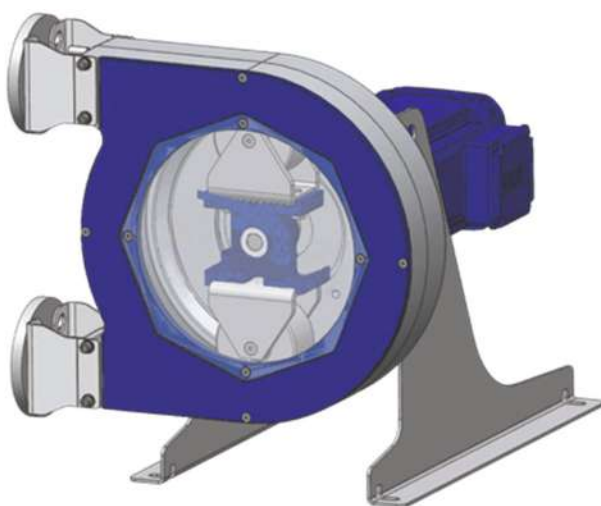
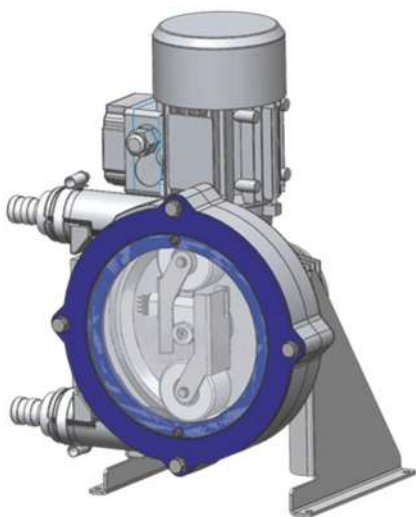




NAYARA ADPN HOSE PUMPS



ADPN SERIES

Installation use and maintenance manual

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Declaration of Conformity

in compliance with the Machinery Directive 2006/42/EC

We hereby declare, that the pump units manufactured in series production

Designation: NAYARA HOSE PUMPS

Series : NAYARA ADPN , NAYARA ADPV

Manufactured By : **AlphaDynamic PUMPS**

59 Km Nat. Road Athens – Lamia
32011 – INOFITA – GREECE
Tel + 30 215 215 9580
www.alphadynamic.eu

in the version delivered by us, are in compliance with the following applicable regulations:

EC Machinery Directive: 2006/42/EC

Harmonized standards: EN 809:1998+A1:2009 , DIN EN 60204-1:2006
EN ISO 12100:2010 , EN 13857:2008
EN 953:1997+A1:2009

Signature of authorized person

Date : 30/6/2025

Printed name of authorized person : Ing . Nikolaos Prodromidis

Title : Technical Manager

1.0 General conditions

Propose of the manual

This manual is specific for the following hose pumps: NAYARA ADPN.

Its contents have been checked for correctness and conformity to the pumps described; however, it is not possible to guarantee the absence of any differences.

Technical data is subject to change without notice.

No part of this manual may be reproduced in any form or by any means, electronic or mechanical, for any purpose, without the written consent of NAYARA Pumps.

The images attached to this manual are to be considered as a general reference and do not necessarily contain all the technical details.

For the purposes of this user manual, the term machine, as set out in the Machinery Directive, always refers to the assembly made up of different parts connected to each other.

NAYARA Pumps produces, by means of this use and maintenance manual, the Declaration of conformity, as indicated in point B of Annex II to Directive 2006/42/CE of the European Economic Community

NAYARA Pumps has carried out a risk analysis and has verified the conformity of the machine with the applicable Standards.

NAYARA Pumps also prepared this manual that contains confidential information and, therefore, cannot be reproduced or copied, in whole or in part, without its consent.

This documentation is the property of NAYARA Pumps and is an integral part of the machine with which it is supplied for the correct installation, maintenance and use thereof.

This manual must accompany the machine in case of transfer to a new owner.

1.1 Responsibility

The manual must be kept throughout the technical lifetime of the machine and must be updated every time a procedure or safety part is changed.

The manual and the certification contained in it must accompany the machine in case of sale or transfer to a new user.

This manual contains all the information deemed necessary for the best knowledge, installation, use and maintenance of these pumps.

Any change in its use and any modification or addition of non-original accessories or that are incompatible with the original design will relieve NAYARA Pumps of any liability and will oblige the user to review the EC certificate of conformity and to assume ownership thereof, in accordance with the laws in force. Before changing the application conditions, the user must contact his NAYARA distributor.

To obtain a swift response, the following information must be provided:

Pump model

Pump serial number and year of construction

Order reference.

NAYARA Pumps disclaims any liability for direct or indirect damage to people as a result of unauthorised modifications to the pumps or not documented in this manual. Also, the need for specific measures or additional Safe design information must be assessed according to the operating conditions or to the process in which the pump is used.

If in doubt, the user must contact the technical service centres of NAYARA Pumps.

1.2 Warranty

NAYARA offers a 1-year warranty (unless otherwise agreed in the order) on the pump components. NAYARA undertakes to repair or replace all damaged parts free of charge unless the damage is due to incorrect use of the pump.

Any repair and replacement works carried out under warranty shall be provided ex-works NAYARA premises.

NAYARA will not be able to accept warranty claims if the components used are not original NAYARA parts. Any damaged parts covered by the warranty must be returned to the NAYARA manufacturing facility or local NAYARA pump distributor.

The returned parts must be accompanied by the safety form (annexed to this manual) duly completed in its entirety and signed.

The form must be attached on the outside of the packaging so that it is readily visible.

Parts that have been in contact with materials and substances that are potentially hazardous to health must be cleaned before being returned to the manufacturer. The safety form must indicate how the parts have been cleaned and which parts have been decontaminated.

NAYARA is not obliged to respect any warranties provided on its behalf by third parties, regardless of whether the latter is a NAYARA representative or subsidiary unless there is a special agreement signed by a NAYARA manager.

2.0 Description

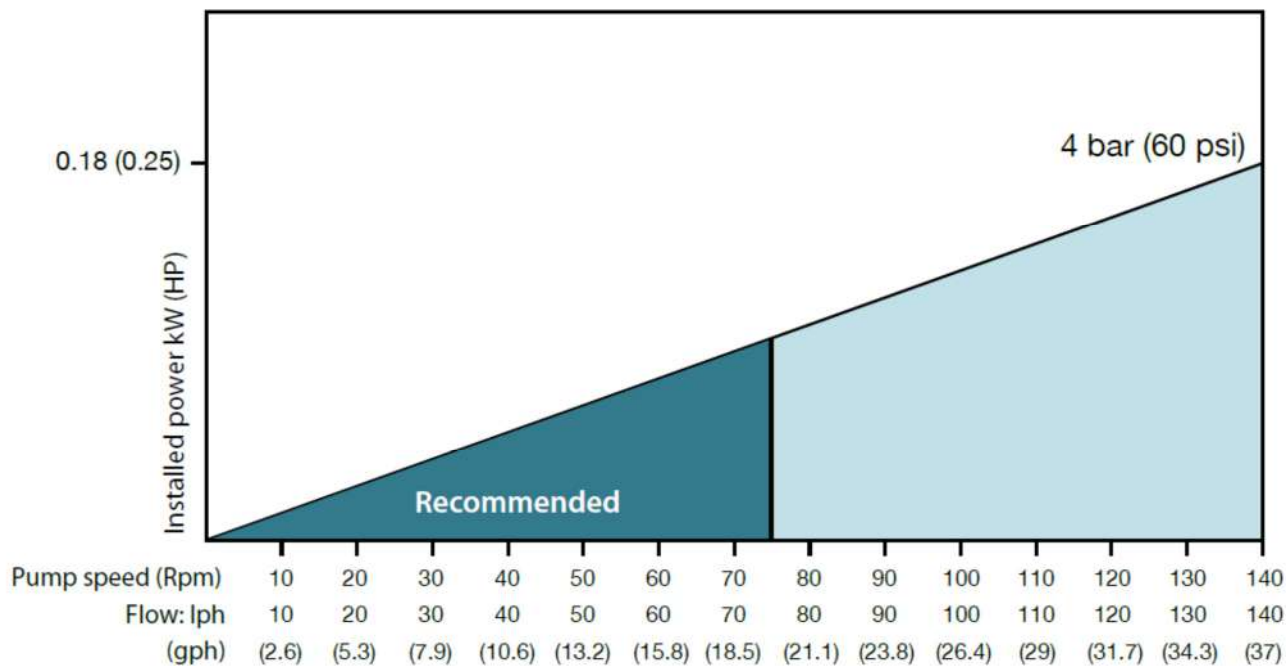
The **ADPN** hose pumps are particularly suitable to convey dirty liquids, thick and viscous mixtures as well as abrasive and corrosive liquids. The rotor is supported by the heavy-duty bearings of the casing or gearbox.

2.1 Performance (l/h)

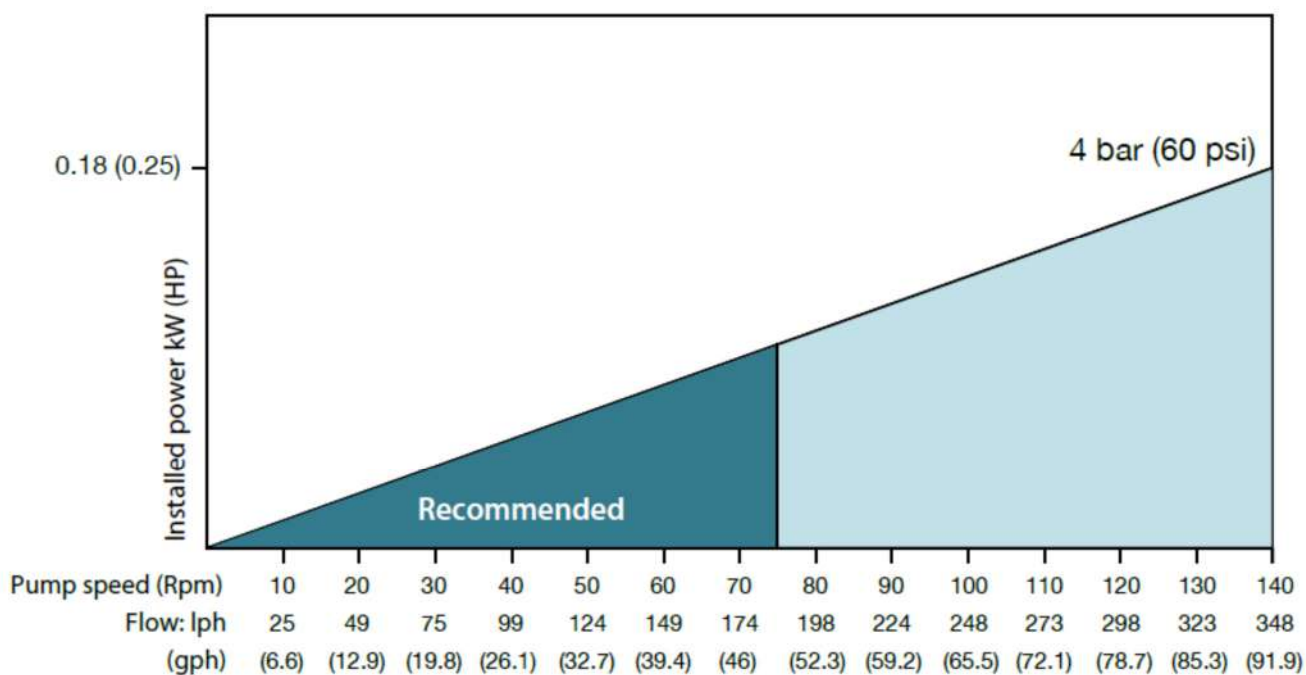
Pump Model	Motor Power kw	Gear Ratio	Rpm	flowrate
ADPN 2	0.18	1:100	15	15 L/h
		1:60	24	24 L/h
		1:40	36	35 L/h
		1:30	48	48 L/h
		1:20	73	73 L/h
ADPN 3	0.18	1:100	15	38 L/h
		1:60	24	60 L/h
		1:40	36	90 L/h
		1:30	48	120 L/h
		1:20	48	183 L/h
ADPN 4	0.18	1:100	15	98 L/h
		1:60	24	156 L/h
		1:46	32	208 L/h
		1:35	41	267 L/h
		1:20	73	475 L/h

Pump Model	Motor Power kw	Gear Ratio	Rpm	flowrate
ADPN 5	0.55	1:86	16	309 L/h
		1:50	25	500 L/h
		1:45	32	618 L/h
		1:37	39	753 L/h
		1:29	50	965 L/h
		1:25	59	1139 L/h
ADPN 6	1.5	1:69	21	874 L/h
		1:58	24	1000 L/h
		1:48	30	1250 L/h
		1:39	36	1500 L/h
		1:35	41	1705 L/h
		1:31	45	1870 L/h
		1:27	54	2250 L/h
ADPN 7	2.2	1:77	19	2630 L/h
		1:58	24	3330 L/h
		1:46	32	4440 L/h
		1:39	36	4995 L/h
		1:32	44	6105 L/h

