MDP 5011

Molecular Pump

User's Manual

adixen
by Alcatel Vacuum Technology

Alcatel Vacuum Technology, as part of the Alcatel Group, has been supplying vacuum pumps, leak detection systems, vacuum measurement and micro machining systems for several years.

Thanks to its complete range of products, the company has become an essential player in multiple applications : instrumentation, Research & Developement, industry and semiconductors.

Alcatel Vacuum Technology has launched Adixen, its new brand name, in recognition of the company's international standing in vacuum position.

With both ISO 9001 and 14001 certifications, the French company is an acknowlegded expert in service and support, and Adixen products have the highest quality and environmental standards.

With 40 years of experience, AVT today has a worldwide presence, through its international network that includes a whole host of experienced subsidiaries, distributors and agents.

The first step was the founding of Alcatel Vacuum Products (Hingham- MA) in the United States, thirty years ago, reinforced today by 2 others US subsidiaries in Fremont (CA) and Tempe (AZ).

In Europe, AVTF-France headquarters and three of its subsidiaries, Alcatel Hochvakuumtechnik (Germany), Alcatel Vacuum Technology UK (Scotland) and Alcatel Vacuum Systems (Italy) form the foundation for the European partner network.

In Asia, our presence started in 1993 with Alcatel Vacuum Technology (Japan), and has been strengthened with Alcatel Vacuum Technology Korea (in 1995), Alcatel Vacuum Technology Taïwan (in 2001), Alcatel Vacuum Technology Singapore, and more recently with Alcatel Vacuum Technology Shanghai (China) (in 2004).

This organization is rounded off by more than 40 represensatives based in a variety of continents.

Thus, whatever the circumstances, the users of Adixen products can always rely on quick support of our specialists in Vacuum Technology.

GB 02834 Edition 03 - June 2005

MDP 5011
Molecular pumps

WELCOME

Dear customer,

You have just purchased an Adixen Molecular pump .
We would like to thank you and are proud to count you as one of our customers.

This product has benefited from Alcatel's many years of experience in the field of molecular pump design.

To guarantee high performances and full satisfaction from this equipment, we suggest that you study this manual before any intervention on your pump, particularly the chapter on installation and start-up.

Applications

- Fast evacuation of small volumes.
- Interseal pumping.
- Regeneration of cryopumps .
- Leak detection.
- Spectrometry.
- Production of electronic tubes.
- INSTRUMENTATION :
  Mass spectrometry, Surface analysis

Avantages

- The design of the MDP pump offers the reliable and the robustness with performances adapted to numerous applications.
- The MDP 5011 works with the **ACT100** controller (refer to the ACT User's manual).

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REFERENCE DU MANUEL : 062199
EDITION : 13 **-** April 06

MDP 5011
Molecular pumps

This product complies with requirements of European Directives, listed in the Declaration of Conformity contained in G 100 of controller's manual. These Directives are amended by Directive 93/68/E.E.C (E.C. Marking).

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CAUTION	**Indicates a potentially hazardous situation which, if not avoided, could result in property damage.**
⚠ CAUTION	**Indicates a potentially hazardous situation which, if not avoided, could result in moderate or minor injury. It may also be used to alert against unsafe practices.**
⚠ WARNING	**Indicates a potentially hazardous situation which, if not avoided, could result in death or severe injury.**
⚠ DANGER	**Indicates an imminently hazardous situation that, if not avoided, will result in death or severe injury (extreme situations).**

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Chapter A

User's manual of MDP 5011 molecular pumps

INTRODUCTION

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MDP 5011 molecular pump overview

TWO PUMP VERSIONS

The standard version : MDP 5011 pump.

The version for corrosif gases: MDP 5011CP pump.

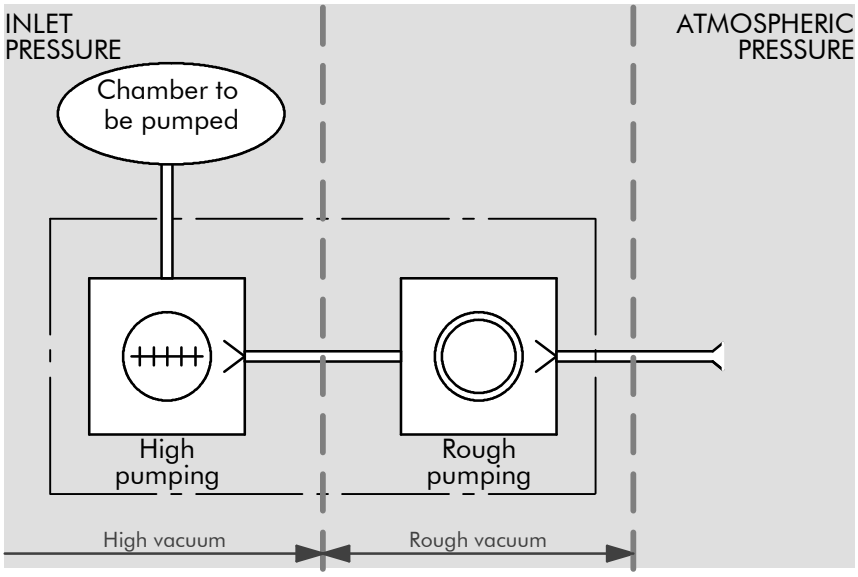
MAIN CHARACTERISTICS

The MDP 5011 offers high pumping performances between 10 mbar and 10^{-5} mbar and a maximum flowrate fo 400 sccm.

With a simple construction but robust rotor and low rotational speed (27000 rpm), the MDP is robust against accidental air in-rush, shock venting and gyroscopic effects.

Including built in ceramic ball bearings, The MDP is easily field maintainable.

THE MOLECULAR PUMP IN AN INSTALLATION



At the pump exhaust, the gases are evacuated to the atmosphere by a roughing pump. Since the MDP compression rate is set by the design, the MDP limit pressure is given by that of the roughing pump used.

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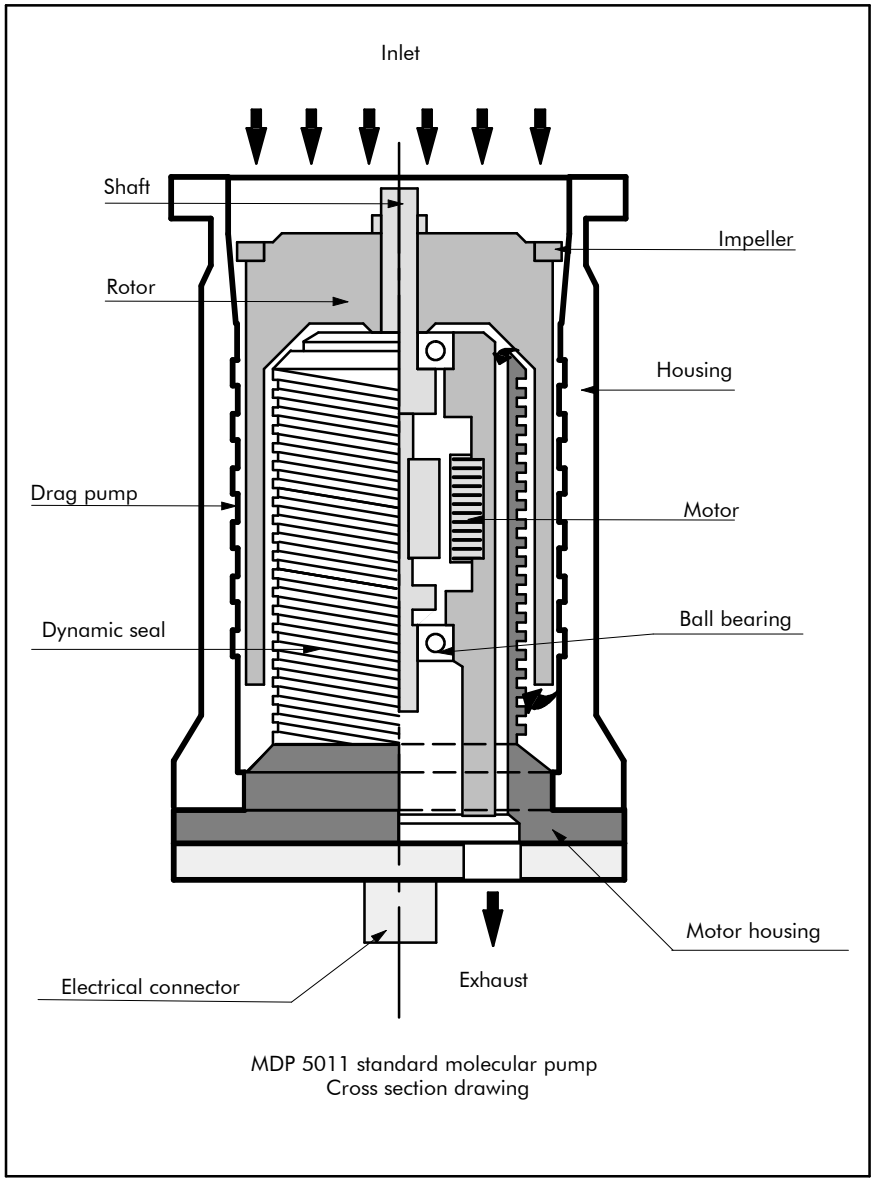
The different version operating principle

MDP 5011 MOLECULAR PUMP

The rotor, a smooth drum with a row of blades at the top, is mounted at the end of a shaft turning in two high-precision ball bearings lubricated with grease, and located in the low-vacuum area. All pumping elements are aluminium.

The pump is rotated by a single-phase electronically controlled electric motor. The rotor is mounted directly on the shaft, while the stator is attached to the pump body.



