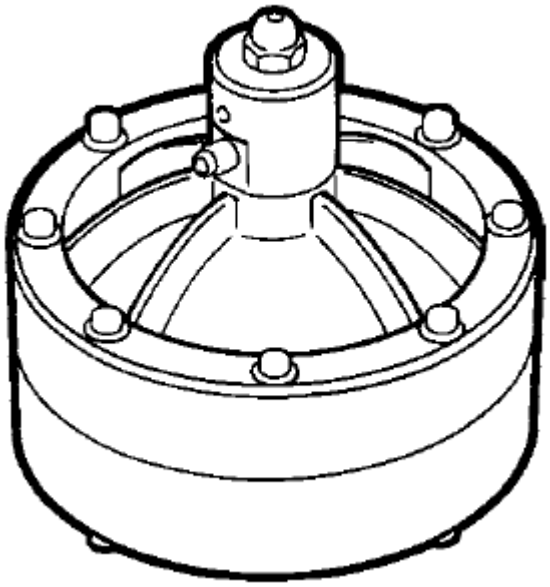
ADPD SERIES

Pulsation dampener



INSTRUCTIONS FOR USE AND MAINTENANCE

VER 1.2017

INDEX

FOREWORD

The ADPD series palsation dampener have been manufactured in accordance with the 2006/42/CE directives.

Therefore, when used according to the instructions contained in this manual, the ADPD series will not pose any risk to the operator.

This manual must be kept in good condition and/or be kept with the machine as a reference for maintenance purposes.

The manufacturer declines any liability concerning any changes, modifications, incorrect use or operation not complying with the contents of this manual and that may constitute a health and safety hazard to people, animals or property nearby the pump.

The Manufacturer trusts you will take full advantage of the performance offered by ADPD palsation dampener.

All technical parameters refer to the standard IM models (please see "TECHNICAL FEATURES"). However, the constant search for innovation and technological quality means that the characteristics detailed herein may change without prior notice.

All of the drawings and any other documentation supplied with the pump are the property of the Manufacturer, who reserves all rights and FORBIDS distribution to third parties without his authorization in writing.

THEREFORE REPRODUCTION, EVEN PARTIAL, OF THIS MANUAL, TEXT OR DRAWINGS IS STRICTLY FORBIDDEN.

INTRODUCTION

This manual is an integral part of the pump, and represents a SAFETY DEVICE. It contains important information that will assist the purchaser and his personnel in installing and using the pump and ensuring that the pump is kept in safe and good working order throughout its working life.

At the beginning of each chapter and section there is a status bar: its symbols state the personnel qualified for the operation/ s in question, the compulsory individual protective devices to wear and/or the power state of the pump. Any other hazard that may occur during operations is highlighted by special symbols embedded in the text.

Special identification symbols are used to highlight and differentiate particular information or suggestions concerning safety and the pump's correct use.

FOR ANY FURTHER INFORMATION REGARDING THE CONTENTS OF THIS MANUAL, PLEASE CONTACT THE MANUFACTURER'S ASSISTANCE DEPARTMENT.

 **WARNING: this sign warns the relevant personnel that the operation in question involves the risk of exposure to various types of health hazards or injuries, unless it is carried out according to current safety norms.**

 **WARNING:** This sign warns the relevant personnel that the operation in question might damage the machinery and/or its components, with consequent hazard to the operator and / or the environment, unless it is carried out in accordance with current safety norms.

 **NOTE:** This note supplies relevant and important information on the current operation.

SYMBOLS FOR COMPULSORY AND PERSONAL

SAFETY: indicate compulsory, adequate personal protection and the hazard/s that might occur during operation consequent to the power status indicated.

OPERATOR: This qualification implies a full knowledge and understanding of the information contained in this manual, besides a specific competence in the field of employment.

INSTALLER AND MECHANICAL MAINTENANCE

OPERATOR: This qualification implies a full knowledge and understanding of the information contained in the manufacturer's use manual, a specific competence to carry our standard installation and maintenance operations beside a specific competence in the field of employment.

WARNING Installation, inspection and maintenance personnel must have adequate technical training as well as an adequate knowledge of their field of operation (correct compatibility of materials and hazards related to possible chemical REACTIONS OF THE PRODUCT TO BE PUMPED.

ELECTRICAL INSTALLER-MAINTENANCE OPERATOR:

This qualification implies a comprehensive knowledge and understanding of the information contained in the manufacturer's user manual, technical competence specific to electrical operations: connection, standard maintenance and/or repairs.

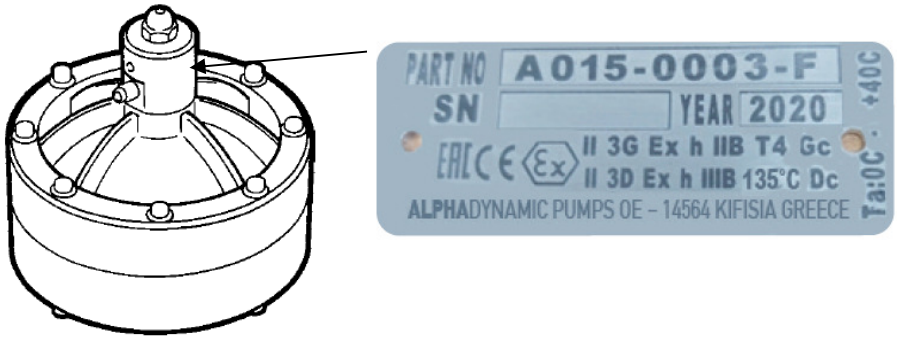
EXTRAORDINARY OPERATIONS: identify work restricted to service technicians that can only be carried out in the manufacturer's workshop.

DAMPENER IDENTIFICATION

Each dampener has an identification plate carrying its specification details and materials. Always refer to this data when contacting the manufacturer, dealer or customer service centers.

WARNING: removing or altering this identification plate and or the data it contains is forbidden.

Identification code * on the plate against the "TYPE" heading specifies the composition and the materials used to build the pump. This data will help ascertain whether the pump is suitablefor the product to be pumped.



MARKINGS AND GENERAL INFORMATION

In compliance with the 94/9/CEE standards, the ADPD pulsation dampeners carry the following identification marks: II 2/2 GD c IIB T135°C : safety symbol to Din 40012 attachment A.

II 2/2GD: surface equipment for use in areas with the presence of gases, vapors or mists in addition to clouds of combustible dust in the air that occur occasionally during normal operation (EN 1127-1 par. 6.3), both in external and internal areas (ZONE 1).

c: protection by constructional safety (EN 13463-5).

IIB: Excluding the following products hydrogen, acetylene, carbon disulphide.

T135°C: Class of admitted temperatures. The processed fluid temperature value must fall within such class range and the user must comply with the instructions contained in the manual and with the current laws. Furthermore, the user must take into account the ignition point of the gases, vapors and mists in addition to clouds of combustible powder in the air existing in the area of use.

DAMPENER DESCRIPTION

Functioning principles

The product pulsation caused by the pneumatic pump moves the dampener diaphragm which in turn causes the dampener air valve to step in. A product chamber suitably dimensioned to the pump type compensates the head and/or delivery changes. The head frequency and capacity are automatically adjusted without any intervention or set up according to the actual product circuit requirements. This reduces dangerous waterhammer effects and vibration therefore protecting other equipment on the same line.

Improper use
WARNING: use of a dampeners for any other use otherthan that previously described IN THE CHAPTER EN-TITLED "TECHNICAL CHARACTERISTICS" is to be considered improper use of the dampener and is therefore forbidden by ALPHADYNAMIC Co.

In particular, it is FORBIDDEN to use ADPD dampeners for:
- operation with liquids that are chemically incompatible with the materials of construction;
- operation with suspended products whose specific weight is higher than the liquid's (for example with water and sand);

WARNING: since an endless variety of products and chemical compositions exist, the user is presumed tohave the best knowledge of their reaction and compatibilitywith the materials used to build the dampener. Therefore,before using the dampener, all the necessary checks andtests must be performed with great care to avoid even theslightest risk, an event that the manufacturer cannot foresee and for which he cannot be held responsible.