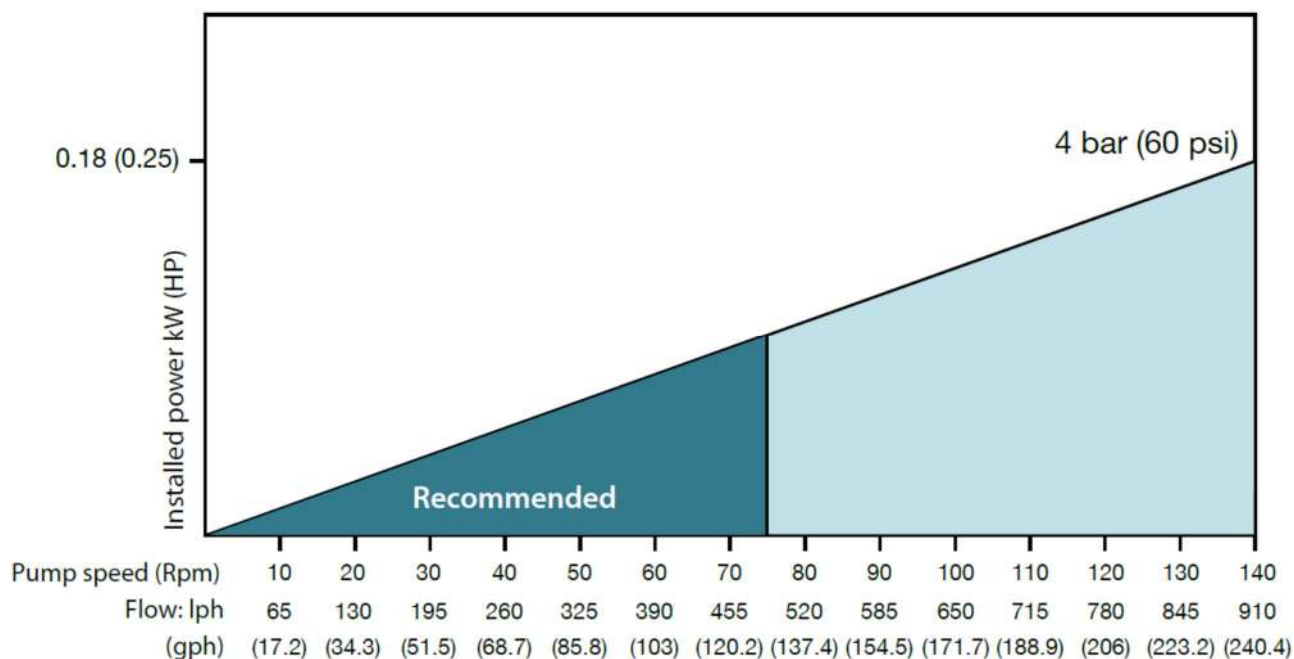
ADPN 2 Performance



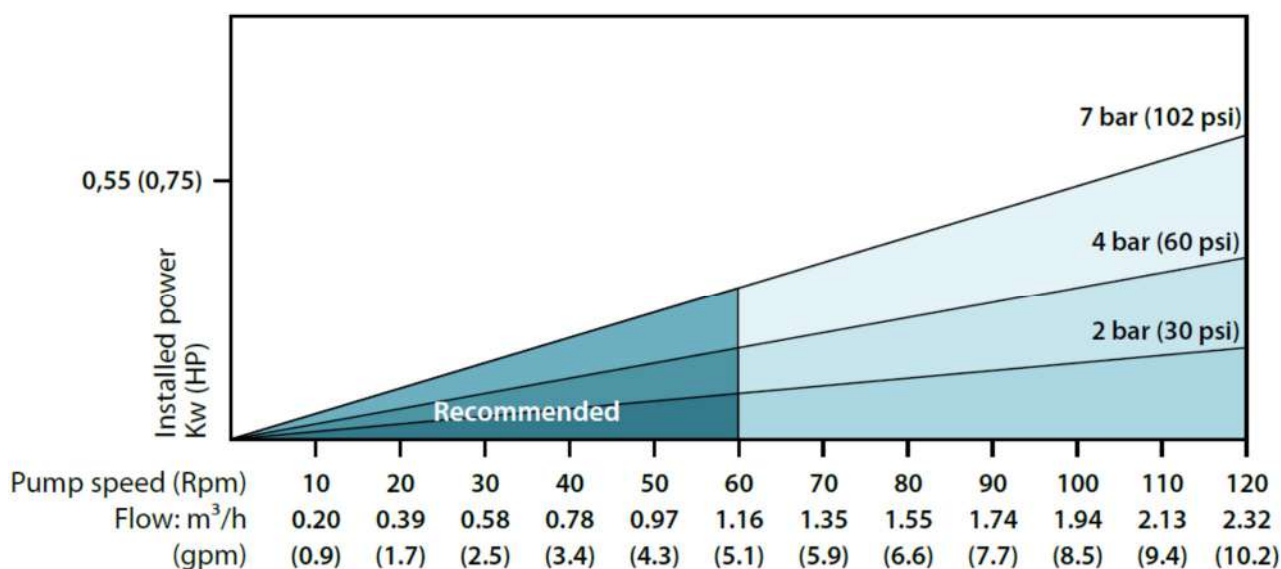
ADPN 3 Performance



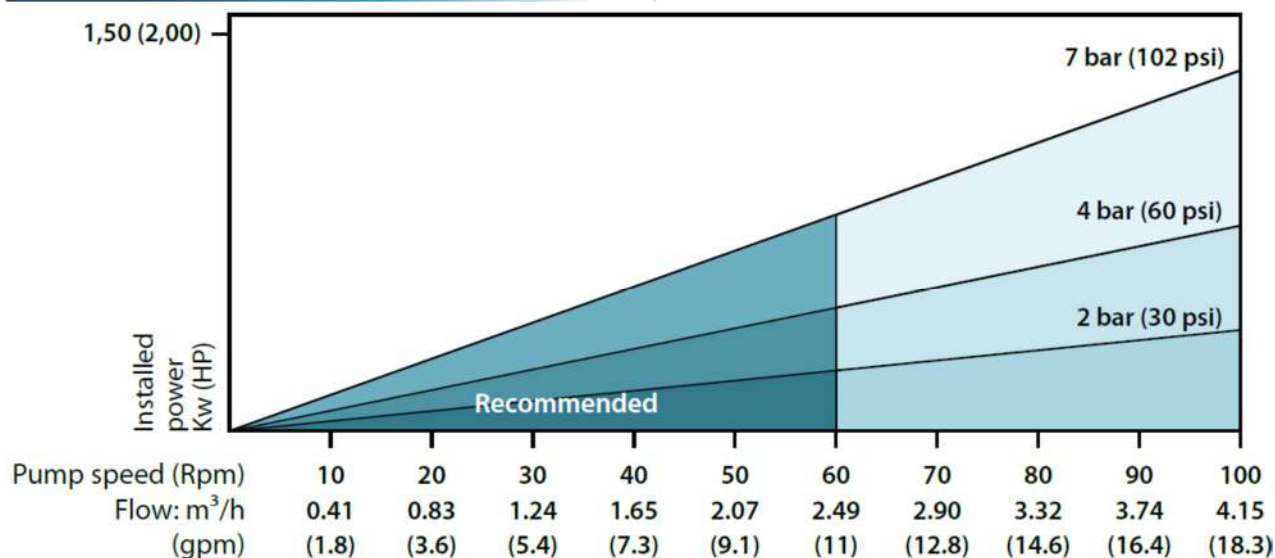
ADPN 4 Performance



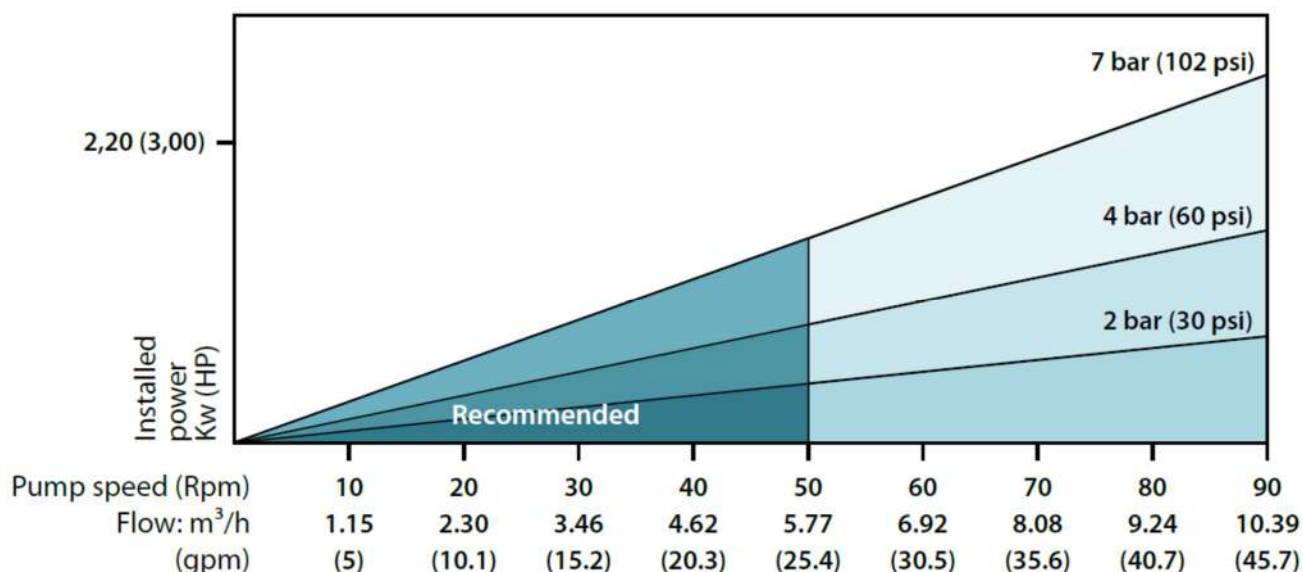
ADPN 5 Performance



ADPN 6 Performance



ADPN 7 Performance



Transmission components and moving parts

The moving parts of the machine are operated by means of an electric motor, connected with a gear reducer. The shaft of the pumps are connected with the gearbox to transfer the rotation to the pump. For pumps model. Model ADPN 5 to ADPN 7 the gearbox shaft is directly connected to pumps rotor.

2. 2 Material in contact with process fluids

The **ADPN** hose pumps are made of materials resistant to almost all liquid products used in processes that involve hose a product into a hydraulic network, such as: food, textile, chemical, water treatment industry, agriculture, etc.

If in doubt about the compatibility of the materials with the products to be used, please contact the Technical Service Centre of **NAYARA Pumps**.

The parts of the **ADPN** hose pumps in contact with the processed products can be made of different types of materials: this offers the possibility to process even particularly aggressive fluids (acids, bases, organic solvents or solutions in organic solvents).

The selected construction material may limit the performances of the pump, in terms of the maximum pressure reached by the fluid at the supply outlet.

MATERIALS:

Hose: NR , NBR , EPDM , VITON FKM

Insert: PTFE, SS316L, PPH and PVDF

OPERATING CONDITIONS:

The pump is suitable for operation under normal conditions:

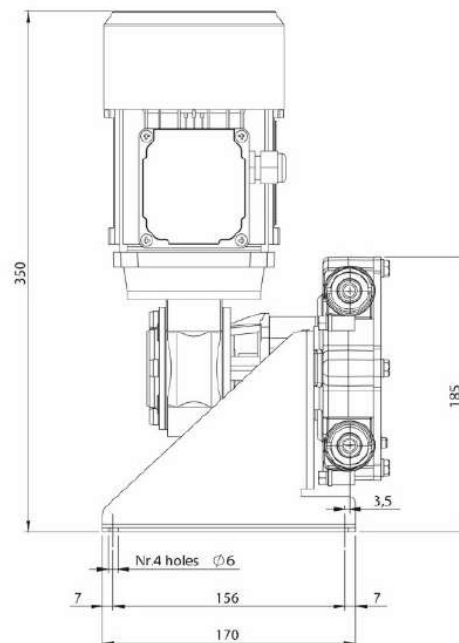
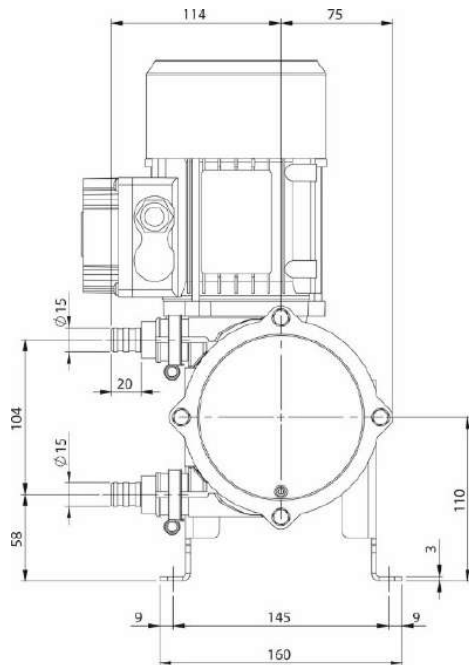
Ambient temperature: 0 ... 40 °C

Hose type	Liquid temperature [°C]
NR	0 ÷ +80
NBR	0 ÷ +80
EPDM	0 ÷ +90
FKM	0 ÷ +90

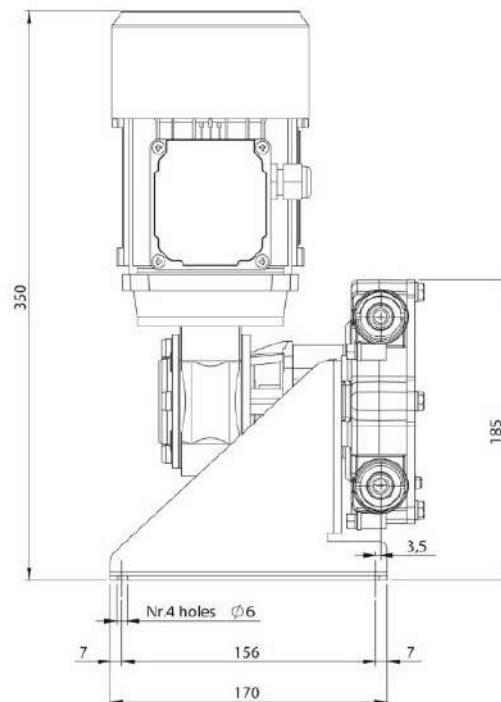
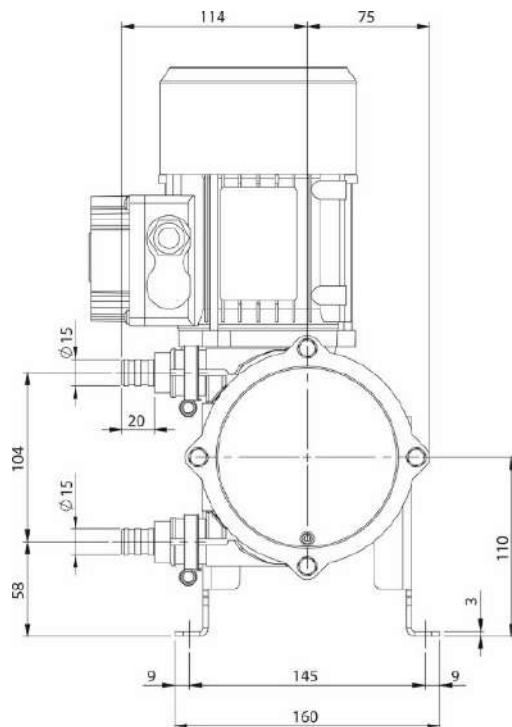
The fluids to be pumped can be processed under conditions slightly exceeding the allowed temperature limits for the external environment, depending on the material of which the hose has been realized.