MDP 5011 standard molecular pump
Cross section drawing

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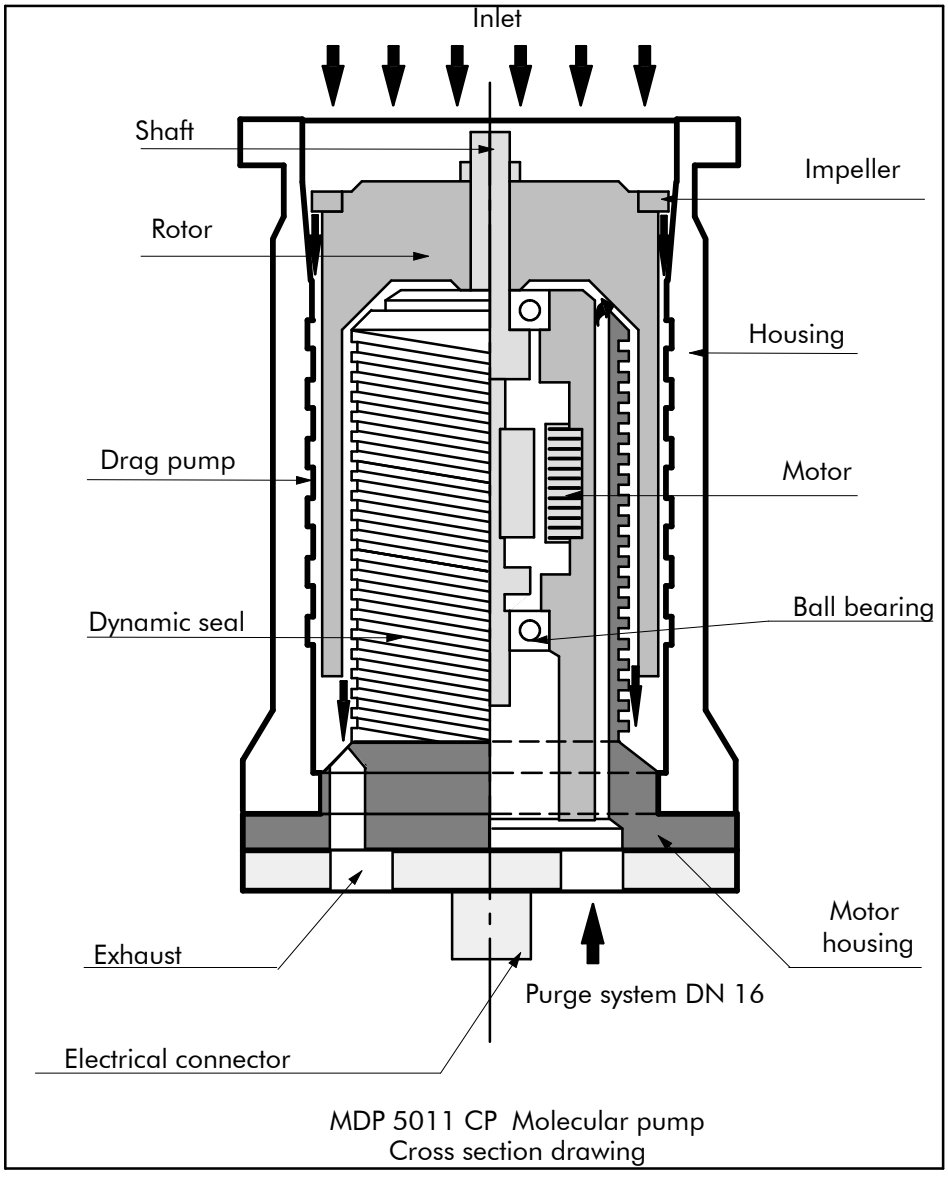
The different version operating principle

MPD 5011CP VERSION FOR CORROSIVE GASES

The MDP 5011 CP is specially designed for aggressive environments. Ball bearings and motor are isolated from process gases by a dynamic inert gas purge system.

MDP 5011 CP can operate with the same electronic frequency converter than the MDP 5011 standard.



MDP 5011 CP Molecular pump
Cross section drawing

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MDP 5011 technical characteristics

Characteristics		Units	MPD 5011	MDP 5011CP
Inlet flange	DN		63 ISO-K	
Rotation speed		rpm	27 000	
Pumping speed	N2 He H2	l/s	7.5 4 3	
Compression rate	N2 He H2		1.10^9 2.10^4 1.10^3	1.10^6 250 50
Ultimate pressure (CP with purge 50 SCCM) *		mbar	1.10^{-6}	1.10^{-5}
Maximum pressure at inlet in continuous operation**	Natural convection Air cooling Water cooling	mbar	1.10^{-1} 10 10	
Maximum pressure at exhaust in continuous operation**	Natural convection Air cooling Water cooling	mbar	40	5
Weight	Natural convection Air cooling Water cooling	kg	2,3 3 2,5	
Recommanded primary pump			Ultimate pressure < 20 mbar	
Starting time (0 à 27000 rpm)		min	< 1	
Using ambient temperature	Natural convection Air cooling Water cooling	°C	35 35 50	
Operate position			indifferent	
Exhaust flange	DN		16 ISO-KF	

* According to Pneurop Specifications

** The 2 maximum pressures can not occur at the same time

Note : the MDP 5011 pump must not be baked.

The compression rate of the MDP 5011 CP is lower than this of the standard MDP 5011 pump.

A part of the dynamic seal allows the protection against corrosion.

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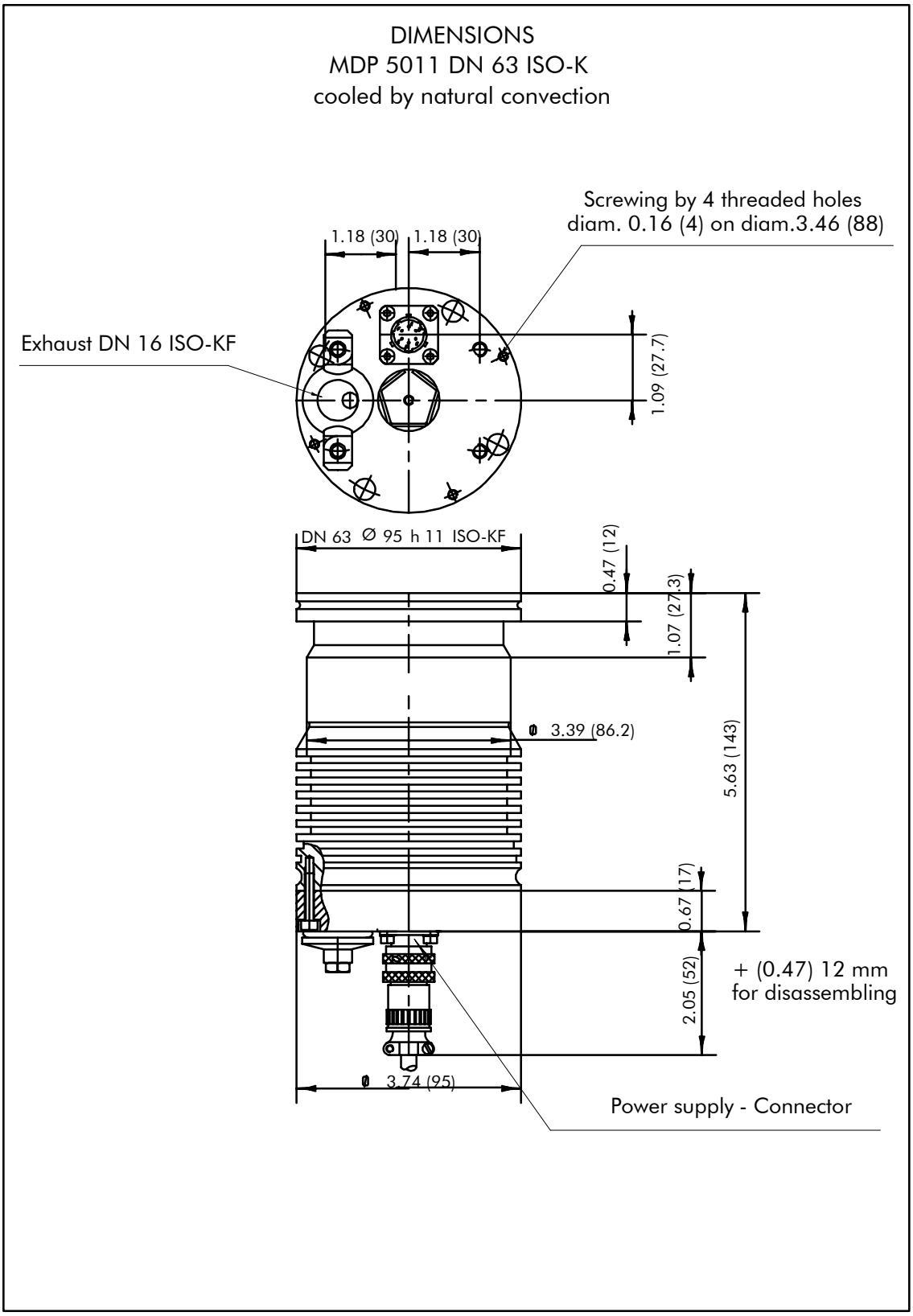
Pump dimensions