WARNING: the user must evaluate the ratio betweenthe maximum surface temperature of the dampenerindicated in the marking and the minimumignition temperature of the layers of powder and the clouds ofpowder as indicated in the EN1227-1 WARNING. Use of the dampener that does not complywith the instructions indicated in the use and mainte-nance manual will cancel the safety and explosion protection requirements. The risks associated with use of the dampe-ner under the exact conditions set forth in the use and main-tenance manual have been analysed, whilst the analysis ofthe risks associated with the interface with other systemcomponents must be carried out by the installer.

ATEX: The user is responsible for classifying the area of use whilst identification of the equipment category is the responsibility of the manufacturer.

TECHNICAL FEATURES

Dimensions and characteristics mentioned in this manual refer to standard products and may vary without notice as a consequence of technical improvements.

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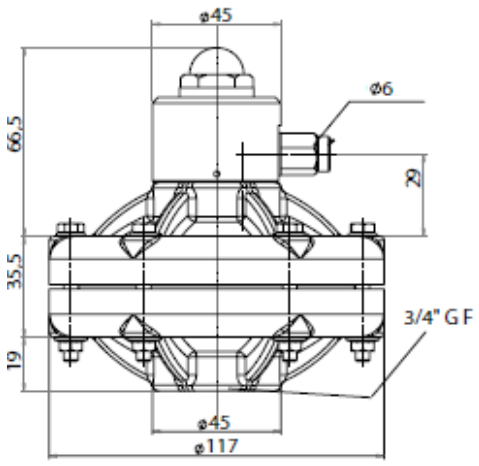

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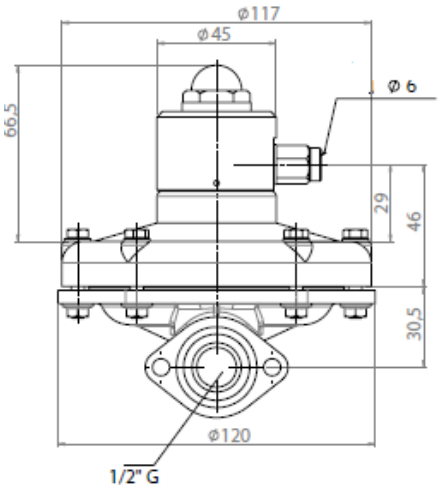

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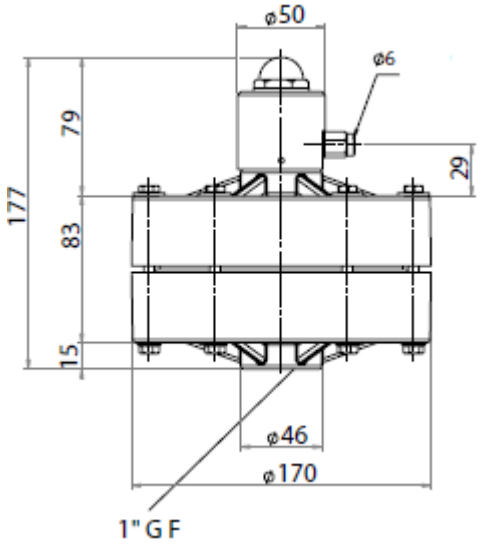

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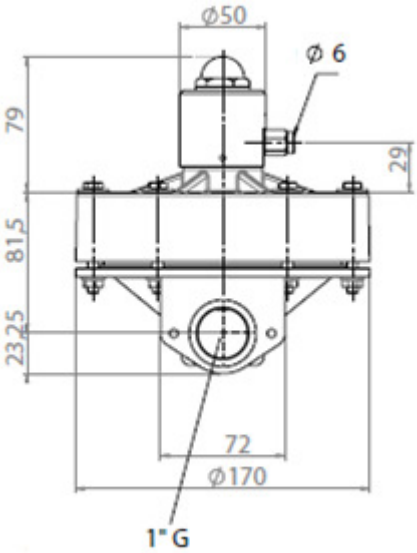

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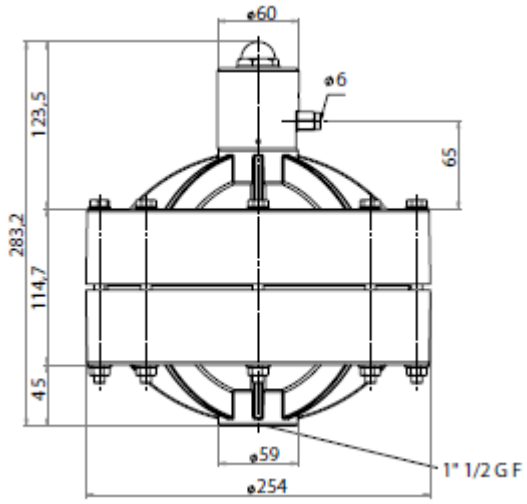
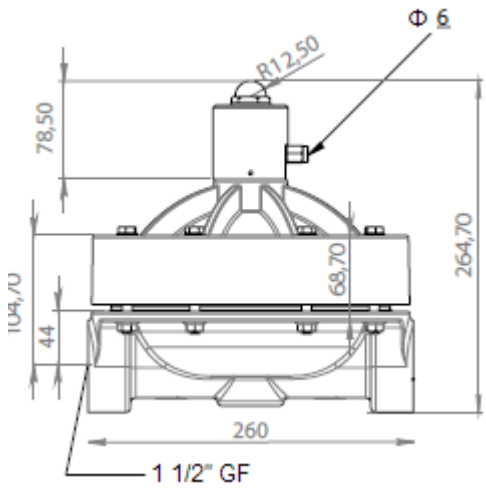
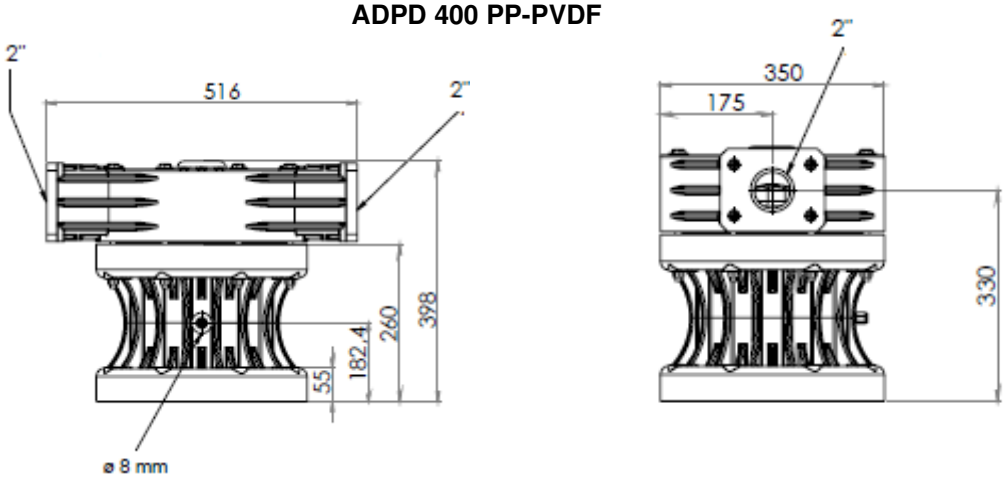