2.3 Overall drawings of the pumps

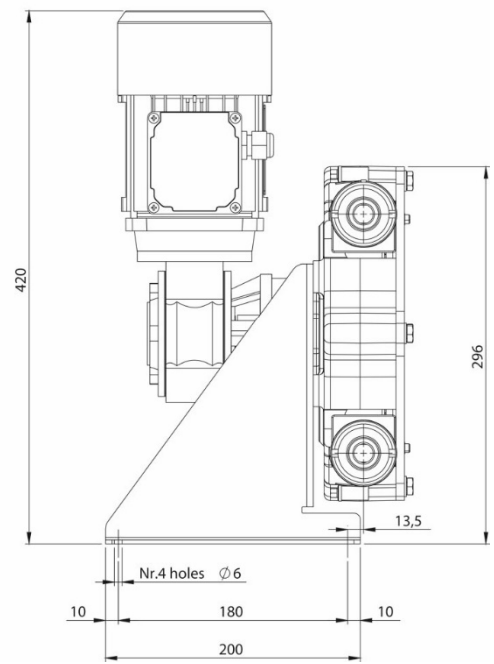
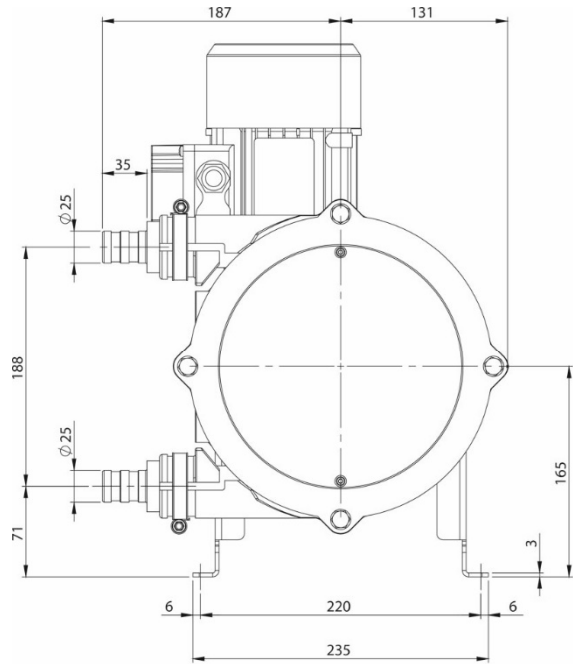
DIMENSIONS ADPN 2



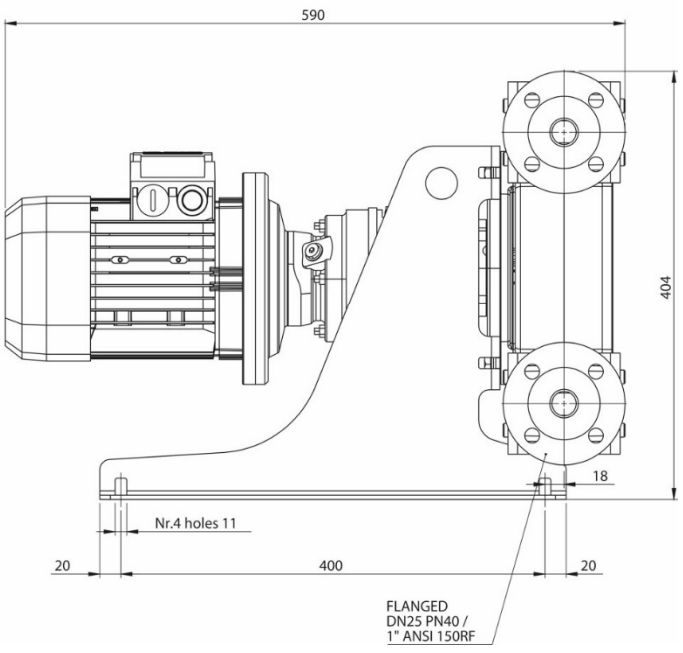
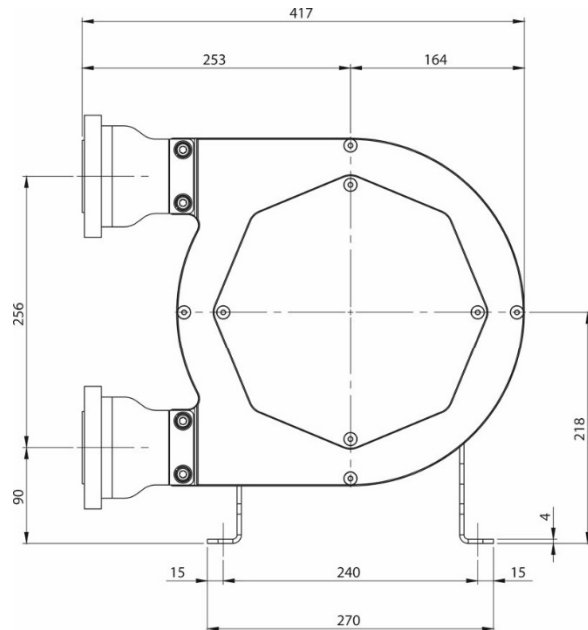
DIMENSIONS ADPN 3



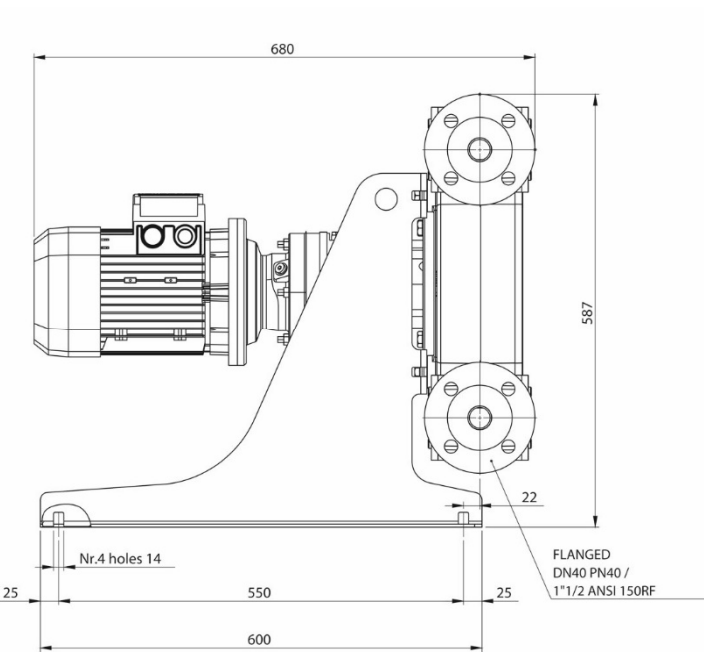
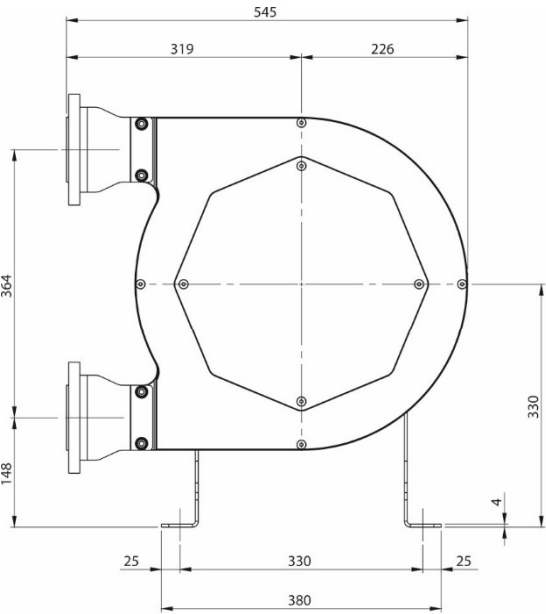
DIMENSIONS ADPN 4



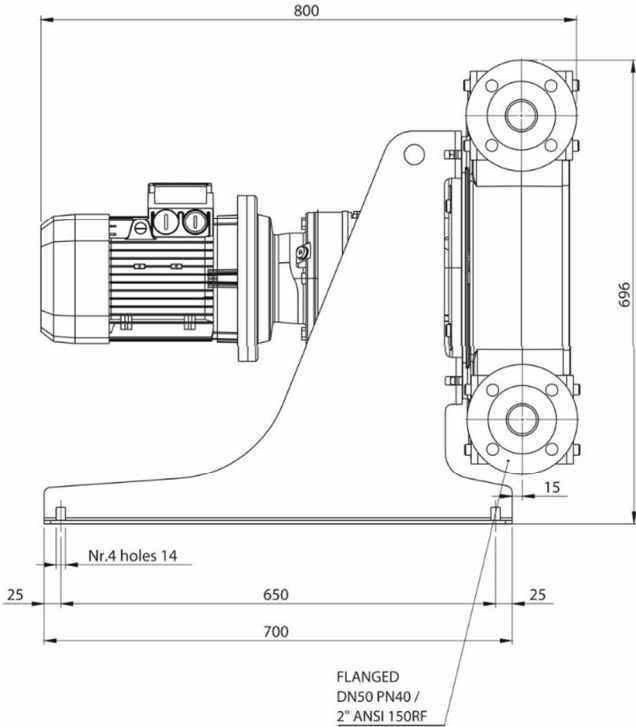
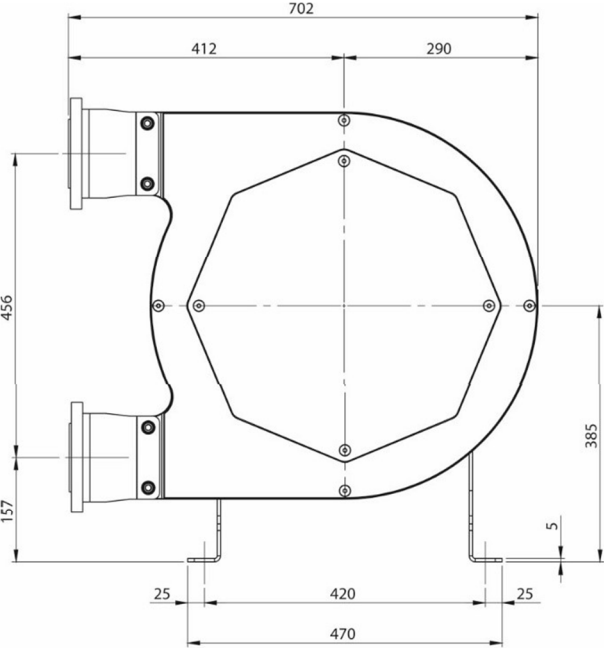
DIMENSIONS ADPN 5



DIMENSIONS ADPN 6



DIMENSIONS ADPN 7



2.4 Hose Dimensions

The NAYARA hoses are manufactured according to very strict specifications to acquire the best performances of the pump and to assure an optimum hose life. They are available different materials: NR, NBR, EPDM , VITON FKM. The material of the hose must be compatible with the pumped liquid.

Consult a NAYARA distributor to define the best hose for your process or consult the chemical resistance table on our website

HOSE DIMENSION (dimensioni in mm)

MODEL	ø INTERNAL	ø EXTERNAL	LENGHT
ADPN2	9	16	345
ADPN3	13	22	390
ADPN4	17	31	590
ADPN5	25	43	860
ADPN6	30	55	1150
ADPN7	45	75	1455

2.5 Motor types

Each pump is supplied with a suitable motor. Motor can be electric or air motor.

In case of electric motor:

Power supply voltage/frequency: according to user availability according to the relevant wiring diagrams (see chapter 4.6 of this manual).

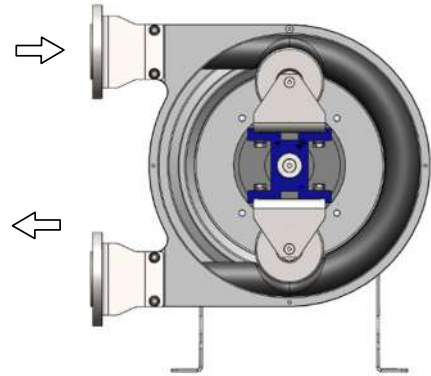
Available motors:

Voltage (V)	Power	Frequency(Hz)	Phases	Connection	Protection
400	See type of pump	50 / 60	3 + PE	Star	Motor Saver
230	See type of pump	50 / 60	3 + PE	Triangle	Motor Saver
220	See type of pump	50	1+N+PE	-	Thermomagnetic switch
110	See type of pump	60	1+N+PE	-	Thermomagnetic switch

2.6 Operating cycle

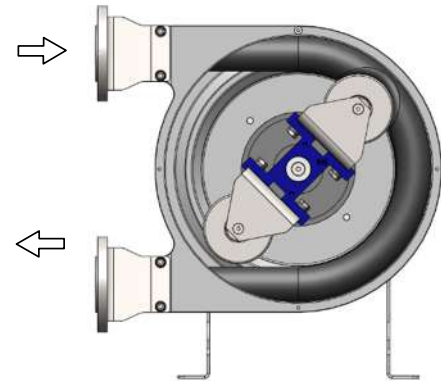
PHASE 1

The pump hose is compressed successively by two rollers assembled on a rotating wheel. The first roller, by pressing the walls of the hose, will create a vacuum and attract the pumped liquid into the hose.



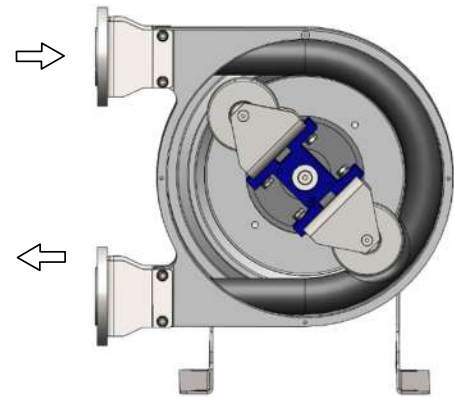
PHASE 2

The pumped liquid has now entered the hose. The second roller will compress the hose and push the liquid towards the pump outlet.



PHASE 3

As soon as, at the discharge side, the roller is detached from the hose, the other roller diametrically opposite is already in compression thus avoiding an internal product leakage. The product is then successively sucked and pushed due to the wheel rotation.



The operators are required only to connect and inspect the suction lines, to check the connection of the supply line and that the latter is not obstructed and to make sure that the liquid has been transferred into the supply line or tank.

The operator must be trained in these operations.

The adopted guards protect the operator from the moving parts of the machine and have been chosen taking into account the «reasonably foreseeable misuse», i.e., the use of the machine in a manner different from that indicated in the instructions for use, but which may result from readily predictable human behaviour.

The adopted guards do not protect the operator from risks related to the shutting off of the pump supply lines.

The pumps can be used for the transfer and hose of any liquid free of suspended solid particles after assessing its compatibility with the materials used in the making of the pump housing, with which the liquid will come into contact.

For the temperature of the processed liquids, refer to the table §2.3.

The following operations involve a physical interface between the operator and the machine:

The main activities that must be carried by the operators are as follows:

- Connection to the pipeline of the liquid to be pumped:

- Checking that the pump is correctly anchored

- Checking the direction of rotation of the motor

- Checking the connection continuity

- Checking the suction line head

Connection to the supply line

- Checking the connection continuity

- Lack of obstructions along the supply line

- Ensuring the connection to the discharge piping

- Checking the pressure/head on the supply piping

Starting the pump

- Liquid transfer and hose

- Checking the flow using the pump

- Checking the amount of liquid transferred (totalisation)

- Stopping the pump

Pump operation check

- Checking the tightness of the clamp of the hose

- Checking the tightness of the inlet / outlet connections

- Checking the transferred liquid flow rate

The operators must be properly informed and trained in relation to the operating and control procedures described above for the proper use of the machine and in how to carry out the manual operations assigned to them.



2.7 Safeguards

The machine is equipped with the following guards:

- fixed guards that isolate the transmission parts:
- these guards consist of
 - the gearbox that encloses and protects the transmission parts between the motor and the pump axle.
 - the pump housing that encloses and isolates the movements of the rotor.
- The pump housing is connected to the gearbox by means of a hub that also keep the pump assembly together; the connection box is closed by a cover fixed with screws.
- The oil level inside the gearbox (if any) must be maintained.
- Always disconnect the power supply before removing the fixed guards.

The safe use of the machine also involves careful care on the part of the users, in the context of the department safety, during the incorporation of the machine in the operating site, particularly as regards the internal passageways and the necessary escape routes

The various parts of the machine for which periodic maintenance and fine-tuning operations are foreseen must be accessible only to the authorised personnel in charge of said operations and only when the machine is stopped.

