

DPK, DPK.V

Installation and operating instructions



DPK, DPK.V

English (GB)

Installation and operating instructions. 3

中文 (CN)

安装和使用说明书 19

Appendix 33

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Original installation and operating instructions

These installation and operating instructions describe Grundfos DPK pumps, 0.75 - 22 kW.

Sections 1-5 give the information necessary to be able to unpack, install and start up the product in a safe way.

Sections 6-11 give important information about the product, as well as information on service, fault finding and disposal of the product.

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Read this document before installing the product. Installation and operation must comply with local regulations and accepted codes of good practice.

1. General information

1.1 Target group

These installation and operating instructions are intended for professional installers.

1.2 Hazard statements

The symbols and hazard statements below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.

DANGER



Indicates a hazardous situation which, if not avoided, will result in death or serious personal injury.

WARNING



Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.

CAUTION



Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

The hazard statements are structured in the following way:

SIGNAL WORD



Description of hazard

Consequence of ignoring the warning.
- Action to avoid the hazard.

1.3 Notes

The symbols and notes below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.



Observe these instructions for explosion-proof products.



A blue or grey circle with a white graphical symbol indicates that an action must be taken.



A red or grey circle with a diagonal bar, possibly with a black graphical symbol, indicates that an action must not be taken or must be stopped.



If these instructions are not observed, it may result in malfunction or damage to the equipment.



Tips and advice that make the work easier.

2. Receiving the product

The product is supplied from the factory in a proper packing in which it must remain until it is to be installed. Make sure that the product cannot roll or fall over.

If the product is not going to be installed immediately, the free end of the power cable or the sensor cables must be protected from moisture which could otherwise penetrate the motor windings. This must be done as soon as the product is received.

Protection can be carried out by fitting a cable cap or by wrapping the free end of the cable in plastic and taping over the plastic with strong waterproof tape.

2.1 Inspecting the product

After receiving and before installing the product, check the following points:

- Check that the pump corresponds to the order.
- Check that accessories and other equipment are not damaged during transport.

3. Installing the product

Before beginning the installation, check that the pump is suitable for the supply voltage and frequency available at the installation site.

DANGER

Electric shock

- Before beginning the installation, switch off the power supply and lock the main switch in position 0.
- Before working on the pump, switch off any external voltage connection to the pump.



CAUTION

Sharp element

- Minor or moderate personal injury
- Wear protective clothing (gloves) when working on the pump.



Observe all safety regulations at the installation site, for instance the use of blowers for fresh-air supply to the pit.



Product installation in pits must be carried out by specially trained persons.

Work in or near pits must be carried out according to local regulations.

For safety reasons, all work in pits must be supervised by a person outside the pump pit.

Pits for submersible sewage and wastewater products contain sewage and wastewater with toxic and/or disease-causing substances. Therefore, all persons involved must wear appropriate personal protective equipment and clothing and all work on and near the product must be carried out under strict observance of the hygiene regulation in force.

3.1 Mechanical installation

DANGER

Electric shock

- Death or serious personal injury
- Before installation and the first startup of the product, check the power cable for visible defects and measure the cable resistance to avoid short circuits.

Before installation, check the oil level in the oil chamber. See section [8.4.5 Oil check and oil change](#).



The pumps are designed for operation in vertical position only.

The pumps are suitable for auto-coupling and free-standing installation. All pump housings can be connected to a JIS flange, hose coupling and auto-coupling.

3.1.1 Lifting the product

It is very important to use the approved lifting equipment.

The weight of the specific product is stated on the nameplate.

WARNING

Crushing hazard

- Death or serious personal injury
- All lifting equipment must be rated for the purpose and checked for damage before any attempts are made to lift the product. The lifting equipment rating must under no circumstances be exceeded.



CAUTION

Crushing hazard

- Minor or moderate personal injury
- The area below the lifted pump must be clear of people and marked off.
- Lift the pump in a way that the pump will not start swing.
- Place the pump on a solid foundation which is suitable to hold the weight.
- Make sure that the pump cannot roll or fall over.



CAUTION

Crushing hazard

- Minor or moderate personal injury
- Always check the lifting bracket and chain for corrosion or wear before lifting.
- Always lift the product by its lifting bracket or by means of a fork-lift truck.
- Never lift the product by the power cable or the hose or the pipe.



CAUTION

Crushing hazard

- Minor or moderate personal injury
- Make sure the lifting bracket is tightened before attempting to lift the product. Tighten if necessary.



3.1.2 Submerged installation on auto-coupling

Pumps for permanent installation can be mounted on a stationary auto-coupling guide rail system. The auto-coupling system facilitates maintenance and service as the pump can easily be lifted out of the tank. See fig. 1.

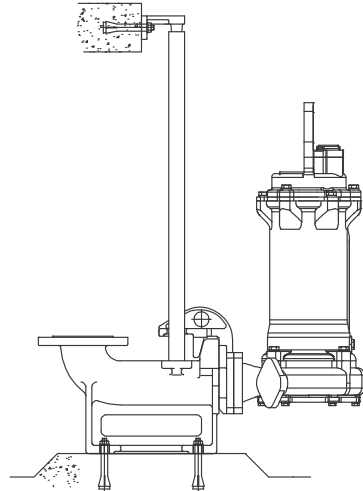


Fig. 1 Submerged pump on auto-coupling

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Proceed as follows:

1. Fit the guide rail bracket on the inside of the pit and fasten it provisionally with anchor bolts.
2. Place the auto-coupling base unit on the bottom of the pit.
Use a plumb line to establish the correct positioning.
3. Fasten with heavy-duty expansion bolts.
Support the auto-coupling base unit so that it is level when being fastened.
4. Connect the outlet line without exposing it to distortion or tension.
5. Insert the guide rails in the auto-coupling base unit and adjust the length of the rails accurately to the guide rail bracket.
6. Unscrew the provisionally fastened guide rail bracket and fit it on top of the guide rails. Fasten the bracket firmly to the pit wall.



The guide rails must not have any axial play as this will cause noise during pump operation.

7. Clean out debris from the pit before lowering the pump into the pit.
8. Fit the guide claw to the outlet port of the pump. Then slide the guide claw down the guide rails and lower the pump into the pit by means of a chain fastened to the lifting bracket. When the pump reaches the auto-coupling base unit, the pump will automatically connect tightly.
9. Hang up the end of the chain on a suitable hook at the top of the pit and in such a way that the chain cannot come into contact with the pump housing.
10. Adjust the length of the power cable by coiling it up on a relief fitting to ensure that the cable is not damaged during operation. Fasten the relief fitting to a suitable hook at the top of the pit.



Make sure that the cable is not sharply bent or pinched.

11. Connect the power cable.

3.1.3 Free-standing submerged installation

Pumps for free-standing submerged installation can stand freely on the bottom of the pit or the like. The pump must be installed on a ring stand. See fig. 2.

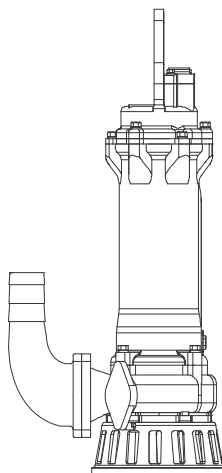


Fig. 2 Free-standing pump on ring stand

Fit a flexible union or coupling to the outlet in order to facilitate service on the pump and easy separation of pump and outlet line.

If a hose is used, make sure that the hose does not buckle and that the inside diameter of the hose matches that of the pump outlet.

If a rigid pipe is used, fit the union or coupling, non-return valve and isolating valve in the order mentioned when viewed from the pump.

If the pump is installed in muddy conditions or on uneven ground, support the pump on bricks or a similar support.

Proceed as follows:

1. Fit a 90 ° elbow to the pump outlet port and connect the outlet pipe or hose.
2. Lower the pump into the liquid by means of a chain secured to the lifting bracket of the pump. Place the pump on a plane, solid foundation to make sure that the pump stands securely.
3. Hang up the end of the chain on a suitable hook at the top of the pit and in such a way that the chain cannot come into contact with the pump housing.
4. Adjust the length of the power cable by coiling it up on a relief fitting to ensure that the cable is not damaged during operation.
5. Fasten the relief fitting to a suitable hook.



Make sure that the cable is not sharply bent or pinched.

6. Connect the motor power cable.

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3.2 Electrical connection

DANGER

Electric shock

Death or serious personal injury

- A motor protector, set to rated current +10 %, must be installed by the customer.
- Make sure that all protective equipment has been connected correctly.



DANGER

Electric shock

Death or serious personal injury

- It is not permitted to extend the pump cable. Contact Grundfos to get the right cable length.



DANGER

Electric shock

Death or serious personal injury

- The motor-protective circuit breaker of the pump controller must include a circuit which automatically disconnects the power supply in case the protective circuit for the pump is opened.



Carry out the electrical connection in accordance with local regulations.



Do not install Grundfos control boxes and pump controllers in potentially explosive environments.



Connect the pump to a control box with a motor protective relay with IEC trip class 10 or 15.



The pump must be connected to a main switch with a minimum contact gap of 3 mm in all poles.



The classification of the installation site must be approved by the local fire-fighting authorities in each individual case.

The supply voltage and frequency are marked on the pump nameplate. The voltage tolerance must be within - 5 %/+ 5 % of the rated voltage. Make sure that the motor is suitable for the power supply available at the installation site.

All pumps are supplied with 10 m cable and a free cable end.

Pumps with sensors must be connected to a GU01 or GU02 pump controller. See fig. 3 for DOL-connected pumps or fig. 4 for star-delta-connected pumps. For further information, see the installation and operating instructions for the selected control box or pump controller at www.grundfos.com.

3.3 Thermal protection

One thermal switch is built into the motor winding and will break the circuit in case of over temperature.

In case of intermittent operation, with water level up to half of the motor, the thermal switch inside the motor winding might be activated and cause the pump to stop.

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- Thermal switch: As standard, a Klixon thermal switch is installed, opening at a temperature of 130 °C.
- Thermal sensor: A PT100 thermal sensors (PCA) is installed.

The thermal switch must be connected according to the wiring diagram fig. 3 or fig. 4. Make sure that the alarm output will cause a motor stop in case of high temperature in the motor.

The thermal switch must be connected to the control wire of the power cable inside the pump and to the safety circuit of the separate pump controller.

3.3.1 Checking after electrical connection

Use a multimeter to check the two signal wires of the power cable. The circuit must be closed and the resistance must be less than 1 Ohm.