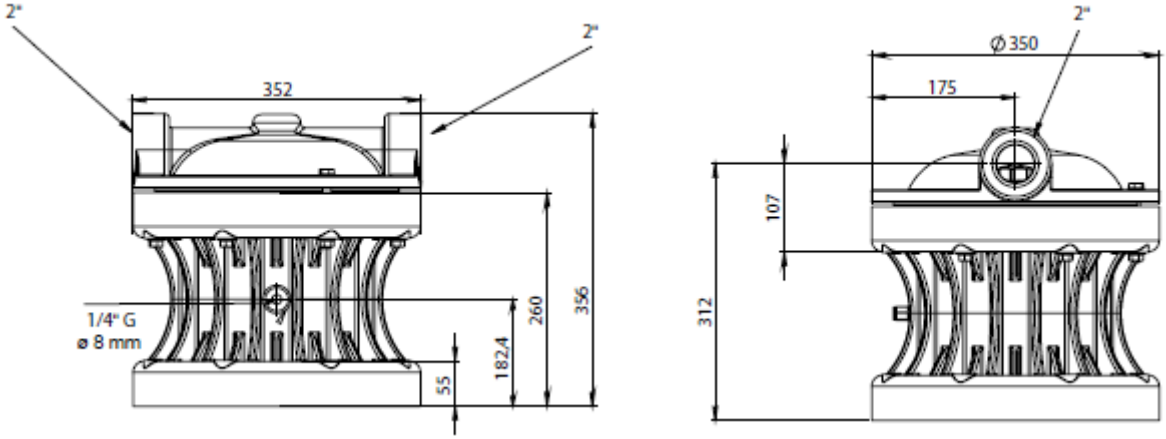
ADPD 300 AISI316



ADPD 400 PP-PVDF



ADPD 400 ALU - AISI316



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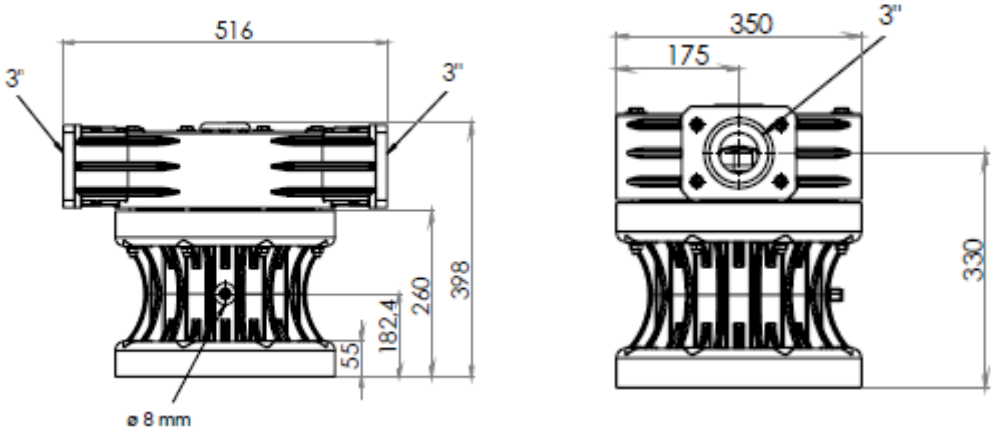

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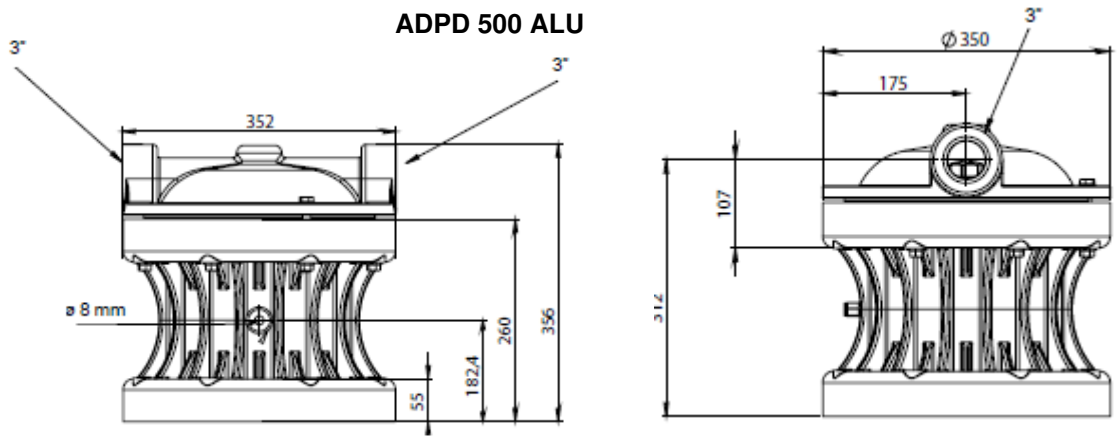


WARRANTY

The high quality of ADPD SERIES pulsation dampeners is often confirmed to us by the end users.
However, should any defect appear, please contact the Manufacturer's After-Sales Service, your delear or the nearest Customer Service Center where you will receive assistance as quickly as possible.

In any case, please provide:
A- Your complete address
B- Dampener identification
C- Explosion risk protection class
D- Anomaly description
All ADPD pulsation dampeners are covered by the following warranty:
1 - Twelve months for any faulty mechanical parts. The warranty period starts from the date of supply.
2 - Any fault or anomaly must be reported to the Manufacturer within eight days.
3 - Warranty repair will be carried out exclusively at the Manufacturer's premises following to shipment or despatch oft he defective dampener.
4 - The warranty will not be extended in the event of repair or replacement of parts of the dampener.
5 - Faulty parts must be forwarded to the Manufacturer who reserves the right to test them in this own factory to identify the fault or any external reason that may have caused it. Should the parts be found not faulty, the Manufacturer reserves the right to invoice the total cost of the parts that had been replaced under this warranty.
Costs and transportation risks of faulty, repaired or replaced parts including custom charges will be borne entirely by the client. Repair or replacement of faulty parts cover any obligation under this warranty. The warranty DOES NOT cover any indirect damage and in particular any normal consumable material such as diaphragms, gaskets, and others.
The warranty does not cover parts damaged as a consequence of carelessness, neglect, incorrect maintenance, or damage due to transportation or any other reason or event that is not directly linked to functioning or manufacturing defects.

The warranty excludes all cases of improper use of the pumpor incorrect applications or non-observance of the information contained in this manual.
Any controversy falls within the jurisdiction of the Court of Piraeus.

SAFETY RULES

Dangerous or hazardous practices or practices not complying with the safety rules and with the recommendations conteined herein, may cause serius injuries, material damage and even explosions and /or death for which the manufacturer cannot be held responsible.
WARNING: these instructions are essential for dampeners' compliance to the requirements of the 94/9/CE directive and must therefore be available, known,understood and applied.

WARNING: the personnel in charge of installing, inspecting and servicing the pulsation dampeners must have a suitable technical knowledge and training inmatters concerning potentially explosive atmospheres andthe related risks.

WARNING: use of the dampeners in a manner that does not comply with to the instructions indicated in the use and maintenance manual will cancel all the requirements for safety and protection against explosions.

WARNING: the maximum allowed temperature for process fluids or powder (zone 1) is equal to 60/80°C depending on the construction materials; if exceeded, respect of the maximum temperature marked on the machine cannot be guaranteed.

WARNING: before intervening on the dampener and/or servicing or repairing it, please note that you must:
A - Discharge any product that was being pumped
B - Wash it internally using a suitable non-flammable fluid, then drain.
C - Cut the air supply using the relevant valve and make sure that no residual pressure remains inside it.
D - Close all on-off valves relative to the product;
E - Disconnect network air supply;
F - Wear suitable individual protection before any mainte-nance or repair (goggles/face protection, gloves,closed shoes, aprons and others).

WARNING: before using the dampener, make sure that the fluid to be pumped is compatible with the construction materials of the dampener, other wise DANGER OF CORROSION, PRODUCT SPILLS AND/ OR EXPLOSIONS CAUSEDBY CHEMICAL REACTIONS.

For installation and use in a potentially explosive enviroment,comply with these general precautions:
- ascertain that the dampener is full and if possible, that the level is above it by 0.5 m;
- ascertain that the fluid treated does notcontain or cannot contain large solids or solids for a dangerous shape.

- ensure that the intake or delivery ports are not obstructed;
- also ascertain that the connection piping is strong enough and cannot be deformed by the dampener's weight or by the intake. Also check that the dampener is not burdened by the weight of the piping.
- If the dampener is to stay in disuse for a long period of time, clean it carefully by running a non-flammable liquid detergent through it that is compatible with the dampener's construction materials;
- if the dampener was turned off for a long period of time, circulate clean water in it for some minutes to avoid incrustations;
- before starting, after long periods of disuse, clean the internaland external surfaces with a damp cloth;
- check the grounding;
- always protect the dampener against possible collisions caused by moving means or by various blunt materials that may damage it or react with its materials;
- protect the dampener's surrounding ambient from splash escaused by accidental dampener failure;
- if the diaphragms are completely torn, the fluid may enter the air circuit, damaging it, and be discharged from the exhaust port. It is therefore necessary for the hexaust port to beconveyed by pipes to a safe area.

WARNING: the air supply pressure must never be over 7 bar or below 2 bar.