As regards the live electrical parts, appropriate safety measures have been provided in accordance with the National Regulations in force and, in particular, with EN 60204.

2.8 Layout

The pumps must be positioned with the shaft positioned horizontally.

The working area of the pump operator must allow for

- adequate access to the actual pump housing for the correct connection of the suction and supply lines and for maintenance
- access to the transmission unit for oil level check and top-up (if any)

The observance of the rules indicated above will also ensure accessibility to the pump motor (also necessary for proper ventilation).

Suction line piping:

- The internal diameter of the pipe must be greater than the diameter of the pump pipe (see §2.5.).
- It must be as short and direct as possible to avoid head losses.
- Install a valve on the suction line especially if the pump is loaded.
- Limit the presence of curves and make sure they are as wide as possible.
- Make sure that the pipeline can support the service pressure of the pump.

Discharge line piping:

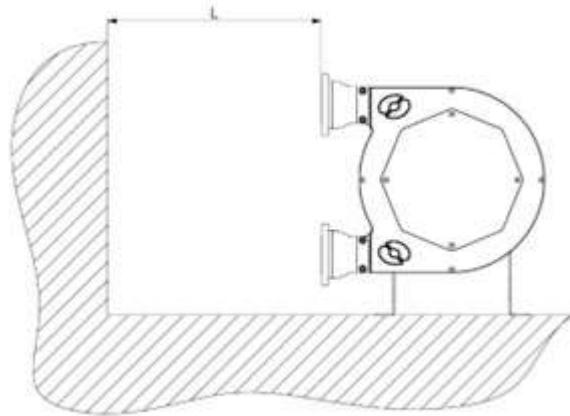
- The internal diameter of the pipe must be greater than the diameter of the pump pipe
- It must be as short and direct as possible to avoid head losses.
- Limit the presence of curves and make sure they are as wide as possible.
- Provide space for a pulsation damper.

- If there is a valve on the discharge line, install a pressure reducing valve or an overpressure protection gauge to avoid any possible damage to the pump and the installation.
- It is recommended to install a flexible connection to absorb the vibrations created by pump pulsations.

When planning the layout for installing the pump, allow for sufficient space for changing the tubing and for the possible installation of a pulsation damper.

The length (L), shown in the table below, is the minimum distance required for tube removal.

PUMP	DISTANCE (L)
ADPN2	400
ADPN3	400
ADPN4	600
ADPN5	700
ADPN6	1200
ADPN7	1500



3. Safety

3.1 Symbols

The following symbols have been used throughout this manual:



General mandatory action



Ask for information



Read carefully



Disconnect before working



Check the grounding connection



Wear suitable and/or protective clothing



Watch your hands



Warning



Warning; live parts



Warning; hot surface



Do not remove the safety devices



Do not carry out work on moving parts



General prohibition

3.2 Field of application (intended use of the machines)

The **ADPN** pumps are peristaltic pumps designed to transfer liquids (even with dispersed solids).

All pumps of this series are not equipped of internal safety valve.



The **ADPN** pumps are designed and built for the above operations in continuous flow regulation or discontinuous for totalisation of transferred liquid: their flow can be regulated by varying the speed of the rotor, by means of an inverter or mechanical variator (even with the pump in movement).

The **ADPN** pumps are made of various materials to be selected based on the products dosed or transferred: the performance of the pumps in terms of maximum discharge pressure also varies according to the construction materials selected (as shown in the tables §2.3).

Unintended use of the machines



- Transfer of liquids that are chemically incompatible materials of which the pump housing is made.
- Transfer of liquids into vessels with pressures higher than indicated for the selected pump.
- Starting the pump with the supply line shut off.

For any use other than that intended, contact the technical department of **NAYARA** Pumps.



The use of the machine for purposes other than those intended and not conforming to what is described in this manual will be considered improper and prohibited, and will also relieve the Manufacturer of any liability, direct and/or indirect.

From an operational point of view, the user must follow the main instructions below:



- Make sure that the fixing screws of the pump housing and those closing the gearbox are properly tightened at all times.
- Maintenance work on the pump housing and gearbox must always be carried out after cutting off the power supply to the motor.
- Do not start the pump if the shut-off valve is closed.
- Check that the maximum pressure at the supply outlet does not exceed the maximum allowed pressure for the pump model being used.

3.3 Personnel requirements



The machine is designed for professional use and even if the operator does not necessarily have to possess specific qualifications, in order to prevent any damage to people or property, ***the Customer must entrust the use of the machine to experienced personnel*** or provide suitable training by shadowing personnel who is already very well familiarised with the use of the machine.



The personnel in charge of using or servicing the machine must also be aware of his responsibilities and mature; he also must be able to interpret the information in this manual correctly so that he can carry out the checks safely and thoroughly.

In addition to acquiring perfect knowledge of this manual, the personnel in charge of using the machine must constantly adopt the appropriate standards of good practice, together with the personal protective equipment required by the laws of the country and anything else made available by their Employer.



3.4 General safety information

NAYARA Pumps has carried out an overall assessment of the risks associated with the use of the machine and has adopted all the necessary measures to reduce or eliminate them; however, when using electromechanical equipment, appropriate safety precautions must always be taken to further reduce the risk of accident or injury.



Before using the machine, therefore, carefully read and memorize the following safety regulations.

- Check that there are no leaks from the suction and delivery ports or from the pump transmission box.
- Check the flow of the product to be pumped on the product suction line, check the cleanliness of any filter on the suction line, check the pressure seal of the delivery line.
- Check that the shut-off valves on the delivery line are open.
- Repairing or having it repaired by personnel not authorized by the Manufacturer means, in addition to losing the guarantee, operating with unsafe and potentially dangerous equipment.
- Any type of check, control, cleaning, maintenance, change and replacement of parts must be carried out with the machine stopped with the main switch open.
- Check that the mains power supply system complies with the regulations in force in the country of installation and that it has been designed and built in a suitable measure for the power installed.
- Make sure that the ground is effectively connected.
- Wear work clothes and individual protective devices foreseen in suitable conditions.
- Do not use chemical products, for cleaning or other, not expressly recommended in this manual
- Periodically check the integrity of the electrical cables and replace them if not intact. This last operation must only be carried out by competent and authorized personnel.
- Safeguard cables from high temperatures, lubricants and sharp edges. Also avoid twisting and knotting the cable. Keep the motor terminal box closed.
- Do not touch and do not let the live electric cables touch.
- Only use original spare parts described in these operating instructions.

The machine is designed to operate automatically once suitably incorporated into its hydraulic circuit, under the control of a single operator.

NAYARA Pumps disclaims any liability for failure to comply with the safety and accident prevention rules described in this manual. The company also disclaims any liability for damage resulting from improper use of the machine or unauthorised changes.

3.5 Risk Analysis

ADPN Pumps has carried out an analysis of the risks associated with the conditions of use of the pump in question, also highlighting those reasonably foreseeable.

The exposure to hazards of the operator depends on the time for which he/she is exposed to the possibility of being affected by the source of danger and also on the frequency with which he/she accesses the danger zones of the pump.

The reasons for exposure to hazards are:

- production requirements;
- need for maintenance;
- need for cleaning;
- accident.

The risk assessment was carried out according to standard UNI EN 12100, using factors related to the severity of harm and to the probability of occurrence of that harm.

Risks arising from the use of the pump

The risks to which the operator may be exposed are essentially due to (in accordance with EN ISO 12100):

Hazards related to the stability of the machine:

The pump may move on the support surface, generating stresses and strains on the lines of the hydraulic circuit.

Mechanical hazards:

These hazards may arise from contact with transmission parts and other moving parts in the pump housing, such as the rotor.

and involve:

- crushing
- dragging hazard

These hazards are also conditioned by the shape of the machine parts, their relative location, mass, stability, speed and acceleration, mechanical strength, potential energy of elastic elements (springs) or of liquids under pressure.

Electrical hazards:

These hazards can result in injury or death from electrocution or burning:

- contact with live parts (direct contact);
- contact with parts which have become live as a result of an insulation failure (indirect contact);
- Insulation not suitable for the intended conditions of use;
- electrostatic phenomena;
- thermal radiation or other phenomena resulting from short circuits, overloads, etc.

Hazards generated by noise

- permanent hearing loss.
- tinnitus.
- tiredness, stress, etc.;
- other effects such as loss of balance, loss of awareness, etc.;
- impairment of speech communication.

Hazards generated by failure to comply with ergonomic principles:

Inappropriate machine positioning in relation to the control and adjustment, cleaning and maintenance activities carried out by the operators may lead to:

- physiological effects;
- psycho-physiological effects;
- human error.

Hazards generated by the release of hazardous materials and/or substances:

These hazards derive from the release of substances or leaks due to the improper connection of the pump housing to the hydraulic circuit lines and to the gearbox.

In order to prevent any risks associated with shutting off the supply line, the user can install a safety valve calibrated to the maximum pressure allowed by the part with the lowest design pressure (pipe, tank or other, installed between the pump and the shut-off valve).

Risks during machine maintenance

Risks due to electricity: risk of direct contact with live parts located in the electrical cabinet that contains the electrical parts

Precautions:

The operation is to be carried out only by skilled authorised personnel and only after opening the main switch.

Risk of crushing: risk of having hands caught between the moving parts of the machine located in the pump housing and in the gearbox.

Precautions:

- Stop, switch off, disconnect the main switch located on the main panel by setting it to the open position and prevent third parties from restarting the machine;
- Report the ongoing maintenance work by means of appropriate signs;
- Use appropriate personal protective equipment for the upper limbs.

Risk of low back injury: risks due to the need to access the machine from remote positions near the floor, and to move significantly heavy masses from these positions.

Risks due to the position that must be adopted in order to approach the machine.

Precautions:

Respect the indicated clearances for machine positioning.

3.6 Solutions adopted to prevent risks

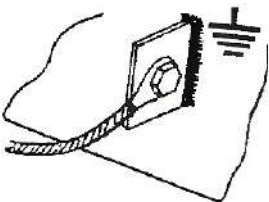
The machine has been equipped with the most suitable devices for the complete protection of the operator:

- The machine is equipped with a base that can be fixed to the ground with mechanical anchors or to a frame with bolts. It is advisable to make the connection to the hydraulic circuit only after positioning and fixing the machine, providing appropriate fasteners on the supply and suction lines, suitable for the process temperatures and pressures.
- All rotating transmission parts are located inside the gearbox and in the pump housing;
 - The pump housing and the connection box are fixed guards.
- The motor connection box can be opened with the use of special tools.
- The machine is remarkably compact and sturdy in design: it ensures an extremely silent operation: if correctly lubricated, the noise emission level at full speed is below 70 dB (A). However, the noise threshold allowed by the Laws in force in the country where the machine is installed may be exceeded in the actual installation environment.
- In this case, the Customer must:
 - ensure the safety of the operators by providing suitable personal protective equipment;
 - inform the operator in advance about the need to use the personal protective equipment provided;
 - ensure that the hearing of the operators is checked periodically.
- The positioning of the machine as shown in the layout will ensure the necessary manoeuvring space for the operators.
- The machine is equipped with seals (O-rings)
 - between the parts of the pump housing;
 - on the connection to the gearbox.

The connections to the supply and suction lines are tight.

However, it is advisable to check the pump housing, line connections and connection box periodically for leaks or dripping.

- There is a grounding terminal in the motor terminal block and also on the motor housing that the user must use in order to ensure the complete protection of the metal frame.



- The pumps must be connected to a specific control and stop system; to be provided by the user.
- Maintenance and cleaning must be performed with the machine stopped and put in safe mode.
- Use the personal protective equipment indicated
- Set up warning and danger signs.



Tampering with or failing to take care of the safety devices causes risks for machine users and other exposed persons.

3.7 Residual risks

Although equipped with the safety devices described above, and built in compliance with the regulations in force and according to the best techniques currently available, the machine presents residual risks that, although limited, cannot be completely eliminated:

3.8 Mechanical risks

Crushing

Any disassembly and replacement of worn or faulty parts (O-rings, hoses) installed in the pump housing shall be carried out on the workbench, with the pump disconnected from the hydraulic circuit lines and from the dowels.

Dragging

There are no particular operations to be carried out on the connection box; however, any work on this part is to be carried out on the bench.



3.9 Electrical risks

Electrical contact

All the electrical equipment of the machine is made in accordance with the applicable standards; however, this risk may arise due to failure to protect, service or check the cables.

It is, therefore, essential that the operator carry out a periodic check of the motor connection cables, in compliance with the applicable safety standards.

Other risks

Risks caused by leaks of hazardous products and substances

These risks arise from the presence of the substances processed by the pump.

The user will be responsible for identifying and equipping the operators with the protective equipment required in case of contact with the specific substances processed by the pump.



4.0 Machine maintenance

Adjustment, maintenance, repair and cleaning work must be carried out with the machine stopped and under conditions such as to prevent any risk: any replacement of components shall be carried out on the workbench.

The distances from nearby fixed structured must be such as to allow easy maintenance.

The following precautions shall be taken for such operations:

- isolate the machine from energy sources;
- tighten the fixing screws of the pump housing and connection box.

*Place appropriate **signs** near the machine, in a place visible to the operators, to warn them about the risks associated with the work carried out.*

In particular, they must prohibit tampering with and removal of the installed safety devices.

4.1 Personal protective equipment

Before using the machine, remember that it presents residual risks that the employer must minimise by making sure that the operators use the personal protective equipment required by the laws in force.

The use of personal protective equipment and clothing is intended to protect a certain part of the body from the risks associated with the work carried out.

As a general rule, they should be used only when the measures adopted to reduce the risk at source are not enough to ensure the complete elimination of the hazard and, therefore, the safety and health of the operator.

See in this regard the chapter on residual risks.

Therefore, the following PPE must be available during operation and maintenance (preventive and in the event of a breakdown):

hand protection:	Gloves for protection against mechanical aggression and from contact with processed substances (^)
eye protection	Goggles against jets of liquid under pressure
feet protection	Safety footwear
body protection	Overall.
respiratory protection	Suitable protective equipment that must be worn when handling the processed substances (^)

(^) according to specific safety instructions

The list above does not exclude the need to use other PPE, depending on the conditions of the work environment.

The personal protective equipment used must comply with the regulations in force in the country of installation and must be CE marked.

5.0 Machine handling and installation

5.1 Unpacking and control

Upon receipt of the pump, please follow the instructions found on the packaging. Carry out a visual inspection to make sure that no damage has occurred during transport. In case, contact your distributor of NAYARA pumps as soon as possible or, if it belongs to you and your responsibility, the transporter in charge.

Conditions of use

ADPN pumps can operate in atmospheres with temperatures between 0°C and 40°C. The pumps are supplied painted with a 100 µm thick polyurethane varnish which provides protection against certain aggressive environments. They are designed for indoor and outdoor installations.

Setup

Before installing the pump, check the following points:

- The pump is delivered with a frame provided with four anchoring holes. It must be fixed on a solid base with a slope which does not exceed 5mm for 1m and must be firmly fastened to this one.
- Require enough space around the pump to carry out maintenance. If such was not possible, consider the moving of the pump to a space provided for this purpose.
- Make sure that the room is adequately ventilated to relieve the heat generated by the pump. Leave a space behind the motor ventilation hood so as not to obstruct air intake.

