



MOLECULAR DRAG PUMPS
MDP SERIES



MDP 5011



If you need:

- to replace a rotary vane pump with a dry pump for an application at 10^{-3} mbar
- a turbopump that can operate up to 10 mbar
- a pump that can flow up to 400 SCCM

There is a pump that has been designed to operate efficiently under these conditions: the MDP 5011.

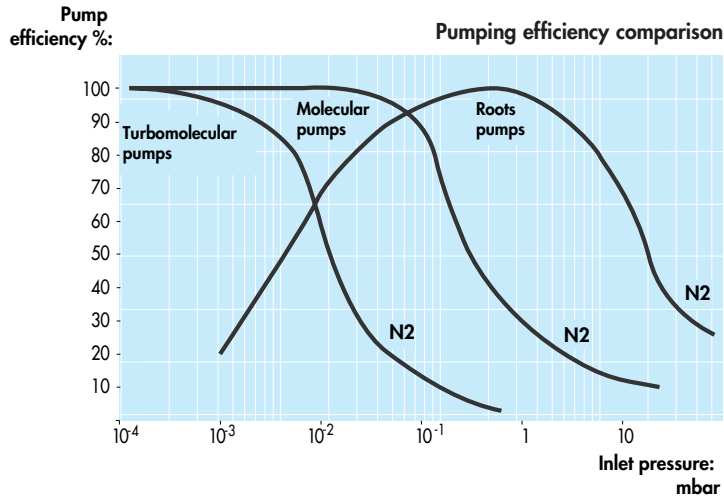
ONE OF A KIND PERFORMANCE

HIGH EXHAUST PRESSURE TOLERANCE

THE MOST ROBUST AND RELIABLE PUMP

ON-SITE MAINTENANCE

Light and compact



The MDP offers an ideal pumping solution between turbo and Roots pumps. This pump is the only one of its kind on the market.

The MDP 5011 is lightweight and compact making it the ideal dry pump for numerous applications, such as:

- Fast evacuation of small volumes
- Interseal pumping
- Regeneration of cryopumps
- Backing pump for turbomolecular pumps
- Leak detection
- High-quality freeze drying
- Spectrometry
- Production of light bulbs
- Production of electronic tubes



The MDP offers high pumping performance between 10 mbar and 10⁻⁵ mbar and a maximum flow rate of 400 sccm.



With an exhaust pressure up to 40 mbar, the MDP can allow the use of a less expensive backing pump.



With its simple construction, robust rotor and low rotational speed (27.000 rpm), the MDP is robust against accidental air in-rush, shock venting and gyroscopic effects.



The MDP 5011 is field maintainable providing lower cost of ownership and increased uptime.



Ceramic bearings

Alcatel has chosen high technology ceramic ball bearings for the MDP 5011 that are lightweight with a low coefficient of friction. These bearings provide high reliability due to low centrifugal forces on the bearing cage and reduced bearing temperature.

Key Points

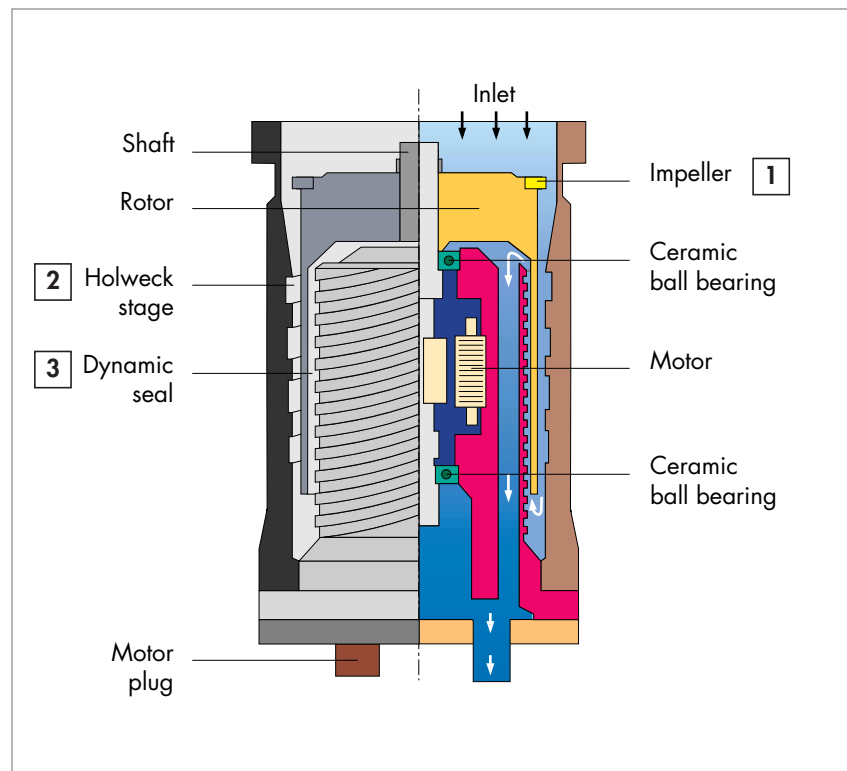
- Ultimate pressure up to 10^{-6} mbar
- Light and compact
- High compression ratio
- High exhaust pressure up to 40 mbar
- Mountable in any position
- High throughput