WARNING: when using the pump with aggressive or toxic liquids or with liquids that may represent a health hazard you must install suitable protection on the pump to contain, collect and signal any spills: DANGER OF POLLUTION, CONTAMINATION, INJURIES AND/OR DEATH.

WARNING: the dampeners must not be used with fluids that are not compatible with its construction materials or in a place containing incompatible fluids.

WARNING: installing the dampeners without on-off valves on the intake and delivery sides to intercept the product in case of spillage is forbidden: danger of uncontrolled product spillage.

WARNING: installing the dampeners without on-off, three-way or check valves on the air supply piping to prevent the pumped liquid from entering the pneumatic circuit if the diaphragms are broken is forbidden: danger of fluid entering the compressed air circuit and being discharged into the environment.

WARNING: Should the user think that the temperature limits set forth in this manual may be exceeded during service, a protective device must be installed on the system that prevents the maximum allowed process temperature from being reached. If exceeded, respect of the maximum temperature displayed on the marking is not guaranteed.

WARNING: The dampener must always be grounded irrespective of any organ to which they are connected. Lack of grounding or incorrect grounding will cancel the requirements for safety and protection against the risk ofexplosion.

WARNING: he use of dampeners for flammable liquidsis forbidden if they are made of nonconductive materials that charge statically (plastic materials) and without suitable grounding DANGER OF EXPLOSIONCAUSED BY STATIC CHARGES.

WARNING :Aggressive, toxic or dangerous liquids maycause serious injuries or damage health, therefore it is forbidden to return a dampener containing such products tothe manufacturer or to a service center. You must empty theinternal circuits from the product first and wash and treat it.

WARNING: Dampeners containing aluminium parts or components coming into contact with the product can-not be used to pump lll-trichloroethane, methylene chlorideor solvents based on other halogenated hydrocarbons: DAN-GER OF EXPLOSION CAUSED BY A CHEMICAL REACTION.

WARNING: The components of the pneumatic ex-changer, including the shaft are made frommaterials that are not specifically resistant to chemical products. Incase the diaphragm break, replace these elements com-pletely if they have come into contact with the product.

WARNING: The air-circuit of ADPD dampener isself-lubricating and does not require any greasing. Therefore avoid using lubricated and/or un-dried air.

WARNING: ascertain that no anomalous noises can beheard during operation. If they occur, stop the dampener immediately.

WARNING: ascertain that the fluid at the delivery side does not contain gas. Otherwise stop the dampener immediately.

WARNING: the diaphragms (in contact with the productor the external ones) are easily subject to wear. Their duration is strongly affected by the conditions of use and by chemical and physical stress. Fields tests carried out onthousands of dampeners with a head value from 0° to 18° C have shown that normal service life exceeds one hundredmillion cycles. However, in places at risk of explosion, thediaphragm must be disassembled and checked every 5million cycles and replaced every 20 million cycles.

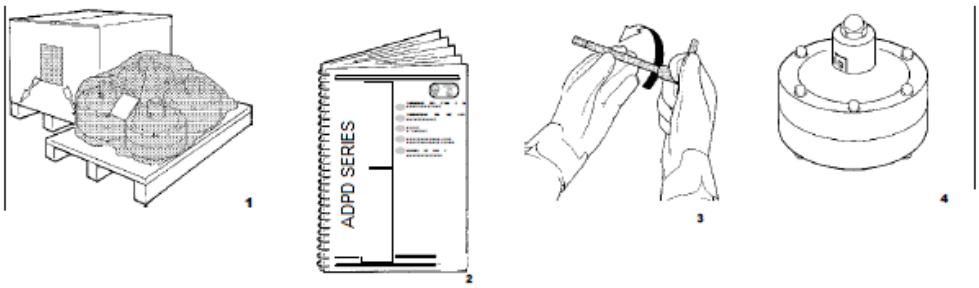
WARNING:Periodic controls must be made to ensure thatthere is no powder and/or deposits on the external andinternal surfaces of the dampener and, if necessary, cleanthem with a damp cloth.

WARNING: removal of the air supply pipe must be done when free from powder. Before restarting the dampener, ensure that no powder has entered the pneumatic distributor. To replace worn parts, use only original spare parts. Failure to comply with the above may give rise to risks For the operator, the technicians, the persons, the dampener and/or the environment that cannot be attributed to the manufacturer

TRANSPORT 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.

1. Depending on the size and weight, the material is forwarded packed in cardboard cases on a pallet or in a crate: on receipt open and remove the packing.
2. Read the User and Maintenance Manual and proceed as explained
3. Make sure that all of the dampener's screws are well tightened
4. Hoist the dampener using suitable equipment according to the weight shown on the plate.

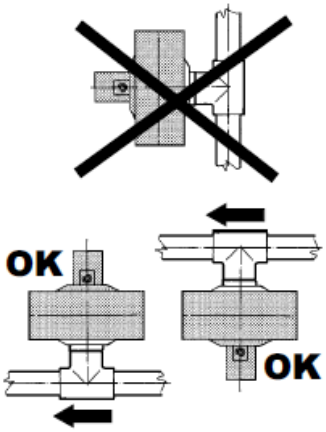


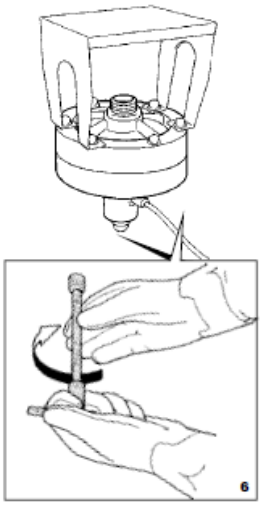
WARNING: Position and secure the dampener horizontally using hangers fixed to the ceiling or feet resting on the ground.

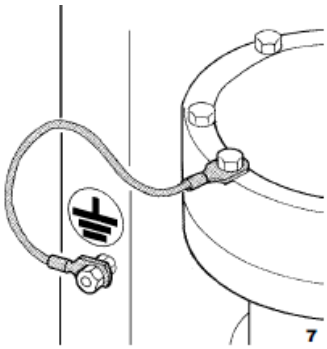
6. Position the dampener correctly on the site chosen for installation and secure onto the brackets using the bolts supplied. Arrange for enough room to carry out maintenance.
7. If the pulsation dampener is made from conductive materials and is suitable for flammable products, carry out effective grounding using a suitable size of cable on each pump casing to discharge static currents: **DANGER OF EXPLOSION AND/ OR FIRE.**

WARNING The dampener must always be grounded irrespective of any organ to which it is connected. Lack of grounding or incorrect grounding will cancel the requirements for safety and protection against the risk of explosion.

Transportation and positioning phases finish here.







CONNECTING THE PRODUCT CIRCUIT

After positioning the pump you can now connect it to the product circuit as follows:

WARNING: only fittings with cylindrical gas threads in materials compatible with both the fluid to be pumped and the pump's construction materials must be used. For example: Pump made from PP = PP fitting Stainless steel pump = stainless steel fitting.

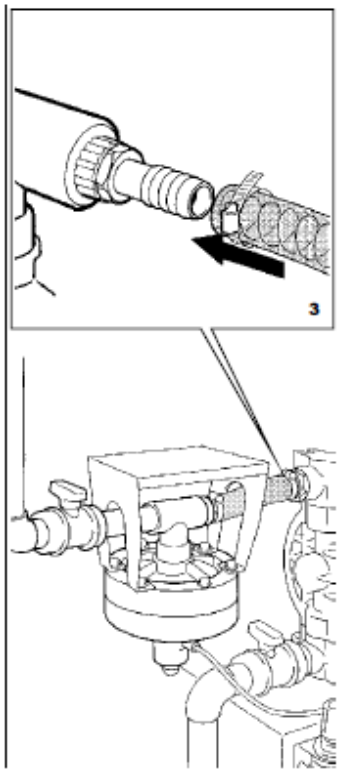
1. On the delivery and discharge manifold install a manual valve of the same diameter as the pump inlet (never smaller) to intercept the fluid correctly in case of spills and/or when servicing the pump.
2. Install the sleeves to secure the flexible hoses on both valves.

