ADV

Vertical Centrifugal Pumps

Installation, Operation and Maintenance





AlphaDynamic Pumps SA Industrial Park of Inofita - HELLAS www.alphadynamic.eu

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1. Introduction

1.1 General

This manual refers to ADV Vertical centrifugal pumps series. Pumps of series ADV are made of thermoplastic materials (Polypropylene or PVDF) and can be of different sizes. Dimensions and capacities available are described in paragraph 7.

1.2 Purpose of the manual

The main purpose of this manual is to assure that the activities of installation, operation and maintenance of the pumps are executed in a correct and safe way by all personnel in charge of these operations. This document also offers indications useful for the customer to solve the problems, order spare parts and contact AlphaDynamic Pumps SA repair service.

1.3 Warning symbols for safety



This symbol indicates a possible danger caused by the presence of electrical fields, contacts or wires with electric current.

All the symbols with the exclamation mark indicate an important situation that needs the attention of the personnel. In particular, these are indications useful for the correct functioning and prevention of possible damage to the equipment.



This symbol signals danger or a situation that requires the maximum attention of the personnel. It's important to respect the instructions stated at the margin of this symbol and proceed very carefully. It's necessary to inform all the personnel and/or users that the rules indicated prevent injuries.

1.4 Qualification and training of the personnel



1.5 Explosive Atmosphere Zones

The pumps described in this manual **CANNOT be used in explosive atmospheres.** These uses require special pumps that AlphaDynamic Pumps SA manufactures with particular materials and precautions. Customers who want to use special pumps in these kinds of zones have to contact the AlphaDynamic Pumps SA technical office for the correct choice of the product.



WE REMIND YOU THAT THE CLASSIFICATION OF THE ZONE REF. ATEX 2014/34/EU DIRECTIVE FOR POTENTIALLY EXPLOSIVE ATMOSHPERE ZONES HAVE TO BE DONE BY THE CUSTOMER AND COMMUNICATED TO ALPHADYNAMIC PUMPS SA FOR THE RIGHT CHOICE OF THE KIND OF PUMP SUITABLE TO WORK IN THESE ZONES.

Furthermore, the customer is responsible of the correct installation of the pump in accordance with the requirements stated in the Directive.

2. Installation

Preliminary remarks

All references to the pumps have to be considered applicable also to systems that use these pumps unless it's specified otherwise.

2.1 Safety general warnings

2.1.1 Introduction about danger

ATTENTION: the non-observance of the indications stated in this manual or the inappropriate use of the equipment by unqualified or unauthorized staff, can cause serious personal injuries or death and damages to products and apparatus! The technical assistance office is at your complete disposal; in case of doubts or problems you can contact us by phone (Number +30 215 2159520) or write an email to info@alphadynamic.eu. It's strongly recommended that you keep **AlphaDynamic Pumps SA** written answer.

2.1.2 Indications of danger



STOP

For the safety of those in charge of the installation of the pump it's necessary to use safety clothing and individual safety devices approved by the current provisions of the law (e.g. Safety glass, gloves and safety insulating-shoes). These pumps have been designed and manufactured to be used in specific conditions and within defined limits. The use outside these specifications has to be agreed and approved by the AlphaDynamic Pumps SA technical service. It must also be considered that, if the pumps are used outside their technical specifications, the CE Certifications and the warranty are no longer valid. Furthermore, if the pump is used outside the technical specifications communicated to us at the moment of the quotation and confirmed in our order confirmation, the customer becomes responsible for the issue of a new CE Certification.



The pump has to be used only for the applications specified in the order for which AlphaDynamic Pump SA has selected the model, the construction materials and has tested the pump to respect the specifications. For other uses, different from those stated in the order, the customer has to send always a written request to the AlphaDynamic Pump SA technical office, which on its part will reply in written form. There will not be any warranty for repairs or alterations on the product done by the users or third parties not specifically authorized by AlphaDynamic Pump SA.

Always shut down the pump before touching or proceeding with any intervention on it or on the circuit of installation. The pump must be empty of pumped liquid and it must be completely decontaminated and successfully rinsed with water before any manual operations or disassembling. Make sure that the electrical system, to which the pump will be connected has, the adequate power and has the correct protection devices (e.g. Grounding, Life safe).



Always switch off the electrical supply before working on the pump for maintenance or part substitution. Always keep an extinguisher next to the pump installed.



Always pay maximum attention to the execution of maintenance activities on pumps and on the connected circuits when they are used with dangerous liquids.