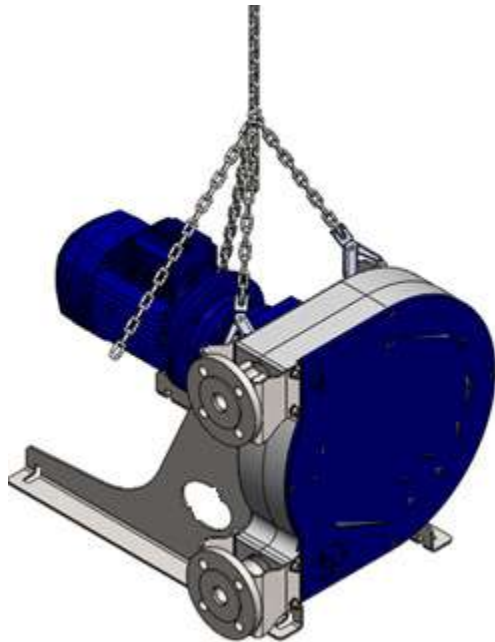
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- Make sure that the room is adequately ventilated to relieve the heat generated by the pump. Leave a space behind the motor ventilation hood so as not to obstruct air intake.

5.2 Lifting the pump

The pumps are supplied with two hoist rings positioned on top of the support frame. When lifting the pump, observe the following points:

- Lift the complete peristaltic pump using the hoist rings plus additional support on the gearbox and motor using suitably sized straps or slings.
- Never exceed the lifting limits and check the weight of the motorized pump in the table below.
- The motorized pump, given its center of gravity, tends to unbalance on the side of the pump head. Make sure people are at a safe distance from the pump to avoid injury.
- Never lift the pump except by the pump lifting rings.
- Never lift the pump by its orifices or supports.



5.3 Handling and storage

The pumps are normally supplied packaged in closed or suitable packaging based on the type of transport chosen, in which they can be kept in a closed warehouse until used.

The overall weight of the machines is always greater than 20 kg in all possible configurations, therefore they cannot be moved by hand.

5.4 Installation

For installation, choose a position protected from rain and jets of water (if the installation is outdoors, the application of a roof canopy is recommended), away from heat sources and well ventilated.

Place the pump on a perfectly horizontal rigid surface to allow good lubrication of all internal elements.

Provide sufficient space in accordance with the lay-out indications

Fix the pump to the chosen flat surface by means of 4 screws.

5.5 Power supply

For AC power supply, a motor protector must be installed and adjusted according to its rated power (motor overload protection or circuit breaker) (See diagrams 1 and 2 below).

For connection to a direct current power supply unit, ensure the protection of the motor by means of fuses suitable for the maximum current consumption.

The control and monitoring device must be made in accordance with the provisions of the Machinery Directive.

Diagram 1

Three-phase connection

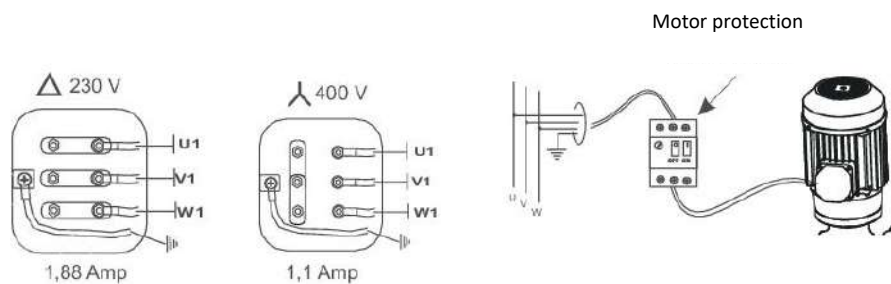
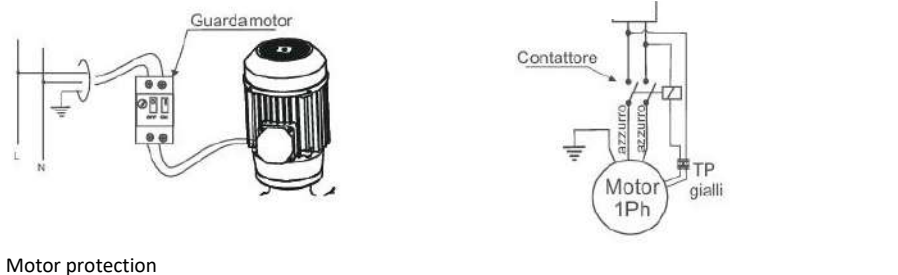


Diagram 2

Single-phase connection



5.6 Using the machine

Checks prior to commissioning

Before proceeding with the calibration of the machine's production cycle, the installer must ensure that:

- **SUPPORT:** Check that the pump is firmly fixed on its support.
- **CHECKING THE HYDRAULIC CIRCUIT:** Check that all the shut-off valves are open and that the outlets of the bleed and safety valves pour the liquid adequately.
- **PRESSURE HOLDER:** Make sure that the pressure holder is correctly adjusted (with shims or using the tag on pressure holder for pump ADPN2, ADPN3, ADPN4) according to the process conditions of the pumped fluid
- **DIRECTION OF ROTATION:** Start the pump to check that the direction of rotation of the motor is the same as that indicated by the arrow. To change the direction of rotation, two phases in the motor terminal box must be inverted.
- **CHECK THE PUMP:** Perform a visual / acoustic check of the correct operation of the pump.

- **PRIMING:** To make priming the pump easier, especially for reduced flow rates or in the absence of a priming valve, it is advisable to reduce the pressure in the delivery and/or fill the pipe via the suction.
- **PROTECTION AGAINST EXCESS PRESSURE:** Select the safety valve and adjust according to the desired value to protect the installation without ever exceeding the maximum nominal pressure of the pump.
- **ELECTRIC PROTECTION:** Select and adjust the electrical protection device according to the motor rated current.

5.7 Checking the actual flow rate

The flow rate to be pumped can be adjusted by means of the mechanical variator and/or inverter. Refer to the operating manual of the drive and/or inverter for the definition of the operating range of the number of revolutions. To obtain a correct measurement, the use of a flow meter is recommended.

6.0 Maintenance

Preventive maintenance

Maintenance operations must be carried out by trained and qualified personnel.

Electrical equipment may only be replaced by suitably qualified personnel.

All machine maintenance operations must be carried out only after pressing the Off (disconnection) button located on the motor protector (circuit breaker) that powers the pump or after cutting off the power supply to the entire system in which the pump is installed.

A suitable warning sign must be placed on the switch.

**System under
Maintenance**



Do not touch

After repair or maintenance, carry out a thorough cleaning and check that there are no tools or other items left and, if necessary, check the correct assembly of the equipment on which work has been done.

6.1 Hose cleaning

The hose cleaning can be done without removing the hose. It can be done with water or with a cleaning liquid (check compatibility with hose material). With numerous products, it is necessary to clean the hose after every pumping in order to avoid the hardening of the product inside this one.



CAUTION! Make sure that the cleaning liquid temperature is adapted to the hose material.

Hose replacement



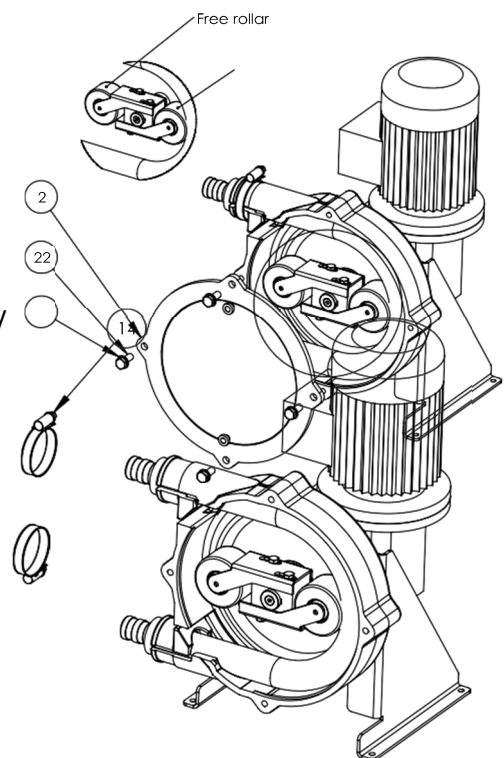
CAUTION! Before any hose change, check the following points:

- This service has to be performed by skilled personnel that is acquainted with this manual.
- Inlet and outlet valves have to be closed to minimize product loss.
- Always carry clothes and necessary protection according to the pumped product.
- Respect all security and environmental rules necessary for the manipulation of the pumped product.

6.2 Hose Removal

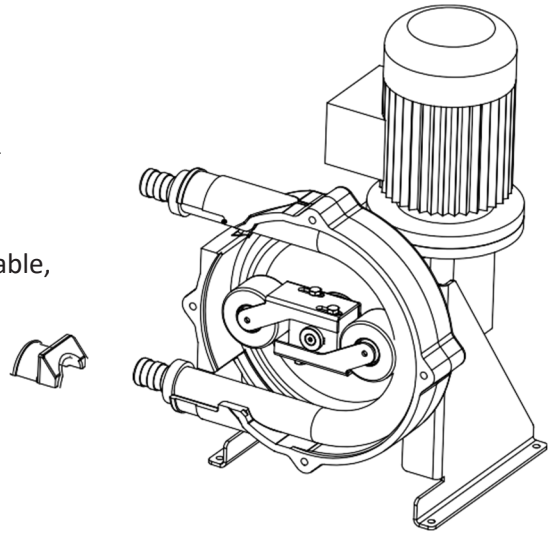
Hose removal from ADPN2 to ADPN4

- 1) Disconnect and remove the suction and discharge piping.
- 2) Place the rotor in the position showed in the fig. so that only one rollar is pressing the hose.
- 3) Disconnect power supply.
- 4) Remove cover #2.
- 5) Loosen the screws of the rollar bracket (2 screws) and withdraw the bracket so that it doesn't press the hose any more. DO NOT loosen the free rollar bracket.
- 6) Dismantle collars #14 on both sides.



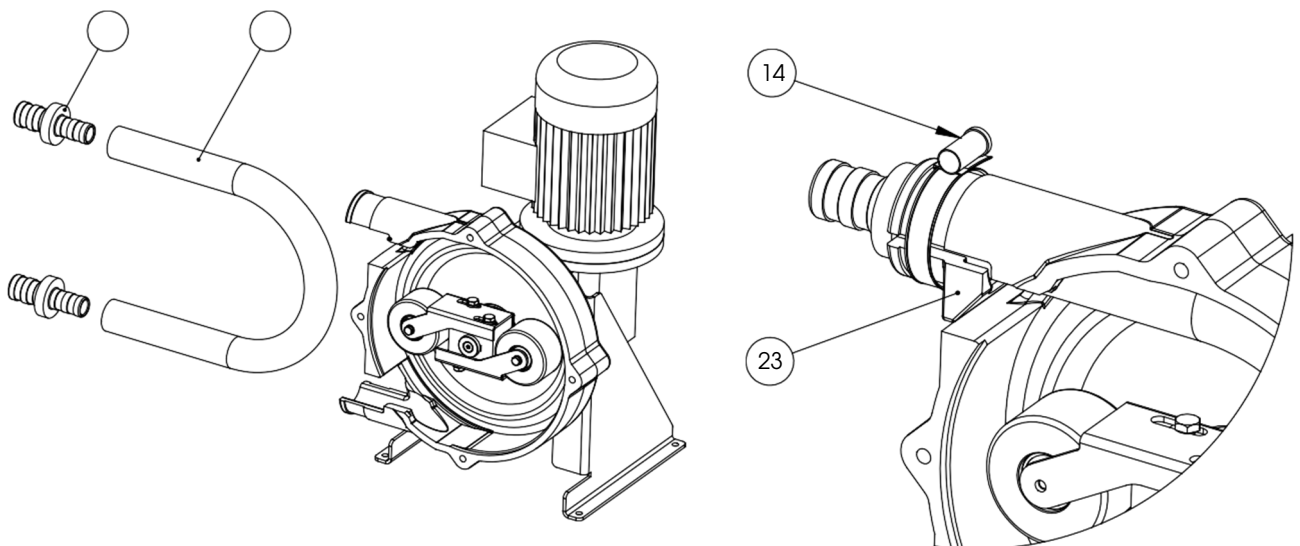
WARNING ! Never run the pump without the cover and sight glass !

- 1) Dismantle hose lockings #23 on both sides.
- 2) Pull the hose out of the front of the pump casing.
- 3) Pull the hose connectors from the worn hose. If re-usable, carefully clean them.
- 4) Carefully clean the pump casing and front cover.



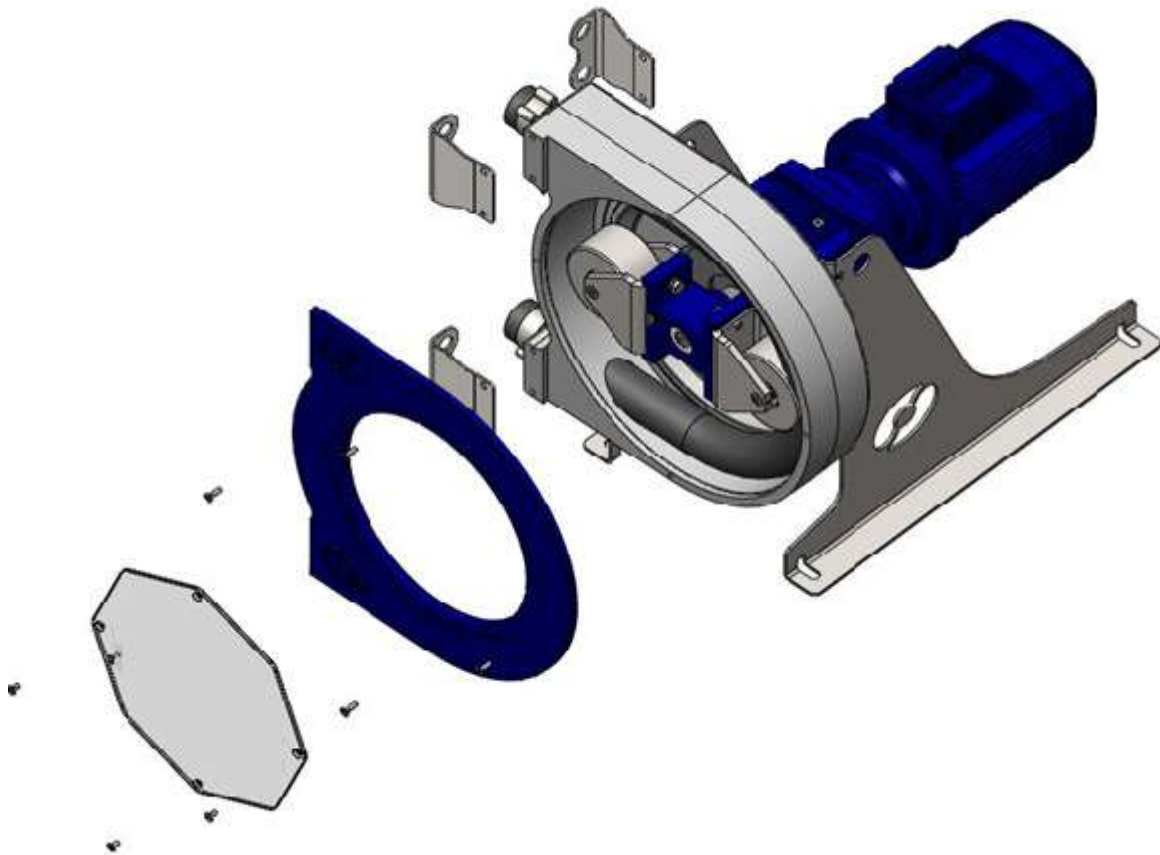
Replacement of the hose from ADPN2 to ADPN4

- 1) Check that the new hose is clean and has the correct size.
- 2) Install connectors #16 on the new hose #20.
- 3) Make sure the rollers are in the same position as before.
- 4) Make a U bend with the hose and place it inside the pump casing.
- 5) Position the upper connector against the pump casing inlet. Place the top hose locking #23 and position the collar #14 in it's groove. Tighten the collar screw.
- 6) Repeat step 5 on the lower connexion.
- 7) Smear non-petroleum silicone grease on the inner surface of the hose (where the rollers run).
- 8) Set the roller pressure according to the procedure described in § 6.3.1 ROLLAR PRESSURE ADJUSTMENT.