The MDP design principle

The Holweck principle is the basis of the MDP design. This design positions the pump performance between Roots-type pumps and turbomolecular pumps.

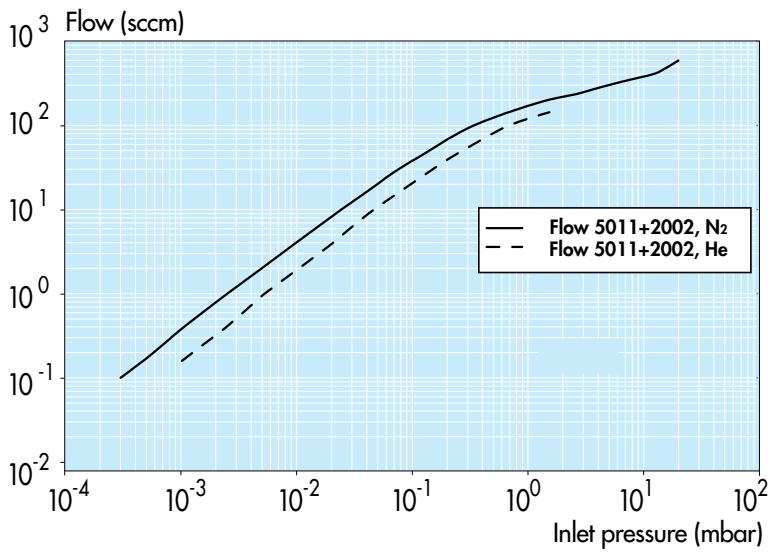
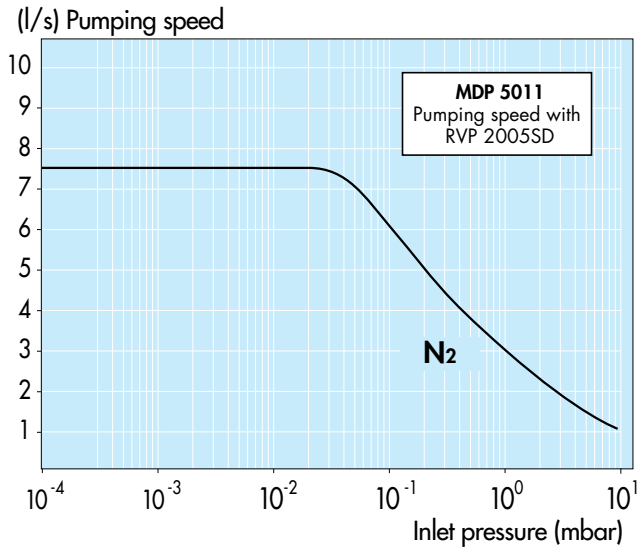
This high technology pump includes 3 different stages:

- 1 - A preliminary stage with a row of blades for maximum conductance, ensuring the highest possible pumping speed
- 2 - A stage with multi-ribbed drum structure to ensure the maximum pumping efficiency and a high compression ratio
- 3 - Final stage with a dynamic seal which allows the pump to operate with a high exhaust pressure

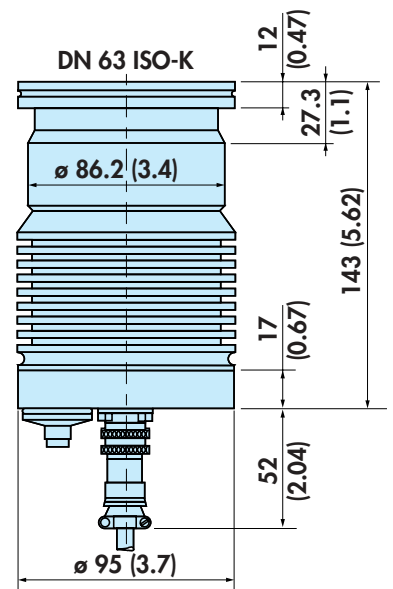


Cross section

MDP 5011 - Pumping speed and flow vs pressure



Dimensions mm (inches)