The use of an electric starter is recommended. A simple switch can be insufficient to start and stop the electric motor connected to the main electric system. An appropriate starter:



- \cdot can prevent accidental starting after a failed attempt to start
- · is a safe switch, protected against water
- protects the electric motor against overloads due to a short circuit (a fuse only protects the wires)
- resists against starting in overload on the motor, preventing dangerous electric arc and early wear of the electrical contacts

2.2 Receipt and Inspection

Even if AlphaDynamic Pumps SA takes all the necessary precautions during packaging, we suggest that you carefully check the received material. Check for any missing parts caused by the courier and/or by AlphaDynamic Pumps SA Check the data on the label of the received pump and compare it with those relative to your purchase order. If the pump has been supplied with the motor, remove the protective shield from the fan of the motor and try to rotate the motor shaft by hand. If you feel a strong resistance to rotation or if you hear abnormal noises contact your reliable reseller or contact the AlphaDynamic Pumps SA assistance service directly. Reassemble the protective fan shield before starting the pump.

2.2.1 Pump Identification

Each pump is fitted with an identification plate detailing its specification and materials. This data must always be reported in all communications to the manufacturer, dealer or service centers.

WARNING: It is forbidden to remove and/or modify the identification plate and/or the data there in.

The identification code * listed aside the TYPE heading, details the pump composition and construction materials in order to determine its suitability and compatibility with the product to be pumped.



2.2.2 Pump description

Recommended use:

ADV vertical centrifugal pumps made from resin have been designed and manufactured to pump below head liquids having an apparent viscosity between 1 and 500cps and that are chemically compatible with the components of the pump. Fluid service temperatures must range from 3°C to a maximum of 60°C for PP pumps and 90°C for PVDF pumps, according to the type of material used to build the pump. ADV centrifugal pumps are designed for a maximum working speed of 2900 revs/min, in direct drive with motors equipped with a rear axial compensator.

2.2.3 Working principles.



ADV vertical centrifugal pumps must be installed below head with appropriate procedures to avoid vortex formation and consequent air bubble suction. The pump must work ONLY when FLOODED. The impeller - integrally joined to the shaft and to the direct drive mounted motor- must be set in rotation at a preset speed (max 2.900 revs/min). Its centrifugal effect activates suction in the main duct and delivery in the secondary duct.



WARNING: use of ADV vertical centrifugal pumps for anything other than that previously described is to be considered improper use and is forbidden by AlphaDynamic Pumps SA . Improper use.

It is SPECIFICALLY forbidden to use ADV pumps:

- for pumping petrol and/or flammable liquids
- for pumping food liquids
- with an opposite rotation to the one specified
- in self-priming working conditions
- for suction in the presence of vortexes, turbulence or air bubbles
- for creating vacuum
- with liquids that are chemically incompatible with the construction materials
- with solids in suspension that have a higher specific weight than the liquid (e.g. water and sand)
- with product temperatures and characteristics of the pump.
- with water that is particularly hard and/ or full of deposits



WARNING: due to the wide variety of products and chemical compositions, the operator is considered to be the best evaluator of reactions and compatibility with the pump's construction materials. Therefore, before use, carry out all necessary checks and tests to avoid any possible hazardous situation, that cannot be predicted or for which the manufacturer cannot be held liable.



WARNING: the use of the pump that does not comply with the instructions indicated in the use and maintenance manual will cancel compliance to the requirements for safety.

The risks associated with the use of the pump under the exact conditions set forth in the use and maintenance manual have been analyzed, whilst the analysis of the risks associated with the interface with other system components must be carried out by the installer.

2.2.4 Technical specifications

The data related to performance refer to standard procedures. The NOMINAL flow and the MAX head values refer to pumping of water at 18°C with free-flow suction and delivery.



TYPE	A	B	L		D	E	F	G	H		M	N	_0_	P	Q	R
ADV 080	340	164		20	100	340	130	119	91	260	290	119	210	Φ140	1"	1 ½"
ADV 090	340	164		20	100	340	130	119	91	260	290	119	210	Φ140	1"	1 ½"
ADV 095	419	210		25	125	360	135	165	60	300	310	165	250	Ф203	1 1⁄2"	2 *
ADV 110	419	210	20	25	125	360	135	165	60	300	310	165	250	Ф203	1 ½"	2*
ADV 120	446	220	0-12	25	125	360	135	165	60	300	310	165	250	Φ203	1 ½"	2 *
ADV 130	487	220	-100	25	125	360	135	165	60	300	310	165	250	Φ203	1 1/2"	2 *
ADV 140	507	235	0-800	25	120	360	135	165	60	300	310	165	250	Φ203	1 ½"	2*
ADV 150	532	233	50(25	132	480	170	215	95	380	430	215	330	Φ275	2"	2 ½"
ADV 155	682	303		25	130	480	170	215	95	380	430	215	330	Ф275	2"	2
ADV 160	702	303		25	130	480	170	215	95	380	430	215	330	Ф275	2"	2 1⁄2"
ADV 180	752	303		25	130	480	170	215	95	380	430	215	330	Φ275	2"	2

2.3 Storage



If the pump is kept in the warehouse, make sure that it's placed in a dry and protected position. Always use the original package or an equivalent protection. If the pump has to remain stored for a long period and/or in particularly damp places the use of hygroscopic substance (silica gel) is recommended to prevent damages.