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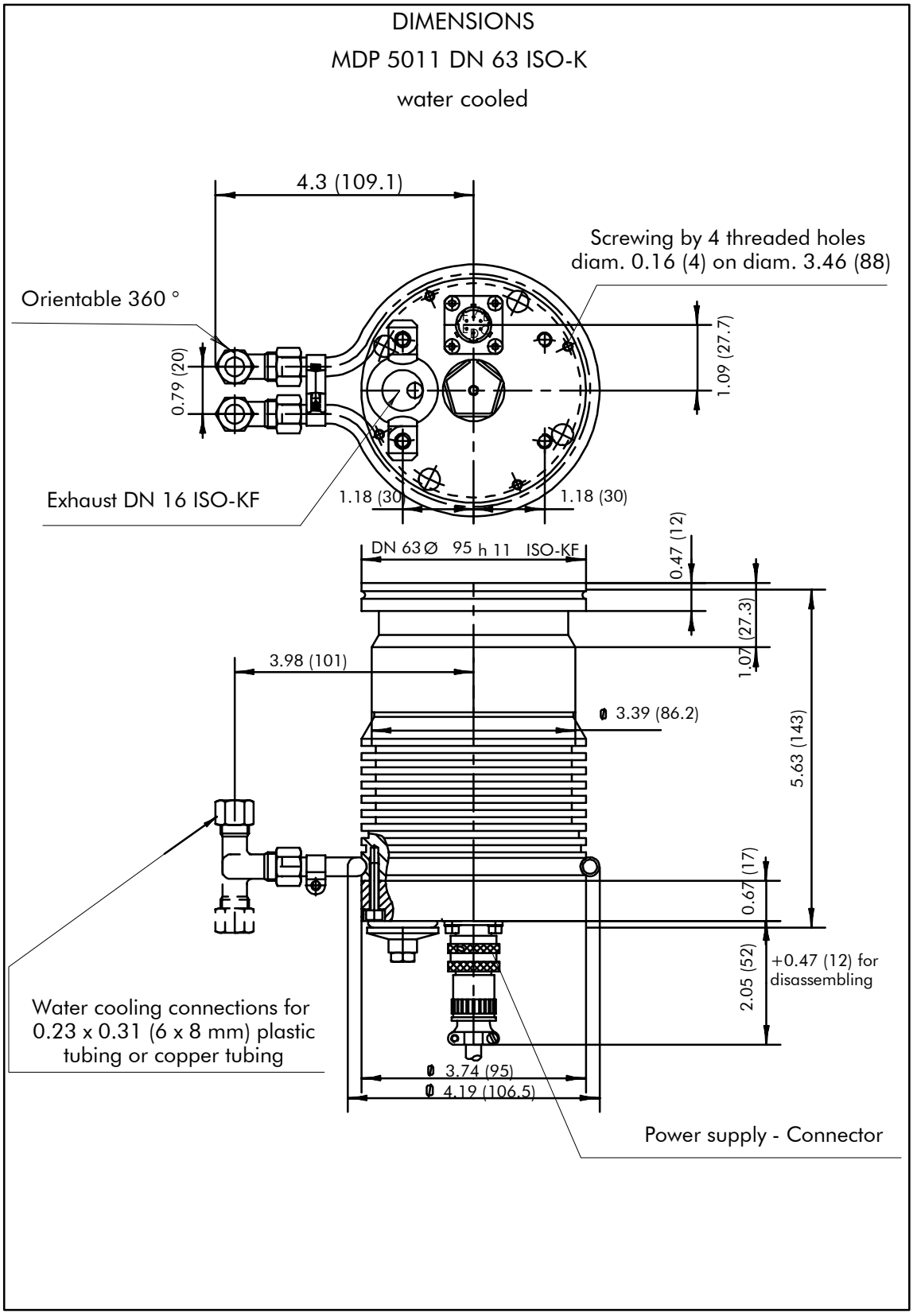
Pump dimensions



Edition 01 - Sep 2004
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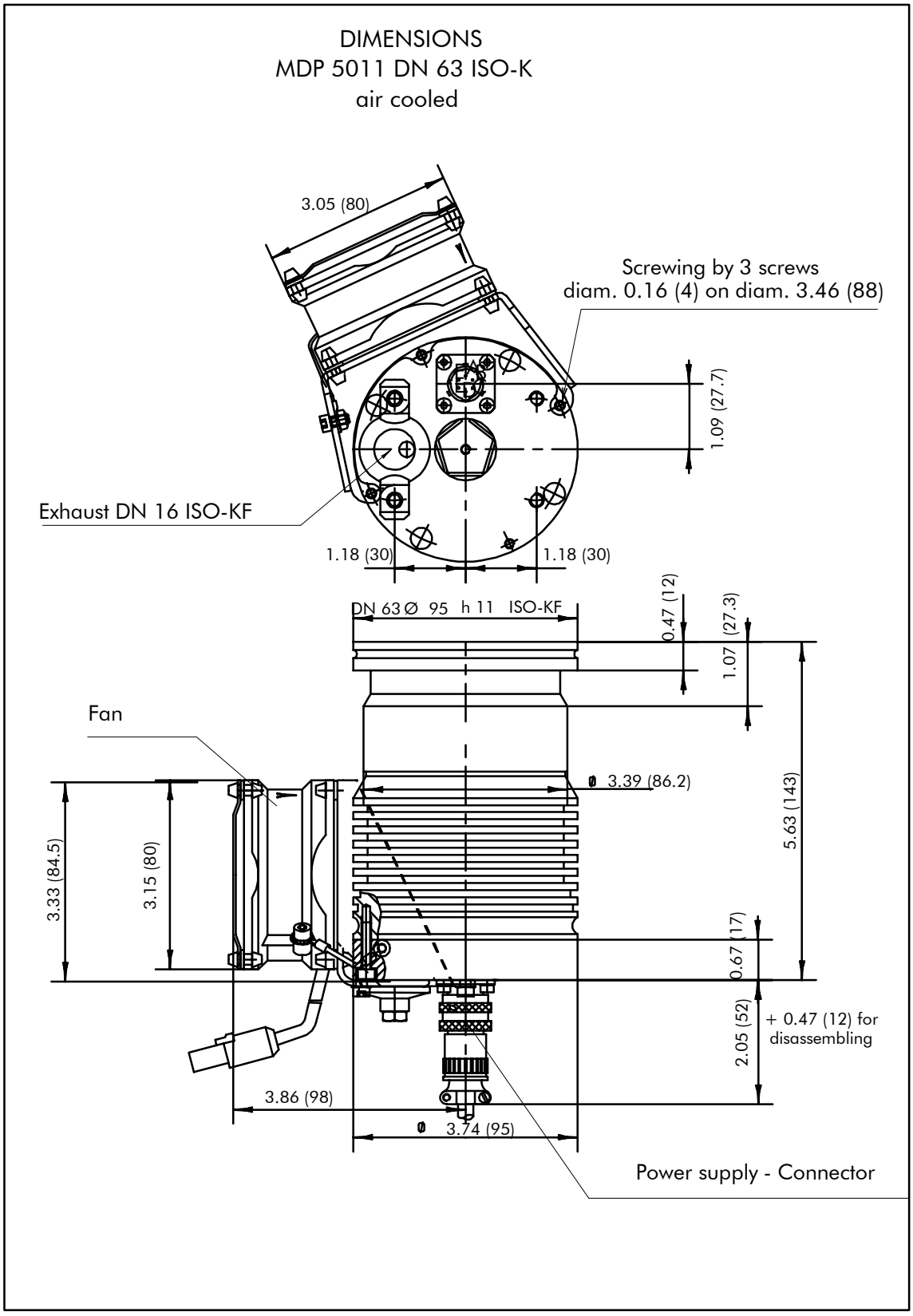
Pump dimensions



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MDP 5011 accessories

SCREEN FILTER: 2,5 MM

This filter protects the pump against solid particles ≥2.5 mm.

Inlet flange (2.5 mm)	P/N
DN 63 ISO-K	**063117**

COMPACT FILTER: 25 MICRONS

The filter stops particles ≥ 25 microns and is used in the event of high densities of dust or risk of implosion when pumping tubes or lamps.

Inlet flange (25 microns)	P/N
DN 63 ISO-K	**062912**

ELECTRICAL VENTING VALVE

This valve is used to refill the pump with air after pump stopping or after a power failure. Valve DN 16 is powered by the mains.

Electrical venting valve DN16 ISO-KF (Voltage available)	P/N
100 V - 50/60 Hz	**063165**
115 V - 60 Hz	**063171**
200 V - 50/60 Hz	**063173**
220 V - 50 Hz	**063169**
240 V - 50/60 Hz	**063172**

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Chapter B

User's manual of MDP 5011 molecular pumps

START-UP

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Safety instructions

CAUTION	**Indicates a potentially hazardous situation which, if not avoided, could result in property damage.**
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⚠ WARNING	**Indicates a potentially hazardous situation which, if not avoided, could result in death or severe injury.**
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Before switching on the pump, the user should study the manual and follow the safety instructions listed in this manual.

UNPACKING

To keep your product in the clean condition in which it left our factory, we recommend unpacking the pump at the site of installation.

Make sure that the equipment has not been damaged during the transport. It it has been damaged, take the necessary steps with the carrier and inform the manufacturer if nessary. In all cases, we recommend that you keep the packaging (reprocessing material) to transport the equipment or for prolonged storage.

STORAGE

⚠ CAUTION

Our equipment can be stored without special precautions (ambient temperature between 5 and 40 °C) provided that the running-in procedure specified in the manual is observed for the first operation of the pump.

⚠ CAUTION

In case of long period of storage (more than 6 months), o-rings and grease could be damaged. In this case, contact the customer service to perform preventive maintenance.

The seal kits must be stored away from heat and light (direct sunlight and ultra violet radiation) in order to prevent any hardening of the elastomer.

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Safety instructions

INSTALLATION - START UP

CAUTION	**The controllers are designed to guarantee safety under normal operating conditions (use in rack). In specific cases of use on tables, make sure that no objects enter the ventilation openings or block the openings when handling the units.**
CAUTION	**Our products are designed to comply with current EEC regulations. Any modification of the product made by the user is liable to cause non-compliance with these regulations, or reduce the EMC (electromagnetic compatibility) performance and the safety of the product. The manufacturer declines any responsibility for such modifications.**
⚠ CAUTION	**Certain controllers can be configured to start up automatically after a power cut. It is the user's responsibility to take all the precautions necessary to prevent the risks resulting from this type of operation.**
⚠ WARNING	**Before performing any maintenance operations on the product, isolate the product from the various energy sources (electricity, compressed air, etc.).**
⚠ CAUTION	**The EMC performance of the product is obtained when the installation complies with EMC rules. In particular, it is essential to:** **- use shielded cables and connections for interfaces,** **- stabilise the power supply line with meshing from the power supply source to a distance of 3 m from the product inlet.**
⚠ WARNING	**When switching off an item of equipment containing loaded capacitors at over 60 VDC or 25 VAC, take precautions concerning the access to the connector pins (single-phase motors, equipment with mains filter, frequency converter, monitoring unit, etc.).**
⚠ WARNING	**Risk of toppling over: although compliance with EEC safety regulations is guaranteed (normal range ±10 °), it is recommended to take precautions against the risk of toppling over during handling, installation and operation.**
⚠ CAUTION	**The performance and the operational safety of this product are guaranteed provided that it is used in normal operating conditions.**

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GB 0725

Safety instructions

INSTALLATION - START UP (CTD)

⚠ WARNING

The vacuum pump is also a compressor: incorrect use may be dangerous.
Study the user manual before starting up the pump.

⚠ DANGER

The access to the rotor of a turbomolecular pump with an unconnected intake is dangerous. Similarly, if the pump is not switched on, its rotor may be rotate by a primary pump which is in operation.