WARNING: the pipes connecting the pump to the dampener must be FLEXIBLE AND REINFORCED WITH A RIGID SPIRAL and never of a smaller diameter than the connection. For viscous fluids, use hoses with an OVERSIZED DIAMETER. Connections using rigid pipes may cause strong vibrations and break the manifolds.
3. Connect the product pipe between the pump and the dampener.
4. Fix the hoses using the relevant clamps.
5. Install and connect the pipe downstream from the pulsation dampener. Its diameter must never be smaller than the connection. The pipe downstream from the dampener can be rigid and made from material compatible with the fluid to be pumped.
6. In the event of a vertical delivery higher than 5 meters, we advise to use a check valve to prevent the fluid from returning into the pump.

WARNING: Ascertain that the fluid treated does not contain or cannot contain large solids or solids having a dangerous shape and that the dampener intake or delivery ports are not obstructed nor limited to avoid either cavitation or strained air motor operation of the pump above.

Connection of the product circuit finishes here.


1
2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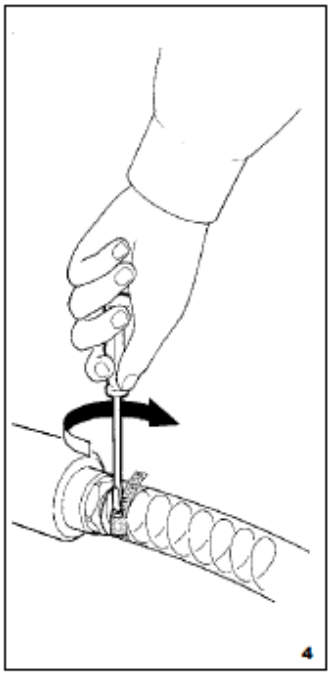
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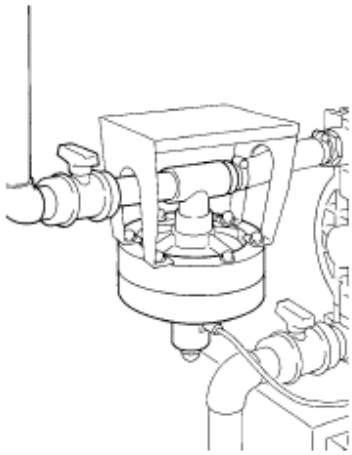


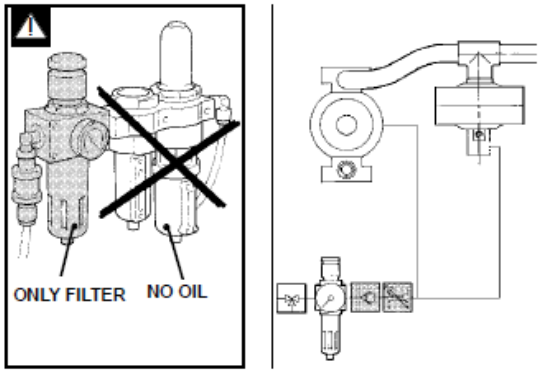
PNEUMATIC CONNECTION

To connect the dampener to the pneumatic circuit, you must:

WARNING: pneumatic supply to the ADPD dampener must be made using FILTERED, DRIED AND NON LUBRICATED OIL FREE AIR at a pressure of not less than 2 bars and not more than 7 bars.

1. Install an on-off valve, a three-way valve and a check valve, near to use but above the dampener and the pneumatic pump, according to the layout shown in figure.

2. Install a pneumatic fitting on the automatic valve port of the pulsation dampener.



3. Connect the supply hose from the net work to the dampener circuit.

WARNING: To avoid a pressure drops, use hoses, accessories and control and regulation elements whose delivery and pressure characteristics are suitable to the dampener's own characteristics.

WARNING:Most snap-on fittings cause pressure drops.

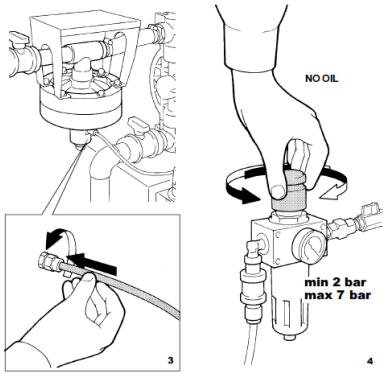
4. Adjust the network pressure of the compres-sed air to guarantee a pressure of NOT LESS THAN 2 bars and NOT MORE THAN 7 bars when the dampener is running. Lower or higher pressure may cause functioning problems or dampener breakage, product spills and damages to persons or objects.

WARNING: Should the user think that the temperature limits set forth in this manual may be exceeded during service, a protective device must be installed on the system to prevent the maximum process temperature from reaching 95°C in the case of class T4 dampeners in pvdf or 60°C for T4 dampeners in PP + CF (polypropylene)

5. Always protect the dampener from possible accidental collisions with moving means or various blunt materials that may damage it or react to its construction materials.

6. Protect the site and the persons from accidental failures by installing a protection guard to hold and collect any product leakage: DANGER OF SERIOUS INJURIES, DAMAGES TO HEALTH AND/OR TO OBJECTS.

7. If the diaphragms are completely torn, the fluid may enter the air circuit damage it, and be discharged through the exhaust port. It is therefore necessary that the air exhaust be conveyed by pipes into a piping reaching a safe area.



COMMISIONING

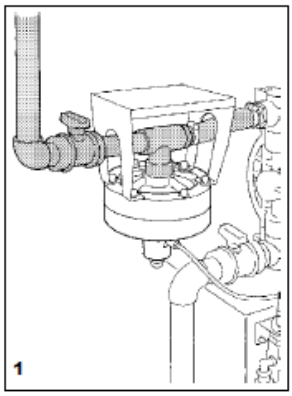
The user must always use materials thatare compatible with the pumped liquidaccording to the dampener's design conditions.

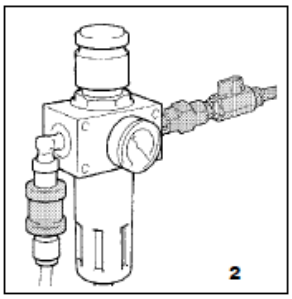
WARNING: It is forbidden to usethe pump with fluids that are notcompatible with the dampener's construction materials or in a place that contains non-compatible fluids.

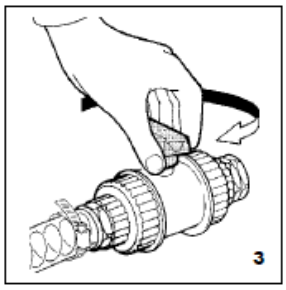
To commission the dampener, proceed asfollows:
1. Make sure that the product delivery and intake hoses are correctly connected.

2. Check that the pump's pneumatic cir-cuit valves are correctly installed (on-offball valve, three-way valve and checkvalve).

3. Open the fluid piping valves.







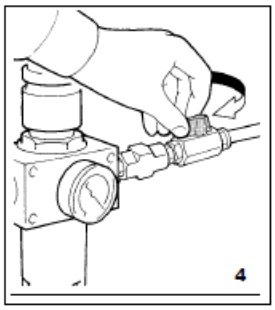
WARNING: never start the dampener with the product valves closed: DANGER OF DIAPHRAGM BREAKAGE.

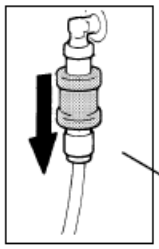
4.Open the on-off ball valve mountedupstream from the dampener and the pump.

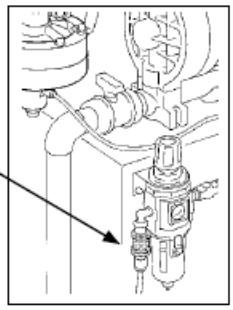
5. Open the air feed through the three-way valve.

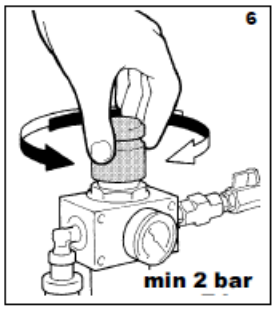
6. Check and regulate the network airpressure when the system is running:MIN 2 bar MAX 7 bar.