Don't remove the protections of the flanges until the installation and close, if they are not closed already, the discharge and suction pump connections to prevent the intrusion of foreign bodies.



Be informed that a long period of storage of the pumps can provoke:

· deterioration of the isolation of the motor due to absorption of dampness

 \cdot deterioration of the gaskets

2.3.1 Transporting and Positioning

The operators in charge of the assembly/disassembly must be informed and trained on the dangers relating to the use of mechanical tools, even small ones. When receiving the goods, check that the pump packaging is undamaged; afterwards proceed as follows:

-According to the equipment size and weight, the plant is either packaged with cardboard, boxes or on pallets.

-Open and discard the packaging

-Consult the Use and Maintenance Manual and comply with its instructions

-Lift the pump with appropriate lifting means, suitable to the weight indicated on the ID plate -Check the correct tightening of all screws

NOTE: ADV pumps are supplied complete with motor. In case of future handling, if the pump is detached from the motor, before proceeding with its positioning it must be assembled as described in the Chapter 2.8.



WARNING: ADV pumps must be fixed in a vertical position using brackets fixed to the drilled plate provided. Vertical, centrifugal pumps are not self priming, therefore they must always be installed in a sufficiently filled tank, guaranteeing minimum and maximum immersion levels. 6. Position the pump in a perfectly vertical position in the place of installation, attaching it using suitable bolts in the drilled plate. Ensure to provide adequate space for future maintenance operations.



WARNING: the suction inlet must be at least 100 mm. fromt he bottom of the tank in order to prevent the formation of deposits and obstructions. Do not install filters of any type on the suction inlet.



WARNING: dry operation of ADV pumps, in addition to damaging the bushing, may cause excessive wear of elements subject to horizontal friction and subsequent

internal overheating and possible fire, therefore the following rules must be complied with:

A – the pump is not self priming and must always be installed and adequately immersed (see MIN and MAX level in the tank);

B – the suction inlet must be housed inside a suitable weir and away from vortexes, turbulence and/or free discharges into the tank;

C – the weight of the delivery pipe must not burden the pump;

D – fit a level regulator device that can halt the motor when the pump

Transportation and positioning are now completed.





2.4 Installation



AlphaDynamic Pumps SA is not responsible for injury to people or damage to things caused by the wrong installation of the pump or installation executed by non-qualified personnel. Install the pump in a position that guarantees a simple use.

2.5 Hydraulic system

The pump is generally part of a hydraulic system that can include a various number of components such as: valves, fittings, filters, expansion joints, instruments, etc. The way the piping is arranged and the position of the components has a great influence on the operation and on the life of the pump.

2.6 Monitoring Equipment



According to the importance of the pumping system, it could be useful to maintain a strict control of the performances and conditions of the process. The use of instruments to monitor the pressure of the suction and discharge circuit is recommended. Even the monitoring of the electric power absorbed by the motor is possible using a wattmeter.



If the temperature of the pumped liquid represents a critical factor, install in the system a thermometer, preferably on the suction line. These control instruments can advise of abnormal operating conditions of pumps such as: accidentally closed valves, missing liquid, overloads etc.

2.7 Motor connection



Check that the voltage and frequency printed on the label of the motor correspond to those of the electric system to be used. Don't connect the electric motor directly to the main system but protect the dedicated system with a suitable main switch with adequate safety protections against overloads. The electric connections have to always be carried out by an expert qualified electrician.



The motors have to be supplied with three-phase voltage or if required by the customer, with single phase voltage. The type of connection of the three-phase motors can be Star (Y) or Delta (Δ) according to the power supply 380 or 220 VAC (see picture 1).



Make sure that the direction of rotation of the motor is that as specified on the pump head and eventually indicated by a sticker arrow on the motor fan. To change the sense of rotation it's sufficient to change two of the three entering line (E.g. L1 with L2) in three-phase motors.

Read the following instructions to change the direction of rotation:

- wear individual homologated protection devices(e.g. gloves, glasses)
- make sure that the operating conditions are similar to the specifications of the pump
- install the pump in the hydraulic system.

3. Operation

3.1 Use and Safety

ATTENTION:

Dangerous or hazardous actions can cause serious injuries or death to people or serious damage to materials and so it's important to assure the respect of all the warnings relative to the safety and the correct use written in this manual.



Verify always that the pumped liquid is compatible with the construction materials of the pump. For any clarification, please contact AlphaDynamic Pumps SA technical office.