3.3.2 Wiring diagrams

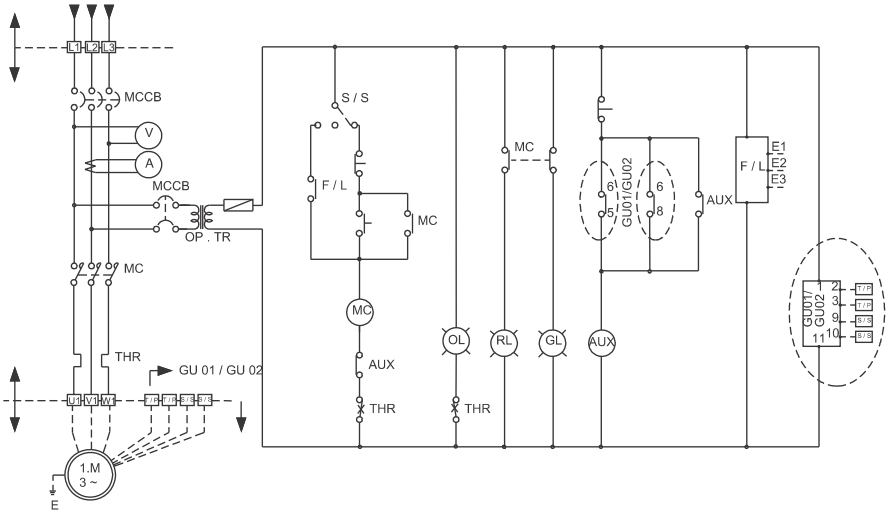


Fig. 3 Direct-on-line starting

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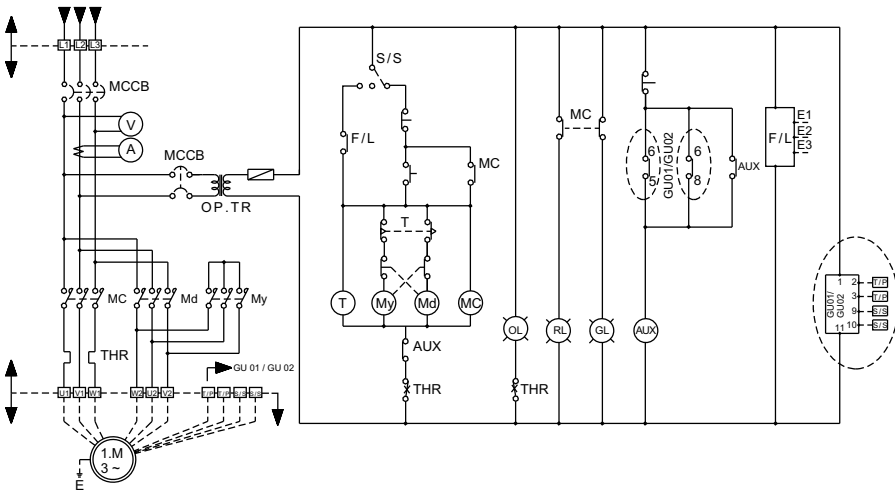


Fig. 4 Star-delta starting

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3.4 Frequency converter operation

Before installing a frequency converter, calculate the lowest allowable frequency in the installation in order to avoid zero flow.

3.4.1 Requirements

- The thermal protection of the motor must be connected.
- Do not reduce the motor speed to less than 30 % of rated speed.
- Keep the flow velocity above 1 m/sec.
- Let the pump run at rated speed at least once a day in order to prevent sedimentation in the pipe system.
- Do not exceed the frequency indicated on the nameplate. In this case there is a risk of motor overload.
- Keep the power cable as short as possible. The peak voltage will increase with the length of the power cable. See data sheet for the frequency converter used.
- Use input and output filters on the frequency converter. See data sheet for the frequency converter used.

3.4.2 Possible consequences

When operating the pump via a frequency converter, please be aware of these possible consequences:

- The locked-rotor torque will be lower. How much lower will depend on the frequency converter type. See the installation and operating instructions for the frequency converter used for information on the locked-rotor torque available.
- The working condition of bearings and shaft seal may be affected. The possible effect will depend on the application. The actual effect cannot be predicted.
- The acoustic noise level may increase. See the installation and operating instructions for the frequency converter used for advice as to how to reduce the acoustic noise.

4. Starting up the product

You can start up the product using either direct-on-line (DOL) starting or star-delta (Y/D) starting. The selection of the starting method depends on several considerations regarding usage and mains supply conditions.

DANGER

Electric shock

Death or serious personal injury

- Before installation and the first startup of the product, check the power cable for visible defects and measure the cable resistance to avoid short circuits.



DANGER

Electric shock

Death or serious personal injury

- Make sure that the power supply cannot be accidentally switched on.



CAUTION

Sharp element

Minor or moderate personal injury

- Wear protective clothing (gloves) when working on the pump or touching the impeller.



Before starting the product:

- Make sure that the fuses have been removed.
- Make sure that all protective equipment has been connected correctly.



4.1 Operating modes

WARNING

Electric shock

Death or serious personal injury

- The pump must be stopped by signal from the level sensors depending on the S1 or S3 operation modes.
- The pump must be stopped when the liquid level falls below the top cover (S1) when operated continuously in S1 mode.
- The pump must be stopped when the liquid level falls below the mid stator housing (S3) when operated intermittently in S3 mode.



The pumps are designed for intermittent operation (S3). When completely submerged, the pumps can also operate continuously (S1).

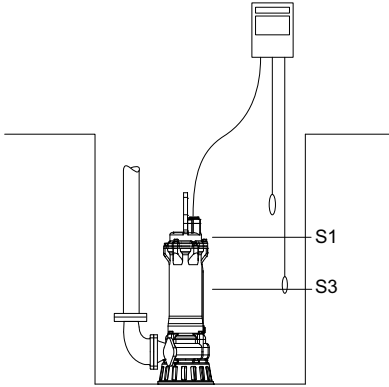
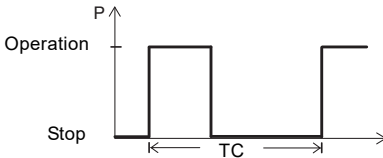


Fig. 5 Operating levels of DPK

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S3, intermittent operation

S3 operation is a series of identical duty cycles (TC) each with a constant load for a period, followed by a rest period. Thermal equilibrium is not reached during the cycle. See fig. 6.

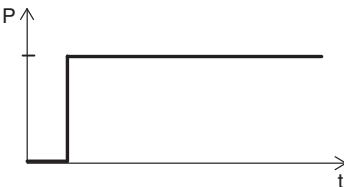


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Fig. 6 S3 operation

S1, continuous operation

In this operating mode, the pump can operate continuously without being stopped for cooling. Being completely submerged, the pump is sufficiently cooled by the surrounding liquid. See fig. 7.



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Fig. 7 S1 operation

4.2 Checking the direction of rotation



Only start and run an unsubmerged pump for a few seconds to check the direction of rotation.

Check the direction of rotation in the following way every time the pump is connected to a new installation.

Proceed as follows:

1. Remove the pump from the system. Let the pump hang from a lifting device, for example the hoist used for lowering the pump into the pit.
2. Start and run the pump for a few seconds.
3. Observe the jerk of the pump. If the pump jerks counterclockwise, the direction of rotation is correct. See fig. 8.
4. Reinstall the pump in the system.

In case the direction of rotation is wrong, interchange any two phases in the power cable.

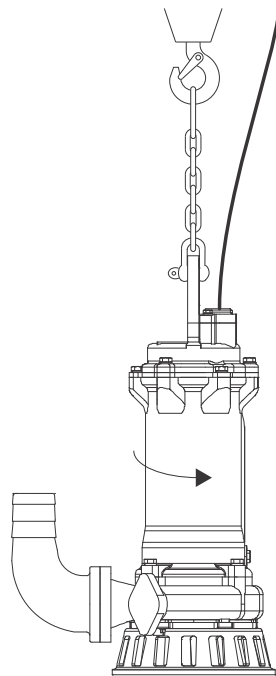


Fig. 8 Jerk direction

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4.3 Preparing for startup

Before starting the product, follow the steps below:

- Check that the fuses have been removed.
- Check that the impeller can rotate freely by turning the impeller by hand.
 - Wear protective clothing (gloves) when touching the impeller.
- Check the condition of the oil. See section [8.4.5 Oil check and oil change](#).
- Check the direction of the rotation. See section [4.2 Checking the direction of rotation](#).
- Make sure that the monitoring units, if used, are operating.
- Check the setting of the level and float switches, or electrodes.

4.4 Startup



The pump must not run dry.



In case of abnormal noise or vibrations from the pump or other pump or power supply failure, stop the pump immediately. Do not attempt to restart the pump until the cause of the fault has been found and corrected.

Proceed as follows:

1. Switch on the power supply.
2. Open the isolating valves, if fitted.
3. Check that the motor is 2/3 covered with liquid. If the liquid level is below that, add liquid to the pit until the minimum level is reached.
4. Vent the pump by tilting it by means of the lifting chain and let trapped air escape.
5. Run the pump briefly, and check if the liquid level is falling. A correctly vented pump will quickly lower the liquid level.
6. Start the pump.

5. Handling and storing the product

CAUTION



Sharp element

Minor or moderate personal injury
- Wear protective clothing (gloves) when working on the pump.

5.1 Handling the product

When handling the product, observe the following points:

- Check the lifting equipment and lifting instructions. See section [3.1.1 Lifting the product](#).
- Move the pump only with a fork-lift or a lifting crane.

5.2 Storing the product

5.2.1 Warehouse storage

- The warehouse must be dry and free from corrosive gases, vapours or vibrations which might damage the pump.
- Store the pump in a vertical position on a pallet or a stand to keep the pump off the floor and facilitate easy removal.
- Coil up the cable, and seal the open end tightly with waterproof plastic and tape or a cable cap. Do this to prevent moisture from penetrating into the motor which will cause severe damage to the windings.
- Give all unpainted surfaces a light coat of oil or grease to prevent corrosion.
- If new pumps are stored for more than two months, turn the impeller by hand every two months to prevent the mechanical seal faces from seizing up. Failure to do this may result in seal damage when the pump is started up again.

5.2.2 Storage in the pit (dry or wet)

- If an installed pump is not in operation for a long time, check the insulation resistance and run the pump for 30 minutes every month. If the pump cannot be run due to lack of water in the pit, inspect the pump and turn the impeller by hand each month and before putting the pump back into service. If the insulation resistance drops below 10 megohms, contact Grundfos.
- When the pump is not in service, disconnect the power supply from the control panel.
- If the pump is disconnected from the control cabinet when not in service, protect the cable end as described in section [5.2.1 Warehouse storage](#).

6. Product introduction

6.1 Product description

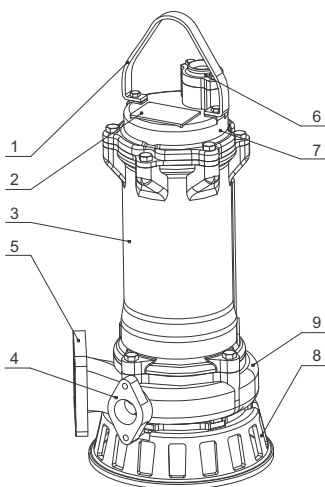


Fig. 9 DPK pump

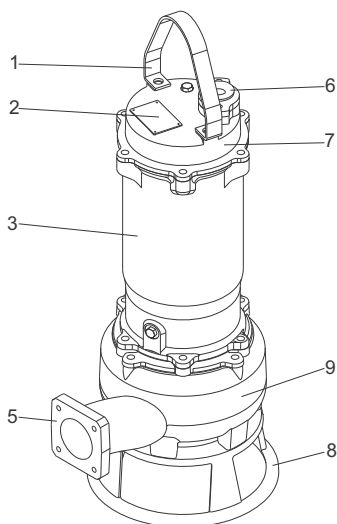


Fig. 10 DPK.V pump

Pos.	Description
1	Lifting bracket
2	Nameplate
3	Motor
4	Flush-valve connection
5	Outlet flange
6	Cable inlet
7	Top cover
8	Ring stand
9	Pump housing

6.2 Applications and intended use

DPK pumps are used for removal of surface, drainage and underground water in permanent or temporary installations. DPK.V pumps can additionally be used for effluent and screened wastewater.

6.3 Improper operating methods

The operational safety of the pump is only guaranteed if it is used in accordance with section [6.2 Applications and intended use](#).



Other applications or the operation of pumps in ambient and operating conditions, which are not approved, are considered improper and are not permitted.



The pump is not allowed to be used for drinking water.

