

EN

INSTRUCTIONS
PRESSURE SWITCH



Table of contents

Notes regarding the instructions 2

Safety 2

Information about the device 4

Transport and storage 5

Assembly and installation 6

Operation 8

Errors and faults 9

Maintenance 10

Technical annex 10

Disposal 11

Notes regarding the instructions

Symbols



Warning of electrical voltage

This symbol indicates dangers to the life and health of persons due to electrical voltage.



Warning

This signal word indicates a hazard with an average risk level which, if not avoided, can result in serious injury or death.



Caution

This signal word indicates a hazard with a low risk level which, if not avoided, can result in minor or moderate injury.

Note

This signal word indicates important information (e.g. material damage), but does not indicate hazards.



Info

Information marked with this symbol helps you to carry out your tasks quickly and safely.



Follow the manual

Information marked with this symbol indicates that the instructions must be observed.

You can download the current version of the instructions and the EU declaration of conformity via the following link:



TDP DSP



<https://hub.trotec.com/?id=44132>

Safety

Read this manual carefully before starting or using the device. Always store the manual in the immediate vicinity of the device or its site of use.



General safety

- Do not use the device in potentially explosive rooms or areas and do not install it there.
- Do not use the device in aggressive atmosphere.
- Check accessories and connection parts for possible damage prior to every use of the device. Do not use any defective devices or device parts.
- Before carrying out maintenance, care or repair work on the device, remove the mains plug from the mains socket. Hold onto the mains plug while doing so.
- Do not remove any safety signs, stickers or labels from the device. Keep all safety signs, stickers and labels in legible condition.



General safety warnings – Electrical safety

- The device is to be supplied with a rated residual current of no more than 30 mA by means of an RCD (Residual Current protective Device).
- Ensure that all electric cables outside of the device are protected from damage (e.g. caused by animals). Never use the device if electric cables or the power connection are damaged!
- The mains connection must correspond to the specifications in the Technical annex.
- Insert the mains plug into a properly fused mains socket.
- Do not under any circumstances use the device if you detect damages on the mains plug or power cable. If the power cable is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard. Defective power cables pose a serious health risk!

- Should there be a risk of flooding, install the plug connections in a flood-proof area. **There is a risk of electric shock!**
- Make sure that the mains voltage corresponds to the specifications on the nameplate.
- Have all electrical installations carried out by an expert according to the national regulations and the device-specific requirements.
- Hold onto the mains plug while pulling the power cable out of the mains socket.
- Protect the power supply cable against heat, oil and sharp edges. Make sure that the power supply cable is not crushed, kinked or subjected to other mechanical stresses.
- Only use splash-proof extension cables intended for outdoor use whilst observing the device's power input. Before using cable drums, always unroll the cable completely. Check the cable for damage. The use of extension cables which are not approved for outdoor use can result in injuries due to electric shock.
- Before performing any work on the device, in case of leaks in the water system, before taking work breaks or when not in use, remove the mains plug from the mains socket.



General safety warnings – Personal safety

- Never insert any objects or limbs into the device.
- This appliance is not a toy. Keep away from children and animals.



Warning

Device-specific safety warnings for pressure switches

- Before taking the device into operation, have the following checked by an expert:
 - Earthing, neutral conductor and RCD must be functioning properly and correspond to the national regulations,
 - electrical plug connections must be protected from moisture.
- Provide appropriate frost protection.
- Never operate the device in the rain. Keep the device away from environmental influences such as wet conditions or frost. In particular, keep the electrical connections dry and make sure they are located in a flood-proof area.
- Do not use the device at freezing temperatures or temperatures above 60 °C.
- Do not use the device for drinking water supply, and do not integrate it into the drinking water circuit. In addition, please observe the local regulations of the water and wastewater authorities.

Intended use

The device serves for switching a connected garden or deep well pump on and off. It is used to pump rainwater or service water into private areas (e.g. into the garden) in compliance with the regulations specified in the technical data. It is installed in the water line between a pump and one or more extraction points. From there, it activates or deactivates the connected pump depending on the present water pressure and the flow rate volume.