Hose removal form ADPN 5 to ADPN 7

- 1) Disconnect the suction and discharge connections from the pump.
- 2) Place the rotor so that just one of the rotors is compressing the hose.
- 3) Disconnect the electric connection from the pump. Verify that all electrical connections are disconnected from the pumps motor.
- 4) Take off the cover pos #03 and unscrew screw pos #44
- 5) Unscrew the two screws pos #24 and pull back the pressure holder pos #06 and take out shims if there are any.
- 6) Put back the cover pos #03 in place, connect the electricity and turn the rotor 180 degrees so that the second roller is not in contact with the hose. **DO NOT UNSCREW** the pressure holder pos #06.
- 7) Disconnect the electric connection from the pump. Verify that all electrical connections are disconnected from the pumps motor. Take off the cover pos #03 and the front support pos #02. Take out the hose from the front of the pump.



Replacement of the hose from ADPN5 to ADPN7

- 1) Check that the new hose is clean and has the correct size.
- 2) Install connectors #16 on the new hose #20.
- 3) Make sure the rollers are in the same position as before.
- 4) Make a U bend with the hose and place it inside the pump casing.
- 5) Position the upper connector against the pump casing inlet. Place the top hose locking #23 and position the collar #14 in its groove. Tighten the collar screw.
- 6) Repeat step 5 on the lower connexion.
- 7) Smear non-petroleum silicone grease on the inner surface of the hose (where the rollers run).
- 8) Set the roller pressure according to the procedure described in § 6.3.1 ROLLAR PRESSURE ADJUSTMENT.

7.0 Maintenance and periodic inspections

1	Pump hose replacement.	In prevention, change the pump hose after 90 % of the life time of the first hose.	
2	Gearbox oil replacement.	Refer to the gearbox maintenance manual provided with the pump.	
3	Replacement of the rollers.	If these are worn on the contact surface.	
4	Check for wear on the roller pressing surface.	At every hose change.	
5	Check the presence of a gearbox oil leakage.	Before starting the pump and periodically during the pump service.	
6	Check for strange noises coming from the pump, gearbox and bearing case or abnormal pump casing temperature.	Periodically during the pump service.	
7	Check for leakages at inlet and outlet ports.	Periodically during the pump service.	Re-tighten collars.

7.1 ADPN series complementary information

Setup

Before the setup of the pump, check the following points:

- 1) The ADPN pump is delivered without a frame. Assembly holes are at the back of the pump for assembly on a frame. Dimensions of these assembly holes can be found in § 2.4 The pump with its drive and frame must be fixed to a solid base with a slope which does not exceed 5mm for 1m and must be firmly fastened to this one.
- 2) The pump frame must be built in order to support the stress and deformations delivered by the pump and drive. It should be built by qualified staff with good engineering practice. In no case NAYARA Pumps is responsible for its construction or conception.
- 3) The alignment of pump and drive shafts must be made in accordance with instructions given by the manufacturer of the coupling. Refer to the specific notice of such material. To achieve alignment and

coupling, use a perfectly straight ruler to control the misalignment, and a feeler gauge for angular misalignment. Control four points (top, bottom, left, right) at each stage of the installation (after setting on foundations, after fixing pipes and after a first start).

- 4) Make sure there is enough room around the pump to carry out maintenance. If that was not the case, envisage the moving of the pump in a space provided for this purpose.
- 5) Make sure the room is adequately ventilated to relieve the heat generated by the pump. Leave a space behind the motor ventilator hood so as not to obstruct the air intake.

7.2 Pump Starting

Follow the steps described. If the hose is not mounted on bare shaft pumps when delivered hose mounting operations should be followed before the starting up.

Bearing case dismantling and lip seal replacement

Disassemble the bearing case in the same way as for the gearbox.

- 1) Remove lip seals ITEM 105 & ITEM 106 from the bearing case.
- 2) Remove the circlips ITEM 107.
- 3) Remove the shaft with the bearings.
- 4) Carry out the disassembly of the bearings and replace them together with the shaft ITEM 102 if necessary.

7.3 Maintenance and periodical controls

Regularly check the absence of grease coming from the leakage channel or from the lip seal ITEM 106.

7.4 STORAGE

Storage of the pump

Store the pump in a sheltered and dry place and ensure that the storage room temperature is between -20°C and +45°C. Protect the pump if necessary and block the inlet and outlet orifices:

If the pump stays without working more than 1 month, withdraw the hose from the pump or withdraw one of the shoes as well as its centring pin and position the wheel so that the second shoe can be seen through the sight glass.

If you can neither withdraw the hose or one of the shoes, run the pump 5min a week.

Storage of the pump hoses

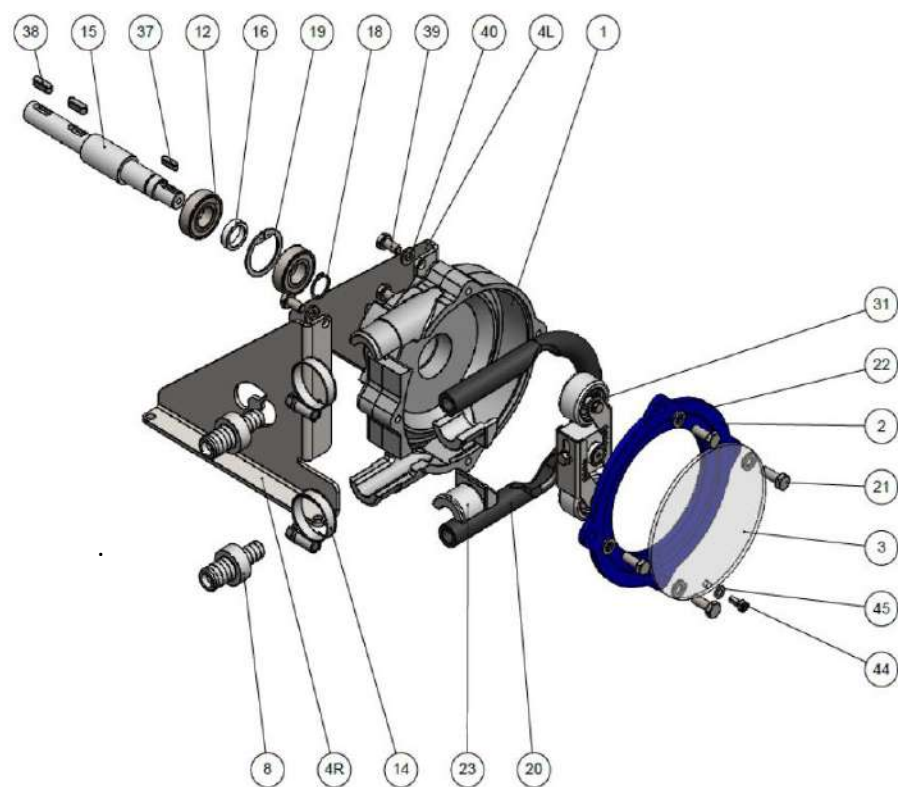
Hoses must be stored sheltered from light in a cool place. Their life is reduced after two years. The performance of hoses is reduced at the end of this expiry date due to the ageing of rubber.

8.0 Troubleshooting

PROBLEM	POSSIBLE REASON	RESOLUTION
The pump does not work	No power supply.	Check that the pump power switch is on position "ON".
		Check the connection of the motor.
	The wheel of the pump stalls.	Check the fixing of the hose.
		Check that the discharge pressure is not too high.
		Check that the product hasn't sedimented in the hose.
Low capacity or pressure	Bad roller adjustment.	Adjust the rollers.
	Air leak at the inlet of the pump.	Check the tightening of the clamps of the pump and the sealing of the inlet piping.
	Valve closed or partly closed at inlet.	Fully open the valve.
	Wear of the hose.	Replace the hose.
	Product too viscous or too high pump speed in comparison with the product viscosity.	Ask for advice from your NAYARA distributor.
	Piping blocked or partly blocked at inlet.	Unblock piping at inlet and make sure of the good flow of the product.
Hose life time is too short.	Incompatibility of the hose with the pumped product.	Make sure the compatibility of the hose with your product and contact your NAYARA distributor.
	Discharge pressure too high.	Check that the discharge pressure of the pump does not exceed the max. pressure of the pump (see curves). Check that the outlet piping is not blocked up and that all valves are opened.
		Make sure that the security valve works correctly.
		Make sure that the piping friction losses do not exceed the value requested for an appropriate functioning of the pump.
	Pump speed too high.	Reduce the pump speed.
	Bad roller adjustment.	Check the adjustment.
Pulsations in piping.	Too high temperature of the product.	Contact your NAYARA distributor.
	Deficient fastening of the piping.	Fix piping correctly.
	Process creating important pulsations due to the product, the speed of the pump, discharge pressure or the sizing of piping.	Contact your NAYARA distributor.
Abnormal noise coming from the bearing case (ADPN 2-ADPN 3-ADPN 4).	Worn bearings.	Replace bearings.

9.0 Exploded view and spare parts list

ADPN 2 exploded view

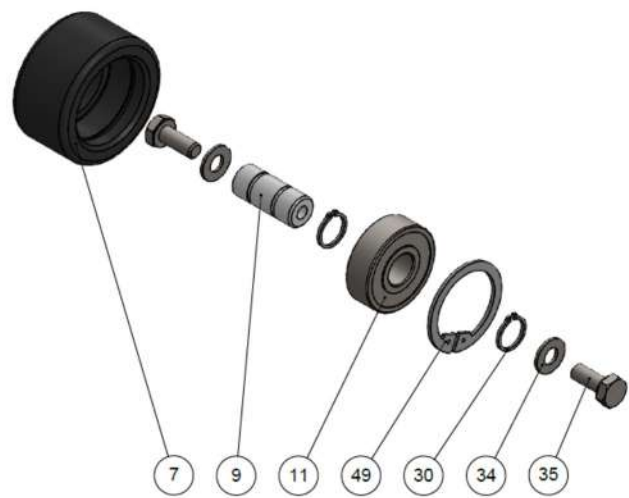


POS	DESCRIPTION
1	CASING
2	COVER
3	SIGHT GLASS
4L	LEFT FRAME
4R	RIGHT FRAME
8	PTFE HOSE CONNECTION
8	SS316L HOSE CONNECTION
12	BALL BEARING
14	COLLAR
15	SHAFT
16	SPACER
18	CIRCLIP
19	CIRCLIP
20	HOSE
21	SCREW
22	WASHER
23	HOSE LOCKING
31	ROTOR ASSEMBLY
37	KEY
38	KEY
39	SCREW
40	WASHER
44	SCREW
45	WASHER