CAUTION

Make sure that the parts or chambers connected to the intake of our pumps withstand a negative pressure of 1 bar in relation to the atmospheric pressure.

⚠ WARNING

The air tightness of the products is guaranteed when they leave the factory for normal operating conditions. It is the user's responsibility to maintain the level of airtightness particularly when pumping dangerous gases.

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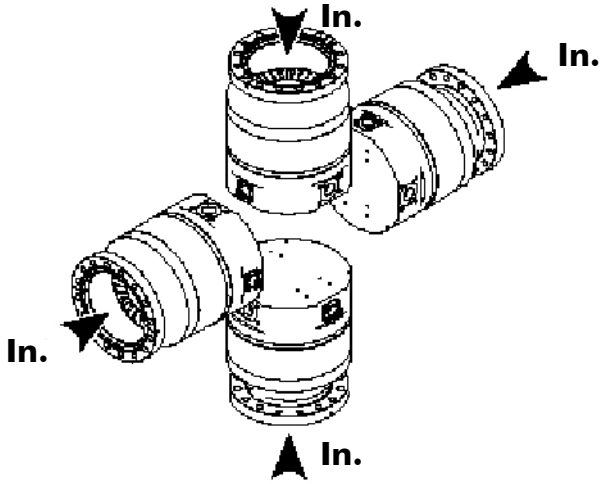
GB 00725

Pump connection to an installation

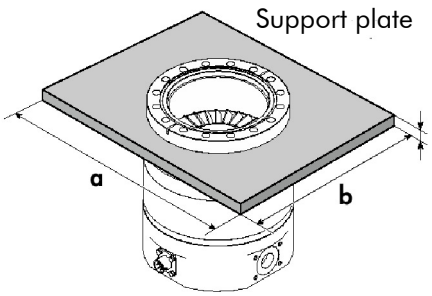
The pump can operate in any position

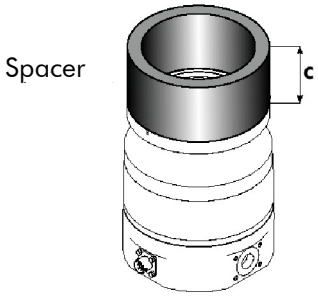


The connection of the pump to the installation must be sufficiently rigid

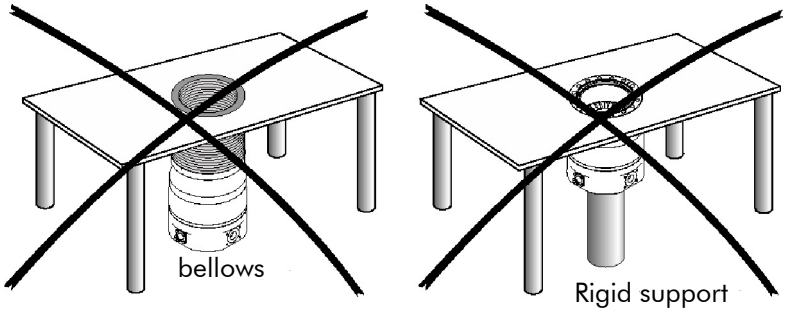
The dimensions of the connection parts should be study carefully: reduce the following as much as possible:

- dimensions **a** and **b** the flexibility of the connection plate
- the overhang **c** between the pump and its anchor point.





some examples of unrecommanded conncections



⚠ WARNING

The equipment attachment devices should be sufficiently rigid to prevent potential risks in the event of failure of a rotary component or a violent shock on the pump (exceptional phenomena). For this use the rotary flange attachment holes. If the inlet flange is attached with claw clamps, use 4 claw clamps.

Edition 01 - Sep 2004
GB 02602

Pump connection to an installation

COOLING RECOMMENDATIONS AND TEMPERATURE LIMITS

Ambient operating temperature

T< 95 °F	Natural convection or air cooled
T< 122 °F	Water cooled

PUMPING CONDITIONS

In cases of high pressure pumping or frequent cycling, the pump temperature is higher, so water or air cooling are recommended.

PUMP LINE CONNECTIONS

⚠ WARNING

Remove the protective parts blocking the inlet, exhaust and, if applicable, purge openings; these components prevent foreign bodies from entering the pump during transport and storage. It is dangerous to leave them on the pump during operation.

Inlet

Install the screen filter or compact filter accessory on the pump; connect the pump to the installation (1).

Inlet flange

DN 63 ISO-KF

Exhaust

Connect the Air inlet valve accessory to the pump.
Connect the pump to primary pumping circuit (1).

Exhauxt flange

DN 16 ISO-KF

(1) Different connection accessories can be found in the Manufacturer's catalog.

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GB 02602

Nitrogen purge connection (MDP 5011CP)

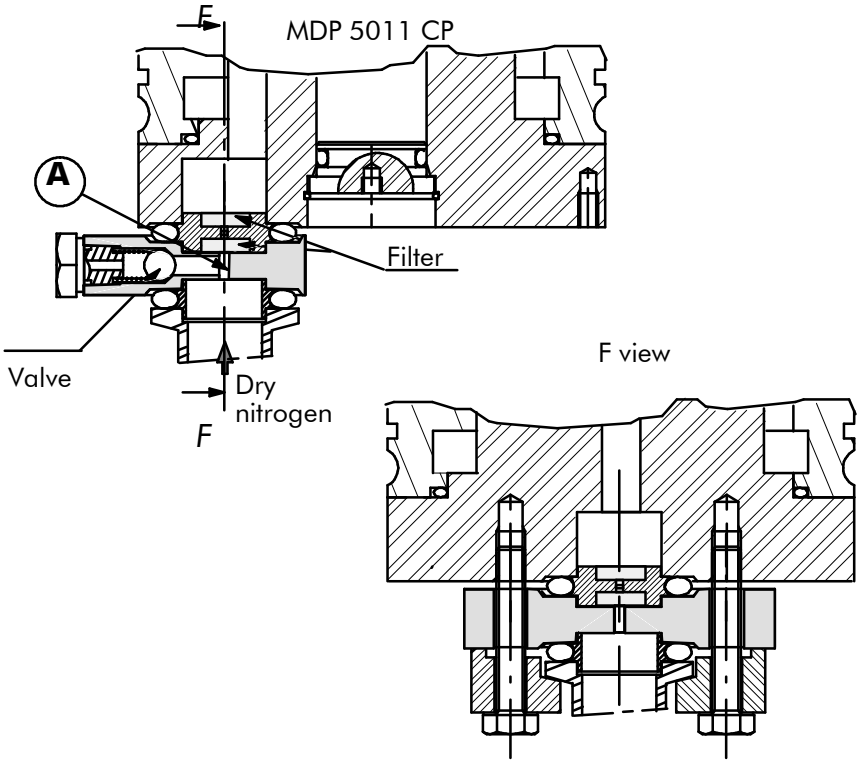
For proper protection from reactive gases and particles the inert gas purge system must be used continuously.

We recommend a nitrogen source that is dry (dew point of 22 °C at atmospheric pressure), and properly filtered (particles < 1 µm and oil < 0,1 ppm).

- The cleanliness of the gas line must be correct.
- The purge gas line must have an DN16 ISO-KF fitting to connect it directly to the MDP with a centering ring and quick connect clamp.

Note : if the pressure in the purge gas line is greater than 1.4 bar (20.5 psi) absolute the check valve automatically opens in order to limit the flow into the MDP to 50 sccm.We recommend that the pressure of the purge line be set at 1 to 1.3 bar (15 to 19 psi) absolute to avoid wasting the purge gas.

If the pressure of the purge line exceeds 1.3 bar (15 psi) absolute the performance of the pump will be affected.



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Venting valve connection

⚠ CAUTION

Check the solenoid valve voltage : it must be compatible with line voltage (see section A510).

It consists of :

A solenoïd valve normally open (NO) mounted on a DN 16 ISO-KF flanged fitting.

The fitting is installed between the outlet flange of the MDP and the foreline of the primary pump.

Connect the solenoïd valve cable to the J connector of the ACT 100 controller.

If there is a power failure, this device vents the MDP pump to atmosphere to prevent oil contamination from the roughing pump.

If the user want to make a venting, he must :

- press the "STOP" switch on the ACT 100 controller.
- Disconnect the power cable on the ACT 100 controller.

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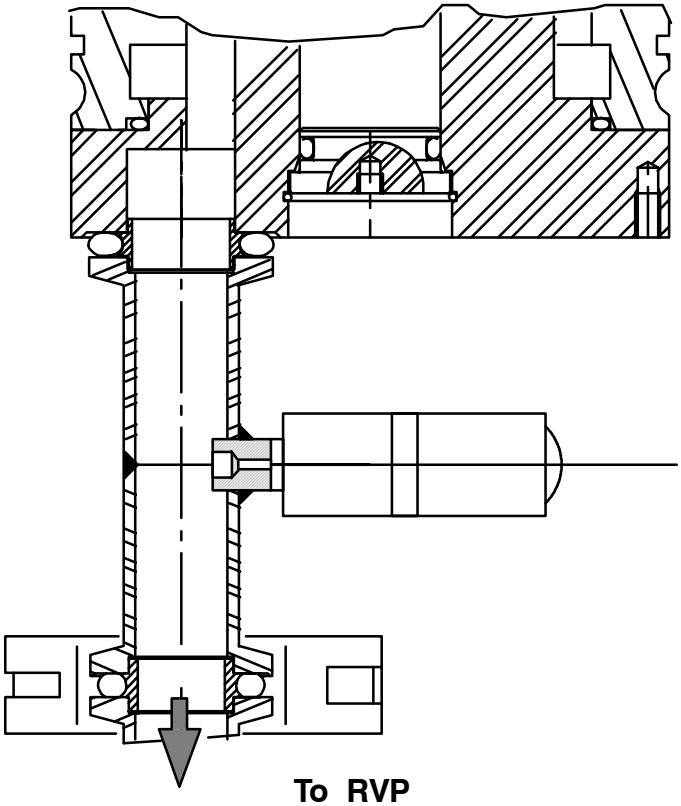
Venting valve system