Clean fresh water is permitted as pump water (e.g. rainwater from a cistern or ground water from a private well). The temperature of the pumped water must not exceed 60° C.

Any use other than the intended use is regarded as misuse.

Reasonably foreseeable misuse

The device is not suitable for the operation of irrigation systems in business, industry or in public areas (e.g. park areas).

Using the device in swimming pools and the like is prohibited.

The device is not suitable for increasing the pressure of existing water supply networks.

The device must not be used for aggressive, abrasive, caustic, corrosive, combustible or explosive pumping media, e.g.:

- brine
- sandy water
- food
- cleaning agents
- fuels (e.g. petrol, diesel)
- oils
- greases
- petroleum
- nitro-cellulose thinner
- waste water from lavatories and urinal installations

The device must not be used at freezing temperatures.

Any unauthorised changes, modifications or alterations to the device are forbidden.

Personnel qualifications

People who use this device must:

- be aware of the dangers that occur when working with electric devices in damp areas.
- have read and understood the instructions, especially the Safety chapter.

Setting the switch-on pressure may only be carried out by specialist companies for water installation.

Electrically skilled person

Electrically skilled personnel must be able to read and understand electric circuit diagrams, to put electrical systems into service and to maintain them, to wire control cabinets, to ensure the functionality of electrical components and to identify possible hazards from electrical and electronic systems.

Residual risks



Warning of electrical voltage

Work on the electrical components must only be carried out by an authorised specialist company!



Warning of electrical voltage

Before any work on the device, remove the mains plug from the mains socket!

Do not touch the mains plug with wet or damp hands. Hold onto the mains plug while pulling the power cable out of the mains socket.



Warning

Dangers can occur at the device when it is used by untrained people in an unprofessional or improper way! Observe the personnel qualifications!



Warning

The device is not a toy and does not belong in the hands of children.



Warning

Risk of suffocation!
Do not leave the packaging lying around. Children may use it as a dangerous toy.

Note

If you store or transport the device improperly, the device may be damaged.
Note the information regarding transport and storage of the device.

Behaviour in the event of an emergency

1. Disconnect the device from the mains feed-in: Hold onto the mains plug while pulling the power cable out of the mains socket.
2. Do not reconnect a defective device to the mains.

Information about the device

Device description

In order to deliver service water for home and garden, the pressure switch serves to control the pump.

The device is installed between a pump and one more extraction points (e.g. a water tap or a garden sprayer). It monitors the pressure in the water line. Should the pressure in the water line drop below a predefined value, the device will switch on the pump. To avoid the pressure dropping below the value, the electrical supply of the pump has to be connected to the pressure switch. The pressure switch recognises when the pressure level is sufficient (e.g. because the water tap has been closed), and switches the connected pump off.

The device also monitors the flow rate volume. Should the water flow rate drop below a value of 2 l/min (e.g. because the pump runs dry), the device switches off the connected pump.

The restart button on the pressure switch is used for restarting the connected pump manually (e.g. when the device switches the pump off because the pump is running dry).

In addition, the device is equipped with a backflow preventer.