CAUTION: if pressure is below 2bars or higher than MAXIMUMt hre shold, stress and spills of product un-der pressure may occur or the dampenermay break





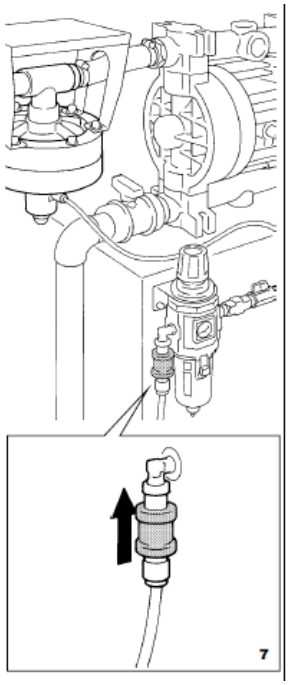




REMARK: The pulsation dampeneris equipped with a pneumaticautomatic valve that adjusts the speedand head required by the system.

7. Only the air supply must be used tostop the dampener by closing the three-way valve to discharge any re-sidual pressure from the dampener's pneumatic circuit.

WARNING: never stop thedampener and the pump when it isrunning and/or when the pneumatic cir-cuit is under pressure by closing the in-take and/or delivery valves on the fluidcircuit: DANGER OF PREMATUREWEAR AND/OR BREAKAGE OF THE DIAPHRAGM.



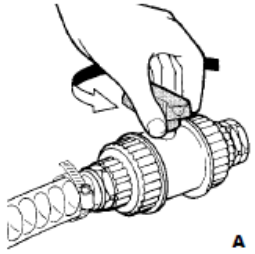
General Danger Sign | Danger Corrosive Material | Danger Flammable Material | Danger Explosive Material | Danger Toxic Material | Danger Incandescent Liquid Sprinkles | Prohibition on Open Flames' Use | No smoking

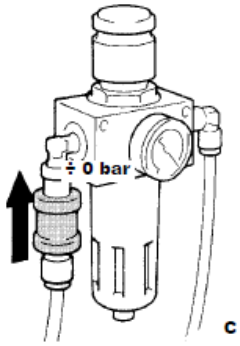
Put the following prohibition and danger signs near the place where the pump is installed

PRODUCT CIRCUIT MAINTENANCE

WARNING: before intervening on the pump and/or performing any maintenance or repair, you must:

A. discharge the product being pumped and close the product on-off valves (both on the intake and delivery sides).
B. Circulate a suitable non-flammable washing fluid then drain it off and close the product shut-off valve.
C. Shut-off the air supply using the relevant three-way valve whilst making sure that no residual pressure subsists.
D. Wait for the pump to cool down for at least fifteen minutes;
E. 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.


A



C


E

WARNING: remove the powderdeposits from the external surfacesof the pulsation dampener with a Cloths oaked in suitable neutral detergents.

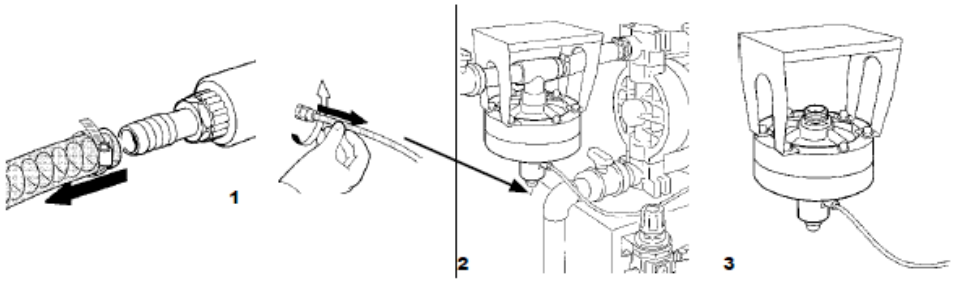
1. Disconnect the product piping from thedampener.

2. Disconnect the compressed air supplypipe.

3. Disassemble and remove thedampener from its place of installation using suitable hoisting equipment.

REMARK: refer to the relevant spareparts table for the order of disassem-bly and reassembly when carrying out theabove operations.

4. Periodically control and clean the in-ternal surfaces with a damp cloth.



A. CLEANING AND REPLACING THE DIAPHRAGMS

For good operation of the pulsation dampener and to guarantee that all the safety and protection requirements against explosion risks have been taken, it is indispensable that the controls, cleaning and/or replacement of the diaphragms in accordance with the intervals shown in the table are carried out.

WARNING: the diaphragms (in contact with the productor the external ones) are easily subject to wear. Their duration is strongly affected by the conditions of use and by chemical and physical stress. Fields tests carried out on thousands of pumps installed with a head equal to 0 and withfluid at 18° C have shown that normal service life exceeds one hundred million cycles. However, in environment at riskof explosion, the diaphragms must be replaced every 20 million cycles.

OBLIGATORY OPERATION	OPERATION TIME (nr. of cycles)		
	every 5000.000	every 5 milion	after 20 milion
CONTROL AND INTERNAL CLEANING	•		
DIAPHRAGM CHECK	_	•	_
DIAPHRAGM REPLACEMENT	_	_	•

WARNING: The components of thepneumatic valve, including theshaft, are made from materials that Are not specifically resistant to chemicals.Should the diaphragms break and thecomponents come into contact with thefluid, replace them completely.

A1. Disassemble the dampener casingsby removing the fixing screws.

WARNING: the user mustperiodically check that there are no deposits of powder on the internalsurfaces and if necessary clean themwell with a damp cloth.

A2. Remove any deposits from the internalsurfaces with a damp cloth.

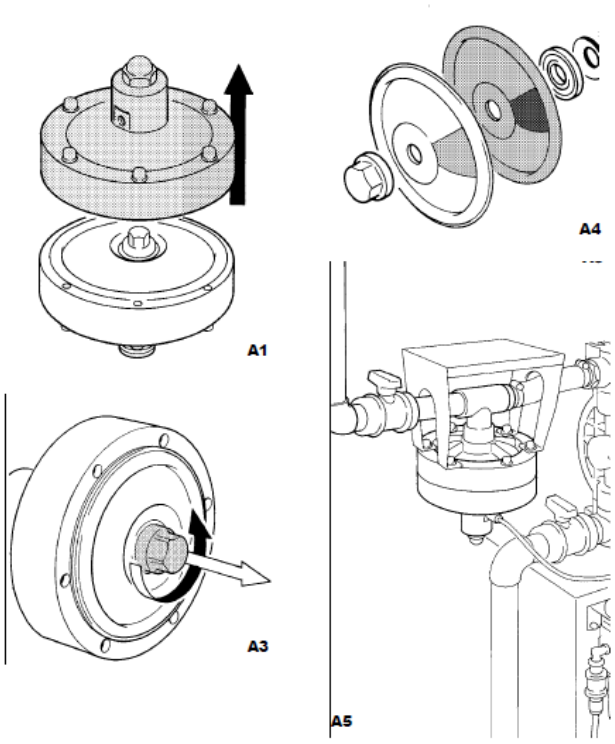
A3. Remove the external diaphragmlocking plate.

A4. Check and/or replace the dampener'sdiaphragms with GENUINE SPAREPARTS OF THE SAME TYPE.

WARNING: ascertain that the inner part of the dampener is free from all types of deposits, and if they are present. Otherwise proceed with deposit
their removal.

A5. Reassemble the dampener following the disassembly sequence described earlier in reverse order. Tighten the fixing bolts evenly.

WARNING: Should the dampener be returned to the manufacturer or to service center, you must first empty out completely; the dampener must be suitable treated and washed before it is sent. Replacing the diaphragms finishes here. You can now reposition the pulsation dampener and reconnect it as described in the previous sections.



AIR CIRCUIT MAINTENANCE

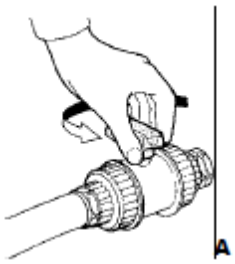
WARNING: before intervening onthe pulsation dampener and/or before performing any maintenance or re-pair, you must:

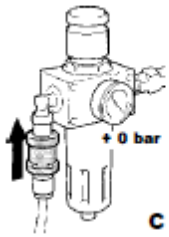
A. Discharge the product that is being pumped and close the manual on-off valves (both on the intake and delivery sides).