6.4 Approvals

The standard version of the DPK pumps has been tested by TÜV according to EC Council Machinery Directive 2006/42/EC, registration no. AM 50143414 and report no. 13009107 002.

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6.5 Identification

6.5.1 Type key

The pump can be identified by the type designation stated on the pump nameplate.

Example: DPK.15.80.22.5.0D

Code	Description	Explanation
DPK	Drainage pump	Pump type
[]	Semi-open impeller	Impeller type
V	Vortex impeller	
15	Maximum solids size [mm]	Free passage
80	Nominal diameter of pump outlet [mm]	Pump outlet
22	Output power P2 $22 = 2.2 \text{ kW}^1$	Power [kW]
[]	Standard	Equipment
S	Sensor(s)	
2	2-pole	Number of poles
4	4-pole	
5	50 Hz	Frequency [Hz]
6	60 Hz	
0D	380-415 V, DOL	Voltage and starting method
1D	380-415 V, Y/D	
0E	220-240 V, DOL	
1E	220-240 V, Y/D	
Z	Custom-built variant	Customisation

¹ Exception: Code 075 = 0.75 kW

6.5.2 Nameplate

Fix the extra nameplate supplied with the pump at the installation site or keep it in the cover of this booklet.

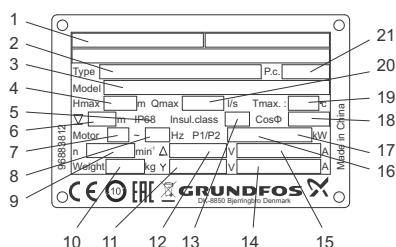


Fig. 11 Nameplate

Pos.	Description
1	Notified body
2	Type designation
3	Product number and serial number
4	Maximum head [m]
5	Enclosure class
6	Maximum installation depth [m]
7	Number of phases
8	Frequency [Hz]
9	Speed [min^{-1}]
10	Weight [kg]
11	Rated voltage [V] Star
12	Rated voltage [V] Delta
13	Insulation class
14	Rated current [A] Star
15	Rated current [A] Delta
16	Motor input power P1 [kW]
17	Motor output power P2 [kW]
18	Power factor
19	Maximum liquid temperature [°C]
20	Maximum flow [m^3/h]
21	Production code, year and week

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7. Protection and control functions

7.1 Pump controllers

The pumps can be controlled via the Grundfos controllers: LC, LCD 107, LC, LCD 108 and LC, LCD 110.

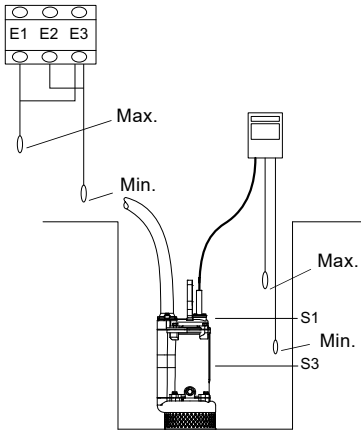


Fig. 12 Pump controllers

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7.3 GU01 and GU02

GU01 is a monitoring device for monitoring the stator temperature and water penetration into the motor. It receives a digital signal.

GU02 is a monitoring device for monitoring stator and bearing temperature as well as water penetration into the motor. It receives an analog signal.

Both monitoring devices must be connected to the control panel via a relay.

GU01 and GU02 are manufactured for Grundfos. For further information, please contact your local Grundfos company.

For further information, see the data sheets for GU01 and GU02 at www.grundfos.com.

7.2 Level controllers

LC controllers are for single-pump installations. LCD controllers are for two-pump installations.

The following LC and LCD pump controllers are available for level control:

- LC 107, LCD 107 with air bells
- LC 108, LCD 108 with float switches
- LC 110, LCD 110 with water level electrodes.

In the following description, "level switch" can be air bells, float switches or water level electrodes, depending on the pump controller selected.

7.2.1 LC, LCD

The LC controller is fitted with two or three level switches: one for start and one for stop of the pump. The third level switch, which is optional, is for high-level alarm.

The LCD controller is fitted with three or four level switches: one for common stop and two for start of the pumps. The fourth level switch, which is optional, is for high-level alarm.

For further information, see the installation and operating instructions for the pump controller selected.

8. Servicing the product

The life of the product depends largely on the operating conditions, so we strongly recommend daily inspection and periodic servicing in order to guarantee maximum product lifetime.

8.1 Safety instructions and requirements

WARNING

Electric shock

- Death or serious personal injury
- Before starting any work on the product, make sure that the fuses have been removed or the main switch has been switched off and locked in position 0. Make sure the power supply cannot be accidentally switched on.



WARNING

Crushing of hands

- Death or serious personal injury
- Make sure that all rotating parts have stopped moving.



Maintenance and service must be carried out by specially trained persons.

8.2 Service documentation

Service documentation is available on www.grundfos.com > International website > Grundfos Product Center > Service & support.

If you have any questions, please contact the nearest Grundfos company or service centre.

8.3 Contaminated products

WARNING

Biological hazard

- Death or serious personal injury
- Flush the product thoroughly with clean water and rinse the product parts in water after dismantling.



The product will be classified as contaminated if it has been used for a liquid which is injurious to health or toxic.

If you request Grundfos to service the product, contact Grundfos with details about the pumped liquid before returning the product for service. Otherwise, Grundfos can refuse to accept the product for service.

Any application for service must include details about the pumped liquid.

Clean the product in the best possible way before you return it.

Costs of returning the product are to be paid by the customer.

8.4 Maintenance

Under normal operating conditions, remove the pump from the pit and inspect it once every year.

Under severe operating conditions where sand, fibrous material and solids are involved, do this once a month.

Check the following points:

- Electrical test of the motor
See sections [8.4.1 Checking the current and voltage](#) and [8.4.2 Checking the insulation resistance](#).



The insulation resistance of the motor must be measured at least once a month.

- Outlet pressure and flow rate
See section [8.4.3 Checking the outlet pressure and flow rate](#).



The outlet pressure and flow rate must be measured at least once a month if a flowmeter is available.

- Seal-sensor resistance
See section [8.4.4 Inspecting the seal sensor](#).
- Oil level and oil condition
See section [8.4.5 Oil check and oil change](#).
- Impeller clearance
See section [8.4.6 Inspection and adjustment of impeller clearance](#).

8.4.1 Checking the current and voltage

Check the pump current and voltage. If the ammeter reading exceeds the rated value or is far lower than the rated value, there is a problem. The voltage must be stable within - 5 %/+ 5 % of the rated value throughout the operational period.

8.4.2 Checking the insulation resistance

If the insulation resistance has declined sharply since the previous reading, this is an indication of impending insulation failure, and the pump must be scheduled for service even though the insulation resistance may still be over 10 mega ohms.

8.4.3 Checking the outlet pressure and flow rate

Declining performance can indicate the need for an overhaul. Regardless of performance, the pressure and flow rate must be stable, and rapidly changing pressure or flow rate indicate system problems on the inlet or outlet side.

8.4.4 Inspecting the seal sensor

Check the resistance of the seal sensor with a multimeter as shown in fig. 13.



Do not use a megger as it will damage the control circuit of the seal sensor.

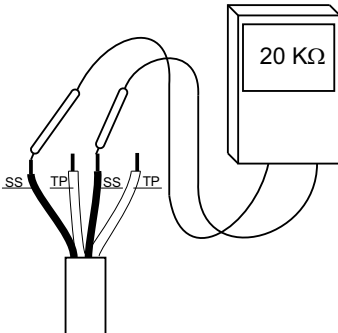


Fig. 13 Resistance check

8.4.5 Oil check and oil change

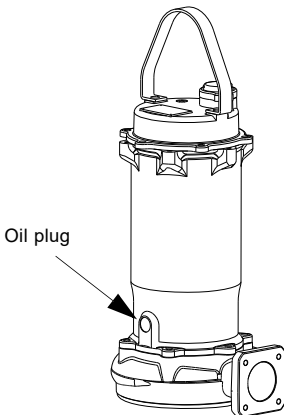


Fig. 14 Position of oil plug

CAUTION

Pressurised system



Minor or moderate personal injury

- When loosening the oil plug of the oil chamber, note that pressure may have built up in the chamber. Do not remove the oil plug until the pressure has been fully relieved.

1. Loosen the oil plug. See fig. 14.
2. Remove the oil plug and check the oil level.
3. Take a sample to inspect the condition of the oil.
4. If the oil needs to be changed, place a clean container under the pump to collect all the drained-off oil.
5. Tilt the pump with the oil-filling hole pointing downwards in order to drain the pump of oil. If the drained oil is contaminated or opaque, this is an indication of an impending mechanical shaft seal failure. Replace the mechanical seal.



Used oil must be disposed of in accordance with local regulations.

6. Fill fresh oil into the oil chamber through the oil filling hole. Use lubrication oil ISO VG 32 Mobil DTE 24 turbine oil 90 or equivalent.

8.4.6 Inspection and adjustment of impeller clearance

Check the clearance between the impeller and the wear plate. Recommended clearance is 0.3 - 0.5 mm. Replace or repair as necessary.

TM04 4119 0809

TM07 1898 2218

9. Fault finding the product

Before attempting to diagnose any fault, read and observe the safety instructions in section [8.1 Safety instructions and requirements](#).



For pumps with a sensor, start fault finding by checking the status on the GU01 or GU02 front panel. See installation and operating instructions for GU01 or GU02.

DANGER

Electric shock

Death or serious personal injury

- Before starting any work on the product, make sure that the power supply has been switched off and that it cannot be accidentally switched on.



Fault	Cause	Remedy
The motor does not start, the fuses blow or the motor protector trips out immediately. Caution: Do not try to start again.	1. Power supply failure, short circuit or earth leakage in the cable or the motor winding.	Have the cable and motor checked and repaired by a qualified electrician.
	2. The fuses blow due to use of wrong type of fuse.	Fit fuses of the correct type.
	3. The impeller is blocked by impurities.	Clean the impeller.
	4. Level pickup, float switch or electrode is out of adjustment or defective.	Check the level pickups, float switches or electrodes.
	5. Motor phase malfunction.	Inspect the motor and the connections.
The pump operates, but the motor protector trips after a short while.	1. Low setting of the thermal relay in the motor protector.	Set the relay in accordance with the specifications on the pump nameplate.
	2. Increased current consumption due to large voltage drop.	Measure the voltage between two motor phases. Tolerance: - 5 %/+ 5 %.
	3. The impeller is blocked by impurities.	Clean the impeller.
	4. The direction of rotation is wrong.	Check the direction of rotation and possibly interchange any two phases in the power supply. See section 4.2 Checking the direction of rotation .
The thermal switch of the pump trips after a short while.	1. The liquid temperature is too high. Inadequate cooling.	Improve cooling or lower the liquid temperature.
	2. The viscosity of the pumped liquid is too high.	Dilute the pumped liquid.
	3. Fault in the electrical connection. (Y-connection of pump to D-connection results in considerable undervoltage)	Check and correct the electrical connection.
The pump operates at below-standard performance and power consumption.	1. The impeller is blocked by impurities.	Clean the impeller.
	2. The direction of rotation is wrong.	Check the direction of rotation and possibly interchange any two phases in the power supply. See section 4.2 Checking the direction of rotation .
The pump operates, but gives no liquid.	1. There is air in the pump.	Vent the pump twice.
	2. The outlet valve is closed or blocked.	Check the outlet valve and open and/or clean it if necessary.
	3. The non-return valve is blocked.	Clean the non-return valve.
The pump is clogged.	1. The liquid contains large particles.	Select a pump with a larger size of passage.
	2. A float layer has formed on the surface.	Install a mixer in the pit.