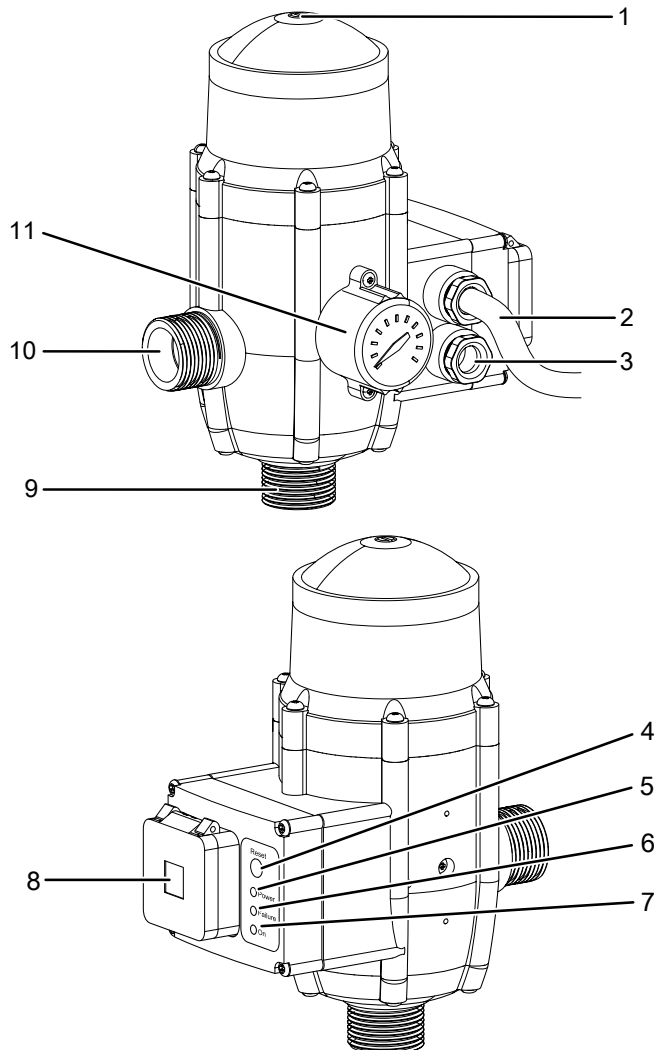
The pressure switch must be connected at maximally 30 m underneath the highest-level consumer.

The water temperature must not exceed 60 °C.

The device may be used in facilities with up to 10 bar water pressure.

Moreover, the device is fitted with a pressure gauge.

Device depiction



No.	Designation / function
1	Pressure setting screw setting the switch-on pressure only permitted by specialist companies for water installation
2	Power cable
3	E-connection pump for 3-phase connection
4	Button <i>Reset</i> restarts the device after an error message
5	LED <i>Power</i> is illuminated in green when the device is switched on.
6	LED <i>Failure</i> is illuminated in yellow in case of a fault.
7	LED <i>On</i> is illuminated in orange when the pump is switched on.
8	Socket
9	Water inlet
10	Water outlet
11	Pressure gauge indicates the current pressure

Transport and storage

Note

If you store or transport the device improperly, the device may be damaged.

Note the information regarding transport and storage of the device.

Transport

Before transporting the device, observe the following:

- Hold onto the mains plug while pulling the power cable out of the mains socket.
- Do not carry the device by holding it at the power cable or hose.

Storage

When the device is not being used, observe the following storage conditions:

- Store the device in a dry location and protected from frost and heat.
- Store the device in a location where it is protected from dust and direct sunlight.
- If required, use a cover to protect the device from invasive dust.
- Put the protective caps on the water connections to protect the inside of the device against dust and dirt.

If you do not use the device for an extended period of time, it must be cleaned thoroughly after its last application and before recommissioning. Deposits and residues could lead to start-up difficulties.

For restart, please proceed according to the Start-up chapter.

Assembly and installation

Scope of delivery

- 1 x Pressure switch
- 1 x Manual

Unpacking the device

1. Open the cardboard box and take the device out.
2. Completely remove the packaging.
3. Fully unwind the power cable. Make sure that the power cable is not damaged and that you do not damage it during unwinding.

Start-up

Positioning

The device is installed between a pump and one more extraction points (e.g. a water tap or a garden sprayer). The following conditions shall be applied:

- The pressure switch must be connected at maximally 30 m underneath the highest level consumer.
- The water temperature must not exceed 60 °C.
- The device may be used in facilities with up to 10 bar water pressure. You can install a pressure reducer between pump and pressure switch if the pressure of the pump exceeds 10 bar.
- The site of installation is protected from weather exposure and wet conditions.

Required pump pressure

The required operating pressure of the pump to be connected depends on the height difference between pump and highest-level consumer (hydrostatic pressure). For instance, a height difference of 20 m requires a pump pressure of 2 bar. To guarantee a failure-free operation, the pressure at which the pressure switch switches the pump on should be 0.2 bar above the hydrostatic pressure. The pump should be able to build up a pressure that is at least 0.8 bar above the switch-on pressure of the pressure switch.

height difference	switch-on pressure of pressure switch	required minimum working pressure of pump
13 m	1.5 bar	2.3 bar
17 m	1.9 bar	2.7 bar
20 m	2.2 bar	3 bar
23 m	2.5 bar	3.3 bar

On the device, the switch-on pressure of the pressure switch can be adjusted to a value between 1.5 bar and 2.5 bar. For more detailed information please refer to the chapter Operation.