In case of use for pumping aggressive, toxic liquids or liquids dangerous for the health of the personnel, it's necessary to install on the pump an adequate protection from possible contamination, proper drainage in case of leakage and warning signs of dangerous product in case of leakage: e.g. **DANGER OF POLLUTION, CONTAMINATION, INJURIES AND/OR DEATH!**



Do not loosen the connection of the pump while it's under pressure.

Do not start and/or use the pump if there are signs of leakage in the system.



The working temperatures have to respect the characteristics of the construction materials of the pump:

- 60 °C polypropylene execution (PP)
- 95° C PVDF execution



DO NOT ALLOW THE PUMP TO RUN DRY (note: the ADV vertical centrifugal pump design doesn't allow dry-running operation because it will damage irrevocably the inner parts of the pump)



An accidental failure can generate sparks up to considerable distances.

In case of vibrations or abnormal noises, stop the pump immediately.

Do not pump inflamed liquids.



Do not touch the pump while it's operating.

Before touching the motor or the bracket switch off the electric current.

3.2 Temperature

Increasing the temperature of the pumped liquid can damage the pump and/or the piping/fittings and there can be a situation of serious danger for the personnel nearby. Avoid sudden changes of the temperature and do not exceed the temperature specified in your order. See the value of temperatures of the construction materials of the pumps in paragraph 3.1.

3.3 Before Starting

Make sure that the pump is installed in accordance with the instructions previously stated in section 2. When the pumping station is new, it's necessary to fill the system with water to ensure that there is no leakage.

WHEN THE PUMP IS INSTALLED ABOVE HEAD IT HAS TO BE PRIMED, THIS MEANS THAT IT HAS TO BE FILLED WITH THE LIQUID AND THE SUCTION PIPING HAS TO BE KEPT FULL WITH LIQUID BEFORE STARTING THE PUMP.

ATTENTION: some liquids react with water. VERIFY IF THE LIQUID TO BE PUMPED REACTS WITH WATER. IN THIS CASE THE SYSTEM HAS TO BE COMPLETELY EMPTIED AND DRAINED.

3.4 Starting

Start the electric motor and gradually open the discharge pipe until you reach the required flow. The pump can't operate more than two or three minutes with its discharge closed. If the pressure shown on the pressure gauge on the discharge piping does not increase, stop the pump immediately and release the pressure carefully. Repeat the operation of installation of the pump as in paragraph 2. If during the starting procedure there are changes of flow-rate, density, temperature or viscosity of the liquid, stop the pump and contact AlphaDynamic Pumps SA technical service.

3.5 Optimum conditions for use



Operating continuously at the peak performance (maximum capacity/head) may cause early wear of the pump. As a general rule, we recommend using the pump at half of its maximum capacity (see the paragraph relative to the technical data). The flow capacity and head of the pump refer to water

pumping at room temperature. If it pumps high temperature liquids or other viscosities and densities, the performance has to be proportionately decreased. Pumps of series ADV work well with liquids having a viscosity up to 500 CPS³



HOWEVER, BOTH VISCOSITY AND THE SPECIFIC GRAVITY HAVE TO BE COMMUNICATED AT THE MOMENT OF QUOTATION.

3.6 Shut down.



Normally the pump should be shut down only after closing the discharge valve. If the suction valve is closed before the other, cavitation of the pump can occur. If the suction is flooded, close the valve after shutting down the pump. In some cases, the pump can be used to empty tanks. In these situations, the liquid can stop flowing in the pump while the pump is still working. In these cases, a pump operating without liquid (this means dry-running) can be dangerously damaged if it's not stopped immediately. For such applications the use of automatic equipment or the constant presence of personnel who can shut down the pump is recommended.

3.7 Long pump inactivity

If the pump has to remain inactive for a long period, before stopping it, it's recommended to let water flow in the system for several minutes so that you avoid any risk of internal deposits or sediments or settlement of solid parts. Drain the liquid in the pump. An eventual freezing of the liquid inside the pump can cause damage. Always verify if the pumped liquid reacts with water. In this case contact AlphaDynamic Pumps SA to find an alternative solution. If the pump is temporarily removed from the system and kept in stock, it's necessary to follow the instructions of paragraph 2.3 "Storage".

3.8 Noise Level

In some circumstances, for example when the pump works with high pressure and low capacity, the increase of the noise can be disturbing for the personnel working in the proximity. In this case it's possible to intervene with:

- earplugs;
- protective homologated caps against noises for the personnel in the proximity;
- soundproofing canopy for the pump. In this case, make sure that the motor ventilation is guaranteed;

4. Maintenance

4.1 General Dispositions



During the warranty period disassembly activities of the pump are allowed only for AlphaDynamic Pumps SA personnel or personnel authorized by AlphaDynamic Pumps SA. All the operations described in the paragraphs below have to be done exclusively by qualified staff and all the warnings written in this manual must be followed step by step.