10. Technical data

10.1 Operating conditions

10.1.1 Operating mode

The pumps are designed for continuous operation, S1, or intermittent operation, S3.

Operating mode S3 means that within 10 minutes the pump must be in operation for 4 minutes and stopped for 6 minutes.

10.1.2 Maximum starts per hour

DPK: Maximum 30 starts per hour

10.1.3 pH value

Pumps in permanent installations can cope with pH values ranging from 4 to 10.

10.1.4 Liquid temperature

0 to 40 °C

10.1.5 Ambient temperature (if the pump is not fully submerged)

0 to 40 °C

10.1.6 Density of pumped liquid

Maximum 1000 kg/m³

In the case of higher densities, contact Grundfos.

10.1.7 Maximum operating pressure

5.7 bar

10.1.8 Installation depth

DPK: Maximum 20 m below liquid level

10.1.9 Max. altitude above sea level

2000 m

10.2 Dimensions and weights

10.2.1 Dimensions

See *Dimensions and weights* in the appendix.

11. Disposing of the product

This product or parts of it must be disposed of in an environmentally sound way:

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.



The crossed-out wheellie bin symbol on a product means that it must be disposed of separately from household waste. When a product marked with this symbol reaches its end of life, take it to a collection point designated by the local waste disposal authorities. The separate collection and recycling of such products will help protect the environment and human health.

See also end-of-life information at www.grundfos.com/product-recycling.

中文 (CN) 安装和使用说明书

翻译原来的英文版

这些安装与操作指导对0.75 - 22 kW的格兰富DPK泵进行了说明。

章节1-5介绍了以安全的方式打开包装、安装并启动本产品所需的信息。

章节6-11介绍了有关产品的重要信息，以及有关服务、故障查找和产品处置的信息。

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开始安装前，请先阅读本文件。安装和操作必须遵守当地规章制度并符合公认的良好操作习惯。

1. 概述

1.1 目标人群

这些安装与操作说明面向专业安装人员。

1.2 危险性声明

以下符号和危险性声明可能出现在格兰富的安装和操作说明、安全说明和维修说明中。



危险

指示危险情况，如果不可避免，可能导致死亡或严重的人身伤害。



警告

指示危险情况，如果不可避免，可能导致死亡或严重的人身伤害。



注意

指示危险情况，如果不可避免，可能导致轻度或中度的人身伤害。

危险性声明的结构如下：



警示语

危险说明

无视警告的后果。
- 避免危险的措施。

1.3 注意

以下符号和注释可能出现在格兰富的安装和操作说明、安全说明和维修说明中。



使用防爆产品时应遵循本说明。



带白色图形符号的蓝色或灰色圆圈表示必须采取行动以避免发生危险。



红色或灰色圆圈加一斜线，也可能带黑色图形符号，表示不得采取或必须停止的行为。



不遵守这些指导可能会造成设备故障或设备损坏。



使工作更轻松提示和建议。

2. 接收产品

水泵包装完毕后由工厂直接送达；在安装前，必须保持水泵包装完整。确保水泵不会滚动或掉落。

如果泵不打算立即安装，必须对电源线或传感器电缆的开口端进行保护，防止水汽，否则可能渗入电机绕组。这项工作必须在接收产品后尽快进行。

可以在电缆开口端上装上电缆帽，或用塑料布包裹电缆开口端，并用结实的防水胶带缠绕粘牢塑料布。

2.1 检查产品

接收本产品之后，安装之前，请检查并确保以下几点：

- 对照订货单检查水泵型号。
- 检查配件和其他设备在运输过程中是否损坏。

3. 安装产品

开始安装前，检查水泵是否适用于安装现场的供电电压和供电频率。

危险

电击



死亡或严重的人身伤害

- 安装开始之前，断开电源并将电源开关锁定在 0 位。
- 在对泵进行作业之前，必须将所有连接到泵上的外部电压全部断开。

注意

尖锐物品

轻度或中度的人身伤害

- 操作水泵时需穿着防护服（手套）。



须遵守安装现场的所有相关安全规定，例如使用鼓风机以保持水池空气流通。



水池内安装的水泵必须由经过专业培训的人员来执行安装。

在水池内或在水池周围开展工作时必须遵守地方规范。

为安全起见，所有在水池内开展的工作必须在一名位于水池外的人员指导下进行。

可潜水式污水和废水产品的水内的污水或废水可能含有毒性和/或致病性物质。因此，在对水泵本体及其附近进行操作时，所有相关人员必须穿戴适当的个人防护装备及救生衣，且必须严格地遵守现行的卫生法规。

3.1 机械安装

危险

电击



死亡或严重的人身伤害

- 在水泵安装和首次启动之前，先检查电源线是否有可见缺陷并测量电缆绝缘值，以防短路。

在安装之前检查油腔内的油位。见章节 [8.4.5 检查油位并更换机油](#)。



该系列的泵型只可在竖立位置运行。

该水泵适用于自动联合和独立安装。所有泵出口均可连接 JIS 法兰、软管连接和自动耦合装置。

3.1.1 起吊产品

必须使用经批准的起重设备，这一点非常重要。

某个产品的重量可在铭牌上查询。

警告

身体压伤



死亡或严重的人身伤害

- 所有起重设备均应经过标称确认是否合用，并在起吊产品之前检查起重设备有无损坏。在任何情况下都不允许超出起重设备的额定载荷。

注意

身体压伤



轻度或中度的人身伤害

- 吊起的水泵下方的区域必须标记并隔离，严禁人员出入。
- 起吊水泵时需确保其不会发生摆动。
- 将水泵放置在能够支撑其重量的坚固基础上。
- 确保水泵不会滚动或掉落。

注意

破碎危险



轻度或中度的人身伤害

- 起吊前必须检查起吊支架和吊链是否有腐蚀和磨损。
- 必须通过产品的起吊支架起吊产品，或用叉车搬运。
- 严禁通过电机电缆或者软管或硬管来起吊产品。

注意

破碎危险



轻度或中度的人身伤害

- 在起吊产品前，应确保吊装支架已拧紧。若有必要，进行紧固。

3.1.2 在自动耦合系统上的潜水安装

永久安装的水泵可以被安装在一个固定的自动耦合导轨系统上。自动耦合系统可以使维护保养和服务简便化，因为可以很容易将水泵从水池中提升出来。见图1。

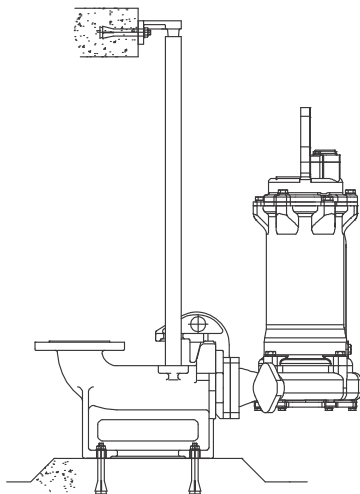


图1 自动耦合装置上的潜水泵

请按以下步骤操作：

1. 在水池的内面安装导轨支架，然后用锚定螺栓将它暂时固定。
2. 将自动耦合装置的底座元件放置在水池底部。用一根铅锤来确立正确的位置。
3. 用重载型膨胀螺栓进行固定。固定时支撑自动耦合装置底座以确保其水平。
4. 连接出水管路但注意不要使它变形或受牵拉。
5. 将导轨插入自动耦合装置的底座部分，并按导轨支架位置正确地调整导轨的长度。
6. 松开临时固定住的导轨支架然后将它安装在导轨的顶端。在水池壁上将支架牢固固定。



导轨之间不得有任何轴向游隙，因为这会在水泵运行时导致噪声。

7. 向水池中放入水泵之前先清除水池中的垃圾碎屑。
8. 在泵的出口上安装导爪。用链条拴在泵的提升架上，将导爪卡到导轨内，然后将泵降到水池内。当泵到达自动耦合装置的底座位置时会自动紧密连接。
9. 将起重链条末端挂在水池顶端的吊钩上，从而防止链条接触泵壳。
10. 将电缆卷在一个线盘上，以此来调整电源电缆的长度并确保该电缆在水泵工作时不会受损。将该线盘固定在水池顶部的吊钩上。



检查电缆没有折角或穿通。

11. 连接电源线。

3.1.3 自立式潜水安装

自立式安装的潜水泵可以单独安装在水池底或类似位置。水泵必须安装在一个环形底座上。见图2。

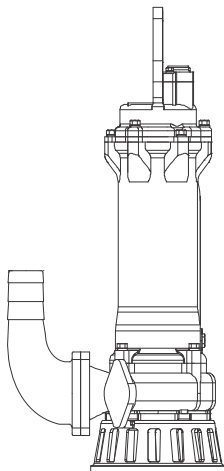


图2 环形底座上的独立泵

在出口上接一个挠性联轴节或联轴器，以便对泵进行服务及泵和出水管路之间的简易分离。

若使用软管，应确保软管不打结，且软管内径与水泵排出口相匹配。

若使用刚性管，按照规定的顺序（从泵的方向看）安装连接器或耦合装置、止回阀和隔离阀。

如果泵是安装在泥泞的条件或不平的地面上，用砖块或类似支持物支撑水泵。

请按以下步骤操作：

1. 在泵排水口处安装一个90°弯头，并连接排水管或软管。
2. 将链条在泵的提升架上栓牢，然后将泵降入水中。将泵放置在坚固的平面上，以确保泵安全固定。
3. 将起重链条末端挂在水池顶端的吊钩上，从而防止链条接触泵壳。
4. 将电缆卷在一个线盘上，以此来调整电源电缆的长度并确保该电缆在水泵工作时不会受损。
5. 将线盘固定在适当的吊钩上。



检查电缆没有折角或穿通。

6. 连接电机电源线。

TM04 4094 0709

TM04 4095 0709

3.2 电气连接

危险

电击



死亡或严重的人身伤害

- 额定值等于电机额定电流+10 %的保险丝必须由用户自行安装。
- 确保所有保护设备的正确连接。

危险

电击



死亡或严重的人身伤害

- 不得延长水泵电缆。请与格兰富联系，以获取正确的电缆长度。

危险

电击



死亡或严重的人身伤害

- 水泵控制器的电机保护断路器必须包含一个可以在泵的保护回路打开时自动断开电源的回路。

危险

电击



死亡或严重的人身伤害

- 确保所有保护设备的正确连接。



按照当地法规进行电气连接。



不要将格兰富控制盒以及泵的控制盒安装在具有潜在爆炸危险的环境内。



将泵连接到一个带电机保护继电器的控制盒，继电器的 IEC 跳闸等级为10或15。



必须将泵连接到一个触点间隔最小为 3 mm 的电源开关。



每次安装现场的等级都必须经过当地消防部门的批准。

供电电压和供电频率在水泵铭牌上标明。允许电压偏差必须在额定电压的- 5 %/+ 5 %范围之内。请确保电机与安装现场中电源之间的匹配性。

所有水泵交货时均配有10米电缆和一个自由电缆终端。

配传感器的泵必须连接一个GU01或GU02水泵控制器。DOL接法的泵型请见图3，星三角接法的泵型请见图4。进一步信息请登录 www.grundfos.com 查阅所选控制盒或水泵控制器的安装与操作指导。