Setting the switch-on pressure



Warning

Setting the switch-on pressure may only be carried out by specialist companies for water installation.

When the switch-on pressure is set too low, the pressure cannot drop and the pump does not start operating. The pressure control is illuminated in green. Then the pressure setting screw has to be turned towards the "+" sign. Every 360° turn increases the water level for approx. 2 m (0.2 bar).

When the switch-on pressure is set too high, a protection against a low water level sets in. The pump cannot start operating. The pressure control is illuminated in green and orange.

Then the pressure setting screw has to be turned towards the "-" sign. Every 360° turn decreases the water level for approx. 2 m (0.2 bar).

When the switch-on pressure is close to the maximum pressure of the pump, the pump frequently starts operating. In this case it cannot be stopped. The pressure control is illuminated in green, orange and yellow. Then the pressure setting screw has to be turned 2.5 times towards the "-" sign. The water level decreases for approx. 5 m (0.5 bar).

Assembly and installation



Warning of electrical voltage

Do not touch the mains plug with wet or damp hands.



Warning of electrical voltage

Disconnect the power supply before opening the cover on the control box!

Note

Never take the electronic card out of the control box. The indications on the terminal block show you how to set up the right connection. A false connection can result in damage to the device.

1. For this reason, you have to disconnect the pump from the mains voltage. Switch the device off and remove the mains plug from the mains socket.
2. Open a consumer at the end of the pressure side, e.g. water tap or garden sprayer so that the remaining pressure is released.

Note

Do not mount the pressure switch on the suction side of the pump!

3. Instead, install the device between the pump and the consumer side. Please note:
 - If necessary, use suitable connectors and hoses/tubes.
 - Check the polarity is correct.
 - Connect the water inlet of the device with the pump and the water outlet with the consumer side.
 - The device comes with 1" external thread: The diameter of the connected lines may not be smaller.

4. Connecting the pump to the pressure switch:
- ⇒ If the pump includes a mains plug, connect the latter to the socket (8) of the pressure switch.
 - ⇒ If the pump includes a 3-phase connecting cable, commission an electrically skilled person to connect the connecting cable to the control box as shown in the circuit diagram in the chapter “Technical annex”.

Note

The power supply of the pump has to be provided by the pressure switch. Do not connect the pump to an installed mains socket!

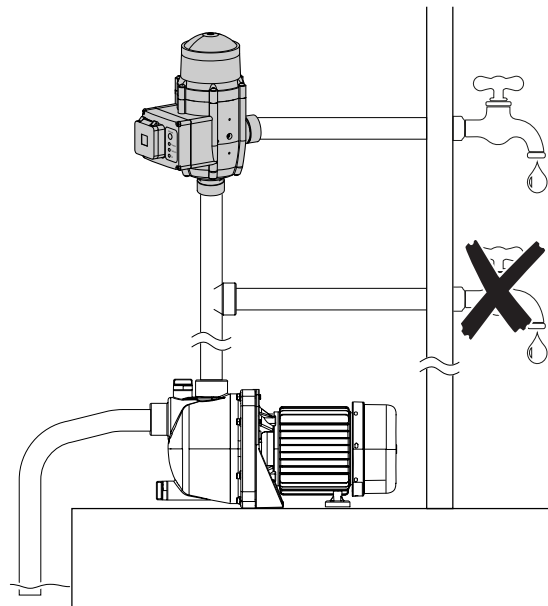
Note

To avoid intrusion of water into the switchboard and consequent damage, tighten the 4 screws on the switchboard and both nuts on the power cable (2) and the E-connection pump (3) so that the cables are attached.