GB 02604 Edition 01 - Sep 2004

Water cooling connection

CHARACTERISTICS OF WATER COOLING

In order to limit the corrosion and clogging of the cooling pipes, it is recommended to use cooling water with the following characteristics:
- Treated soft water or non-corrosive industrial water.
- pH between 7.5 and 11.
- Hardness <7 milli-equivalent/dm ^{3} (28 mg CaO or 50 mg $CaCo_3$ per liter water) = 3.5 mmol/l (100mg Ca Co_3 per liter water)
- Resistivity >1500 Ω.cm.
- Solid pollution <100 mg/dm ^{3} .
- Max.pressure: 7 bars.
- Temperature: 50 °F< T <77°F

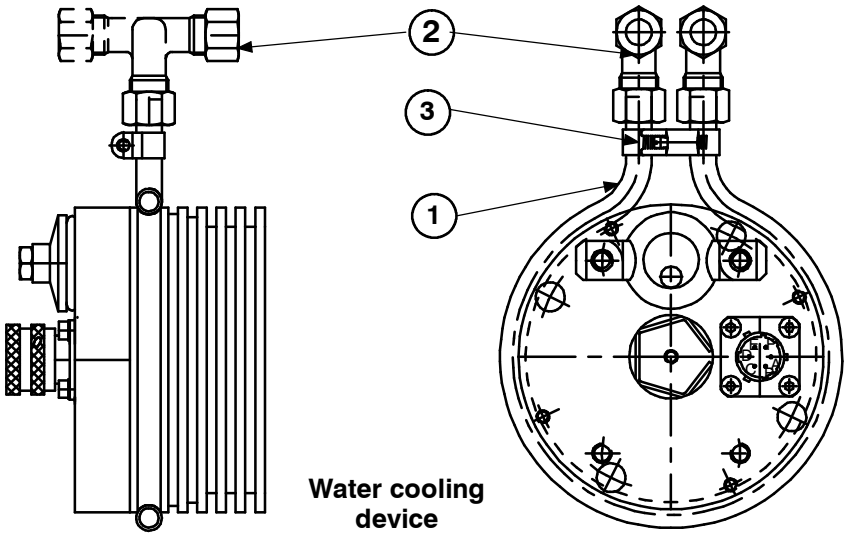
CONNECTION

Provide a water inlet pipe and a tap to adjust the flow rate.

It consists of a water circulator ring which can be equipped on the MDP housing.

It is recommended for use at ambient temperature between 95 and 122 °F, or in continuous use at high pressure.

When the air cooling device must be replaced by a water cooling device, proceed as follows:
- Install the cooling ring (1) on the MDP housing in the specific groove and put it facing the water line.
- Screw the 2 water fittings (2) to the cooling ring and orientate them.
- Secure the device by screwing the hose clamp (3) with a screwdriver : the cooling ring does not rotate.



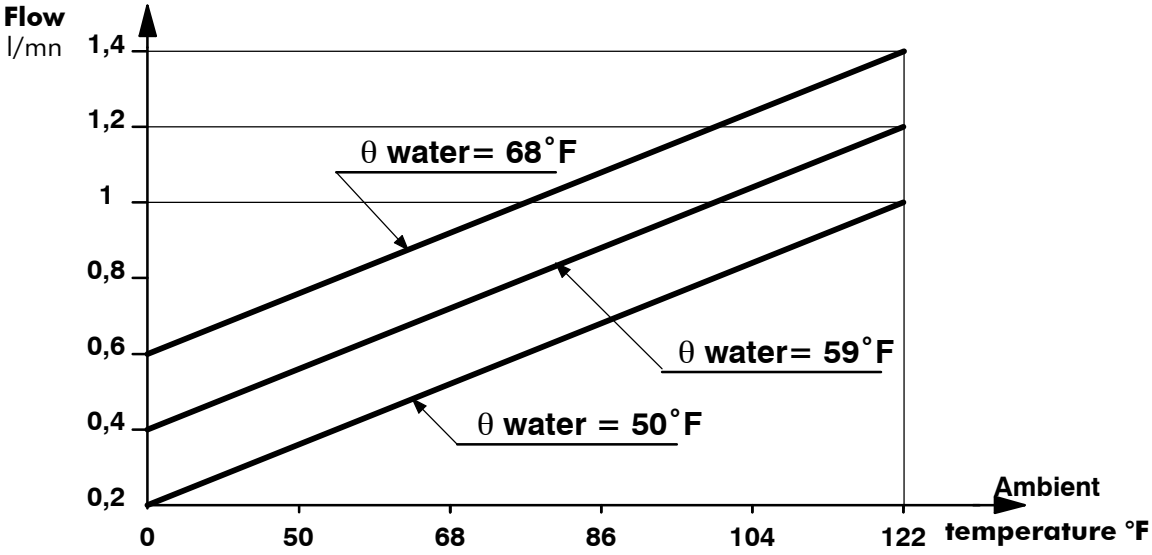
Water cooling device

Edition 02 - March 06
GB 02603

Water cooling connection

Connection to the water line

- Use a flexible or a rigid 6 x 8 mm hose to connect one of the water fittings to the water line. The user must provide some method of controlling water flow.
- Use a flexible or a rigid 6 x 8 mm hose to connect the other fitting to the drain.
- Control the flow of water depending on ambient temperature, and water temperature using the following graph.



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Air cooling kit connection

Air cooling kit:

When the water cooling kit must be replaced by an air cooling device, proceed as follows :

- Install the fan on the pump housing by a bracket. This last is assembled on the pump rear tape with 3 screws M4 (refer **section A40**1 - 3/3).
- Connect the contact plug of the minus wire to a fan assembling screw.

Electrical connection

- Connect the fan cable to the K connector of the controller.

The fan provides sufficient cooling for ambient temperature up to 95 °F.
If the ambient temperature is above 95 °F, the user should install a water cooling collar.

It is recommended for use at ambient temperature between 95 and 132 ° F, or in continuous use at high pressure.

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Chapter C

User's manual of MDP 5011 molecular pumps

OPERATION

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Safety instructions for product use

⚠ WARNING	**Before to use the controller, make sure that the mechanical and electrical connections have been made (see chapters from pump and controller's manuals).**
⚠ CAUTION	**When the pump is new, or after a prolonged shut-down of 3 months or more (under normal storage conditions), it is recommended to operate the pump at atmospheric pressure for 10 minutes (inlet and exhaust open to atmosphere) in order to ensure a slow rotation and grease re-distribution in the pump ball-bearings.**
⚠ DANGER	**The access to the rotor of a molecular pump with an unconnected inlet is dangerous. Similarly, if the pump is not switched on, it may be driven by another pump in operation (risk of injury).**
⚠ WARNING	**The pumps are designed so as not to present a thermal risk for the user's safety. However, specific operating conditions can generate temperatures which require particular care to be taken by the user (external surfaces >70 °C).**
CAUTION	**Avoid moving or causing a shock on a pump in operation. There is a risk of seizure if the pump rotates in an axis perpendicular to its axis of rotation.**
CAUTION	**The controller should never be switched off as long as the rotor of the pump is moving.**
CAUTION	**It is highly recommended to install:** ■ **a screen filter at the pump inlet,** ■ **an isolation valve between the chamber to be pumped and the pump,** ■ **an isolation valve between the pump and the roughing pump.**

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C 150

Molecular pump operation in a pumping application

FIRST PUMP START-UP

⚠ CAUTION

When the pump is new, or after a prolonged shut-down of 3 months or more (under normal storage conditions), it is recommended to operate the pump at atmospheric pressure for 10 minutes (inlet and exhaust open to atmosphere) in order to ensure a slow rotation and grease re-distribution in the pump ball-bearings.

⚠ DANGER

The access to the rotor of a molecular pump with an unconnected inlet is dangerous. Similarly, if the pump is not switched on, it may be driven by another pump in operation (risk of injury).

SAFETY INSTRUCTIONS FOR PRODUCT USE

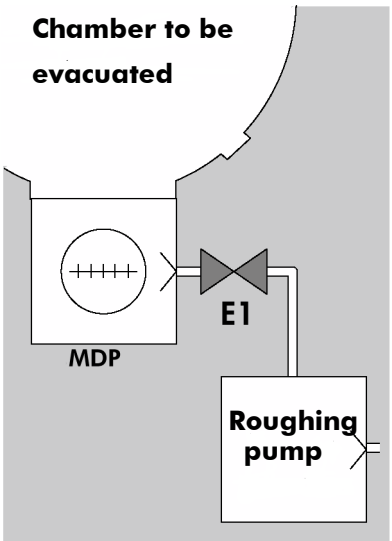
Refer to section **C100** of this manual.

EXAMPLE OF A SINGLE VALVE ASSEMBLY

The chamber and pipes are at atmospheric pressure, the pumps are switched off, the valves are closed

Start-up:
- start up the MDP cooling system
- open the E1 valve
- start up the primary pump
- start up the MDP pump.

Stop:
- close E1
- stop the primary pump
- stop the MDP pump
- stop the cooling system.



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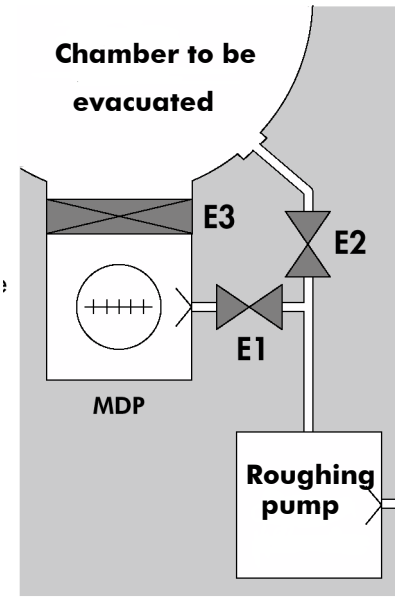
Molecular pump operation in a pumping application

EXAMPLE OF A 3 VALVE ASSEMBLY (EXAMPLE 1)

The chamber and pipes are at atmospheric pressure, the pumps are off, the valves are closed.

Pre-evacuation of the chamber:
- start up the primary pump
- start up the MDP cooling system
- open the E2 valve.

When the pressure in the chamber is ≤1mbar, the secondary pumping can be started up:
- close E2
- start up the MDP pump
- open E1 and E3.



EXAMPLE OF A 3 VALVE ASSEMBLY (EXAMPLE 2)

The chamber in atmospheric , the pumps are operating, the valves E2 and E3 are closed, the cooling circuit is operating.