Clean the external surface of the pump using only antistatic equipment. Every operation executed on the apparatus has to be done after the disconnection of electric supply.



Use exclusively lifting machinery to move pumps with weight higher than 16 kg. During the moving of the machine or parts of the machine avoid collisions or falls which can damage the apparatus.



Before disassembling the parts of the pump, make sure that the dangerous internal liquids have been removed /washed. **THE PUMP HAS TO BE DRAINED AND DECONTAMINATED.**



4.2 Inspections

In general, ADV vertical centrifugal pumps do not need a "routine" maintenance and most of all they don't require frequent dismantling. However, periodical inspection is advisable to verify the state of wear of the impeller, the shaft, and the bearings and if the general conditions of the internal parts of the pump are good.

The time between the inspections is strongly dependent on the operating conditions of the pump: the characteristics of the liquid, the temperature, the materials used and obviously the time of operation. If a problem occurs or the pump needs a complete inspection see section "Problem solutions" and "Pump disassembly ".

4.3 Product circuit connection

After having correctly positioned the pump, proceed with connecting the pump to the product circuit, as follows:



WARNING: To connect the pump only use connections with cylindrical gas threads made by materials compatible with the fluid to be pumped and with the pump construction materials. E.g.: pump in PP = connections in PP

Check if the connection tubes to the pump are clean inside and do no contain any working residue.

1.Install a manual full-bore ball valve on the delivery manifold, of a diameter equal to the pump connection (never smaller), thus to ensure fluid shut-off in case of leaks and/or future maintenance.

2.Install the delivery conduit on the manual valve of the pump, using rigid tubes made from the same material as the pump.



WARNING: the delivery conduit must be executed using rigid pipes made from a material that is compatible with that of the pump and the fluid to be pumped. Never use pipes that have a smaller diameter than the pump connection.



WARNING: pipes must be adequately supported; DELIVERY PIPING MUST NOT FORM SIPHONS AND MUST NEVER BURDEN THE PUMP.

3. Provide adequate support for the delivery conduit.



WARNING: Check that the treated fluid does not or could contain solid matter of a large size or a potentially damaging shape and that there are no restrictions or obstructions on the suction and/or delivery of the pump, thus avoiding phenomenasuch as cavitation and electrical motor strain.



4.4 Commissioning

The installer/operator must always use material compatible with the pumped liquid and in accordance with the design conditions of the pump.



WARNING: it is forbidden to use liquids that are incompatible with the materials of the pump components or in an environment where there are incompatible fluids

In order to start-up the pump, proceed as follows.

1. Check that the product delivery conduit is connected.



WARNING: dry operation of ADV pumps, besides damaging the internal bushing, causes overheating and fusion of parts subject to horizontal friction, and may subsequently cause a fire.

- 2. Open the manual ball valve of the fluid piping;
- 3. Fill the tank, respecting the MIN and MAX levels, so as to flood the pump.
- 4. Start the motor with the appropriate controls.
- 5. To stop the pump, only use the stop controls of the pump electrical motor.



WARNING: never stop a working pump by closing the delivery ball valve of the fluid circuit: THE PUMP MAY STALL AND/OR A FIRE MAY BE CAUSED BY THE FUSION OF THE CERAMIC BUSHING DUE TO DRY OPERATION.



WARNING: check that there is no anomalous noise vibration while the pump is working. If so, immediately stop the pump, check, and eliminate the cause.

WARNING: check that there are no air bubbles in the outlet fluid. If so, immediately stop the pump, check, and eliminate the cause.

WARNING: do not install filters on the suction inlet as they may cause pressure loss.

6 .After the first two hours of operation of the pump, and after having stopped it correctly, you must:

- A. visually check that there is no product leakage from the casing;
- B. check the tightening of all bolts;
- C. check the seal of the fluid delivery conduit. The noise levels of the machine correspond to:

The sound pressure level of the A weighted emission, in the working place, is less than 75 dB.

4.5 Standard maintenance time schedule

In order to guarantee performance and safe use, ADV pumps need standard maintenance operations throughout their life span and in accordance to the time-schedule detailed in the following table. The time schedule for routine maintenance shown in the table refers to standard use and working conditions. More demanding working conditions require more frequent operations, with a 30% to 50% more frequent interventions than those indicated.

WARNING: failure to proceed and/or comply with standard maintenance and/or its time schedule, renders the warranty null and can excessively wear and damage the internal parts of the pump and/or the motor, as well as create hazardous situations, for which the manufacturer is not to be held liable.

