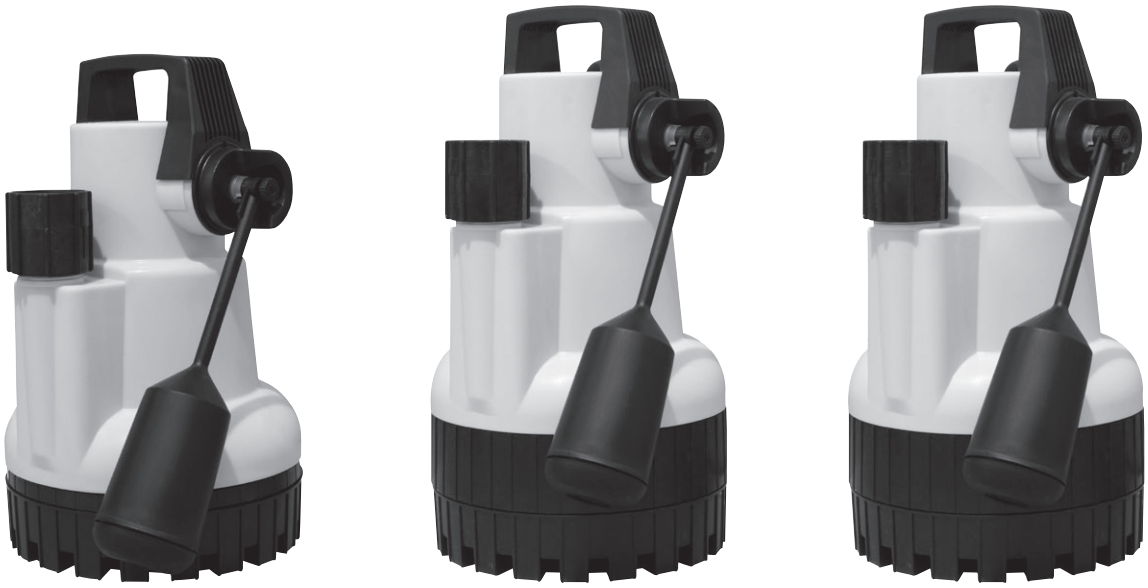
Submersible pump

Delta V3, V4, & V6

Installation and operating manual



BASEMENT DRAINAGE & PROTECTION

Legal information/Copyright

Installation/Operating Manual Delta V3,V4 & V6 Submersible Pumps.

Subject to technical modification without prior notice.

Glossary

Backflow

Waste water flowing back from the sewer into the connected drainage piping.

Certificate of decontamination

A certificate of decontamination is enclosed by the customer when returning the product to the manufacturer to certify that the product has been properly drained to eliminate any environmental and health hazards arising from components in contact with the fluid handled.

EN 12050-2

European Standard for waste water lifting units which are used to dispose of faeces-free waste water occurring below the flood level of buildings and sites. It defines general requirements as well as principles of construction and testing.

Flood level

Maximum backflow level of waste water in a drainage system

Hydraulic system

The part of the pump in which the kinetic energy is converted into pressure energy

Pump

Machine without drive, additional components or accessories

Pump set

Complete pump set consisting of pump, drive, additional components and accessories

Submersible motor pump

Submersible motor pumps are floodable, close coupled units which are not self-priming. The pumps are usually operated completely submerged. They may be operated outside the fluid for short periods of time, until the minimum fluid level has been reached.

Waste water

Water consisting of a combination of water discharged from households, industrial and other businesses as well as surface water.

1 General

1.1 Principles

This operating manual is valid for the pumps indicated on the front cover.

The operating manual describes the proper and safe use of this equipment in all phases of operation.

The name plate indicates the type series and size, the main operating data, the order number and the order item number. The order number and order item number clearly identify the pump set and serve as identification for all further business processes.

In the event of damage, immediately contact Edincare Pumps on 01442 211 554 or email info@edincare.com to maintain the right to claim under warranty.

1.2 Symbols

Table 1. Symbols used in this manual.