Pre-evacuation of the chamber:
- close E1 and open E2.

The pressure in the chamber is ≤ 1mbar :
- close E2
- open E1 and E3.

TO REFILL THE CHAMBER WITH AIR

Close the E3 valve (E1 remains open) and open an air inlet on the chamber.

TO STOP PUMPING

Pumps are isolated by closing the valves.
- close the E3 valve

MDP pump and primary pump rotating
- stop the MDP pump
- close the E1 valve
- stop the primary pump.
- stop the cooling circuit.

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Chapter D

User's manual of MDP 5011 molecular pumps

MAINTENANCE

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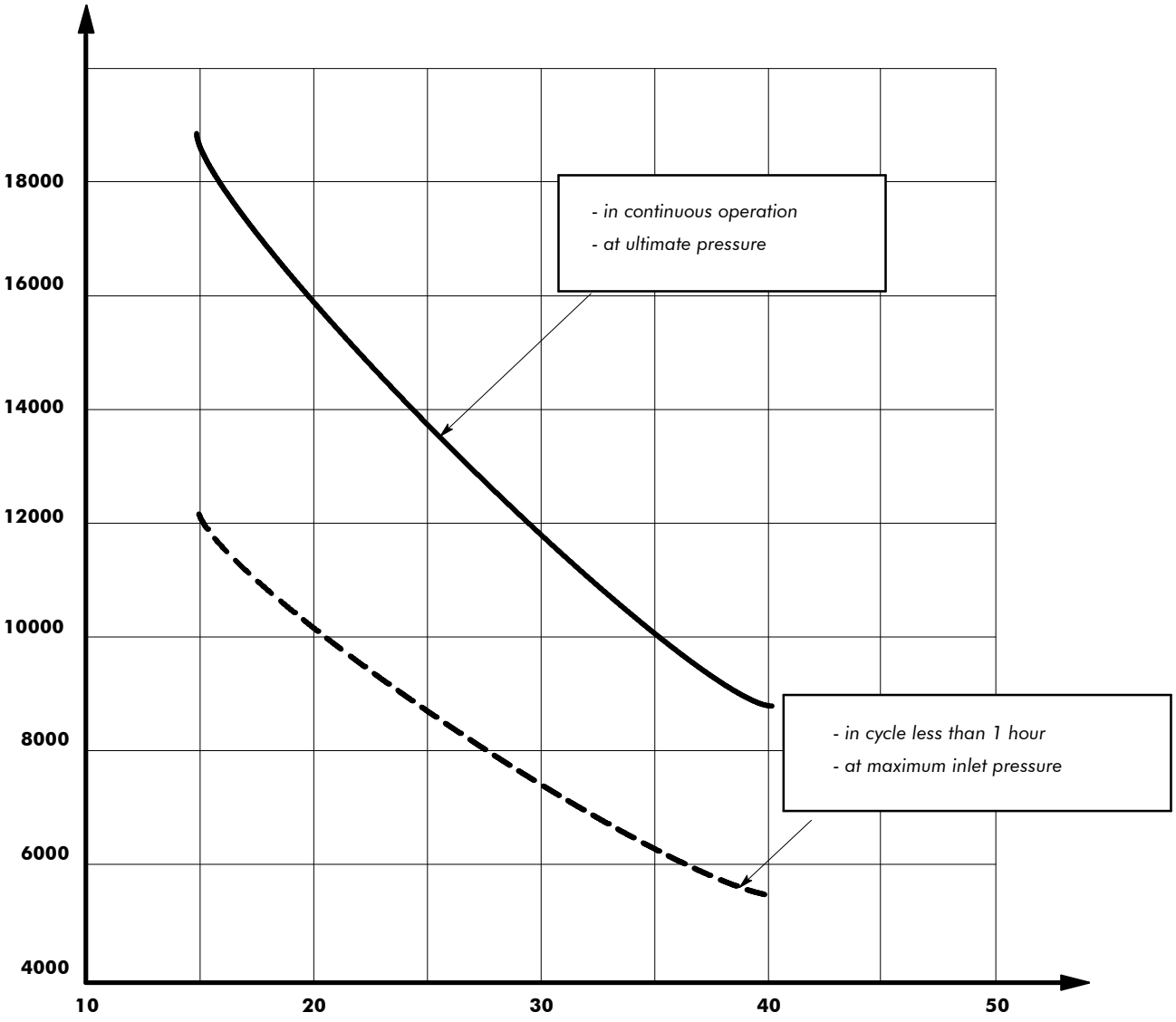
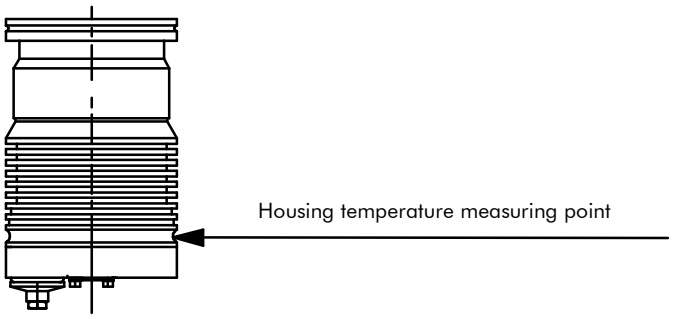
MDP 5011 pump maintenance frequency

Example : for use at 20 °C housing temperature, in continuous operation, at ultimate pressure :
- **16000 h :** 1st lubrication
- **32000 h :** 2nd lubrication
- **48000 h :** disassemble the MDP, replace the ball bearings.

Relubrication schedule (hours)





GB 02609 Edition 01 - - Sep 2004

Safety recommendations related to maintenance

⚠ WARNING

Standard precautions before any maintenance operation: before performing a maintenance operation, switch off the product by setting the main switch to "0", disconnect the main cable.

⚠ WARNING

Before any intervention on a corrosive pump model (C, CP or Ci), we advise to prolonge the N_2 flow for 30 min.

⚠ WARNING

After pumping on corrosive or toxic gases, in case of pump return for repair, it is strongly recommended to seal the pump with blank flanges and fill in the safety questionnaire (refer to G200).

⚠ WARNING

Before any maintenance operation, check the pumping conditions of the installation: toxicity, possible corrosion of the pumped gases. Depending on the case, we recommend:
- to purge the pumping installation with dry nitrogen before any intervention
- to wear gloves, goggles and breathing masks, if necessary
- to ventilate the room well and disassemble the equipment under a fume hood.

⚠ DANGER

During maintenance, operator could be in contact with residues from exhaust port or with contaminated sub products which could cause severe injury or death. Always wear gloves, protective glasses and breathing mask.

⚠ WARNING

The airtightness of the products is guaranteed when they leave the factory for normal operating conditions. It is the user's responsibility to maintain the level of airtightness particularly when pumping dangerous gases.

⚠ WARNING

After a complete maintenance operation, it is recommended to perform a helium airtightness test.

Edition 02 - March 06

GB 02610

MDP 5011 pump lubrication

The first lubrication required for the correct operation of MDP pumps is performed in the factory. Subsequent lubrications should be performed according to the procedure below and according to a frequency defined as a function of processes used (see **section D300**).

Only use the grease recommended by the manufacturer and contained in the lubrication syringe (see **section F100**).

⚠ CAUTION

Avoid introducing foreign matter into the pump during these operations. Lubrication must be performed with the pump switched off.

Use of the lubrication syringe

The ATH contains two bearings which must both be reloaded with grease at each relubrication period.

The syringe is equipped with two jumpers with different widths and colours (red and black) **used to proportion the grease accurately for each pump bearing** (see figure page 2/3).

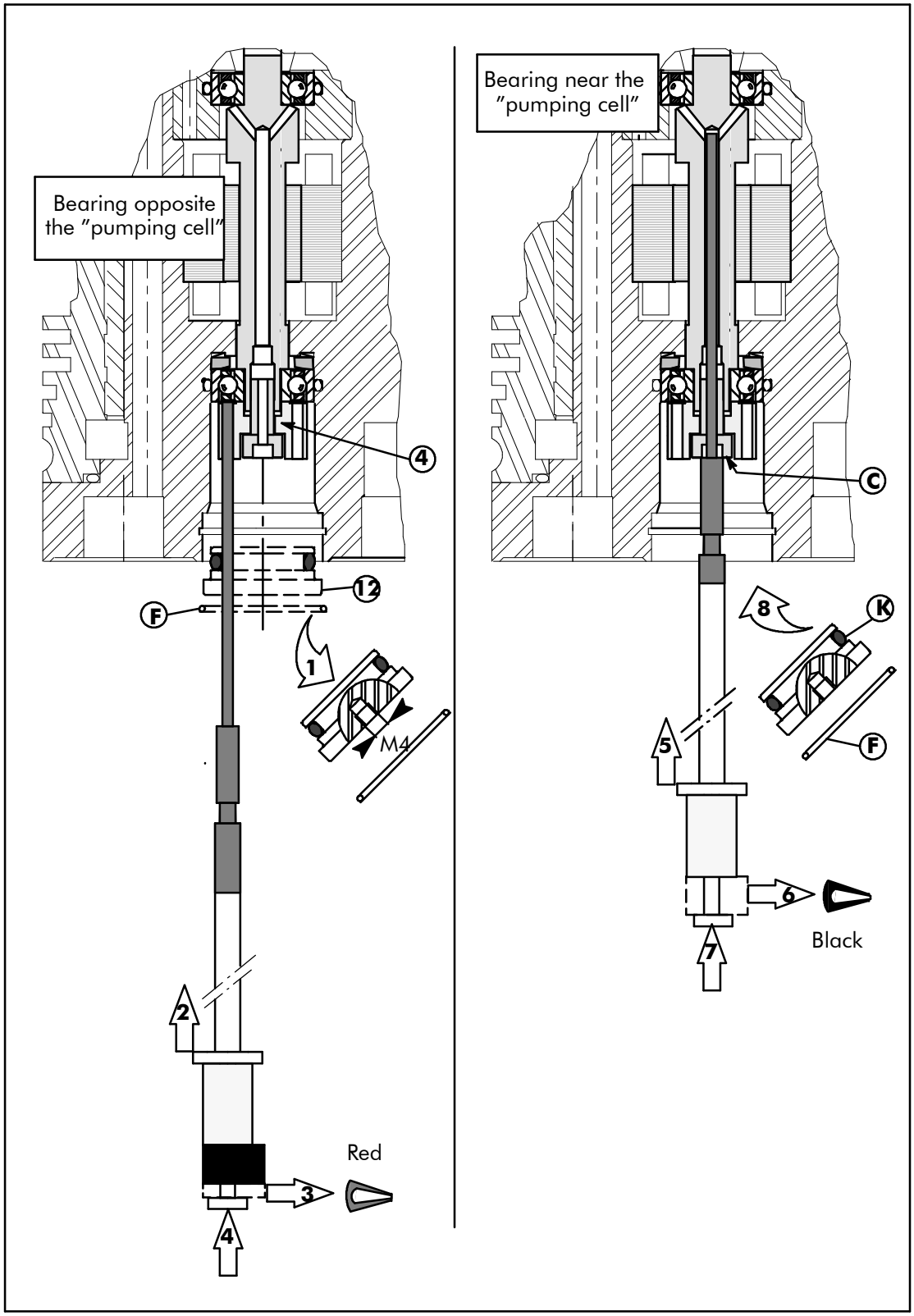
- Lubrication of bearing on the pumping cell side: **black jumper.**
- Lubrication of bearing opposite the pumping cell side: **red jumper.**