CHECK AND/OR OPERATION	EVERY 100 HOURS	EVERY 1000 HOURS	EVERY 1500 HOURS
A GREASE THE BEARING	•		
PRODUCT CIRQUIT MAINTENANCE		•	
INTERNAL CLEANING OF THE PUMP	-	•	
REPLACEMENT OF THE WEARING BUSHING			•
REPLACEMENT OF STATIC SEAL SEAL		•	

4.5.1 Bearing Lubrification

The pump bearing must be periodically lubricated after every 100 hours of operation as follows:

WARNING: before starting any work on the pump and/or carrying out this maintenance work you must first:

A -stop the motor and disconnect the electric supply to prevent it from starting in an uncontrolled manner;

B -discharge the product that was being pumped and close the on off delivery valve.

C -wear suitable protective equipment before starting work (face mask, gloves, closed shoes, overalls, etc

A1 Fill the grease cup using a grease gun, without overfilling it.

WARNING: lubricate using bearing grease.

A2 Remove any grease from the pump shaft using a clean cloth.



4.5.2 B Maintenance for the product circuit

Product circuit maintenance checks must be carried out periodically every 1,000 hours to check for product leakage, proceeding as follows:

B1 Check that there is no product leakage from the delivery conduit.

B2 Visually check that there is no leakage between the flange and the casing.

WARNING: in case any leakage results, before any operation on the pump and/or before any maintenance or repair operation, proceed as follows:

A. discharge the product beingpumped and close the product delivery on-off valve;

B. circulate a suitable, nonflammable washing fluid, after which drain it out by opening the delivery valve; stop the pump motor;

C. close the product on-off valve.

D. section the power supply to the motor of the pump to prevent uncontrolled start-ups;



E. wear appropriate individual protective devices before any operation (mask, gloves, tie-up shoes, aprons, etc.).

WARNING: To clean the pump, only use a clean cloth, moistened with an appropriate detergent. Before intervening on the pump and/or before carrying out maintenance or repair operations, you must :

• Wait for the pump to cool down for at least fifteen minutes.

• Perform the necessary operations while wearing protection gloves and any other appropriate personal protection equipment (face masks, gloves, closed shoes, etc.): Danger of burning and ejection of liquid under pressure.

B3 To carry out maintenance and/or internal repairs, disassemble the pump as follows:

B3.1 Disconnect the fluid delivery pipe.

B3.2 Disconnect the power supply cable from the terminal board of the motor.

B3.3 Proceed with disassembling and remove the pump from the installation area, using appropriate lifting equipment.

NOTE: For the pump assembly and disassembly sequence of the operations hereafter described consult the relevant, spare parts table.



4.5.3 C Pump opening and internal cleaning.

This operation must be carried out regularly every 1,000 working hours or, in the event of loss of performance, to verify the condition and/or to replace the impeller.

To open and clean the pump, proceed as follows:

C1 Remove any elbows and/or manual valves from the delivery pipe.

C2 Remove the screws and the outer cover of the pump body;

C3 Clean the impeller and/or, if it is damaged, replace with original spare parts.

NOTE: Up to size ADV140, the pumps have an O-Ring inside the hole of the impeller. Pump sizes ADV150, ADV155 and ADV160 have a teflon washer flush with the ceramic bushing behind the impeller.



WARNING: all OR gaskets must be replaced every time the pump is opened/ reassembled: PRODUCT LEAKAGE HAZARD.

C4 Remove any deposits found inside the body of the pump, the internal conduits, and the area behind the impeller.

C5 Replace the gaskets with original spare parts of the same type.

C6 Proceed with reassembly, following the inverse order and fasten the bolts on the pump cover evenly.

The impeller cleaning and/or replacement is now completed, and it is now feasible to reposition and connect the pump as described in the previous Chapters.



4.5.4 D Replacement of the static seals

The static seals must be replaced every time that the pump is disassembled, but in any case, complete replacement must occur after 1,000 working hours, proceeding as follows:

D1 Disassemble the pump as described in section C of this chapter.

D2 With the help of the spare parts lists, disassemble the internal parts of the pump.

D3 Replace all of the internal static seals with original parts of the same type.

D4 Reassemble the pump following the drawings on the spare parts lists.

4.5.5 E Replacement of the wearing bushings

This standard maintenance operation must be carried out every 1.500 working hours, either for a check or due to a flow-through or leaks through the holes of the casing flange. In order to disassemble the internal bushing, proceed as follows:



WARNING: lack of maintenance and excessive wear of the internal ceramic bushing causes internal vibration of the shaft that may cause product leakage from the spindle flange: PRODUCT PROJECTION HAZARD

E1 Disassemble the pump as described in section C of this

chapter. E2 Remove the manual valve on the pump's

delivery conduit.

E3 Remove the screws and withdraw the external shell of the pump body with the delivery conduit. E4 Holding the impeller still with an appropriate whip, loosen the impeller's lock nut.