Symbol	Description
✔	Conditions which need to be fulfilled before proceeding with the step-by-step instructions
▷	Safety instructions
➔	Results of an action
⇨	Cross-references
1. **2.**	Step-by-step instructions
	Note Recommendations and important information on how to handle the product

1.3 Key to safety symbols/markings

Table 2: Definition of safety symbols/markings

Symbol	Description
DANGER	**DANGER** This signal word indicates a high-risk hazard which, if not avoided, will result in death or serious injury.
WARNING	**WARNING** This signal word indicates a medium-risk hazard which, if not avoided, could result in death or serious injury.
CAUTION	**CAUTION** This signal word indicates a hazard which, if not avoided, could result in damage to the machine and its functions.
	**General hazard** In conjunction with one of the signal words this symbol indicates a hazard which will or could result in death or serious injury.
	**Electrical hazard** In conjunction with one of the signal words this symbol indicates a hazard involving electrical voltage and identifies information about protection against electrical voltage.
	**Machine damage** In conjunction with the signal word CAUTION this symbol indicates a hazard for the machine and its functions.

2 Safety

All the information contained in this section refers to hazardous situations.

DANGER

In addition to the present general safety information the action-related safety information given in the other sections must be observed.

2.1 General

- This operating manual contains general installation, operating and maintenance instructions that must be observed to ensure safe operation of the system and prevent personal injury and damage to property.
- Comply with all the safety instructions given in the individual sections of this operating manual.
- The operating manual must be read and understood by the responsible specialist personnel/operators prior to installation and commissioning.
- The contents of this operating manual must be available to the specialist personnel at the site at all times.
- Information and markings attached directly to the product must always be complied with and kept in a perfectly legible condition at all times. This applies to, for example:
  - Arrow indicating the direction of rotation
  - Markings for connections
  - Type designation
- The operator is responsible for ensuring compliance with all local regulations not taken into account.

2.2 Intended use

- The pump (set) must only be operated in the fields of application and within the use limits specified in the other applicable documents.
- Only operate pumps/pump sets which are in perfect technical condition.
- Do not operate the pump (set) in partially assembled condition.
- Only use the pump to handle the fluids described in the data sheet or product literature of the pump model or variant.
- Never operate the pump without the fluid to be handled.
- Observe the minimum flow rates indicated in the data sheet or product literature (to prevent overheating, bearing damage, etc).
- Observe the minimum flow rate and maximum flow rate indicated in the data sheet or product literature (to prevent overheating, mechanical seal damage, cavitation damage, bearing damage, etc).
- Do not throttle the flow rate on the suction side of the pump (to prevent cavitation damage).
- Consult the manufacturer about any use or mode of operation not described in the data sheet or product literature.

2.3 Personnel qualification and training

All personnel involved must be fully qualified to transport, install, operate, maintain and inspect the machinery this manual refers to.

The responsibilities, competence and supervision of all personnel involved in transport, installation, operation, maintenance and inspection must be clearly defined by the operator.

Deficits in knowledge must be rectified by means of training and instruction provided by sufficiently trained specialist personnel. If required, the operator can commission the manufacturer/supplier to train the personnel.

Training on the pump (set) must always be supervised by technical specialist personnel.

2.4 Consequences and risks caused by non-compliance with this manual

- Non-compliance with these operating instructions will lead to forfeiture of warranty cover and of any and all rights to claims for damages.
- Non-compliance can, for example, have the following consequences:
  - Hazards to persons due to electrical, thermal, mechanical and chemical effects and explosions
  - Failure of important product functions
  - Failure of prescribed maintenance and servicing practices
  - Hazard to the environment due to leakage of hazardous substances

2.5 Safety awareness

In addition to the safety information contained in this operating manual and the intended use, the following safety regulations shall be complied with:

- Accident prevention, health regulations and safety regulations
- Explosion protection regulations
- Safety regulations for handling hazardous substances
- Applicable standards, directives and laws

2.6 Safety information for the operator/user

- Fit protective equipment (e.g. contact guards) supplied by the operator for hot, cold or moving parts, and check that the equipment functions properly.
- Do not remove any protective equipment (e.g. contact guards) during operation.
- Provide the personnel with protective equipment and make sure it is used.
- Contain leakages (e.g. at the shaft seal) of hazardous fluids handled (e.g. explosive, toxic, hot) so as to avoid any danger to persons and the environment.Adhere to all relevant laws.
- Eliminate all electrical hazards. (In this respect refer to the applicable national safety regulations and/or regulations issued by the local energy supply companies.)
- If shutting down the pump does not increase potential risk, fit an emergency stop control device in the immediate vicinity of the pump (set) during pump set installation.
- Make sure the system cannot be accessed by unauthorised persons (e.g. children).

