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by Alcatel Vacuum Technology

MOLECULAR DRAG PUMPS

MDP SERIES



ALCATEL

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.



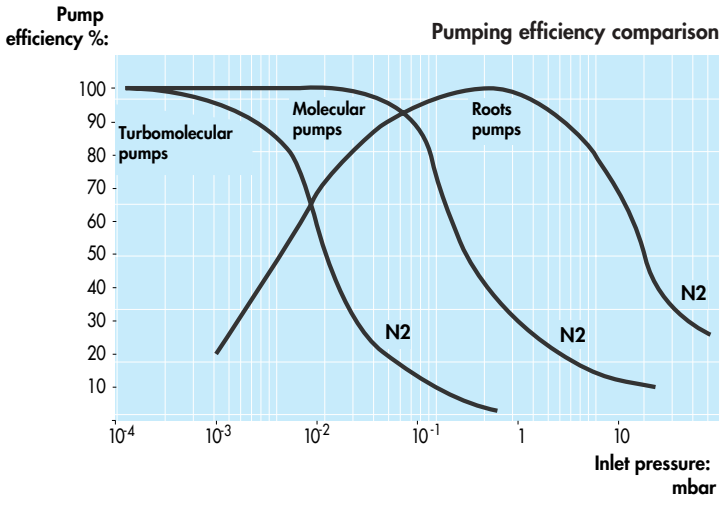
ONE OF A KIND PERFORMANCE

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

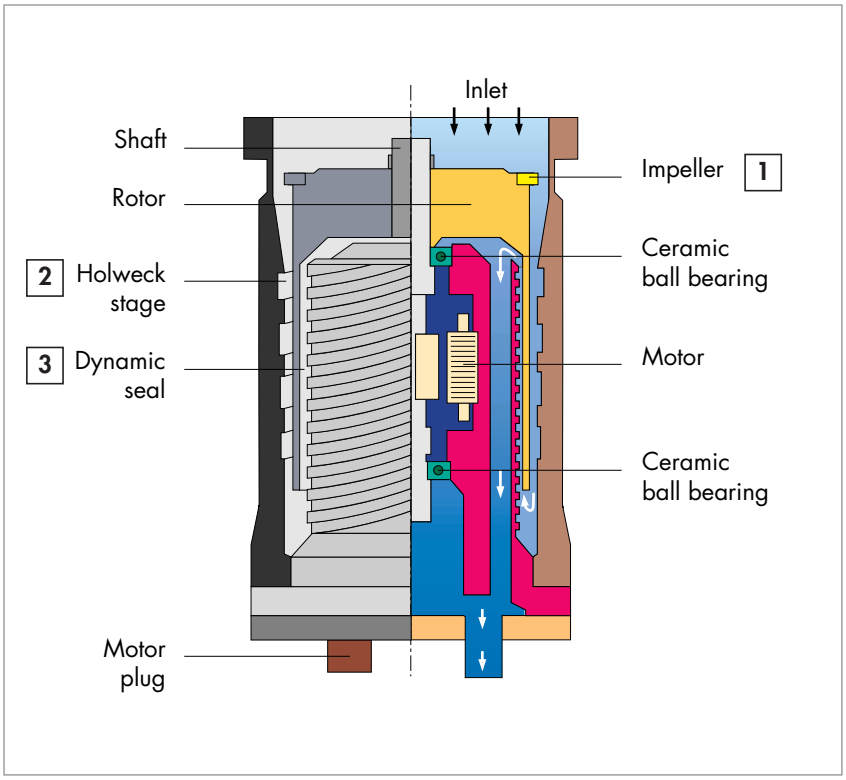
The Holweck principle is the basis of the MDP design. This design positions the pump performance between Roots-type pumps and turbomolecular pumps.