ADPN 2 Roller Assembly exploded view

POS	DESCRIPTION
7	PRESSURE ROLLAR
9	PIN
11	BALL BEARING
30	CIRCLIP
34	WASHER
35	SCREW
49	CIRCLIP

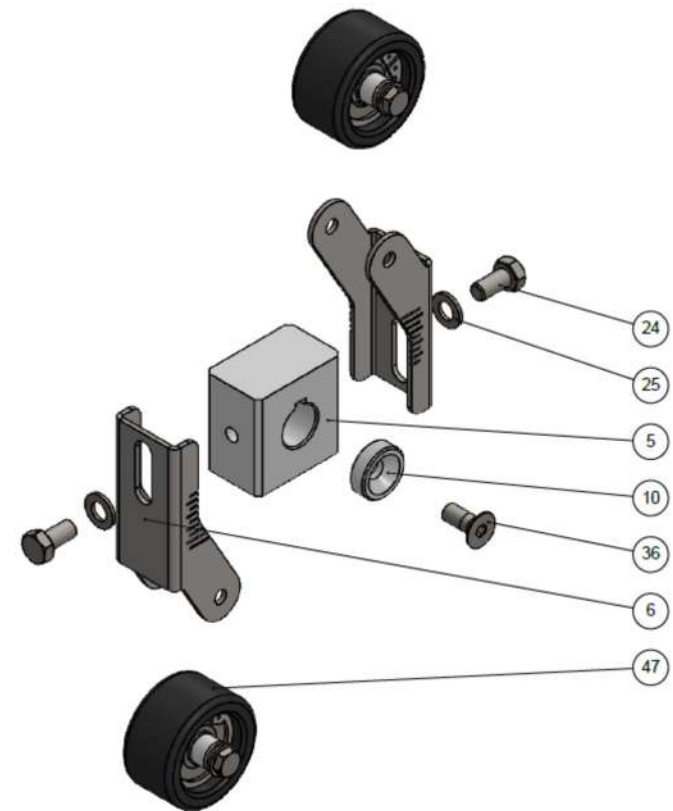
ADPN 2 Rotor Assembly exploded view



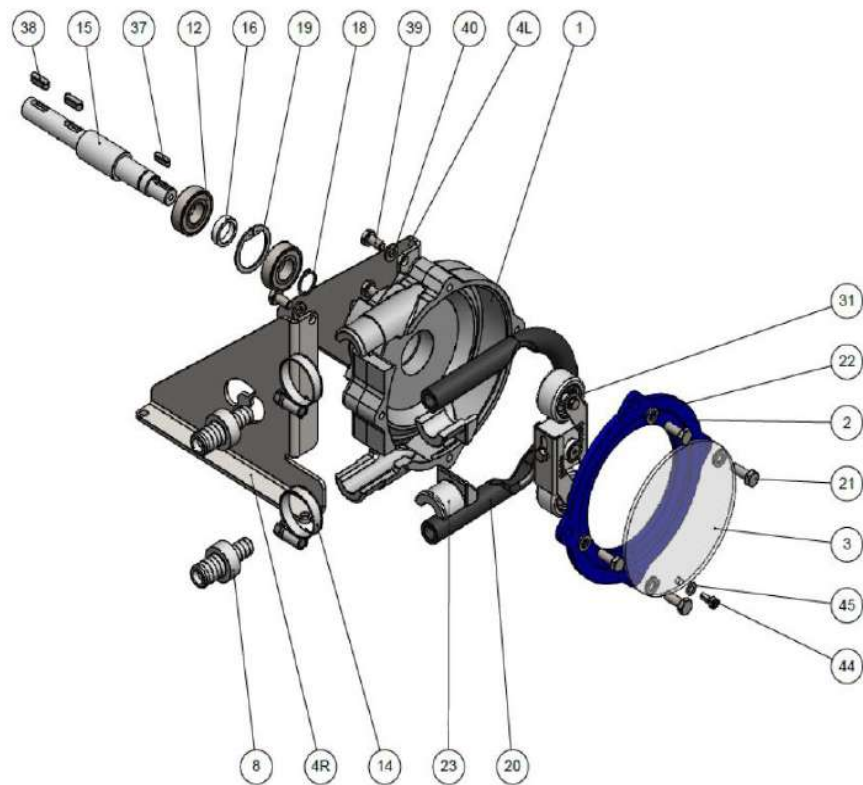
ADPN 2 Rotor Assembly parts list

POS	DESCRIPTION
5	ROTOR
6	PRESSURE HOLDER
10	ROUND ROTOR ASSY
24	SCREW
25	WASHER
36	SCREW
47	ROLLER ASSEMBLY

ADPN 2 Rotor Assembly exploded view



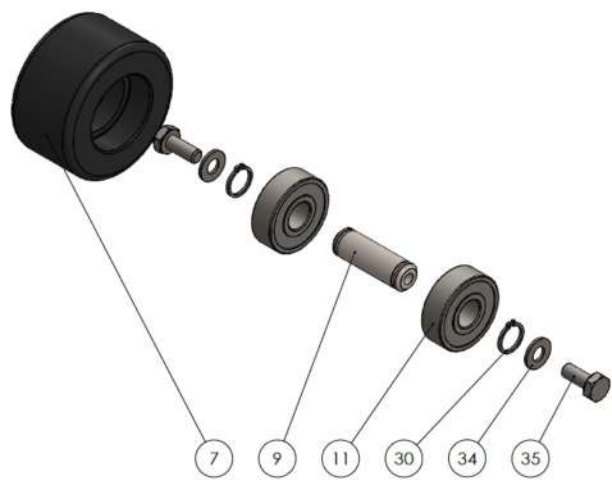
ADPN 3 exploded view



ADPN 3 Spare part list

POS	DESCRIPTION
1	CASING
2	COVER
3	SIGHT GLASS
4L	LEFT FRAME
4R	RIGHT FRAME
8	PTFE HOSE CONNECTION
8	SS316L HOSE CONNECTION
12	BALL BEARING
14	COLLAR
15	SHAFT
16	SPACER
18	CIRCLIP
19	CIRCLIP
20	HOSE
21	SCREW
22	WASHER
23	HOSE LOCKING
31	ROTOR ASSEMBLY
37	KEY
38	KEY
39	SCREW
40	WASHER
44	SCREW
45	WASHER

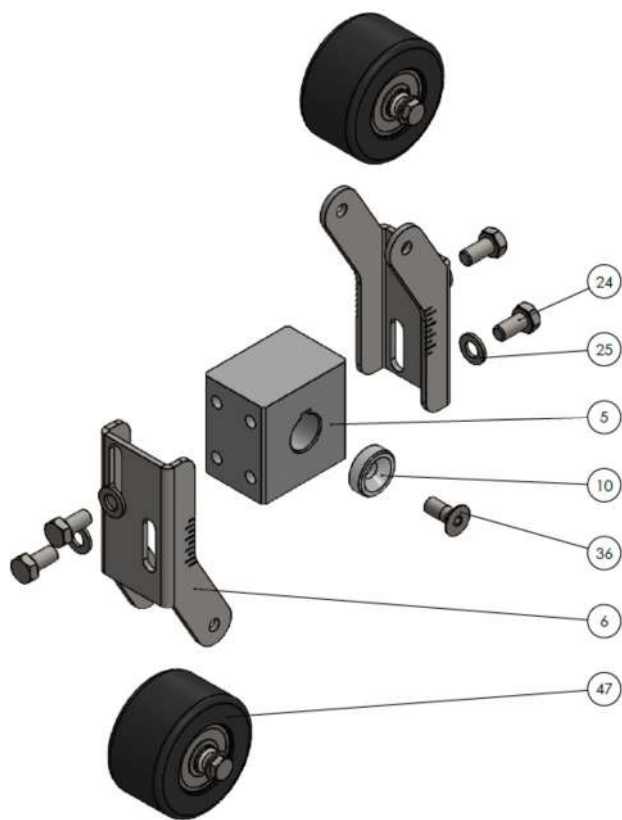
ADPN 3 Roller Assembly exploded view



ADPN 3 Roller Assembly parts list

POS	DESCRIPTION
7	PRESSURE ROLLAR
9	PIN
11	BALL BEARING
30	CIRCLIP
34	WASHER
35	SCREW

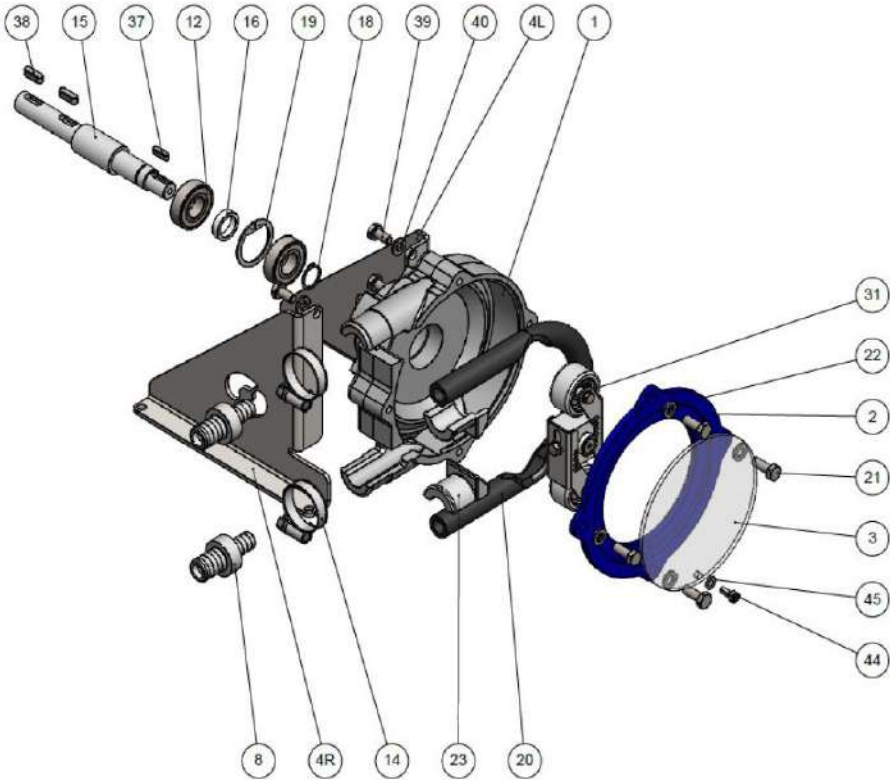
ADPN 3 Rotor Assembly exploded view



ADPN 3 Rotor Assembly parts list

POS	DESCRIPTION
5	ROTOR
6	PRESSURE HOLDER
10	ROUND ROTOR ASSY
24	SCREW
25	WASHER
36	SCREW
47	ROLLAR ASSEMBLY

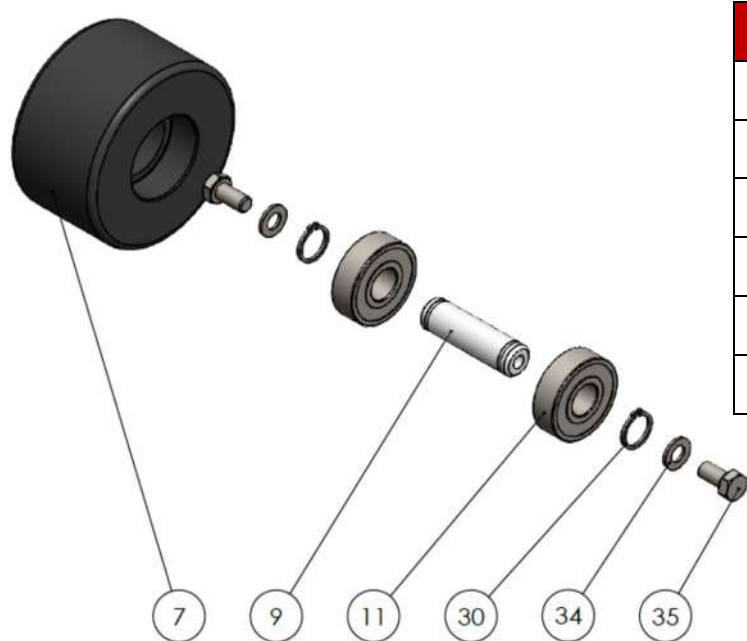
ADPN 4 exploded view



ADPN 4 pump parts list

POS	DESCRIPTION
1	BODY
2	COVER
3	SIGHT GLASS
4L	LEFT FRAME
4R	RIGHT FRAME
8	PTFE HOSE CONNECTION
8	SS316 HOSE CONNECTION
12	BALL BEARING
14	COLLAR
15	SHAFT
16	SPACER
18	CIRCLIP
19	CIRCLIP
20	HOSE
21	SCREW
22	WASHER
23	HOSE LOCKING
31	ROTOR ASSEMBLY
38	KEY
39	SCREW
40	WASHER
44	SCREW
45	WASHER

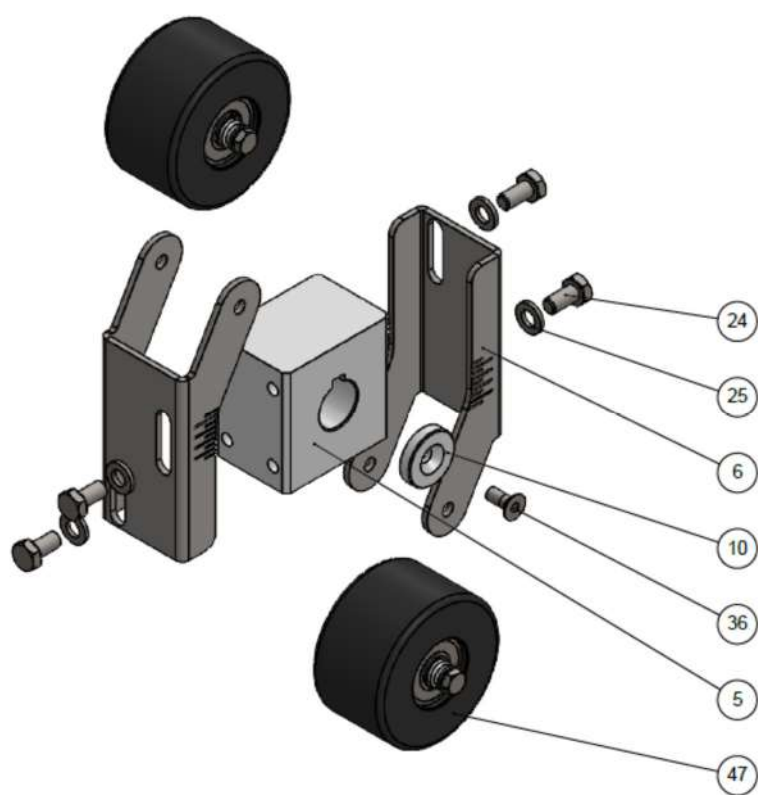
ADPN 4 Roller Assembly exploded view



ADPN 4 Roller Assembly parts list

POS	DESCRIPTION
7	PRESSURE ROLLAR
9	PIN
11	BALL BEARING
30	CIRCLIP
34	WASHER
35	SCREW

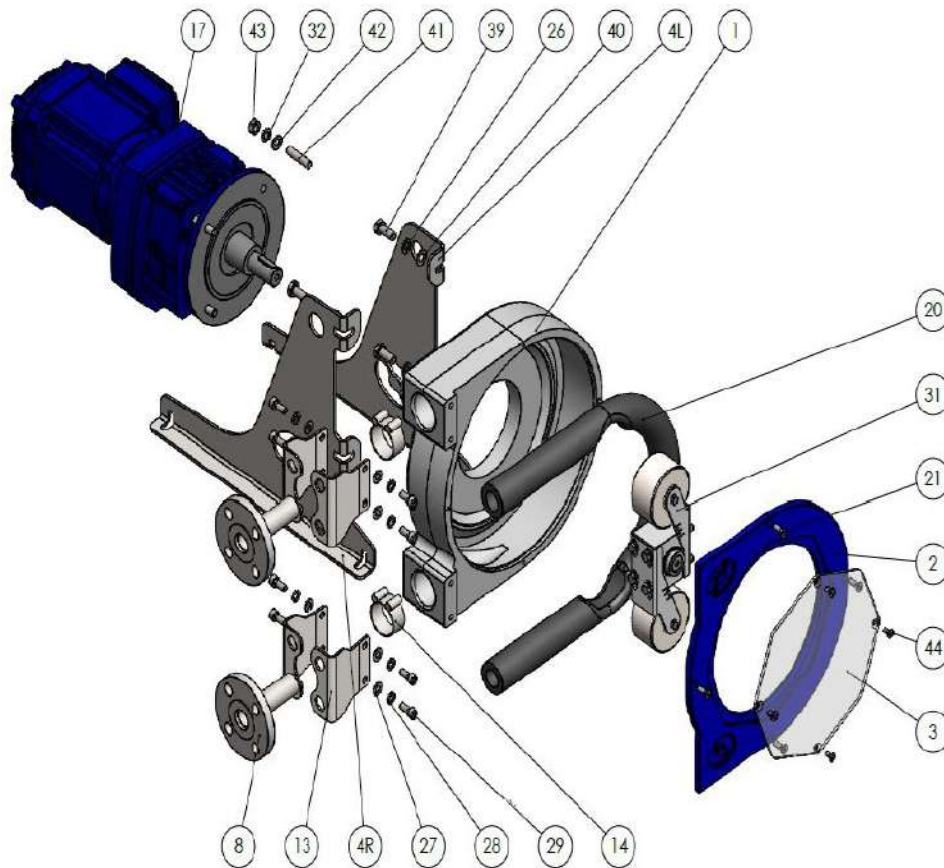
ADPN 4 Rotor Assembly exploded view



ADPN 4 Rotor Assembly parts list

POS	DESCRIPTION
5	ROTOR
6	PRESSURE HOLDER
10	ROUND ROTOR ASSY
24	SCREW
25	WASHER
36	SCREW
47	ROLLAR ASSEMBLY

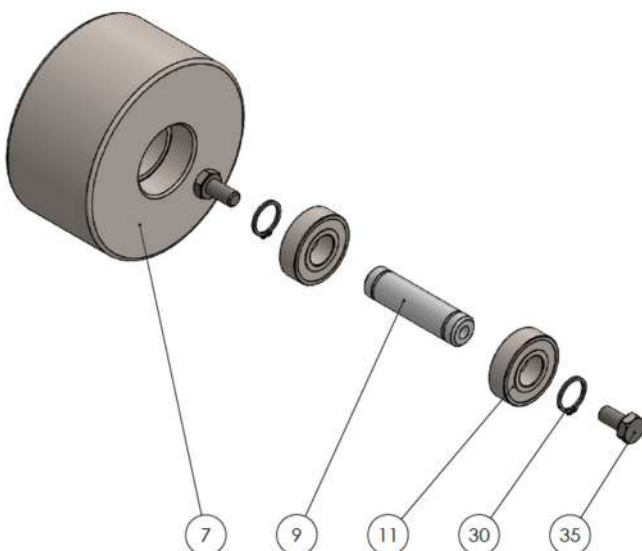
ADPN 5 exploded view



ADPN 5 pump parts list

POS	DESCRIPTION
1	CASING
2	COVER
3	SIGHT GLASS
4L	LEFT FRAME
4R	RIGHT FRAME
8	ISO FLANGE DN 25
8	ANSI FLANGE 1"
13	BRACKET
14	COLLAR
17	GEARBOX
20	HOSE
21	SCREW
26	GROWER
27	WASHER
28	GROWER
29	SCREW
31	ROTOR ASSEMBLY
32	GROWER
39	SCREW
40	WASHER
41	GEARBOX STUD
42	WASHER
43	NUT
44	SCREW