3.3 热保护

电机绕组中内置有一个热敏开关，一旦温度过高，就会断开电路。

在间歇运行的情况下，如果水位不超过电机的一半，则可能会激活电机绕组内的热敏开关，使水泵停止运转。

DPK 19和22 kW

- 热敏开关：作为标准配置，安装有Klixon热敏开关，可在130 °C的温度下打开。

- 热传感器：安装有PT100热传感器（PCA）。

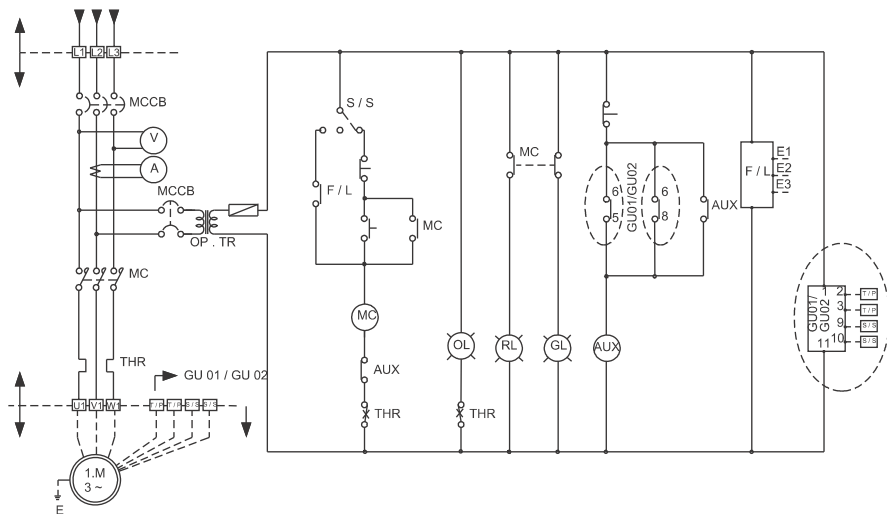
必须根据接线图3或图4连接热敏开关。确保在电机高温的情况下，报警输出会使电机停止。

热敏开关必须连接到泵内部电源线的控制电缆上，并连接到单独的水泵控制器的安全电路上。

3.3.1 完成电气连接后进行检查

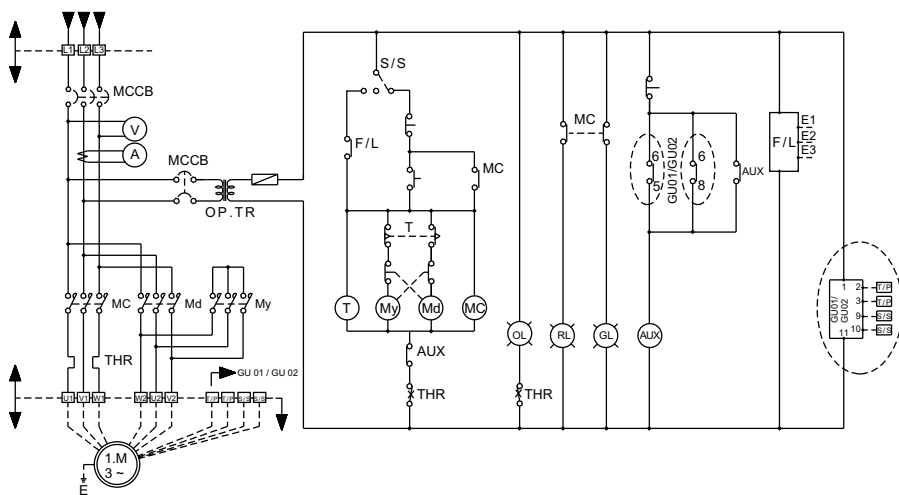
使用万用表检查电源电缆的两条信号线。电路必须闭合并且电阻必须小于1欧姆。

3.3.2 接线图



TM04 4096 0709

图3 直接启动



TM04 4097 3316

图4 星-三角启动

3.4 变频器操作

安装变频器之前，先计算好安装所允许的最低频率以防止零流量。

3.4.1 要求

- 必须连接电机热敏保护。
- 不要将电机速度降到额定速度的30 %以下。
- 保持流速在每秒1米以上。
- 每天至少一次水泵以额定速度运行以防管路系统中发生沉淀。
- 不要超出铭牌上规定的频率范围。否则电机过载。
- 电源线应尽可能短。
峰电压会随电源线的长度增加而增加。参见所用变频器的数据表。
- 在变频器上使用输入和输出滤波器。参见所用变频器的数据表。

3.4.2 可能发生的后果

在通过变频器运行水泵时，请您注意以下可能发生的后果：

- 锁定转子的扭矩会降低。降低的数值取决于变频器的类型。对于锁定转子可用扭矩的信息，请参阅相应变频器的安装与操作指导手册。
- 轴承和轴封的工作条件也可能受到影响。所受的具体影响视应用而定。实际发生的影响无法估计。
- 噪音也可能会增加。对于如何降低噪音的建议，请参阅相应变频器的安装与操作指导手册。

4. 启动产品

可以使用直接（DOL）启动或星三角（Y/D）启动来启动产品。根据水泵用途及电源情况来选择合理的启动方式。

危险

电击



死亡或严重的人身伤害

- 在水泵安装和首次启动之前，先检查电源线是否有可见缺陷并测量电缆绝缘值，以防短路。

危险

电击



死亡或严重的人身伤害

- 确保不会意外接通电源。

注意

尖锐物品



轻度或中度的人身伤害

- 操作水泵或触摸叶轮时需穿着防护服（手套）。



启动产品之前：

- 确保保险丝已移除。
- 确保所有保护设备的正确连接。

4.1 运行模式

警告

电击



死亡或严重的人身伤害

- 必须根据S1或S3运行模式，通过液位传感器的信号将水泵停止。
- 在S1模式下连续运行时，如果液位低于顶盖（S1），则必须停止水泵。
- 在S3模式下间歇运行时，如果液位低于中间定子壳体（S3），则必须停止水泵。

该泵设计用于间歇性运行 (S3)。在完全潜水的情况下，该泵亦可用于连续运行 (S1)。

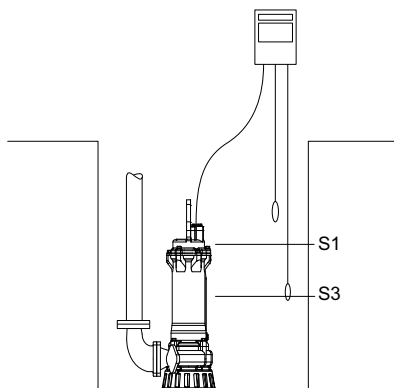


图 5 DPK的工作水位

S3, 间歇运行

S3的运行是一系列相同的占空比 (TC)，每个都有一段恒定负载，随后是休息期。在循环过程中没有达到热平衡。见图6。

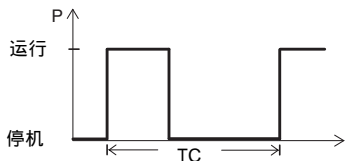


图 6 S3 运行

S1, 连续运行

在该运行模式下，水泵可以连续运行，不需要为冷却目的而停机。由于水泵完全浸没在水下，泵送液体即可为水泵提供足够的冷却。见图7。

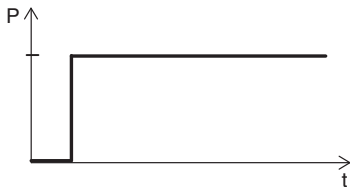


图 7 S1 运行

4.2 检查旋转的方向



使未潜水的泵仅启动并运行几秒钟，以检查旋转方向。

每次水泵连接到新的安装时都要按照以下指导检查转动方向。

请按以下步骤操作：

1. 将泵撤出系统。将泵悬挂在提升装置上，例如用于将泵降至水池中的提升装置。
2. 启动并运行泵几秒钟。
3. 观察泵的运动（冲击）方向。若水泵按逆时针冲击，则其转动方向正确。见图8。
4. 将泵装回到系统中。

如果转动方向不正确，互换电源线的两相。

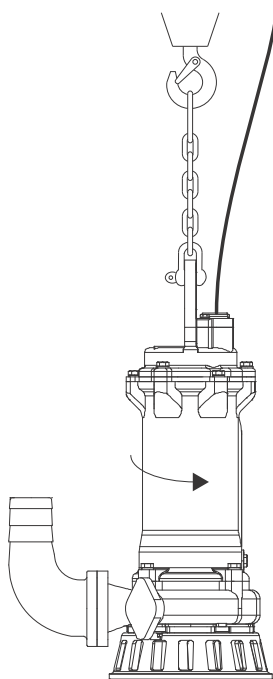


图 8 冲击方向

TM04 4124 0809

TM04 9231 3710

TM02 7776 4003

TM04 4118 0809

4.3 准备启动

在启动产品之前，请按照以下步骤操作：

- 检查保险丝是否已移除。
- 用手转动叶轮，检查其是否能正常转动。
 - 触摸叶轮时需穿着防护服（手套）。
- 检查油质。
 - 见章节 **8.4.5 检查油位并更换机油**。
- 检查旋转方向。
 - 见章节 **4.2 检查旋转的方向**。
- 如果使用监控单元，检查该装置是否正常工作。
- 检查液位和浮子开关或电极的设置。

4.4 启动



切不可让泵干转。



如果发现本泵或其它泵有异常噪声、异常振动，或电源故障，请立即停泵。

在找到故障原因并排除故障之前不要重新启动水泵。

请按以下步骤操作：

1. 接通电源。
2. 打开隔离阀，如果安装了的话。
3. 检查是否有 2/3 的电机浸没在液体中。
 - 如果液位低于上述位置，向水池中加液直到达到最低液位。
4. 除气的方法是用提升链条将水泵倾斜以使截留在泵中的空气逸出。
5. 让泵短暂运行，然后检查液位是否降落。已正确除气的泵会迅速降低液位。
6. 启动水泵。

5. 产品的搬运与储存

注意



尖锐物品

- 轻度或中度的人身伤害
- 操作水泵时需穿着防护服（手套）。

5.1 产品搬运

使用本产品时，请注意以下几点：

- 检查起吊设备并查看吊装说明。
 - 见章节 **3.1.1 起吊产品**。
- 仅用叉车或升降式起重机移动水泵。

5.2 产品储存

5.2.1 仓库存放

- 存放的仓库必须干燥并免于可对水泵造成损害的腐蚀性气体、蒸汽或振动。
- 将泵以竖直位置放置在托架或货架上，使水泵离开地面并方便转移。
- 卷起电缆，并用防水塑料和胶带或电缆盖将电缆的开口端严实地封好。这样做的目的是防止潮湿进入电机。潮湿进入电机可对电机线圈造成严重损坏。
- 在所有未涂油漆的表面抹一层机油或油脂以防锈蚀。
- 如果新泵需要存放两个月以上的时间，每两个月用手转动叶轮以防止机械机封面卡滞。如果不这么做的话，水泵再次启动时可能引起机封破坏。

5.2.2 存放在水池中（干或湿）

- 如果已安装的泵在一段较长的时间内不运行，则要每月检查绝缘阻抗并运转水泵30分钟。
 - 如果由于水池缺水导致泵无法运行，请每个月检查泵并手动转动叶轮，然后再将泵重新投入使用。如果绝缘阻抗降低到10兆欧以下，请联系格兰富。
- 在水泵停止服务时，应该从控制箱上断开电源。
- 如果水泵在停止使用期间从控制箱上拆除，按照章节 **5.2.1 仓库存放** 中所述方法对电缆的末端进行保护。