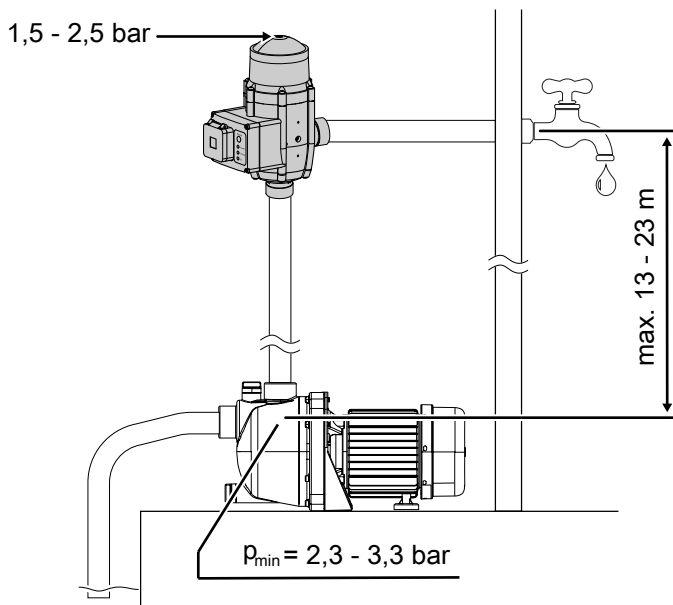
Info

Height difference and minimum working pressure p_{min} depend on the set switch-on pressure of the pressure switch (see chapter Required pump pressure).



Info

It is helpful to fill the suction hose with water to support the suction procedure of the pump. To do so, the end of the suction hose has to be provided with a backflow preventer! Please observe the instructions of the pump.



Operation

Switching the device on

1. Open a consumer at the end of the pressure side, e.g. water tap or garden sprayer so that any remaining air in the line is able to escape.
2. Connect the mains plug of the pump with the plug (8) of the pressure switch.
3. Connect the mains plug of the pressure switch with a safety socket.
 - ⇒ The LED *Power* (5) is illuminated.
 - ⇒ The pressure switch activates the pump.
 - ⇒ After approx. 20 to 25 seconds, the pump has built up the operating pressure. While the pump is in operation, the LED *On* (7) is illuminated.
4. Close the tap on the pressure side when the desired amount of water has been supplied and the air was able to escape.
 - ⇒ The pump continues to operate a little longer, until the operating pressure that is set in the pressure switch is reached.
 - ⇒ If the pressure switch detects that the flow rate is too low, it automatically switches off the pump. This serves as a protection against the pump running dry. In this case, the LED *Failure* (6) is illuminated. If so, check whether the suction hose connected to the pump is correctly positioned, whether a shut-off valve in the suction hose is accidentally closed or whether a filter is contaminated.



Info

It is helpful to fill the suction hose with water to support the suction procedure of the pump. To do so, the end of the suction hose has to be provided with a backflow preventer! Please observe the instructions of the pump.

If there is no more air in distribution network, opening the water tap causes the water pressure to drop. This is detected by the pressure switch. It will automatically activate the garden pump for as long as the water tap is opened.

After closing the water tap, the pressure in the distribution network increases. Then the pressure switch switches off after a few seconds.

Reset

If the pump runs dry and the water flow rate falls below the set minimum value, the pressure switch switches off the pump for reasons of safety. The LED *Failure* (6) is illuminated. Please proceed as follows to restart the pressure switch and the pump:

1. Stop the pump running dry by filling water into the suction hose (if possible) or into the pump. For this purpose, many pumps are equipped with a water filler neck. If necessary, find out more in the instructions of your pump.
2. When you eliminated the dry run of the pump, press the button *Reset* (4) at the pressure switch.
 - ⇒ The LED *Failure* (6) goes out.
 - ⇒ The pressure switch activates the pump.
 - ⇒ The LED *On* (7) is illuminated for as long as the pump is in operation.

Setting the switch-on pressure



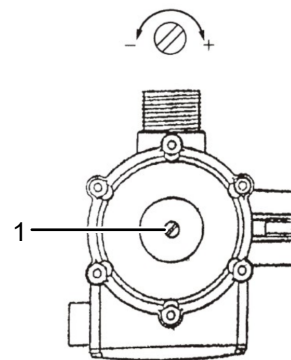
Warning

Setting the switch-on pressure may only be carried out by specialist companies for water installation.