2.7 Safety information for maintenance, inspection and installation

- Modifications or alterations of the pump (set) are only permitted with the manufacturer's prior consent.
- Use only original spare parts or parts/components authorised by the manufacturer. The use of other parts/components can invalidate any liability of the manufacturer for resulting damage.
- The operator ensures that maintenance, inspection and installation are performed by authorised, qualified specialist personnel who are thoroughly familiar with the manual.
- Only carry out work on the pump (set) during standstill of the pump.
- Only perform work on the pump set when it has been disconnected from the power supply (de-energised).
- The pump (set) must have cooled down to ambient temperature.
- Pump pressure must have been released and the pump must have been drained.
- When taking the pump set out of service always adhere to the procedure described in the manual. (⇨ Section 6.3, Page 21)
- Decontaminate pumps which handle fluids posing a health hazard.
- As soon as the work has been completed, re-install and re-activate any safetyrelevant devices and protective devices. Before returning the product to service, observe all instructions on commissioning.

2.8 Unauthorised modes of operation

Never operate the pump (set) outside the limits stated in the data sheet and in this manual.

The warranty relating to the operating reliability and safety of the supplied pump (set) is only valid if the equipment is used in accordance with its intended use. (⇨ Section 2.2, Page 7)

3 Transport/Temporary Storage/Disposal

3.1 Checking the condition upon delivery

1. On transfer of goods, check each packaging unit for damage.
2. In the event of in-transit damage, assess the exact damage, document it and notify Delta Membranes or the supplying dealer and the insurer about the damage in writing immediately.

3.2 Transport

CAUTION

Improper pump transport

Damage to the pump!

- ▷ To transport the pump/pump set always use the handle provided.
- ▷ Never suspend the pump (set) from the float switch (type SE only) or the power supply cable for transport.
- ▷ Prevent the pump (set) from getting knocked or dropped.

3.3 Storage/preservation

CAUTION

Damage during storage due to frost, humidity, dirt, UV radiation or vermin

Corrosion/contamination of the pump!

- ▷ Store the pump (set) in a dry, dark, frost-proof room not exposed to sunlight where the atmospheric humidity is as constant as possible.

Store the pump (set) vertically in a dry, dark, frost-proof room not exposed to sunlight. Under these conditions it does not need additional preservation.

3.4 Disposals

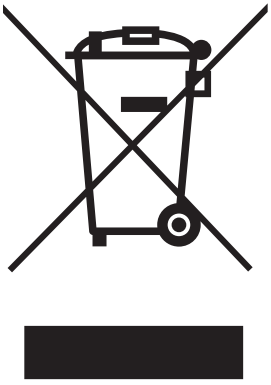
WARNING

Fluids, consumables and supplies posing a health hazard

Hazard to persons and the environment!

- ▷ Collect and dispose of any preservatives, flushing liquids and fluid residues.
- ▷ Wear safety clothing and a protective mask, if required.
- ▷ Observe all legal regulations on the disposal of fluids posing a health hazard.

1. Dismantle the product.
   Collect greases and other lubricants during dismantling.
2. Separate and sort the materials, e.g. by:
   - Metals
   - Plastics
   - Electronic waste
   - Greases and other lubricants
3. Dispose of materials in accordance with local regulations or in another controlled manner.



Electrical or electronic equipment marked with the adjacent symbol must not be disposed of in household waste at the end of its service life.

Contact your local waste disposal partner for returns.

If the used electrical or electronic equipment contains personal data, the user is responsible for deleting it before the equipment is returned.

4 Description

4.1 General description

- Submersible waste water pump (see submersible motor pump)

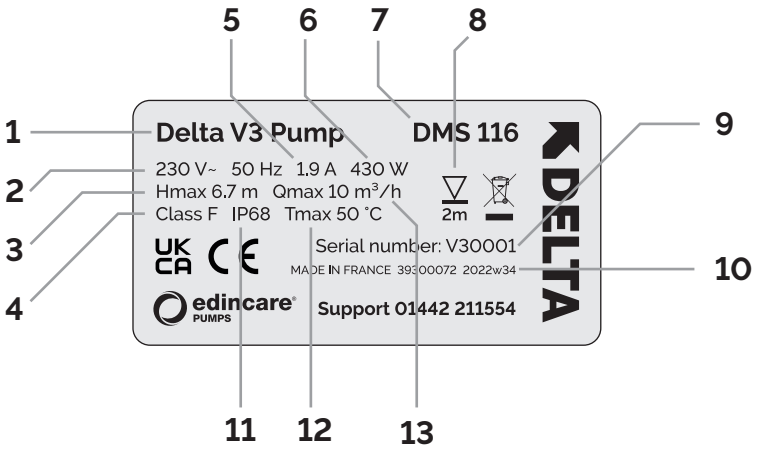
Pump for handling seepage water, chemically neutral, slightly contaminated waste water, and wash water.