6. 产品概述

6.1 产品描述

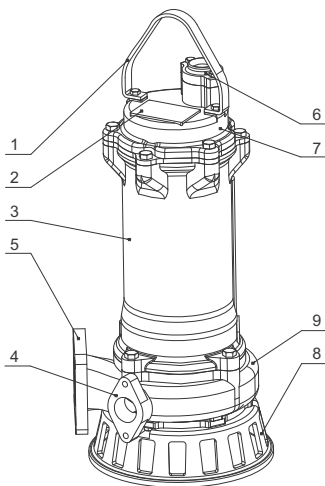


图9 DPK 泵

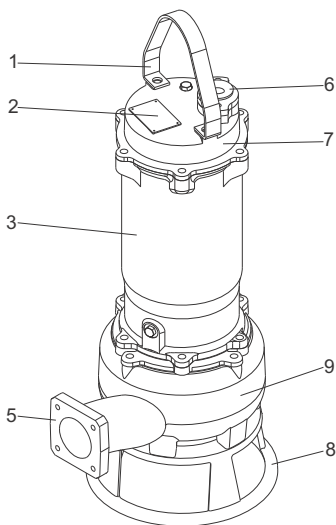


图10 DPK.V泵

位置	描述
1	起吊支架
2	铭牌
3	电机
4	冲洗阀连接
5	排出口法兰
6	电缆入口
7	顶盖
8	环形底座
9	泵壳

6.2 应用

DPK泵用于清除永久性或临时性装置中的地表水、下水道污水和地下水。DPK.V泵还可用于排放污水和过滤废水。

6.3 不适当的操作方法

只有遵照章节 [6.2 应用](#) 使用泵才可保证泵的操作安全。



将本泵应用于其他目的；或是在未经准许的周围环境和条件下运行，均被视为不合理应用，是不允许的。



禁止将该泵用于饮用水。

6.4 认证

标准版型的 DPK 泵由 TÜV 根据欧盟2006/42/EC机械指令进行测试，注册号AM 50143414，测试报告编号：13009107 002。

TM04 4092 0709

TM06 6236 4115

6.5 标识

6.5.1 型号说明

水泵可以通过泵铭牌上注明的型号代码来识别。

示例：DPK.15.80.22.5.0D

代码	描述	说明
DPK	排水泵	泵型号
[]	半开式叶轮	叶轮型号
V	涡流叶轮	
15	最大颗粒尺寸 [mm]	自由口径
80	泵排水端口的标称直径 [mm]	泵出口
22	输出功率 P2 22 = 2.2 kW ¹	功率 [kW]
[]	标准	设备
S	传感器	
2	二极	极数
4	四极	
5	50 Hz	频率 [Hz]
6	60 Hz	
0D	380-415 V, 直接启动 (DOL)	电压与启动方式
1D	380-415 V, 星/三角启动 (Y/D)	
0E	220-240 V, 直接启动 (DOL)	
1E	220-240 V, 星/三角启动 (Y/D)	
Z	定制型号	定制

¹ 以下情况例外：代码 075 = 0.75 kW

6.5.2 铭牌

将泵交货时附带的另一个铭牌固定在安装现场，或保存在本书的封面内。

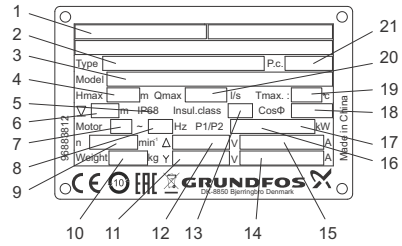


图 11 铭牌

位置	描述
1	公告
2	型号名称
3	产品号与序列号
4	最大扬程 [m]
5	外壳防护等级
6	最大安装深度 [m]
7	极数
8	频率 [Hz]
9	速度 [min ⁻¹]
10	重量 [kg]
11	额定电压 [伏] 星形
12	额定电压 [伏] 三角
13	绝缘等级
14	额定电流 [安] 星形
15	额定电流 [安] 三角
16	电机输入功率 P1 [kW]
17	电机输出功率 P2 [kW]
18	功率因数
19	最高介质温度 [°C]
20	最大流量 [m ³ /h]
21	生产代码 (年和周)

7. 保护及控制系统

7.1 水泵控制器

该泵可通过格兰富控制器进行控制：LC、LCD 107、LC、LCD 108和LC、LCD 110。

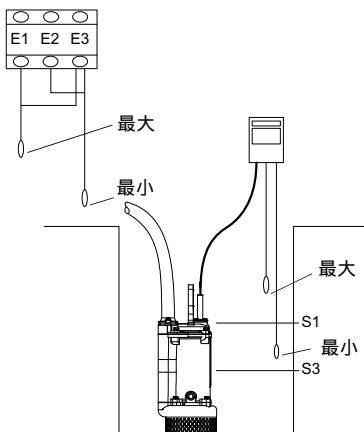


图 12 水泵控制器

7.2 液位控制器

LC 控制器用于单泵安装。LCD 控制器用于双泵安装。可提供以下 LC 和 LCD 水泵控制器用于液位控制：

- LC 107, LCD 107 带气钟
- LC 108, LCD 108 带浮子开关
- LC 110, LCD 110 带水位电极。

取决于所配控制器的类型，以下叙述中的“液位开关”可指气钟、浮子开关或水位电极。

7.2.1 LC, LCD

LC型控制器配有2个或3个液位开关：一个用于启动水泵，另一个用于停止水泵。第三个液位开关为选配，用于高位报警。

LCD控制器则配备3或4个液位开关：一个用于泵的一般停机，另两个用于泵的启动。第四个液位开关为选配，用于高位报警。

如需进一步信息，请参阅所配水泵控制器的安装与操作手册。

7.3 GU01 与 GU02

GU01 是一个监控器，用于监控定子温度和电机进水。它接收数字信号。

GU02 是一个监控器，用于监控定子和轴承温度以及电机进水。它接收模拟信号。

这两个监控器都必需通过继电器连接到控制面板。

GU01 和 GU02 由格兰富生产制造。如需进一步信息请与您当地的格兰富公司联络。

如需进一步资讯，请登录 www.grundfos.com 查阅 GU01/GU02 的数据表。

8. 维修产品

本产品的使用寿命在很大程度上取决于工作条件的优劣；因此我们强烈建议您对泵进行每日检查和定期服务，这样才能保证最长的产品寿命。

8.1 安全指导和要求

警告

电击



死亡或严重的人身伤害

- 在对泵开展任何工作之前，请务必保证保险丝已经拆去或电源开关已经断开并锁定在0位。
- 确保电源不会被意外接通。

警告

夹手



死亡或严重的人身伤害

- 确保所有转动部件已经停止。



保养与维修须由经过专业培训的人员进行。

8.2 服务文献

服务文档可在www.grundfos.com>国际网站>格兰富产品中心>服务与支持上找到。

如您有任何问题，请与附近的格兰富公司或服务中心联系。

8.3 受污染的产品

警告



生物危险

死亡或严重的人身伤害

- 拆卸后，用清水将产品彻底冲洗干净，并用水冲洗产品部件。

若水泵应用于会对人体产生危害的有毒液体，则必须将其归类为受污染水泵。

如需格兰富对水泵进行维修，必须在将水泵退回维修之前，向格兰富提供关于泵送液体的详细信息。否则的话，格兰富有权拒绝对该产品进行维修。

任何维修申请必须包含泵送液体的详细信息。

在返还产品之前，尽可能将产品清洗干净。

退回产品可能发生的费用由客户承担。

8.4 维护和服务

在正常工作条件下，每年将泵从水池中取出并检查一次。

在恶劣的工作条件下，例如涉及泥沙、纤维物质和固体颗粒时，上述工作则应每月一次进行。

检查以下几点：

- 电机的电气测试
见章节 **8.4.1 检查电流和电压** 和 **8.4.2 检查绝缘电阻**。



每月必须至少检查一次电机的绝缘电阻。

- 出口压力和流量
见章节 **8.4.3 检查出口压力和流量**。



每月必须至少检查一次出口压力和流量（如果有流量计可用的话）。

- 密封传感器电阻
见章节 **8.4.4 检查密封传感器**。
- 油位及油况
见章节 **8.4.5 检查油位并更换机油**。
- 叶轮间隙
见章节 **8.4.6 检查并调整叶轮间隙**。

8.4.1 检查电流和电压

检查泵的电流和电压。如果电流表的读数超过额定值或大大低于额定值，则表示有问题。整个工作过程中，电压必须一直稳定在额定值的 - 5 %/+ 5 % 之间。

8.4.2 检查绝缘电阻

如果绝缘电阻与上次检查值相比有大幅下降，这是水泵很快会发生绝缘故障的预兆。此时即使绝缘电阻可能仍然在10兆欧之上也必须安排对泵进行维修。

8.4.3 检查出口压力和流量

水泵性能的降低可能说明需要大修。无论水泵性能怎样，压力和流量都必须处于稳定状态，压力或流量的快速波动说明系统的入口或出口侧存在问题。

8.4.4 检查密封传感器

用万用表检查泄露传感器的电阻，如图13所示。



不可使用兆欧表，因为这会破坏密封传感器的控制电路。

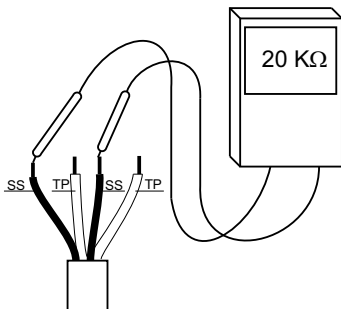


图 13 电阻检查

8.4.5 检查油位并更换机油

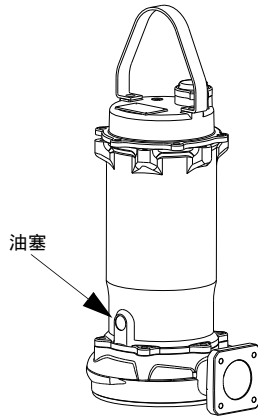


图 14 油塞的位置

注意

加压系统

轻度或中度的人身伤害

- 在松开油腔的油塞时，请注意油腔内可能会有压力累积。在压力完全释放之前请勿取下油塞。



1. 拧下油塞。见图14。
2. 拧下油塞并检查油位。
3. 取油样，以检查油质。
4. 如果机油需要更换，在水泵下方放置一个干净的容器，用于收集油腔内排出的机油。
5. 倾斜水泵，使得加油孔指向下方以排放出泵内的残油。
如果放出的机油已受污染或不透明，这说明存在潜在机械密封故障。更换机械密封。