The device is equipped with a pressure setting screw (1). The setting screw is used to set the pressure value at which the device switches on the connected pump. For more detailed information about the required pump pressure please refer to the start-up chapter.

Please proceed as follows to set the switch-on pressure:

1. Turn the pressure setting screw (1) towards the minus sign to reduce the switch-on pressure. The minimum switch-on pressure (screw all the way to the minus sign) is 1.5 bar.
 - ⇒ Every 360° turn reduces the pressure for approx. 0.2 bar.
2. Turn the pressure setting screw (1) towards the plus sign to increase the switch-on pressure. The maximum switch-on pressure (screw all the way to the plus sign) is 2.5 bar.
 - ⇒ Every 360° turn increases the pressure for approx. 0.2 bar.



Note for setting the switch-on pressure:

- The switch-on pressure is set too low:
 - When the tap is opened, the pump does not start operating.
 - The LED *Power* (5) is illuminated in green.
 - Turn pressure setting screw towards the plus sign.
- The switch-on pressure is set too high:
 - The dry-run protection is activated and the pump does not start operating.
 - The LEDs *Power* (5) and *Failure* (6) are illuminated (green / yellow).
 - Turn pressure setting screw towards the minus sign.
- Switch-on pressure is set close to the maximum pressure of the pump:
 - The pump operates continuously or frequently switches on or off.
 - The LEDs *Power* (5), *Failure* (6) and *On* (7) are illuminated (green / yellow / orange).
 - Turn pressure setting screw 2.5 times towards the minus sign.
 - The pressure is reduced by approx. 0.5 bar.

Shutdown



Warning of electrical voltage

Do not touch the mains plug with wet or damp hands.

If you like to disconnect the pressure switch from the water network, (e.g. for cleaning, maintenance or storing during winter), proceed as follows:

1. Disconnect the pressure switch from the power supply by plugging the mains plug out of the mains socket.
2. Afterwards, disconnect the power supply of the pump from the pressure switch.
3. Open a tap that is connected to the pressure switch to release any remaining water pressure.
4. Disconnect the connection on the water outlet of the pressure switch. Afterwards, disconnect the connection on the water inlet of the pressure switch.
5. Empty the pressure switch (and your pump as well). Carefully dry pressure switch and power cable.

Note

During winter, store pressure switch (and your pump) in a dry room and protected against frost.

Errors and faults



Warning of electrical voltage

Do not touch the mains plug with wet or damp hands.

- Switch the device off.
- Hold onto the mains plug while pulling the power cable out of the mains socket.

The device has been checked for proper functioning several times during production. If malfunctions occur nonetheless, check the device according to the following list.

The connected pump does not start operating:

- Check the power connection.
- Check the power cable and mains plug for damage.
- Check the on-site fusing.
- Check the necessary initial pressure of the pump.
- Check whether enough water is available and make sure the water can be sucked by the pump without any problems.
- Check whether the LED *Failure* (6) is illuminated. If so, press the *Reset* (4) button. If the pump is still not starting to operate, make sure that the water in the water lines can flow freely. If necessary, fill the pump with water (dry run). If this does not help, check the pump for its correct function and check whether the pump capacity is sufficient (see Start-up chapter).
- Check whether the power supply of the pump is switched on. The LED *On* (7) on the pressure switch should be illuminated.

The pump runs permanently and does not stop operating

- Possible leakage in the system that exceeds the minimal flow rate of 2 l/min at which the pressure switch switches off the pump. Check the distribution network for leakages and remove any existing leakages.

The connected pump starts to operate several times and stops again

- Check the water line for leakages and remove any existing leakages.

The device still does not operate correctly after these checks:

Please contact the customer service. If necessary, bring the device to an authorised specialist electrical company or to Trotec for repair.

Maintenance

Activities required before starting maintenance



Warning of electrical voltage

Do not touch the mains plug with wet or damp hands.

- Hold onto the mains plug while pulling the power cable out of the mains socket.

Notes on maintenance

Inside the device, there are no parts that need to be maintained or lubricated by the user.