4.2 Designation

Delta V3 Submersible Pump

4.3 Name plate

Figure 1. Nameplate example



1. Pump type
2. Rated voltage / frequency
3. Maximum head
4. Thermal class of winding insulation
5. Full load current
6. Rated power (P2)
7. Product code
8. Maximum immersion depth
9. Serial number
10. Batch number
11. Ingress protection of enclosure
12. Maximum fluid ambient temperature
13. Maximum flow rate

4.4 Design details

Design

- Vertical installation
- Single-stage
- To EN 12050-2
- Wetted parts made of materials coated with anti-corrosive

Drive

- Single-phase AC motor
- Cooled by the fluid handled
- Thermal motor protection with automatic reset and start-up
- Earthed power supply cable

Pump casing

- Annular casing

Impeller type

- Free-flow impeller

Bearings

- Enclosed bearings, grease-packed for life

4.5 Configuration and function

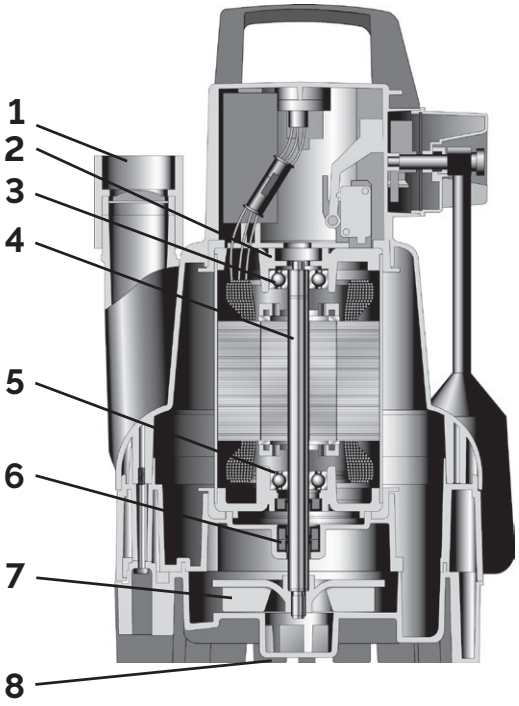


Figure 2. Sectional drawing

1. Discharge nozzle
2. Bearing bracket
3. Rolling element bearing
4. Shaft
5. Rolling element bearing
6. Shaft seal
7. Impeller
8. Foot opening

Design

The pump is designed with an axial fluid inlet and an outlet parallel to the axis, pointing upwards. The hydraulic system runs in common bearings and is connected to the motor by a shaft coupling.

Function

The fluid enters the pump via an opening in the foot (8) and is accelerated outward by the rotating impeller (7). In the flow passage of the pump casing the kinetic energy of the fluid is converted into pressure energy. The fluid is pumped to the discharge nozzle (1), where it leaves the pump. At the rear side of the impeller, the shaft (4) enters the casing via the casing wall. The shaft passage through the cover is sealed to the atmosphere with a shaft seal (6). The shaft runs in rolling element bearings (3 and 5), which are supported by a bearing bracket (2). The bearing bracket is linked with the pump casing and/or casing cover.

Sealing

The pump is sealed by three bi-directional shaft seals in tandem arrangement. A lubricant reservoir between the seals ensures cooling and lubrication of the shaft seals.

4.6 Scope of supply

Depending on the model, the following items are included in the scope of supply:

- Pump set
- Lift check valve
- Connection socket with internal thread
- Float switch/locking disc (for external control systems or dual-pump stations)
- Power cable with shockproof plug

Accessories

Further required accessories can be purchased from our distributors.

5 Installation at site

5.1 Safety regulations

DANGER

Unsuitable electrical installation

Danger to life!

- ▷ Make sure the electrical installation meets the VDE 0100 installation rules (i.e. sockets with earthing terminals).
- ▷ Make sure the electric mains is equipped with a residual current device of maximum 30 mA.
- ▷ Always have the electrical connections installed by a trained and qualified electrician.
- ▷ Only use the plugs and power cables supplied with the pump.

DANGER

Use in an outdoor area

Danger of death from electric shock!

- ▷ Any extension cords must match the quality of the supplied pump cable (10-metre cable length).
- ▷ Do not expose electrical connections to any moisture.