E5 Withdraw the OR gaskets and the impeller.

E6 Verify the play of the shaft and the ceramic bushing in their housings.



E7 To replace the bushing, proceed as follows:

E7.1 Remove the key of the impeller from the shaft.

E7.2 Withdraw the worn bushing from the shaft.

E7.3 Unscrew the screws of the support flange with the worn external bushing and remove it with the help of extraction holes.



WARNING: the internal bushing is composed of extremely precise elements, manufactured in ceramic material and in reinforced Teflon, hence they must never be lubricated and/or handled with dirty hands to avoid irreparable bare or damage.

E7.4 Wear clean protective gloves and glasses.

E7.5 To clean the bushing, use a clean cloth, moisten with alcohol;

E7.6 Reassemble the new internal bushing in its housing.

E7.7 Reassemble the support flange with the new external bushing and fix it with appropriate screws.



WARNING: all OR gaskets must be replaced every time the pump is opened/reassembled: PRODUCT LEAKAGE HAZARD.

E7.8 Fit the key on the shaft housing.

E7.9 Fit the front O-ring gasket and the nut and tighten it until the impeller is locked.

E7.10 Reassemble the pump casing and the fastening screws and evenly tighten with a cross sequence.



5. Problem solutions

The following instructions are exclusively reserved to qualified and authorized maintenance operators. In case of any anomaly and in order to avoid repair any malfunctions, follow the instructions hereafter to identify the anomaly.

WARNING: for any major intervention, contact AlphaDynamic Pumps SA Assistance: our technicians will assist you in the shortest possible time.

DEFECTS	POSSIBLE CAUSE	SUGGESTION				
1. The pump does not start	1.1 Power failure	1.1 Check the electrical power circuit and supply				
- p - p	1.2 Seized impeller	1.2 Disassemble the pump body and check				
	2.1 The impeller is damaged	2.1 Disassemble the pump and check the impeller				
2. The pump is operating and not pumping	2.2 The manual delivery valve is closed	2.2 Open the delivery valve and /or check the delivery pipes				
	2.3 Suction is blocked	2.3 Open the suction valve and /or check the suction pipes and filter conditions				
	2.4 Fluid is too dense	2.4 Install oversized pipes, especially for suction and decrease the pump revolutions				
	2.5 Clogged suction	2.5 Check and clean				
	3.1 Fluid is too dense	3.1 No solution				
	3.2 Clogged delivery pipe	3.2 Check and clean				
3.The pump does not deliver as per performance curve	3.3 Clogged suction	3.3 Check and clean				
	3.4 The impeller is damaged	3.4 Replace the impeller				
	3.5 Damaged pump body	3.5 Disassemble the pump body and check				
	3.6 Electrical motor wrongly connected	3.6 Check the electrical connection and power voltage				
	3.7 The electric motor is damaged	3.7 Replace the motor				
4.Noise and vibrations	4.1 Suction clogs while working	4.1 Replace the motor				
	4.2 Damaged pump shaft	4.2 Disassemble pump and motor and check the shaft and its rotation concentricity				
	4.3 The impeller touches the pump body	4.3 Open the pump and check				
	4.4 Worn-out bearings	4.4. Open the pump and replace the bearings				
	4.5 Incorrect installation	4.5 Check the installation again with greater care				
	4.6 Worn-out sealing	4.6 Open the pump, disassemble the sealing and check its conditions				
5.The Motor overheats	5.1 Fluid is too dense	5.1 No solution				
	5.2 Wrong electrical connection	5.2 Check the supply voltage and the motor connections				
	5.3 The impeller touches the pump body or there is some foreign matter	5.3 Open the pump and check				
	5.4 Damaged pump shaft	5.4 Open the pump, disassemble the motor, and check the pump shaft and its rotation concentricity				

5.1 Decommissioning

In case of long periods of inactivity, proceed as follows:



WARNING: discharge all fluid from the pump. The pump must be suitable washed and treated

by running a non-flammable liquid detergent through it that is compatible with the pump's construction materials: FIRE, INJURY, HEALTH AND/OR DEATH HAZARD.

1. Proceed with washing the inside using products appropriate to the fluid pumped;

- 2. Wait for the product discharge and then stop the motor and section the electrical power
- 3. Close the fluid delivery valve assembled on the pump.
- **4.** If the pump is to be stored, proceed with:
- 4.1 If the pump has not worked for long periods, it is recommended to put clean water in

the circuit for a few minutes before starting operation again, thus avoiding sediments.

4.2 Disconnect the electrical motor from the power supply;

4.3 Disassemble the pump as described in the first section, "*B* MAINTENANCE OF THE

PRODUCT CIRCUIT" Chapter

4.4 Supply the motor with packets of hygroscopic salt for humidity and protect it with a plastic sack.



WARNING: Storage must be in a closed and well-ventilated environment, with a temperature between 5° and 28°C and a humidity not higher than 90%.