Cleaning

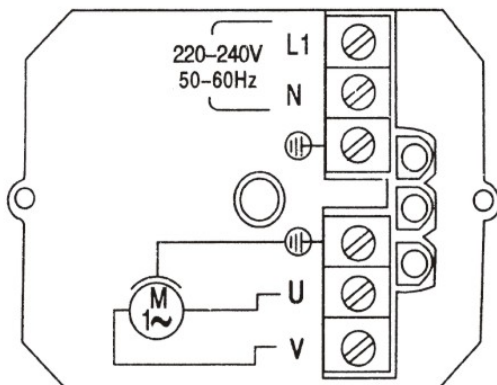
- Clean the device with a soft, damp and lint-free cloth. Protect electrical components from moisture. Do not use any aggressive cleaning agents such as cleaning sprays, solvents, alcohol-based or abrasive cleaners to dampen the cloth.

Technical annex

Technical data

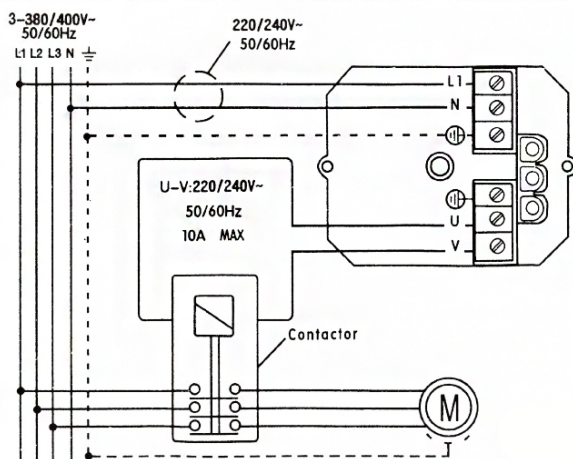
Parameter	Value
Model	Pressure switch TDP DSP
min flow rate	2 l/min
Delivery head	23 m at 1.5 bar
Power supply	220-240 V ~ 50 Hz
Type of protection	IP 65
Maximum connected load for pump	- max. 2300 W (230 V/AC, 10(6) A) for single-phase connection - max. 4000 W (400 V/AC, 10(6) A) for three-phase connection
Power input	1100 W
Max. inlet pressure	1 MPa
Integrated pressure gauge	yes
Max. temperature of pumping medium	60 °C / 140 °F
Pumping medium	clean fresh water
Start-up pressure	1.5 to 2.5 bar
Max. pressure	10 bar
Connection thread	1" external thread
Cable length	0.85 m
Dimensions (length x width x height)	120 x 183 x 225 mm
Weight	1.5 kg

Circuit diagram for three-phase pump connection without mains plug (1-phase)



Circuit diagram for three-phase pump connection without mains plug (3-phase)

A switching device must be interposed when three-phase pumps are used. The chosen capacity for the protection has to be compatible with the pump.



Disposal

Always dispose of packing materials in an environmentally friendly manner and in accordance with the applicable local disposal regulations.



The icon with the crossed-out waste bin on waste electrical or electronic equipment is taken from Directive 2012/19/EU. It states that this device must not be disposed of with the household waste at the end of its life. You will find collection points for free return of waste electrical and electronic equipment in your vicinity. The addresses can be obtained from your municipality or local administration. You can also find out about other return options that apply for many EU countries on the website <https://hub.trotec.com/?id=45090>. Otherwise, please contact an official recycling centre for electronic and electrical equipment authorised for your country.

The separate collection of waste electrical and electronic equipment aims to enable the re-use, recycling and other forms of recovery of waste equipment as well as to prevent negative effects for the environment and human health caused by the disposal of hazardous substances potentially contained in the equipment.

Only for United Kingdom

According to Waste Electrical and Electronic Equipment Regulations 2013 (SI 2013/3113) (as amended) devices that are no longer usable must be collected separately and disposed of in an environmentally friendly manner.

Trotec GmbH

Grebener Str. 7
D-52525 Heinsberg

☎ +49 2452 962-400

☎ +49 2452 962-200

✉ info@trotec.com

www.trotec.com