DANGER

Continuous pump operation in swimming pools, garden ponds or similar

Danger of death from electric shock!

- ▷ Make sure that nobody is in the water while the pump is in operation..
- ▷ Only use the pump for draining swimming pools, garden ponds, etc. (It is impermissible to use this pump as a recirculation pump, for example.)

5.2 Checks to be carried out prior to installation

Before beginning with the installation check the following:

- The pump set can be operated on the power supply network according to the data on the name plate.
- The fluid to be handled matches the description of suitable fluids.

5.3 Fitting the swing check valve and socket (if supplied but not fitted)

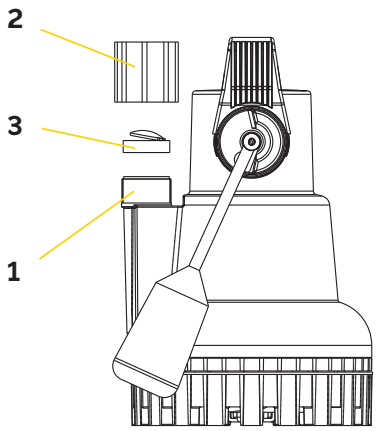


Figure 3: Fitting the swing check valve and socket

1. Discharge nozzle
2. Socket 1¼"
3. Swing check valve

1. Position the swing check valve on the discharge nozzle. Make sure the disc of the swing check valve opens upwards.
2. Screw the socket on with the long thread and tighten it.

5.4 Adjusting the cut-in level control

Figure 4. Switching levels.

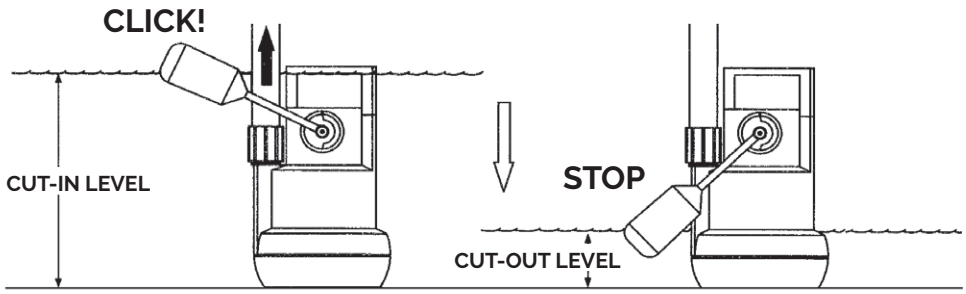
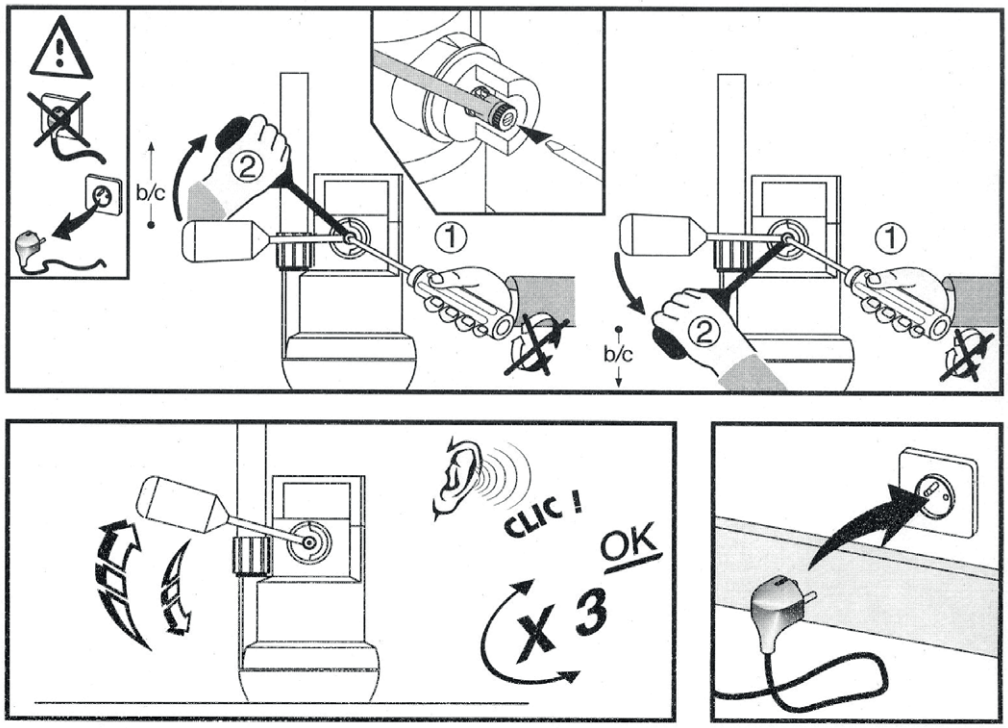


Table 4. Cut-in levels and cut-out levels.