MDP 5011 - Technical data

| Characteristics | | Units | MDP 5011 | MDP 5011CP |
|---|--------------------|-------|-----------------------------|-------------------|
| Pumping speed | N2 | l/s | 7.5 | |
| | He | l/s | 4 | |
| | H2 | l/s | 3 | |
| Compression ratio | N2 | | 1.10 ⁹ | 1.10 ⁶ |
| | He | | 2.10 ⁴ | 250 |
| | H2 | | 1.10 ³ | 50 |
| Ultimate pressure measured to Pneuop standards with purge | ambient air cooled | mbar | | |
| | forced air cooled | mbar | 1.10 ⁶ | 1.10 ⁵ |
| | water cooled | mbar | | |
| Maximum continuous N2 inlet pressure | ambient air cooled | mbar | 1.10 ¹ | |
| | forced air cooled | mbar | 10 | |
| | water cooled | mbar | 10 | |
| Maximum exhaust pressure (pumping speed >=4m ³ /h) | ambient air cooled | mbar | | |
| | forced air cooled | mbar | 40 | 5 |
| | water cooled | mbar | | |
| Recommended rotary vane pump or membrane pump | | | ultimate pressure < 20 mbar | |
| Starting time | | mn | <1 | |
| Rotational speed | | rpm | 27,000 | |
| Maximum ambient temperature | ambient air cooled | °C | 35 | |
| | forced air cooled | °C | 35 | |
| | water cooled | °C | 50 | |
| Exhaust flange | | | DN 16 | |
| Controller | | | ACT 100 | |
| Weight | ambient air cooled | kg | 2.3 | |
| | forced air cooled | kg | 3 | |
| | water cooled | kg | 2.5 | |
| Controller weight | | kg | 2 | |
| Power supply | | V | 100/115/200/230 | |
| | | Hz | 50/60 | |
| Power consumption | | VA | 75 | |

Controller options

ACT 100 OEM board

- Power supply:
100, 115, 200 - 230 V selectable
- Dimensions:
213.2 x 97.5 x 96.5 mm
(8.39 x 3.84 x 3.80 inches)
- Features:
ON/OFF Switch, Status LEDs
- Remote control: ON/OFF



ACT 100 controller

- 1/4 rack 3U format
- 4 leds :
 - power
 - pump starting
 - pump at speed
 - fault
- Remote control: ON/OFF
- Hour counter
- Available in 100, 115, 200 - 230V (50/60 Hz)



A comprehensive range of accessories

The **Standard Inlet Screen** provides effective protection to the pump against particulates with a 2.5 mm mesh.



The **Dense Mesh Inlet Screen** traps particles above 20 microns, and is used when there is a high concentration of dust or risk of implosion.



The ready-for-use **Lubrication Syringe** contains exactly the amount of grease required to regrease both bearings.



A number of **Venting Valves** are available to ensure correct operation of the pump and prevent oil contamination from a wet backing pump.

2-way Solenoid Venting Valve is controlled by the frequency converter.



The **Seal Kit** contains all the seals that need to be replaced during reassembly of the pump.



The **Tool Kit** allows the user to replace bearings quickly and easily.



Each ceramic bearing is chosen to fit to the nearest micron. There is a type of bearing for each rotor shaft size. A **Ceramic Bearing Kit** contains one bearing of the required size (see technical instructions) with one pressure washer.



Ordering information

MDP 5011 pump

(order controller, inlet screen and interconnecting cable separately)



| Model | Flange DN | Cooling method | Single phase voltage | |
|----------|-----------|----------------|----------------------|----------------------|
| | | | PART NUMBER | |
| | | | 200/230 V - 50/60 Hz | 100/115 V - 50/60 Hz |
| MDP 5011 | 63 ISO-K | Natural | 795600 | 795600 |
| | | Air | 795601 | 795602 |
| | | Water | 795604 | 795604 |

MDP 5011 CP pump (for corrosive gases)

(order controller, inlet screen and interconnecting cable separately)



| Model | Flange DN | Cooling method | Single phase voltage | |
|-------------|-----------|----------------|----------------------|----------------------|
| | | | PART NUMBER | |
| | | | 200/230 V - 50/60 Hz | 100/115 V - 50/60 Hz |
| MDP 5011 CP | 63 ISO-K | Natural | 795629 | 795629 |
| | | Air | 795650 | 798073 |
| | | Water | 795652 | 795652 |



Controllers

| Model | For pumps | Single phase voltage | | | |
|---------|-------------------------|----------------------|------------------|------------------|------------------|
| | | PART NUMBER | | | |
| | | 100 V - 50/60 Hz | 115 V - 50/60 Hz | 200 V - 50/60 Hz | 230 V - 50/60 Hz |
| ACT 100 | MDP 5011 MDP 5011 CP | 111155 | 111156 | 111157 | 111158 |

ACT 100 OEM board: For OEM board please consult us.