B. Circulate a suitable, non-flammable washing fluid then drain it out and close the product shut-off valve.

C. Shut-off the air supply using therelevant three-way valve whilst making sure that not residual pres-sure subsists;

D. Wear suitable individual protectivedevices before intervening: goggles/masks, gloves, closed shoes, aprons and others): DAN-GER OF EJECTION OF FLUID UNDER PRESSURE





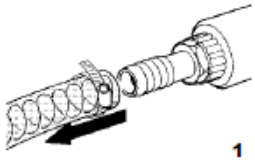
WARNING: before removing the airsupply pipe or fitting clean theexternal surfaces of the dampener. Before restarting the dampener, ensure that nopowder has entered the pneumaticdistributor.

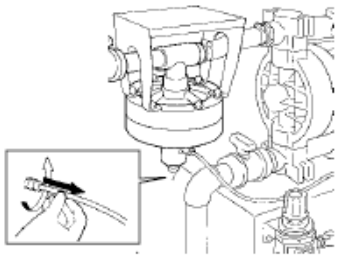
1. Disconnect the product piping from thedampener;

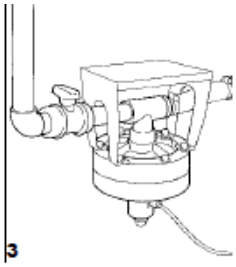
2. Disconnect compressed air piping from the dampener.

3. Disassemble and remove the dampener from its place of installation usingsuitable hoisting means.

REMARK: Refer to the relevant spare parts table for assembly and disassembly order when carrying out these operations







To replace the air valve you must:

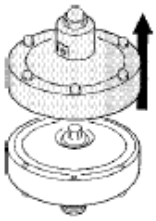
A. REPLACING THE AIR VALVE

WARNING: Should the dampener be returned to the manufacturer or service center, you must empty it out completely. In toxic, noxious or other types of dangerous products have been used, the dampener must be suitably treated and washed before it is sent.

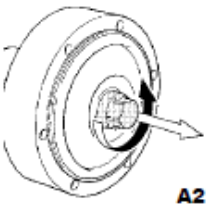
A1. Disassemble the dampener casingsby removing the locking screws.

A2. Remove the diaphragm and the shaft.

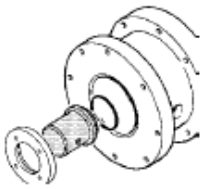
A3. Remove the automatic valve from thedampener casing



A1



A2



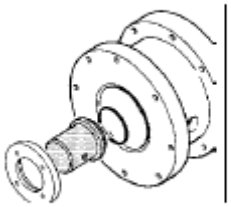
A3

WARNING: to avoid incorrect reassembly andsubsequent malfunction of the dampener the automatic valve must notbe open.

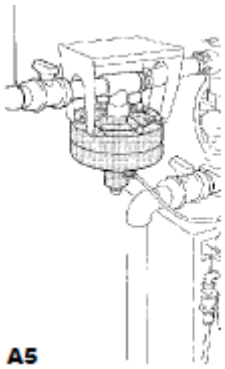
A4. Assemble the new automatic valve on the dampener casing.

A5. Reassemble the dampener according to the previously described sequence, but in reverse order and tighten the fixing bolts evenly.

Replacement of the air valve finishes here. You can now reposition the dampener and reconnect it as described in the previous sections.



A4



A5

TROUBLESHOOTING

The following instructions are intended excluvively for authorised skilled maintenance engineers. In event of abnormal behaviour and in orer to fix faults, please refer to the following trobleshooting instructions.

WARNING: For more serious problems, we strongly oraccomend that you contact the ALPHADYNAMIC Co SERVICE DEPARTMENT; our engineers will provide you assistance as quickly as possible.

PROBLEM	POSSIBLE SOURCE	ADVICE
1. The dampener doesn't run and/or it doesn't start.	**1.1** No air in the circuit	**1.1a** Check circuit, valves and connections
	1.2 Insufficient air pressure	**1.2a** Adjust pressure on the relevant reducer
	1.3 Insufficient air flow rate	**1.3a** Check that piping and accessories have suitable passage
	1.4 Damaged control valve	**1.4a** Check and replace
	1.5 Damaged air valve.	**1.5a** Replace air valve; check whether the air discharge is obstructed by ice. If so, clear it. See air supply paragraph.
	1.6 Broken diaphragm.	**1.6a** Check if any air comes out from the product delivery pipe. If so, replace diaphragm.
2 The dampener is not performing at its best.	**2.1** There is an air leak in thevalve.	**2.1a** Replace the air valve
	2.2 The product pipe is clogged and obstructed.	**2.2a** Disassemble the product pipe and clean it.
	2.3 The product being pumped is too viscous	**2.3a** Take appropriate action.
	2.4 The air is dirty, full of condensate or oil	**2.4a** Check the air feed line.
	2.5 Air volume or pressure isinsufficient.	**2.5a** Check pressure using a pressure guage installed on thepump when the pump is running: see on page 20. Ifthe pressure value at that point is too low in relation to thenetwork pressure, check all the air fittings, especially thesnap-on ones. Ensure that all the air control equipmenthas sufficient flow. **WARNING: 90% of the stalls occurwith snap-on fittings.**

DECOMISSIONING

Should the dampener remain inactive for long periods, proceedas follows

WARNING: Discharge any residual fluid from the pulsation dampener. Wash and treat as suitable,using a non-flammable detergent compatible with the dampener's material: DANGER OF INJURIES, DAMAGE TO HEALTH AND/OR DEATH.

1. Wash internally using products suitable for the fluid being pumped.
2. Close the fluid intake and delivery valves.
3. Close the air supply using the three-way valve; this will discharge any residual pressure.
4. If you want to store the dampener in the warehouse, youmust respect the following:

WARNING: Storage must be in a closed and protected environment at temperatures from 5 to 45°C, and a hu-midity level not above 90%.

5. If the dampener was in disuse for a long period of time, you must circulate clean water through it before restarting it to avoid incrustations.

DEMOLITION AND DISPOSAL

ADPD dampeners do not contain dangerous parts orparts that require preventive conditioning; however, when they are worn out, they must be disposed of in the following manner:

WARNING: Discharge any residual fluid from the pump.In case of dangerous, toxic fluids and/or otherwise nox-ious products, wash and treat as suitable: danger of injuries,damage to health and/or death.

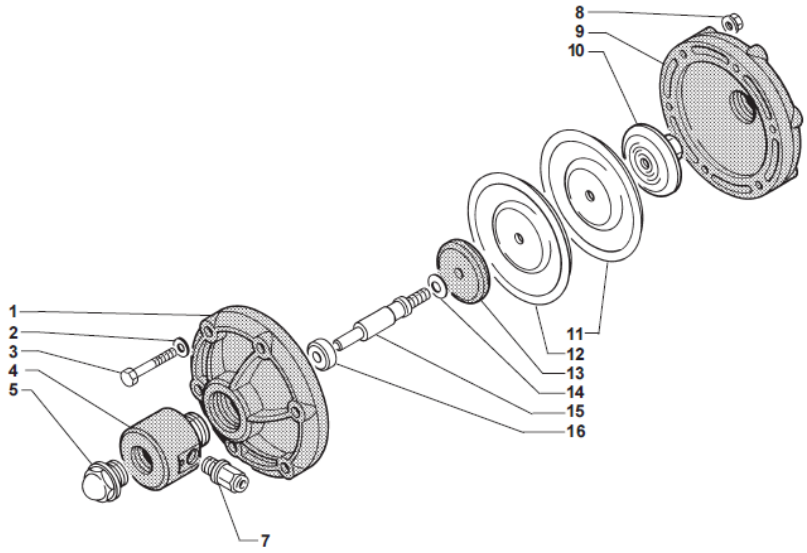
1. Disconnect the air supply.