Pump set	Factory setting		Maximum limits	
	Cut-out level (mm)	Cut-in level (mm)	Cut-out level (mm)	Cut-in level (mm)
Delta V3	70	145	295	375
Delta V4	110	200	315	420
Delta V6	110	200	315	420

For manual operation the cut-out level must be no lower than 15mm.

Figure 5. Adjusting the cut-in level control



1. Unplug the pump from the electric mains.
2. Insert a screwdriver into the screw at the float and hold it in this position. **Do not turn the screw**.
3. Push the float up or down to adjust it to the required cut-in level.
4. Pull the screwdriver back out again.
5. Check the cut-in level by moving the float up and down. You should be able to hear a "click" each time the float is lifted up to the cut-in level.
6. Plug the pump back into the mains.

5.5 Piping

5.5.1 Connecting the piping (stationary installation – 5 metre cable length)

NOTE

The highest point of the discharge line must be above the flood level (usually street level) to prevent any backflow from the sewage system.

Connect the pump and piping at the G 1¼ thread of the discharge nozzle. Use a pipe with an inner diameter of 32 millimetres.

5.5.2 Connecting the piping (transportable installation – 10 metre cable length)

1. A hose with an inner diameter of 30 millimetres can be connected to the pump set. To do so, screw a G 1 ¼ adaptor into the threaded socket (see accessories "drainage hose set A 25 B").
2. Fasten the hose with a hose clip.

5.6 Installing the pump set

Figure 6. Installation dimensions and switching levels.

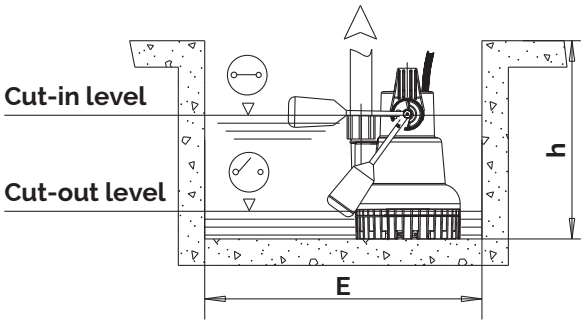


Table 5. Recommended installation dimensions.

Pump set	E (mm)	h (mm)
Delta V3	400x400	400
Delta V4, V6	400x400	500

1. If required, suspend the pump set using a rope attached to the handle.
2. Place the pump set on a solid surface.
   Observe the recommended installation dimensions.
3. Position the pump set so that the float can move freely.

5.7 Connection to power supply

Plug the pump into the mains socket.

The pump switches on and off automatically.

6 Commissioning / Start-up / Shutdown

6.1 Start-up/shutdown

The pump's automatic control system will cut in when level "A" is reached and will cut out when level "B" is reached. (⇨ Section 5.6, Page 19)

6.2 Operating limits

CAUTION

Unsuitable fluids

Damage to the pump!

- ▷ Never use the pump to handle corrosive, combustible or explosive fluids.
- ▷ Never use the pump to handle waste water containing faeces.
- ▷ Do not use the pump for foodstuff applications..

Table 6. Overview

Characteristic	Delta V3 Pump	Delta V4 Pump	Delta V6 Pump
Head	6.5 m max.	10 m max.	12.5 m max.
Flow rate	10 m^3/h max.	12 m^3/h max.	14 m^3/h max.
Immersion depth	2 m max.	2 m max.	2 m max.
Voltage/frequency	230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz
Starting current	4.1 A	9.5 A	11.5 A
Maximum temperature of fluid medium	0 to 50 °C	0 to 50 °C	0 to 50 °C
Particle size (maximum diameter)	10 mm	10 mm	10 mm
Residual water level (in manual operation)	15 mm min.	15 mm min.	15 mm min.
Power input	430 W max.	750 W max.	1050 W max.
Ingress protection	IP68	IP68	IP68
Power cable	H05RN8-F 3×0,752	H05RN8-F 3×0,752	H05RN8-F 3×0,752
Frequency of starts (starts/hour)	30 max.	30 max.	30 max.