ADPN 5 Roller Assembly exploded view



ADPN 5 Roller Assembly parts list

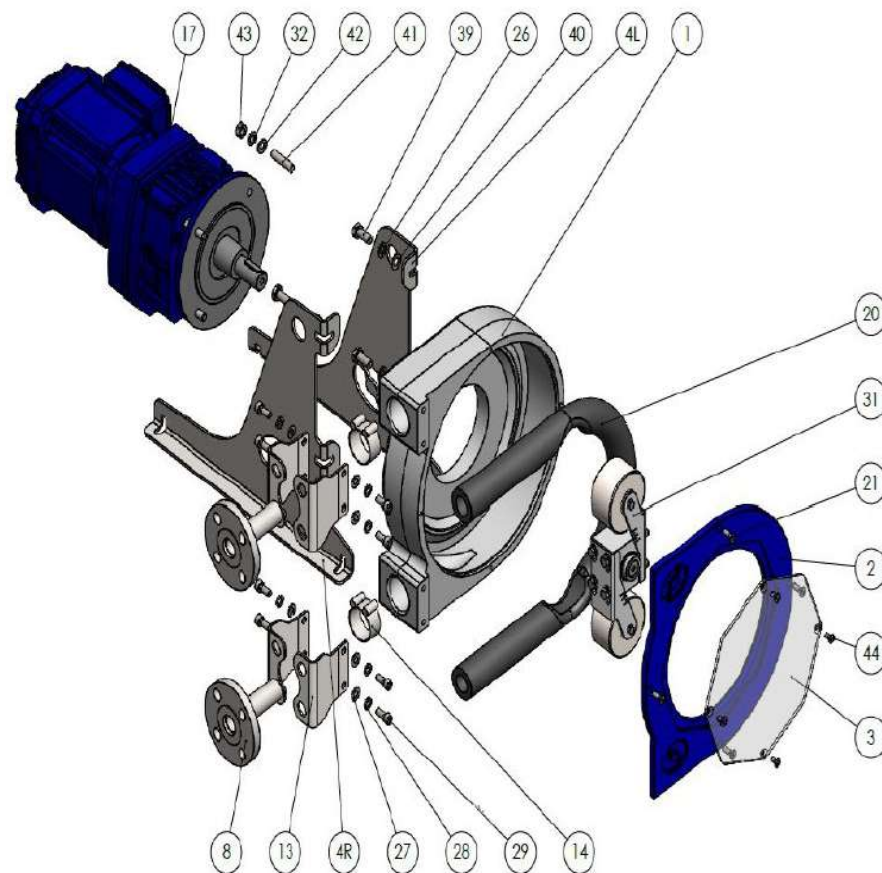
POS	DESCRIPTION
7	PRESSURE ROLLAR
9	PIN
11	BALL BEARING
30	CIRCLIP
35	SCREW

Exploded view diagram of the front suspension assembly. The components are labeled with callout numbers:

- 5: Steering knuckle
- 6: Control arm
- 10: Coil spring
- 24: Bolt
- 25: Nut
- 36: Bolt
- 46: Nut
- 47: Bolt

POS	DESCRIPTION
5	ROTOR
6	PRESSURE HOLDER
10	ROUND ROTOR ASSY
24	SCREW
25	WASHER
36	SCREW
46	GROWER
47	ROLLAR ASSEMBLY

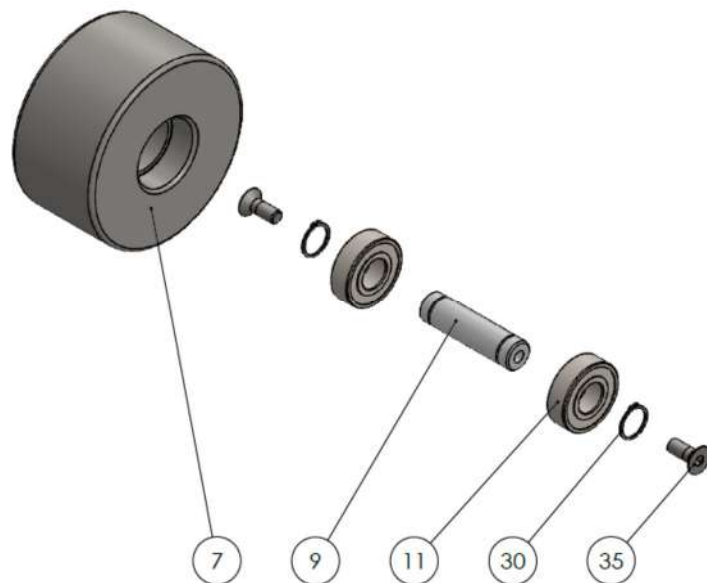
ADPN 6 exploded view



ADPN 6 pump parts list

POS	DESCRIPTION
1	CASING
2	COVER
3	SIGHT GLASS
4L	LEFT FRAME
4R	RIGHT FRAME
8	ISO FLANGE DN 40
8	ANSI FLANGE 1" 1/2
13	BRACKET
14	COLLAR
17	GEARBOX
20	HOSE
21	SCREW
26	GROWER
27	WASHER
28	GROWER
29	SCREW
31	ROTOR ASSEMBLY
32	GROWER
39	SCREW
40	GROWER
41	GEARBOX STUD
42	WASHER
43	NUT
44	SCREW

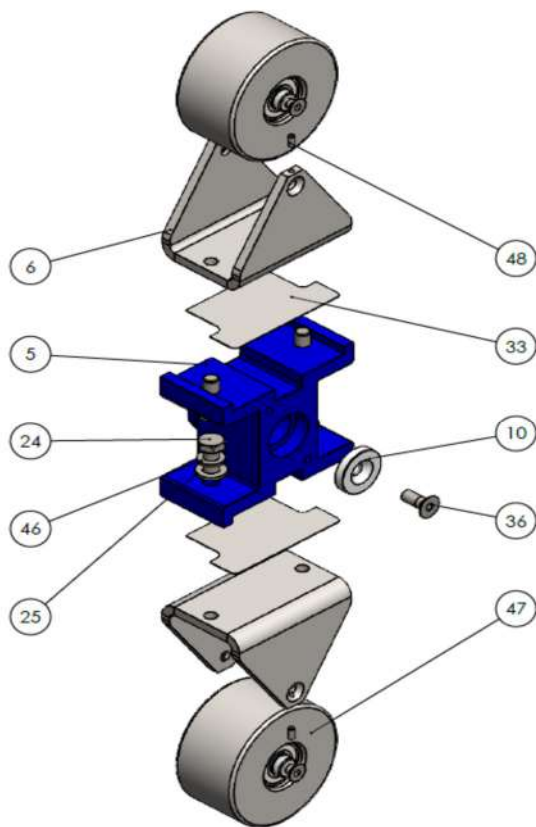
ADPN 6 Roller Assembly exploded view



ADPN 6 Roller Assembly parts list

POS	DESCRIPTION
7	PRESSURE ROLLAR
9	PIN
11	BALL BEARING
30	CIRCLIP
35	SCREW

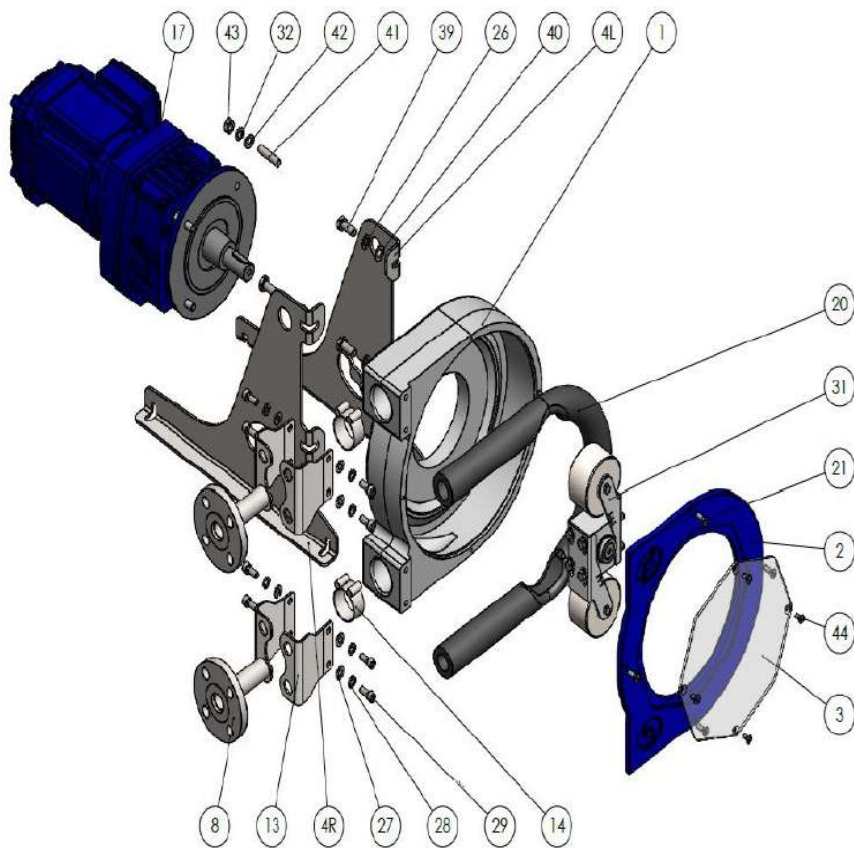
ADPN 6 Rotor Assembly exploded view



ADPN 6 Rotor Assembly parts list

POS	DESCRIPTION
5	ROTOR
6	PRESSURE HOLDER
10	ROUND ROTOR ASSY
24	SCREW
25	WASHER
33	SHIM
36	SCREW
46	GROWER
47	ROLLAR ASSEMBLY
48	DOWEL

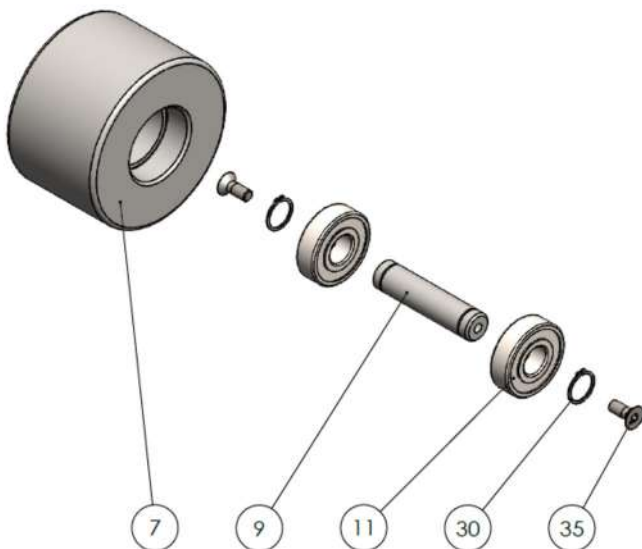
ADPN 7 exploded view



ADPN 7 pump parts list

POS	DESCRIPTION
1	CASING
2	COVER
3	SIGHT GLASS
4L	LEFT FRAME
4R	RIGHT FRAME
8	ISO FLANGE DN 50
8	ANSI FLANGE 2"
13	BRACKET
14	COLLAR
17	GEARBOX
20	HOSE
21	SCREW
26	GROWER
27	WASHER
28	GROWER
29	SCREW
31	ROTOR ASSEMBLY
32	GROWER
39	SCREW
40	GROWER
41	GEARBOX STUD
42	WASHER
43	NUT
44	SCREW

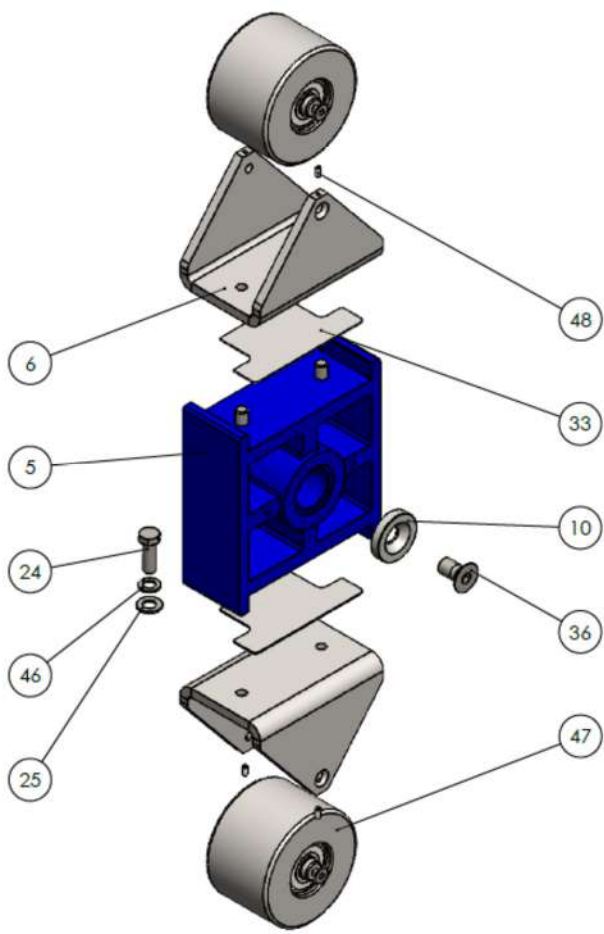
ADPN 7 Roller Assembly exploded view



ADPN 7 Roller assembly spare part list

POS	DESCRIPTION
7	PRESSURE ROLLAR
9	PIN
11	BALL BEARING
30	CIRCLIP
35	SCREW

ADPN 7 Rotor Assembly exploded view



ADPN 7 Rotor Assembly parts list

POS	DESCRIPTION
5	ROTOR
6	PRESSURE HOLDER
10	ROUND ROTOR ASSY
24	SCREW
25	WASHER
33	SHIM
36	SCREW
46	GROWER
47	ROLLAR ASSEMBLY
48	DOWEL



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