按照地方规范来处置废弃的密封油。

6. 从加油孔加注新油。使用润滑油 ISO VG 32 Mobil DTE 24 液压油 90 或同等等级机油。

8.4.6 检查并调整叶轮间隙

检查叶轮与耐磨环之间的间隙。建议的间隙为 0.3 - 0.5 mm。必要时更换或修理。

9. 故障查询

在尝试对任何故障进行诊断之前，应阅读并遵守章节

8.1 [安全指导和要求](#)中的安全说明。



对于配传感器的泵型，故障排除工作应该从检查GU01或GU02前面板的状态开始。参见GU01或GU02的安装与操作指导手册。



危险

电击

死亡或严重的人身伤害

- 在对产品进行任何操作前，必须确保电源已断开，并且不会被意外接通。

故障	原因	修复
电机无法启动，保险丝熔断或电机保护器立即跳闸。 小心：不要尝试再次启动。	1. 电源故障、短路、电缆或电机线圈接地故障。	由合格的电工检查电缆和电机，并对其进行维修。
	2. 保险丝型号不对导致保险丝烧断。	装配匹配的保险丝。
	3. 叶轮被杂物堵塞。	清洁叶轮。
	4. 液位计、浮子开关或电极失调或失效。	检查液位计、浮子开关或电极。
	5. 电机缺相。	检查电机及其连接。
水泵工作，但电机保护器在短一段时间后跳闸。	1. 电机保护热敏继电器的设置过低。	按照水泵铭牌上的规格说明设置继电器。
	2. 电压降太低致使耗电量增加。	测量电机两个相位之间的电压。允许误差：- 5 %/+ 5 %。
	3. 叶轮被杂物堵塞。	清洁叶轮。
	4. 转动方向错误。	检查转动方向，必要时互换电源的任意两相。见章节4.2 检查旋转的方向 。
泵的热敏开关在短一段时间后跳闸。	1. 液体温度过高。冷却不足。	加强冷却或降低泵送液体的温度。
	2. 泵送液体的粘度太高。	稀释泵送液体。
	3. 电气连接出现故障。(泵的Y-连接被接成Δ-连接因而导致大幅度低电压)	检查并纠正电气连接。
水泵在低于标准性能和标准功率的状态下运转。	1. 叶轮被杂物堵塞。	清洁叶轮。
	2. 转动方向错误。	检查转动方向，必要时互换电源的任意两相。见章节4.2 检查旋转的方向 。
水泵运转，但不泵送液体。	1. 水泵中有空气。	水泵二次排气。
	2. 出口阀关闭或阻塞。	检查出口阀，必要时打开并/或进行清洗。
	3. 止回阀堵塞。	清洁单向阀。
水泵堵塞。	1. 液体中含有大颗粒。	选择通道较大的泵型。
	2. 液体表面形成一个悬浮层。	在水池中安装一个搅拌机。

10. 技术数据

10.1 运行条件

10.1.1 运行模式

该泵设计用于连续运行 (S1) 或间歇性运行 (S3)。
在 S3 运行模式下，每10分钟内水泵必须工作4分钟、停机6分钟。

10.1.2 每小时最大启动次数

DPK: 每小时最多30次启动

10.1.3 pH 值

永久安装的水泵可以处理的液体的 pH 值范围为4至10。

10.1.4 液体温度

0至40 °C

10.1.5 环境温度（如果泵未完全浸没）

0至40 °C

10.1.6 泵送液体的密度

最大1000 kg/m³

如需泵送更高密度液体，请联系格兰富。

10.1.7 最大工作压力

5.7 bar

10.1.8 安装深度

DPK: 最大深度为液面以下20米

10.1.9 最大海拔高度

2000米

10.2 尺寸和重量

10.2.1 尺寸规格

见附录中的图 *Dimensions and weights*。

11. 产品处置

必须以环境友好的方式对本产品或产品的部件进行回收处理。

1. 使用公立或私立废品回收服务设施。
2. 如果以上无法做到，与附近的格兰富公司或服务站联系。



产品上打叉的垃圾桶符号的意思是它必须与家庭垃圾分开处理。当带有此符号的产品达到使用寿命时，请将其送至当地废物处理机构指定的收集点。单独收集和回收这些产品有助于保护环境和人类健康。

另请参阅www.grundfos.com/product-recycling上的产品生命终期信息。

Dimensions and weights

DPK

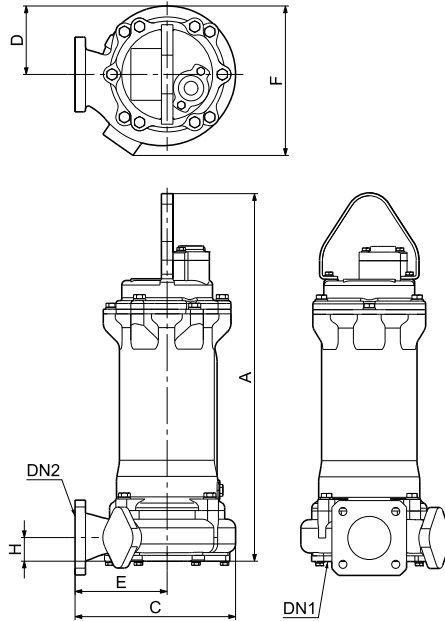


Fig. 1 Dimensions of pump without accessories

TM04 4099 0709

Pump type	A	C	D	E	F	H	DN1	DN2	Weight [kg]
DPK.10.50.075	398	226	88	127	196	40	48		31
DPK.10.50.15	428	226	88	127	196	40	48		35
DPK.10.80.22, 50 Hz	456	246	102	145	212	46	48		40
DPK.10.80.22, 60 Hz	448	246	88	147	215	36	48		60
DPK.15.80.30	575	279	119	160	246	39	75		47
DPK.15.80.37	625	279	119	160	246	39	75	See section <i>Outlet flange</i>	113
DPK.15.80.55	792	380	142	222	317	66	75		118
DPK.15.100.75	792	375	138	220	312	59	72		166
DPK.20.100.110	840	375	151	220	325	59	90		177
DPK.20.100.150	840	375	151	220	325	59	90		300
DPK.20.150.190	1023	483	181	432	416	113	110		300
DPK.20.150.220	1023	483	181	432	416	113	110		300

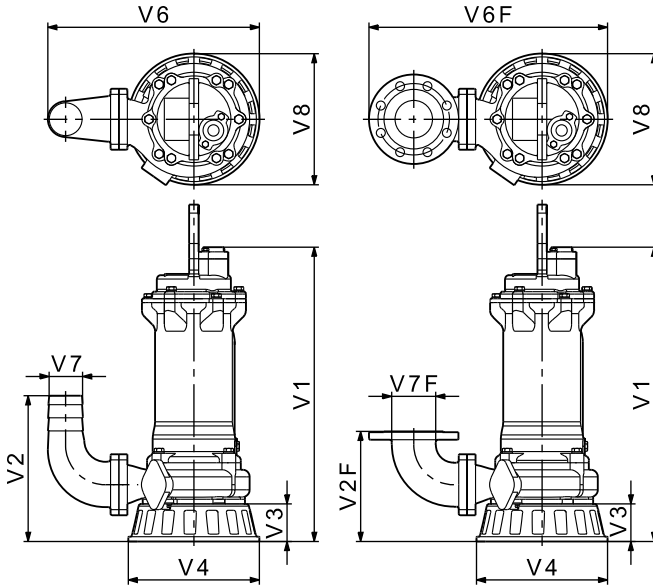


Fig. 2 Dimensions of pump on ring stand

TM04-4100-0709

Pump type	V1	V2	V2F	V3	V4	V6	V6F	V7	V7F	V8	Net weight [kg]
DPK.10.50.075	425	232	202	70	223	354	384	50	50	223	31
DPK.10.50.15	452	232	202	70	223	354	384	50	50	223	35
DPK.10.80.22, 50 Hz	483	306	230	70	235	415	477	80	80	235	40
DPK.10.80.22, 60 Hz	475	296	220	70	223	411	473	80	80	223	60
DPK.15.80.30	555	309	233	80	280	452	514	80	80	280	47
DPK.15.80.37	597	309	233	80	280	452	514	80	80	280	60
DPK.15.80.55	734	356	280	100	350	549	611	80	80	350	113
DPK.15.100.75	734	384	309	100	350	572	630	100	100	350	118
DPK.20.100.110	780	384	309	100	350	572	630	100	100	350	166
DPK.20.100.150	780	384	309	100	350	572	630	100	100	350	177
DPK.20.150.190	1163	513	362	90	380	708	778	150	150	407	300
DPK.20.150.220	1163	513	362	90	380	708	778	150	150	407	300

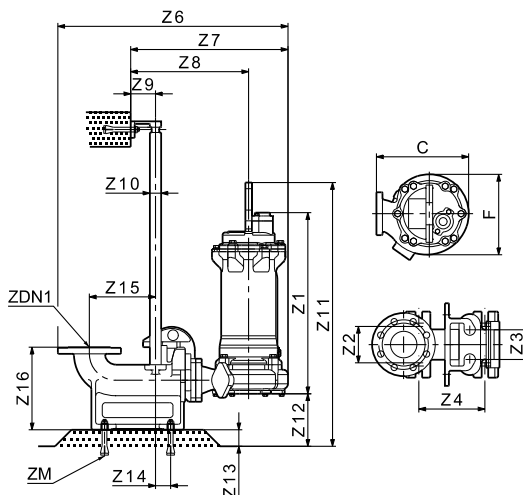


Fig. 3 Dimensions of pump on auto coupling

TM04-4101-0709

Pump type	C	F	Z1	Z2	Z3	Z4	Z6	Z7	Z8	Z9
DPK.10.50.075	226	196	355	120	70	120	569	396	284	50
DPK.10.50.15	226	196	382	120	70	120	569	396	284	50
DPK.10.80.22, 50 Hz	246	212	413	130	90	200	685	460	342	75
DPK.10.80.22, 60 Hz	246	215	405	130	90	200	679	454	344	75
DPK.15.80.30	279	246	475	130	90	200	701	476	357	75
DPK.15.80.37	279	246	517	130	90	200	701	476	357	75
DPK.15.80.55	380	317	634	130	90	200	802	577	419	75
DPK.15.100.75	375	312	634	150	90	200	870	585	430	75
DPK.20.100.110	375	325	680	150	90	200	884	599	430	75
DPK.20.100.150	375	325	680	150	90	200	884	599	430	75
DPK.20.150.190	483	416	1078	250	150	300	1083	743	540	90
DPK.20.150.220	483	416	1078	250	150	300	1083	743	540	90

Pump type	Z10	Z11	Z12	Z13	Z14	Z15	Z16	ZDN1	ZM	Net weight [kg]
DPK.10.50.075	1"	558	160	50	28	140	250	50	4 x M16 x 200	31
DPK.10.50.15	1"	588	160	50	28	140	250	50	4 x M16 x 200	35
DPK.10.80.22, 50 Hz	1"	610	154	50	46	200	250	80	4 x M16 x 200	40
DPK.10.80.22, 60 Hz	1"	612	164	50	46	200	250	80	4 x M16 x 200	60
DPK.15.80.30	1"	736	161	50	46	200	250	80	4 x M16 x 200	47
DPK.15.80.37	1"	786	161	50	46	200	250	80	4 x M16 x 200	60
DPK.15.80.55	1"	926	134	50	46	200	250	80	4 x M16 x 200	113
DPK.15.100.75	1 1/4"	983	191	50	51	250	350	100	4 x M16 x 200	118
DPK.20.100.110	1 1/4"	1031	191	50	51	250	350	100	4 x M16 x 200	166
DPK.20.100.150	1 1/4"	1031	191	50	51	250	350	100	4 x M16 x 200	177
DPK.20.150.190	1 1/2"	1199	164	80	65	290	450	150	M20 * 200L	300
DPK.20.150.220	1 1/2"	1199	164	80	65	290	450	150	M20 * 200L	300

DPK.V

Note: DPK.V variants only available in 50 Hz.