6.3 Shutdown/storage/preservation

6.3.1 Measures to be taken for shutdown

1. Unplug the system from the electric mains.
2. Wait for the pump to cool down (at least 10 minutes) before removing it from the tank.
3. Separate the pump from the discharge line.
4. Unscrew the connection socket at the discharge nozzle and remove the swing check valve.
5. Clean the pump and its add-on parts under a water jet.
   - Point the water jet into the discharge nozzle.
   - Remove the swing check valve and point the water jet into the opening.
6. Allow the parts to dry.
7. Re-install the connection socket and the swing check valve. Observe the assembly sequence.
8. Store the pump vertically in a dry, dark and frost-proof room.

NOTE

Special preservation measures are not required.

6.4 Returning to service

(⇨ Section 5, Page 16)

7 Servicing/Maintenance

7.1 Safety regulations

DANGER

Power supply not disconnected

Danger to life!

▷ Pull the mains plug and secure the pump against unintentional start-up..

DANGER

Work on the pump set by unqualified personnel

Danger of death from electric shock!

▷ Have pump components modified and dismantled by authorised personnel only.

WARNING

Insufficient stability

Risk of crushing hands and feet!

▷ During assembly/dismantling, secure the pump (set)/pump parts to prevent tilting or tipping over.

WARNING

Fluids handled, consumables and supplies posing a health hazard

Hazard to persons and the environment!

▷ Clean the pump prior to any maintenance and installation work.
▷ Make sure persons cannot come into contact with the fluid handled.

7.2 Servicing/inspection

The pump is practically maintenance-free.

It will suffice to clean the pump once a year and carry out visual inspections of the condition of the pump and supply line.

7.3 Drainage/disposal

The pump will be automatically drained when it is taken out of the fluid handled.

Always flush and clean the pump before transporting it to the workshop. Provide a certificate of decontamination for the pump set.

WARNING

Fluids, consumables and supplies which are hot or pose a health hazard

Hazard to persons and the environment!

- ▷ Collect and properly dispose of flushing fluid and any residues of the fluid handled.
- ▷ Wear safety clothing and a protective mask, if required.
- ▷ Observe all legal regulations on the disposal of fluids posing a health hazard.

7.4 Dismantling/reassembling the pump set

Dismantling/reassembly work must be effected by authorised specialist personnel only.

NOTE

All maintenance work, service work and installation work can be carried out by Edincare Pumps or Delta authorised service providers. For contact details please refer to the enclosed “Addresses” booklet or visit www.edincare.com.

7.5 Recommended spare parts stock

It is not necessary to keep spare parts on stock.

8 Trouble-shooting

WARNING

Improper work to remedy faults

Risk of injury!

▷ For any work performed to remedy faults, observe the relevant information given in this instruction manual and/or in the product literature provided by the accessories manufacturer.

If problems occur that are not described in the following table, please call Edincare Pumps Helpdesk on 01442 211554 or email info@edincare.com.

Table 7. Trouble-shooting

Characteristic	Possible cause	Remedy*
Pump is running, but does not or hardly delivers.	The hydraulic system is clogged by foreign matter.	Clean the hydraulic system with a water jet. (⇨ Section 6.3, Page 21)
	The discharge line is closed.	Open all accessories fitted at the discharge line.
	The lift check valve has been fitted for the opposite direction of flow or is clogged.	Reassemble observing the correct sequence (⇨ Section 9.1, Page 25) or clean the lift check valve.
The pump is not running or only for a short time.	The thermal motor protection device triggers because:	
	1) Pump overheating	Check the fluid temperature.
	2) Pump running dry	Verify the minimum fluid level.
	3) The power supply is interrupted	Check the electrical installation

* Pump pressure must be released before attempting to remedy faults on parts which are subjected to pressure. Disconnect the pump from the power supply and let it cool down.