2. Disassemble and remove the dampener from its position.

3. Separate elements according to type (see the dampenerscomposition code).

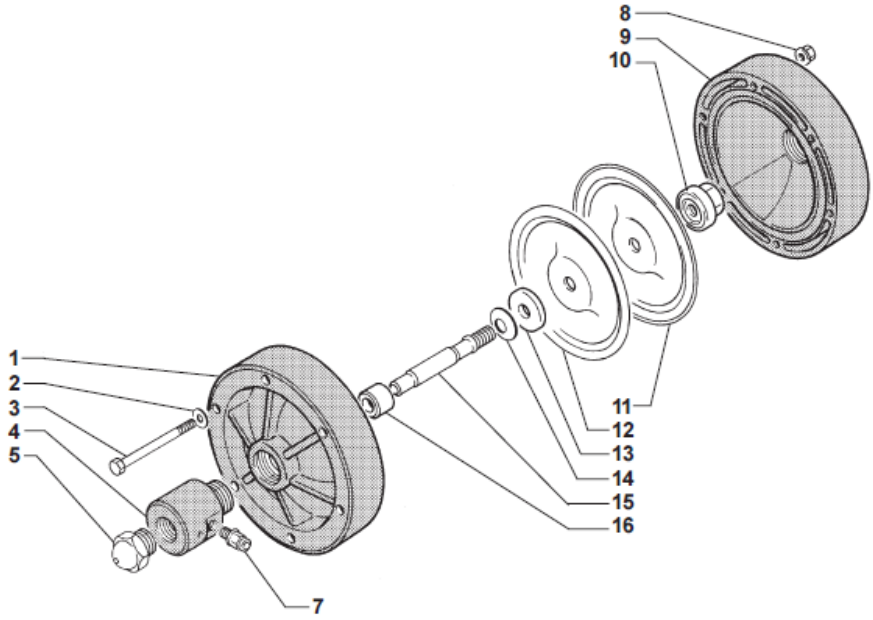
WARNING: parts in polypropylene must be disposed ofas special refuse; in all cases contact specialised companies authorised for their disposal and make sure that no small or large components are dispersed in the environment that may cause pollution, accidents or direct and/or indirect damage.

ADPD 100



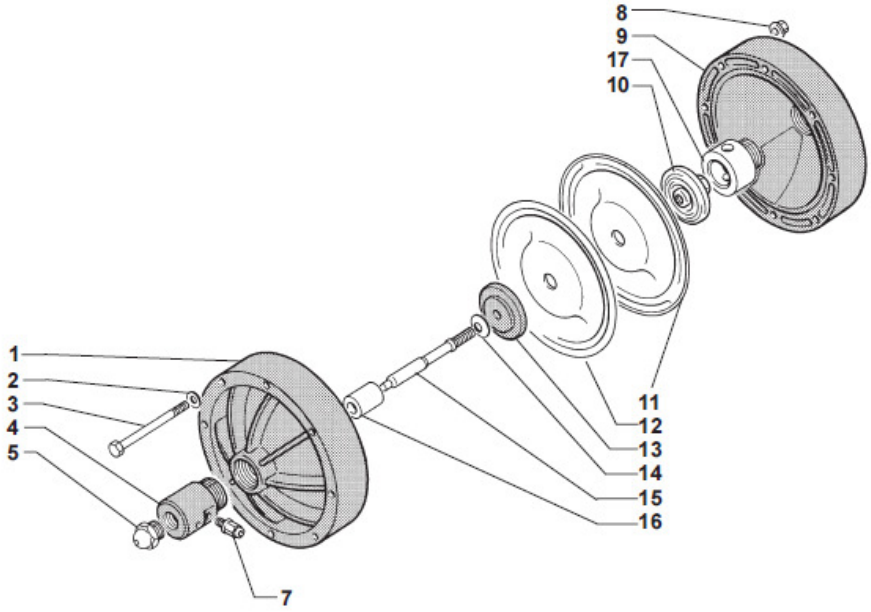
POS	DESCRIPTION	QTY
1	AIR SIDE HOUSING	1
2	WASHER	6
3	SCREW	6
4	VALVE	1
5	TRANSPARENT COVER	1
7	RIGHT CONNECTOR	1
8	BOLT	6
9	LIQUID SIDE HOUSING	1
10	EXTERNAL CAP	1
11	EXTERNAL DIAPHRAGM	1
12	INTERNAL DIAPHRAGM	1
13	INTERNAL CAP	1
14	BELLEVILLE WASHER	1
15	CONNECTION SHAFT	1

ADPD 200



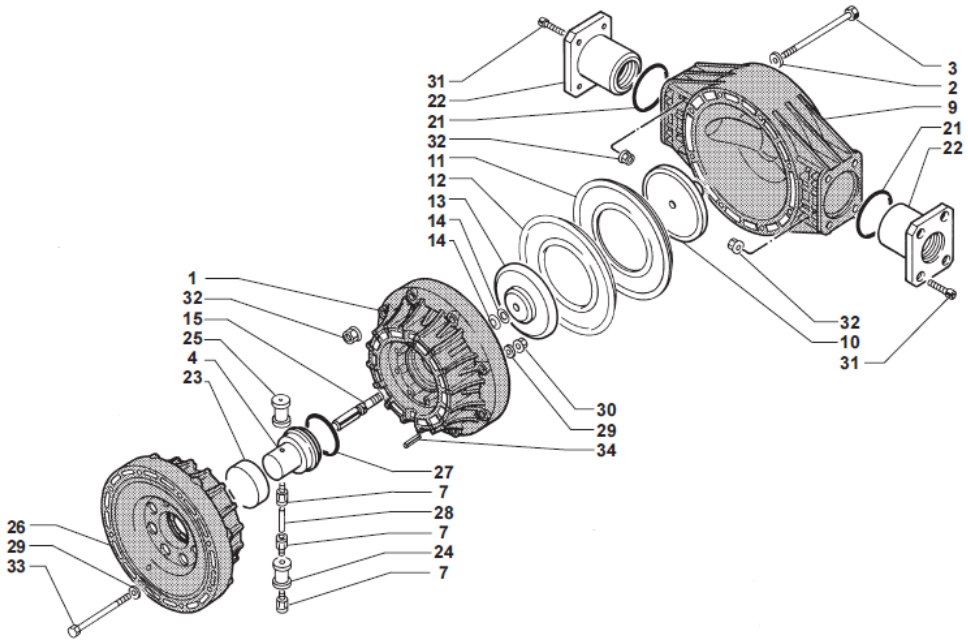
POS	DESCRIPTION	QTY
1	AIR SIDE HOUSING	1
2	WASHER	6
3	SCREW	6
4	VALVE	1
5	TRANSPARENT COVER	1
7	RIGHT CONNECTOR	1
8	BOLT	6
9	LIQUID SIDE HOUSING	1
10	EXTERNAL CAP	1
11	EXTERNAL DIAPHRAGM	1
12	INTERNAL DIAPHRAGM	1
13	INTERNAL CAP	1
14	BELLEVILLE WASHER	1
15	CONNECTION SHAFT	1
16	SPACER	1

ADPD 300



POS	DESCRIPTION	QTY
1	AIR SIDE HOUSING	1
2	WASHER	6
3	SCREW	6
4	VALVE	1
5	TRANSPARENT COVER	1
7	RIGHT CONNECTOR	1
8	BOLT	6
9	LIQUID SIDE HOUSING	1
10	EXTERNAL CAP	1
11	EXTERNAL DIAPHRAGM	1
12	INTERNAL DIAPHRAGM	1
13	INTERNAL CAP	1
14	BELLEVILLE WASHER	1
15	CONNECTION SHAFT	1
16	AIR SIDE SPACER	1
17	LIQUID SIDE SPACER	1

ADPD 400 - 500



POS	DESCRIPTION	QTY
1	AIR SIDE HOUSING	1
2	WASHER	6
3	SCREW	6
4	VALVE	1
7	RIGHT CONNECTOR	1
9	LIQUID SIDE HOUSING	1
10	EXTERNAL CAP	1
11	EXTERNAL DIAPHRAGM	1
12	INTERNAL DIAPHRAGM	1
13	INTERNAL CAP	1
14	BELLEVILLE WASHER	1
15	CONNECTION SHAFT	1
21	ORING	2
22	ADAPTOR	2
23	SPACER	2
24	CONNECTOR	1
25	CONNECTOR	1
26	FLANGE	1
27	ORING	1
28	TUBE	1
29	WASHER	16
30	BOLT	8
31	SCREW	8
32	BOLT	16
33	SCREW	8
34	PINS	4

NOTES

ADPD SERIES

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