons (fig 12, 1 - 2), the pump motor stops unconditionally and cannot start again until the "+" and "-" buttons (fig 12, 1 - 2) are pressed again simultaneously and released. This Inhibition also prevails over any motor start set in "MANUAL" mode.

The blocking of the pump stops if DTRON3 and COM BOX are disconnected. Turning on the DTRON3 again or the absence of connection between DTRON3 and COM BOX does not affect the setting of the inhibition.

ALARM RESET function

The alarms can be set manually by pressing the "Reset/Select" button (Figure 12, 3).

9.3 SETUP mode

Once in SETUP mode (see paragraph 8.1)

With the exception of the CUT-IN function, the activation of each function causes the corresponding LED to light up, which will flash as described below:

- ON x 3 sec
- Flashing 0.3 sec ON and Off, 4 times

SETTINGS SELECTION mode

With the "Reset/Select" button (Figure 12, 3) you can go through the settings described below.

The first setting you will find, once the SETUP Mode is activated, is the "CUT-IN Variation".

CUT-IN Variation

With this function it is possible to vary the pump CUT-IN value. This value can be increased/decreased with the "+" and "-" buttons (Fig 12, 1-2) and can assume the values represented in the barometric scale by flashing.

Instead, the current value of the CUT-IN is highlighted with the corresponding LED lit with a steady light.



Too low a CUT-IN value could prevent the pump turning on and keep it off at all times.

Too high a CUT-IN value could cause a DRYRUN alarm.

It is recommended not to exceed the CUT-IN value of:

- 2.5 bar (36.2 psi) for models DTRON3 (X) 35/90 and 35/120
- 3.5 bar (50.7 psi) for models DTRON3 (X) 45/120

Enabling/disabling manual operation

In this setting, the pump motor is switched on using the "+" button (Fig 12, 1).

The "-" button (Fig 12, 2) restores normal operating conditions.

Associating/Dissociating COM BOX / DTRON3

In this setting, by pressing the "+" button (Fig 12, 1) for 5 seconds, the COM BOX temporarily enters the PLC association status through the power supply network.

Pressing the "-" button (Fig 12, 2) for 5 seconds eliminates any association with the DTRON3.

Enabling/disabling ANTICYCLING

In this setting, use the "+" button (Fig 12, 1) to activate the ANTICYCLING function described above.

The "-" button (Fig 12, 2) deactivates this function.

10 COM BOX TROUBLESHOOTING

FAULTS	PROBABLE CAUSES	REMEDIES
The Pump and the COM BOX do not connect to each other	1. They are galvanically separated	1. Check that the two units are on the same power supply and in the same phase.
	2. They are too far apart	2. Connect the two units at a shorter distance
	3. The two units are not associated	3. Repeat the first association procedure described in 8.3.