Edition 02 - March 06

GB 02611

MDP 5011 pump lubrication

RELUBRICATION PROCESS



Edition 02 - March 06
GB 02611

MDP 5011 pump lubrication

BEARING LUBRICATION

- Stop the MDP pump and the primary pump.
- Vent the MDP pump to atmospheric pressure.
- Remove the lock pin (F).
- Tighten a screw M4 in the thread of the end cap (12) and remove it.

Bearing opposite the pumping cell

- Introduce the syringe equipped with its needle into a hole of the ring (4) and remove the red jumper.
- Distribute the dose of grease in 2 diametrically opposed points, until the syringe plunger comes to a stop against the black jumper.

Bearing on pumping cell side

- Introduce the lubrication syringe needle into the drilled screw located at the center of the rotor until it comes to a stop against the screw head.
- Keep the syringe pressed down to the bottom of its housing throughout the operation.
- Remove the black jumper from the syringe and introduce the grease until the plunger comes to a stop.
- Remove the syringe.
- Reassemble the end cap (12) and the lock pin (F) .

The relubrication operation is complete.

Execute the pump running-in (See **section E 30**0).

Edition 02 - March 06

Gb 02611

MPD 5011 running-in using ACT 100 controller

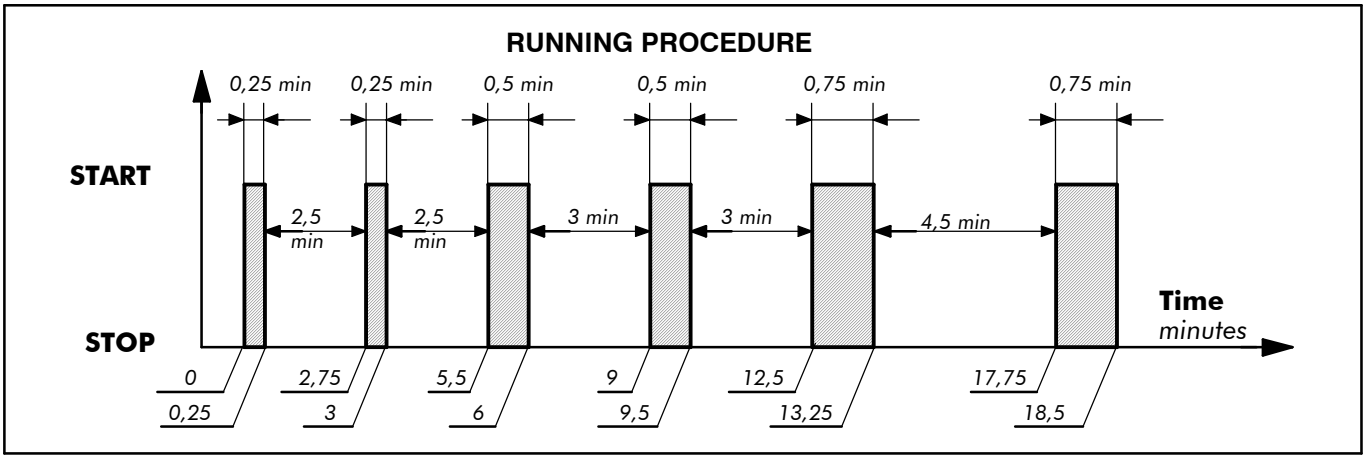
Start the MDP to atmospheric pressure for 6 min. as follows .

Disconnect the primary pump from MDP (vacuum connection).

at time t = 0, press "start" button
at time t = 3 min, press "stop" button
1st cycle

at time t = 6 min, press "start" button
at time t = 9 min, press "stop" button
2nd cycle

Complete the running-in with the following cycles, after first having connected and started up the primary pump :



Edition 01 -- Sep 2004
GB 02612

Spare parts - Instructions of use

REPLACEMENT OF PARTS AND USE OF NON GENUINE PARTS

Our products are designed to comply with current EC regulations and guarantee optimal operating conditions with maximum safety conditions for the user.

Any modification of the product made by the user is liable to lead to non-compliance with the regulations, or even to put into doubt the performance of the product and the user's safety.

Replacement of defective components by other parts than genuine parts, and use of these parts, jeopardize the initial safety conditions of the equipment.

In such case, the EC declaration of conformity becomes null : AVTF withdraws his responsability for such operations.

Besides, counterfeiting and unfair trading of parts are condemned under the civil and criminal laws.

AVTF urges users not to take parts in the use of "imitations", in the misappropriation and pirating of intellectual property performed by some dishonest operators.

AVTF supplies maintenance components, spare parts or kits to perform the maintenance of its products (**see chapter F**).

Edition 02 - Sept 03

GB 01390

MDP 5011 first level of maintenance

LUBRICATION SYRINGE

Ready-to-use, it contains the grease load required for a regreasing operation on the 2 bearings.

P/N : 056993

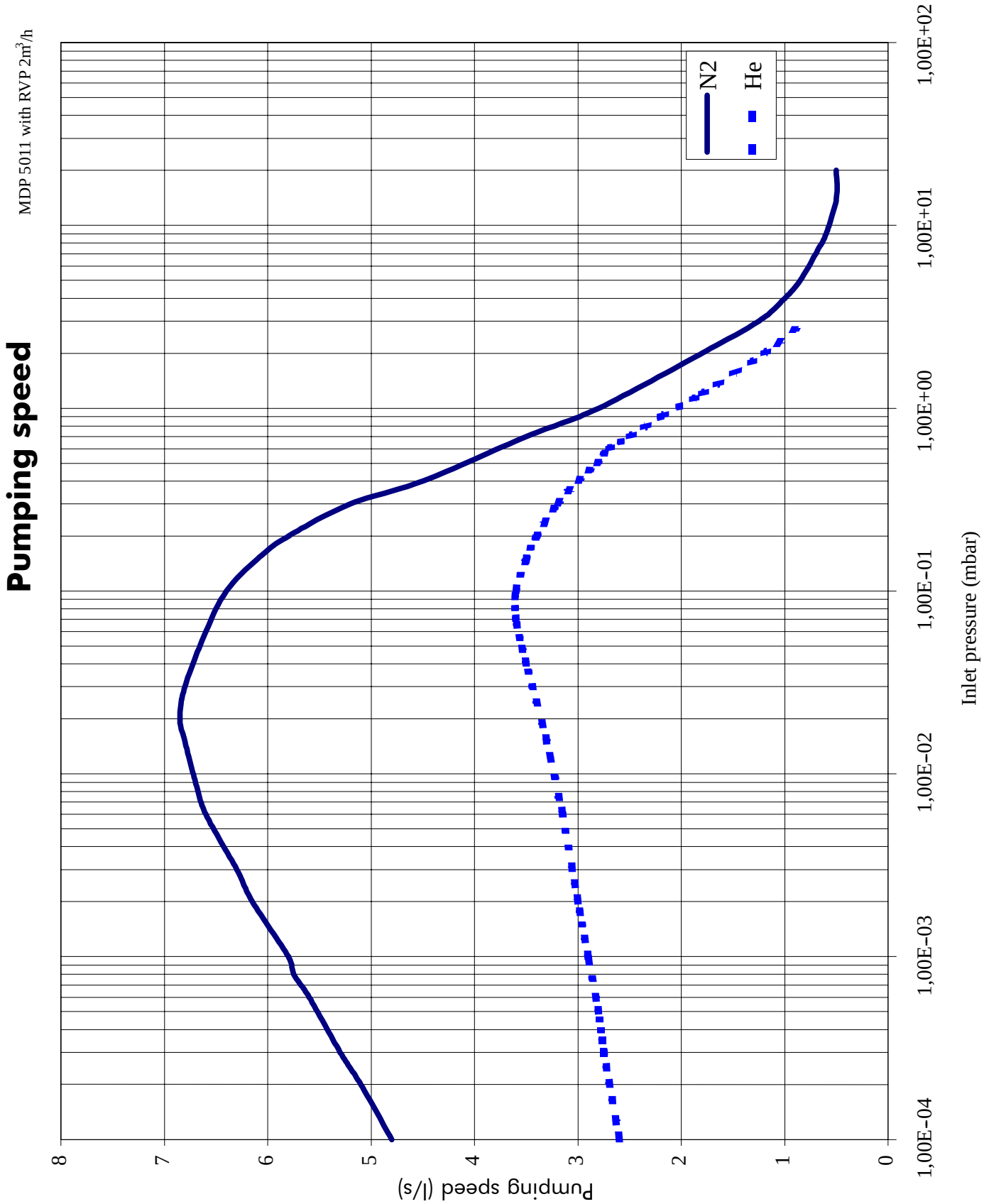
AIR INLET ELECTROVALVES ACCESSORIES

Description	P/N
Electrovalve coil 240 V 50/60 Hz	**038124**
Electrovalve coil 220 V 50 Hz	**038121**
Electrovalve coil 200 V 50/60 Hz	**038125**
Electrovalve coil 115 V 60 Hz	**038122**
Electrovalve coil 100 V 50/60 Hz	**038126**
Electrovalve operator	**038102**
Silencer	**075990**