5.2 Dismantling and demolition

ADV vertical, centrifugal pumps are not made with hazardous materials or parts; at the end of their working life however, it is necessary to dispose as follows:



WARNING: discharge all fluid from the pump. In case of hazardous, toxic and/or harmful products, wash and treat appropriately. INJURY, HEALTH AND/OR DEATH HAZARD.

- 1. Disconnect the power supply from the pump''s motor.
- 2. Disassemble the pump from the installation place;
- 3. Wash and/or treat the pump internally and externally, according to the product it treated;

4. Sort out the components by type, and in accordance with the pump composition as indicated on the identification plate.



WARNING: For disposal, please refer to authorized firms, ensuring not to dispose small or large parts in the environment were they might cause pollution, accidents or direct/indirect damage.

6. Spare parts

6.1 How to order spare parts.

A complete kit of spare parts for these kinds of pumps is available. Please contact AlphaDynamic Pumps SA or our distributors. To have the spare parts it's necessary to communicate the model of the pump, the size, the material, the serial number, the year of construction and the number relative to the spare part required. All the references are written directly on the pump label and on the section drawings of the pump. If you don't have the necessary drawings, please contact the AlphaDynamic Pumps SA.

7.Data



7.1 Performance curves

8. Warranty

All AlphaDynamic Pumps SA products are guaranteed for a period of twelve (12) months starting from the delivery date of the goods. For the warranty service to be applicable the customer must report the defect in writing no later than 8 (eight) days from the moment that the damage occurs and must return the part (or parts) to AlphaDynamic Pumps SA for repair or replacement. Pumps cannot be repaired or substituted on site. In the case of a request of warranty service, it's better to send the complete pump together with its motor to AlphaDynamic Pumps SA. The costs of delivery and the relative risks, and possible customs duties have to be paid by the customer. AlphaDynamic Pumps SA will not accept the costs of collection and shipment. The manufacturer is not responsible for damage caused during the shipment of the parts or of the pump sent to AlphaDynamic Pumps SA to be repaired under warranty. The warranty system provides that, after a careful examination at our factory, AlphaDynamic Pumps SA is free to choose to repair or replace the part (or parts) of the pump which is/are defective in materials or in workmanship, or both. We will not give any refund or credit for the defective material or for direct or indirect damage caused by our pumps. In any case, any reimbursement cannot exceed the cost of the pump or of the supplied material. If the pumped liquid and the needed performances have not been communicated to AlphaDynamic Pumps SA before the offer and confirmed in the quotation and order confirmation, the customer takes the whole responsibility for the usage of the product, especially if not used in an appropriate way, and the warranty, the conformity to the Machine Directive 2006/42/CE and the relative CE declaration are no longer valid. In this case the customer is the sole responsible for the introduction of the pump in the market, for the declaration of conformity to the Machine Directive and the CE mark. In any case, the user is considered the one who knows better the chemical compatibility and the reactions between the liquid to be pumped and the construction materials of the pump and consequently the information given in this regard by AlphaDynamic Pumps SA is merely indicative. If the returned piece is no longer covered by warranty, or if after inspection AlphaDynamic Pumps SA finds the piece to not be defective, inspection charges will be charged to the customer and the repaired or substituted piece will be returned to the customer at the customer's own expense. Pumps which have been repaired or substituted under warranty will be supplied on the same delivery conditions as the order and the warranty will not be extended. Warranty does not cover components subject to natural wear due to time, such as mechanical seals, bearings, bushings and lip seals. The customer is solely responsible for the good performance of pumps and for their careful maintenance. Therefore, no claims will be allowed when goods have been improperly handled (not stored in a suitable closed dry place, which is necessary because of the fragility of materials), contaminated, handled with negligence, improperly installed, tampered with or not well regulated, incorrectly used in wrong applications. In particular, AlphaDynamic Pumps SA will not take any responsibility in the case of wear due to corrosion.

Ordinary maintenance and repair carried out outside AlphaDynamic Pumps SA authorized network, will cause invalidation of the warranty and of the CE declaration of conformity. The warranty does not cover damage due to extraordinary or natural events, such as lightning, ice, fire, and others. All the warranty obligations are considered fully satisfied after the repair or substitution of the defective parts. The warranty service will be suspended in the case of faulty or delayed payment and the period lost cannot be recovered. This warranty is an integral part of the offer and of the order confirmation. In the case of litigation, the court which has jurisdiction is the Athens (Greece) and the law that will be applied is the Greek Law.

9 .Exploded View

ADV 080 / 090 PUMP



ADV 095 / 110 PUMP





ADV 120 / 130 PUMP







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ADV 150 PUMP



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