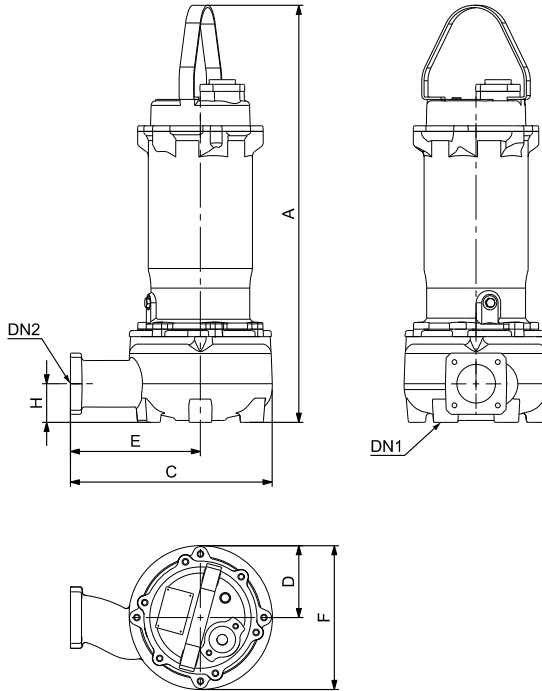


Fig. 4 Dimensions of pump without accessories

Pump type	A	C	D	E	F	H	DN1	DN2	Weight [kg]
DPK.V.65.80.15.2.5	548	372	125	247	250	103	65		58.6
DPK.V.65.80.15.4.5	715	410	165	245	329	85	65		75.5
DPK.V.65.80.22.2.5	568	372	125	247	250	103	65		62.6
DPK.V.65.80.22.4.5	715	410	165	245	329	85	65		78.5
DPK.V.80.80.37.2.5	728	429	153	276	306	82	80		79.9
DPK.V.80.80.37.4.5	895	460	193	267	386	92	80		116.1
DPK.V.80.80.55.2.5.0D									107.4
DPK.V.80.80.55.2.5.1D	886	429	153	276	306	82	80	See section <i>Outlet flange.</i>	107.5
DPK.V.80.80.55.2.5.0E									113.3
DPK.V.80.80.55.2.5.1E									111.4
DPK.V.80.80.55.4.5									120.7
DPK.V.80.80.75.2.5.0D									114.6
DPK.V.80.80.75.2.5.1D	886	429	153	276	306	82	80		119.7
DPK.V.80.80.75.2.5.0E									118.7
DPK.V.80.80.75.2.5.1E									118.5
DPK.V.80.80.75.4.5	895	460	193	267	386	92	80		130.0

TM06 5237 4115

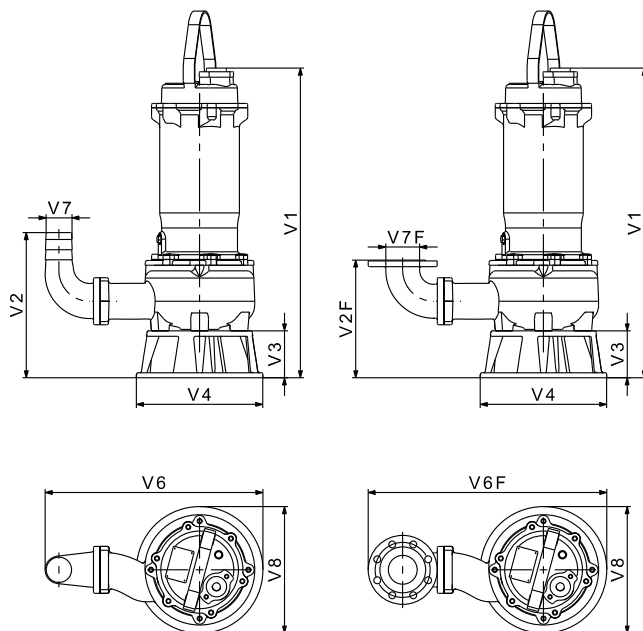
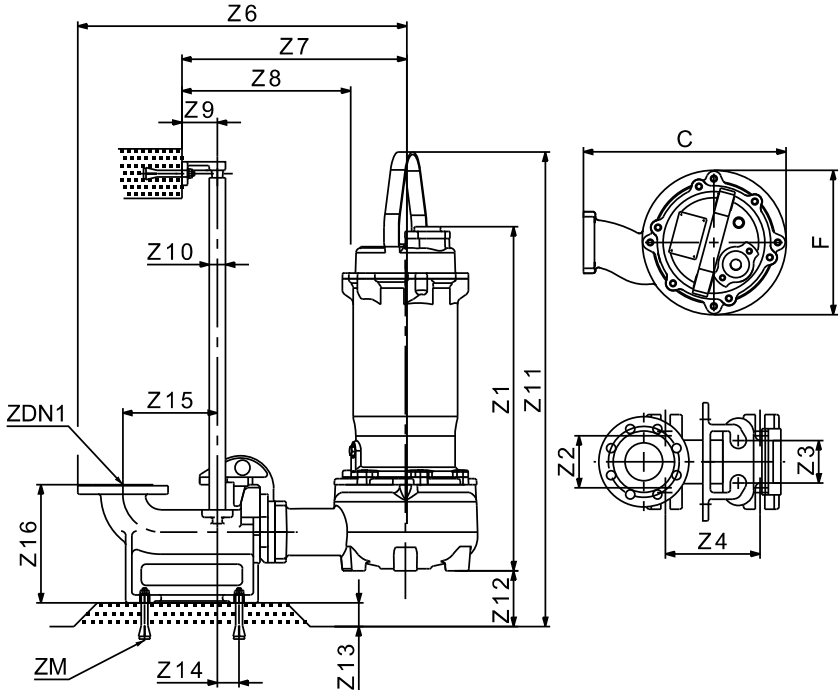


Fig. 5 Dimensions of pump on ring stand

TM06 5238 4115

Pump type	V1	V2	V2F	V3	V4	V6	V6F	V7	V7F	V8	Weight [kg]
DPK.V.65.80.15.2.5	636	421	345	128	330	564	626	80	80	330	58.6
DPK.V.65.80.15.4.5	737	405	329	130	351	574	635	80	80	351	75.5
DPK.V.65.80.22.2.5	656	421	345	128	330	564	626	80	80	330	62.6
DPK.V.65.80.22.4.5	737	405	329	130	351	574	635	80	80	351	78.5
DPK.V.80.80.37.2.5	752	398	322	130	351	604	665	80	80	351	79.9
DPK.V.80.80.37.4.5	867	412	336	130	351	612	674	80	80	351	116.1
DPK.V.80.80.55.2.5.0D											107.4
DPK.V.80.80.55.2.5.1D											107.5
DPK.V.80.80.55.2.5.0E	858	402	326	130	351	604	665.5	80	80	351	113.3
DPK.V.80.80.55.2.5.1E											111.4
DPK.V.80.80.55.4.5	867	412	336	130	351	612	674	80	80	351	120.7
DPK.V.80.80.75.2.5.0D											114.6
DPK.V.80.80.75.2.5.1D											119.7
DPK.V.80.80.75.2.5.0E	858	402	326	130	351	604	665.5	80	80	351	118.7
DPK.V.80.80.75.2.5.1E											118.5
DPK.V.80.80.75.4.5	867	412	336	130	351	612	674	80	80	351	130.0



TM06 5239 4115

Fig. 6 Dimensions of pump on auto coupling

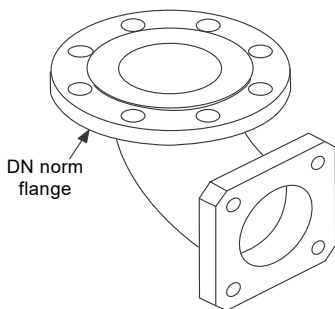
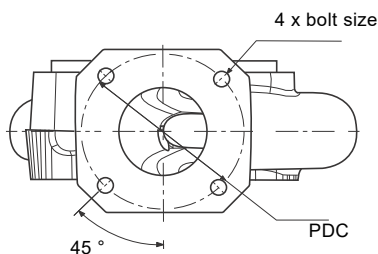
Pump type	C	F	Z1	Z2	Z3	Z4	Z6	Z7	Z8	Z9
DPK.V.65.80.15.2.5	372	250	508	130	90	200	834	609	444	75
DPK.V.65.80.15.4.5	410	329	607	130	90	200	843	619	442	75
DPK.V.65.80.22.2.5	372	250	528	130	90	200	834	609	444	75
DPK.V.65.80.22.4.5	410	329	607	130	90	200	843	619	442	75
DPK.V.80.80.37.2.5	429	306	618	130	90	200	851	626	473	75
DPK.V.80.80.37.4.5	460	386	737	130	90	200	882	657	464	75
DPK.V.80.80.55.2.5	429	306	728	130	90	200	851	626	473	75
DPK.V.80.80.55.4.5	460	386	737	130	90	200	882	657	464	75
DPK.V.80.80.75.2.5	429	306	728	130	90	200	851	626	473	75
DPK.V.80.80.75.4.5	460	386	737	130	90	200	882	657	464	75

Pump type	Z10	Z11	Z12	Z13	Z14	Z15	Z16	ZDN1	ZM	Weight [kg]
DPK.V.65.80.15.2.5	25	644	97	50	46	200	250	80	4 x M16 x 200	58.6
DPK.V.65.80.15.4.5	25	831	115	50	46	200	250	80	4 x M16 x 200	75.5
DPK.V.65.80.22.2.5	25	664	97	50	46	200	250	80	4 x M16 x 200	62.6
DPK.V.65.80.22.4.5	25	831	115	50	46	200	250	80	4 x M16 x 200	78.5
DPK.V.80.80.37.2.5	25	846	118	50	46	200	250	80	4 x M16 x 200	79.9
DPK.V.80.80.37.4.5	25	1003	108	50	46	200	250	80	4 x M16 x 200	116.1
DPK.V.80.80.55.2.5.0D									4 x M16 x 200	107.4
DPK.V.80.80.55.2.5.1D	25	1004	118	50	46	200	250	80	4 x M16 x 200	107.5
DPK.V.80.80.55.2.5.0E									4 x M16 x 200	113.3
DPK.V.80.80.55.2.5.1E									4 x M16 x 200	111.4
DPK.V.80.80.55.4.5	25	1003	108	50	46	200	250	80	4 x M16 x 200	120.7
DPK.V.80.80.75.2.5.0D									4 x M16 x 200	114.6
DPK.V.80.80.75.2.5.1D	25	1004	118	50	46	200	250	80	4 x M16 x 200	119.7
DPK.V.80.80.75.2.5.0E									4 x M16 x 200	118.7
DPK.V.80.80.75.2.5.1E									4 x M16 x 200	118.5
DPK.V.80.80.75.4.5	25	1003	108	50	46	200	250	80	4 x M16 x 200	130.0

Outlet flange

Note: For DPK and DPK.V only.

Note: Outlet flange need to be ordered as a separate accessory.



Outlet flange	Holes for bolts	PCD [mm]
DN 50	4 x M10	92
DN 80	4 x M12	130
DN 100	4 x M16	165
DN 150	4 x Ø23	230

TM06 9726 3017 - TM069727 3017

Appendix

产品中有害物质的名称及含量 (Names and Contents of the Hazardous Substances)

部件名称 (Part name)	有害物质 (Hazardous Substances)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr6+)	多溴联苯 (PBB)	多溴联苯醚 (PBDE)
泵壳(Pump housing)	X	O	O	O	O	O
紧固件(Fasteners)	X	O	O	O	O	O
管件(Fittings)	X	O	O	O	O	O
定子 (Stator)	X	O	O	O	O	O
转子 (Rotor)	X	O	O	O	O	O

本表格依据 SJ/T 11364 的规定编制 (This Table is prepared in accordance with the provisions of SJ/T 11364)

O: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。(Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.)

X: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 该规定的限量要求。(Indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.)



该产品环保使用期限为 10 年，标识如左图所示。

(The environmental protection use period for this product is 10 years as shown in the left image)

此环保期限只适用于产品在安装与使用说明书中所规定的条件下工作

(This environmental protection use period is only apply to product working under condition specified in Installation and Operation Manual)

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