Edition 02 - March 06

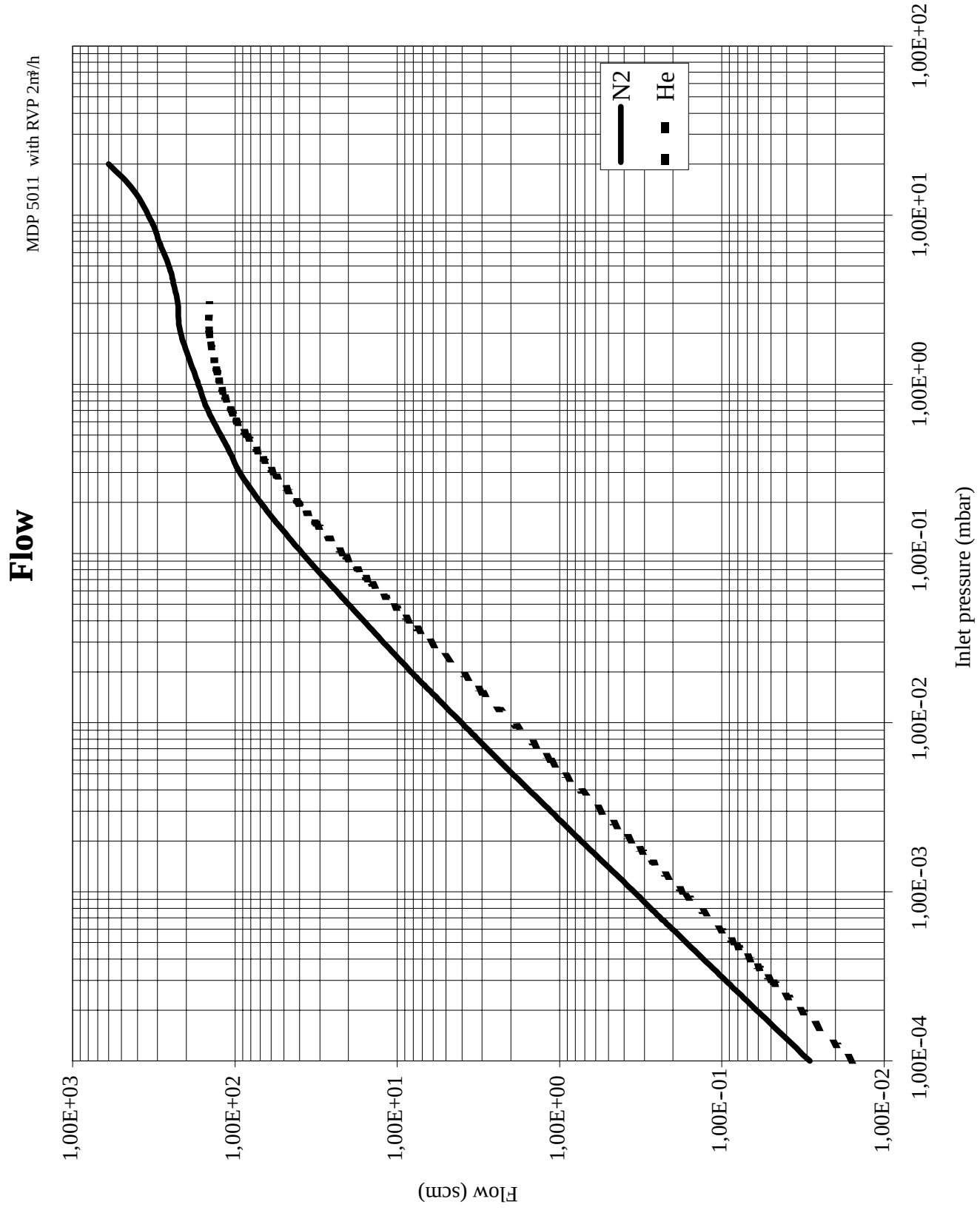
Gb 02613

Pumping curves



GB 02623 Edition 01 - - Sep 2004

Pumping curves



GB 02623 Edition 01 - Sep 2004

Safety questionnaire

Procedure for returning ADIXEN vacuum pumps and helium leak detectors

You wish to return an Alcatel vacuum pump or helium leak detector for maintenance. The equipment will be dismantled and possibly cleaned by a technician from our Service Centre.
In compliance with European Community's L360 directives , French labor code L231 - R231 and Federal OSHA Safety Standard 1910-1200, Alcatel Vacuum Technology requires this form to be completed to preclude the potential health risk to its service personnel that can occur when receiving, disassembling, or repairing potentially contaminated products.

Equipment returned without this form completed and secured to outside of package will be returned to customer unprocessed.
Equipment must be drained of fluids and residue, securely packaged and shipped prepaid. Concerning the closing of the ports (inlet & outlets of the product), metallic airtight blank flanges should be used if toxic or copper gases have been pumped.

We wish to draw your attention to the following points:

- **The risk may be of the following nature:**

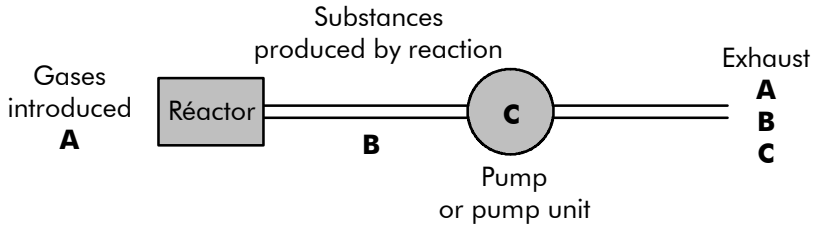
  Chemical: Danger to health, risks of explosion, fire, risks for the environment. Please indicate the chemical formula and name of the gases or substances that have been in contact with the equipment (pump or helium detector).

  Biological: Pathogenic germs, micro-organisms (bacteria, viruses, etc.) classes 1 to 4 and group E. We are currently unable to deal with contamination of this sort without risk to the safery of our staff. If your equipment has been contaminated in this way, contact us so that we can try to find a solution together.

  Radioactive: Contact us in this case.

  Copper contamination : Copper based by products formed in sputtering or etching processes are considered as a poison in some semi-conductor processes .

⚠ WARNING **In the event of chemical contamination, please indicate the following gases or substances:**



- Gases (or substances) introduced into the reactor and which may be found at the exhaust (A).
- Gases (or substances) resulting from the reaction or process (B).
- Gases (or substances) that may possibly be formed inside the pump (due to a thermodynamic or chemical reaction, condensation, deposition, precipitation, etc.) (C).

- **Precautions need to be taken** before transferring contaminated pumps.
  Please contact customer service for recommendations.

Edition 03 - April 06
GB 00956

G 200

Safety questionnaire

Ce questionnaire est téléchargeable sur le site : www.adixen.com / This questionnaire can be downloaded from: www.adixen.com

Procédure de retour des pompes à Vide et Détecteur de Fuite à Hélium ADIXEN

(Ce formulaire ne peut être rempli et signé que par une personne habilitée)

Procedure for returning ADIXEN Vaccum Pumps and Helium Leak Detectors

(This questionnaire is only to be filled in and signed by an authorized person)

SOCIETE - COMPANY	**EQUIPEMENT - EQUIPEMENT**
Nom Société – Name of company :	Description : . . . . .
Nom personne – Name of person :	
(Qui remplit ce formulaire) – (Who has filled in questionnaire)	
Fonction – Position :	N° de Série – Serial no : . . . . .
N° Tél. – Tel. no :	Type de procédé – type of process : . . . . .
N° Fax – fax no:	(Pour lequel l'équipement est utilisé) – (for which equipement is used)
(Pour renseignements éventuels sur les produits utilisés) – (for any information on products used)	Date de l'expédition – Date of consignment : . . . . .

INTERVENTION - SERVICE

Intervention souhaitée (Révision, réparation,...) – Service required (overhaul, repair, etc.) :

Type d'anomalie constatée – Type of anomaly observed :

PROCEDE CUIVRE - COPPER PROCESS

Produit utilisé sur un procédé Cuivre - Product used on a Copper process Oui - Yes Non - no

ASPECT SECURITE – SAFETY ASPECT

L'équipement mentionné ci-dessus a été en contact avec les produits suivants – The above equipment has been in contact with the following substances :

(nom et formule chimique) – (name and chemical formula)

Ces produits présentent un risque de nature
These susbstances present the following risks

		Explication détaillée – Detailed explanation
Chimique – Chemical		Si "Oui" risque de nature – If "Yes", what type of risk
Toxique – Toxic	Oui – Yes Non – No	
Cancérigène - Carcinogenic	Oui – Yes Non – No	
Combustible - Combustible	Oui – Yes Non – No	
Corrosive - Corrosive	Oui – Yes Non – No	
Explosive - Explosive	Oui – Yes Non – No	
Biologique – Biological	Oui – Yes Non – No	
Radioactive – Radioactive	Oui – Yes Non – No	
Autre – Other		
(Vous reporter éventuellement à la page précédente) – (See preceding page if necessary)		

SIGNATURE

Vous avez répondu "Oui" à une des questions précédentes :

Je confirme que seules les substances précisées ont été en contact avec l'équipement sus-mentionné, et que les procédures de préparation, d'emballage, et de transport ont été respectées.

You have replied "yes" to one of the above questions:

I confirm that only the substances mentioned have been in contact with the above equipment and that the preparation, packing and transport procedures have been complied with.

Je confirme que le matériel sus-mentionné n'a été en contact avec aucune substance dangereuse, et a été vidé de son huile. (Si applicable)

I confirm that the above equipment has not been in contact with any dangerous substance and has been emptied of oil. (if applicable)

Réponse "**Oui**" (fermeture étanche de l'aspiration et du refoulement) Reply "**Yes**" (seal inlet and outlet ports with blank flanges)	Réponse "**Non**" (sans risque) Reply "**No**" (no risk)
Nom - Name :	Nom - Name : . . . . .
Fonction - Position :	Fonction - Position : . . . . .
Date :	Date : . . . . .
Signature autorisée – Authorised signature :	Signature autorisée – Authorised signature :
Tampon / Cachet Stamp / Seal	Tampon / Cachet Stamp / Seal

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Edition 03 - Avril 06

GB 000956

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