Power cords for ACT 100

| Designation | PART NUMBER |
|---|------------------|
| A USA low voltage USA high voltage | 103567 103898 |
| C Europe | 103566 |
| J Japan low voltage Japan high voltage | 103567 104559 |
| K United Kingdom | 104411 |
| S Switzerland | A459212 |

Interconnecting cables (pump to controller)

| Cable for pumps | Length | PART NUMBER |
|-------------------------|--------|-------------|
| MDP 5011 MDP 5011 CP | 0.5 m | A461868-005 |
| | 2.5 m | A461868-025 |
| | 3.5 m | A461868-035 |
| | 5 m | A461868-050 |
| | 7 m | A461868-070 |
| | 10 m | A461868-100 |

Accessories

Inlet screens and dense mesh dust filters

| For pumps | Inlet flange | Mesh | | PART NUMBER |
|------------------|--------------|--------|------|-------------|
| | | 2.5 mm | 20 µ | |
| MDP 5011/5011 CP | DN 63 ISO-K | ● | | 063117 |
| | | | ● | 062912 |

Electrical venting valves

(controlled by the ACT controller)

| For pumps | Flange DN ISO-KF | Single phase voltage | | | | | |
|------------------|------------------------|----------------------|-------------------|-------------------|-------------------|-------------------|------------|
| | | PART NUMBER | | | | | |
| | | 100 V 50/60 Hz | 115 V 50/60 Hz | 200 V 50/60 Hz | 220 V 50/60 Hz | 240 V 50/60 Hz | 24 V DC |
| MDP 5011/5011 CP | 16 | 063165 | 063171 | 063173 | 063169 | 063172 | 108347 |

Maintenance parts

| For pumps | Seal kit | Grease syringe | Tool kit For bearing replacement |
|-------------------------|-------------|----------------|-------------------------------------|
| | PART NUMBER | PART NUMBER | PART NUMBER |
| MDP 5011 MDP 5011 CP | 062194 | 056993 | 062172 |

Ceramic bearing replacement kits

includes ceramic bearing and pressure washer.

(The bearing damping O-Ring is included in the seal kit to be ordered separately)

| For pumps | PART NUMBER | | | | |
|-------------------------|---------------|--------|--------|--------|--------|
| | Suffix number | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| MDP 5011 MDP 5011 CP | 066671 | 066672 | 066673 | 066674 | 066675 |

These part numbers refer to the inner shaft diameter which must correspond to the pump serial number suffix number.

CHINA

Alcatel Vacuum Technology Shanghai
Tel: (86) 21 5027 0628
Fax: (86) 21 3895 3815

FRANCE

Alcatel Vacuum Technology France
Tel: 33 (0) 4 50 65 77 77
Fax: 33 (0) 4 50 65 77 89

GERMANY

Alcatel Hochvakuum Technik GmbH
Tel: (49) 9342 96 10 0
Fax: (49) 9342 96 10 30

ITALY

Alcatel Vacuum Systems S.p.a.
Tel: (39) 039 686 3855
Fax: (39) 039 667 125

JAPAN

Alcatel Japan
Tel: (81) 44 797 5920
Fax: (81) 44 797 5932

KOREA

Alcatel Vacuum Technology Korea
Tel: (82) 2 409 6277
Fax: (82) 2 409 6279

NETHERLANDS

Alcatel Vacuum Technology
Netherlands
Tel: (31) 306 35 13 60
Fax: (31) 306 35 12 21

SINGAPORE

Alcatel Singapore Pte Ltd
Tel: (65) 6254 0828
Fax: (65) 6254 7018

TAIWAN

Alcatel Vacuum Technology Taiwan
Tel: (886) 3 5599 230
Fax: (886) 3 5599 231

UNITED KINGDOM

Alcatel Vacuum Technology (U.K.)
Tel: (44) 1 506 418 000
Fax: (44) 1 506 418 002

USA

Alcatel Vacuum Products
Tel: (1) 781 331 4200
Fax: (1) 781 331 4230



Alcatel Vacuum Technology

98 Avenue de Brogny - BP 2069 - 74009 Anney Cedex - France - Tel.: 33 (0) 4 50 65 77 77 - Fax: 33 (0) 4 50 65 77 89

www.adixen.com