9 Related documents

9.1 Exploded view and list of components

Figure 7. Exploded view of pump

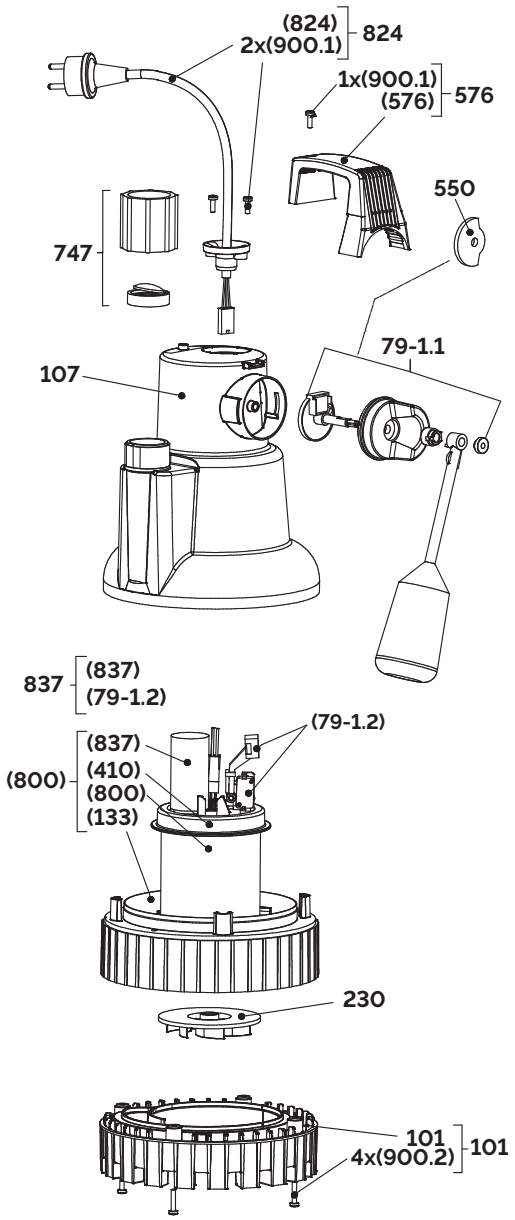


Table 8. List of components

Part #	Description
101	Pump casing
107	Discharge casing
230	Impeller
550	Locking disc for float
576	Handle
747	Swing check valve and inspection hole
79-1.1	Automatic switch (external)
800	Motor
824	Cable

10 EU Declaration of Conformity

We:

Edincare Pumps, Unit 8, Heron Business Park,
Eastman Way, Hemel Hempstead, HP2 7FW, England

herewith declare under sole responsibility, that the products

Delta V3 Submersible Pump (DMS 116, serial number 30001 to 39999)
Delta V4 Submersible Pump (DMS 216, serial number 40001 to 49999)
Delta V6 Submersible Pump (DMS 084, serial number 60001 to 69999)

are in conformity with the provisions of the following Directives and Standards:

Pump set: EC Machinery Directive 2006/42/EC
Pump set: Electromagnetic Compatibility Directive 2014/30/EU

We also declare that the following harmonised international standards have been applied:

ISO 12100
EN 809
EN 60034-1, EN 60034-5/A1
EN 60335-1/A1, EN 60335-2-41

This Declaration of Conformity was issued in England on 27 September 2022

Andrew Davies
Director

11 Certificate of Decontamination

Type: .....

Order number/

Order item number[5]: .....

Delivery date: .....

Applications: .....

Fluid handled[5]: .....

Please tick where applicable[5]:

☐ Corrosive

☐ Oxidising

☐ Flammable

☐ Explosive

☐ Hazardous to health

☐ Harmful

☐ Toxic

☐ Radioactive

☐ Bio-hazardous

☐ Safe

Reason for return[5]: .....

Comments: .....

.....

The product/accessories have been carefully drained, cleaned and decontaminated inside and outside prior to dispatch/ placing at your disposal.

We herewith declare that this product is free from hazardous chemicals, biological and radioactive substances.

For mag-drive pumps, the inner rotor unit (impeller, casing cover, bearing ring carrier, plain bearing, inner rotor) has been removed from the pump and cleaned. In cases of containment shroud leakage, the outer rotor, bearing bracket lantern, leakage barrier and bearing bracket or intermediate piece have also been cleaned.

For canned motor pumps, the rotor and plain bearing have been removed from the pump for cleaning. In cases of leakage at the stator can, the stator space has been examined for fluid leakage; if fluid handled has penetrated the stator space, it has been removed.

☐ No special safety precautions are required for further handling.

☐ The following safety precautions are required for flushing fluids, fluid residues and disposal:

.....

.....

We confirm that the above data and information are correct and complete and that dispatch is effected in accordance with the relevant legal provisions.

.....	.....	.....
Place, date and signature	Address	Company stamp

Index

Technical support 01442 211554

Delta House, Merlin Way, North Weald, Epping, Essex, CM16 6HR

01992 523 523 | info@deltamembranes.com | www.deltamembranes.com

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