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

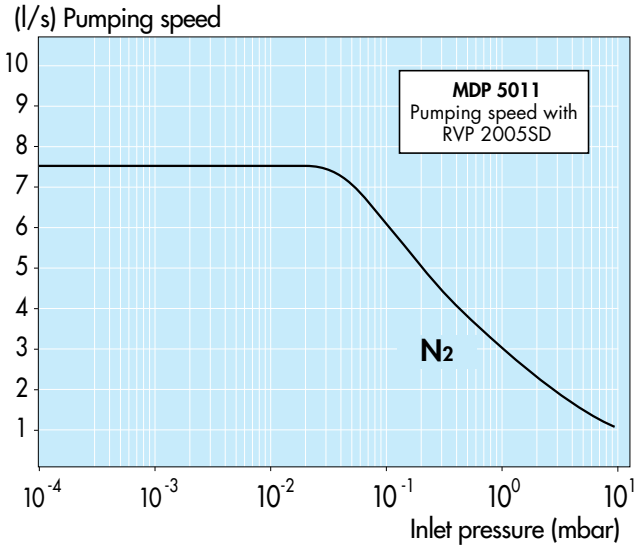
2 - A stage with multi-ribbed drum structure to ensure the maximum pumping efficiency and a high compression ratio

3 - Final stage with a dynamic seal which allows the pump to operate with a high exhaust pressure

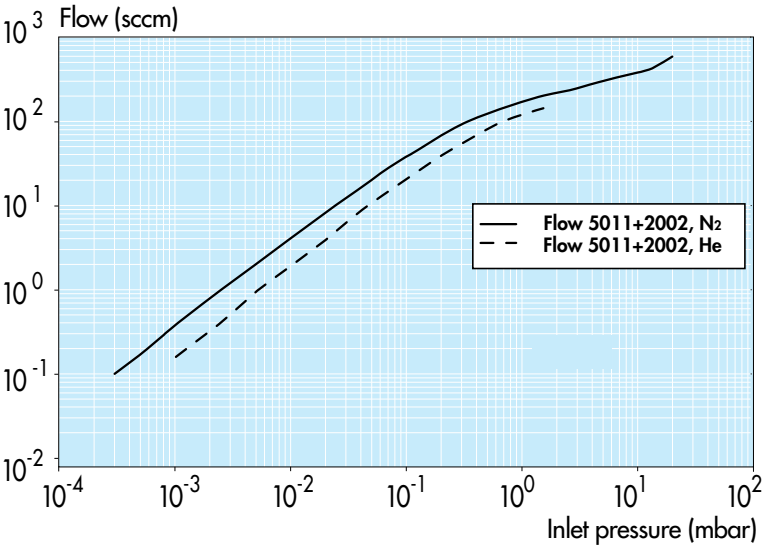


Cross section

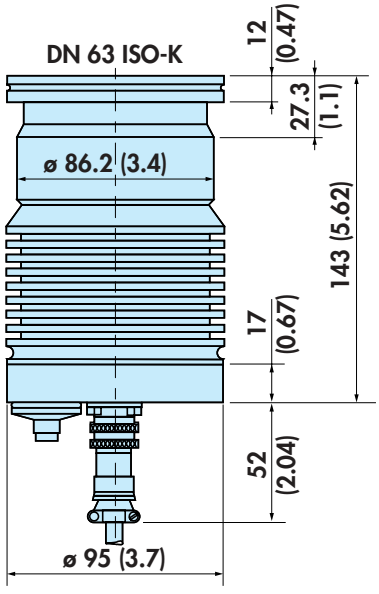
MDP 5011 - Pumping speed and flow vs pressure







Dimensions mm (inches)



MDP 5011 - Technical data

Characteristics		Units	MDP 5011	MDP 5011CP
Pumping speed	N2	l/s	7.5	
	He	l/s	4	
	H_2	l/s	3	
Compression ratio	N2		1.10^9	1.10^6
	He		2.10^4	250
	H_2		1.10^3	50
Ultimate pressure measured to Pneurop standards with purge	ambiant air cooled	mbar	1.10^{-6}	1.10^{-5}
	forced air cooled	mbar		
	water cooled	mbar		
Maximum continuous N_2 inlet pressure	ambiant air cooled	mbar	1.10^{-1}	
	forced air cooled	mbar	10	
	water cooled	mbar	10	
Maximum exhaust pressure (pumping speed >=4m^3/h)	ambiant air cooled	mbar	40	5
	forced air cooled	mbar		
	water cooled	mbar		
Recommanded rotary vane pump or membrane pump			ultimate pressure < 20 mbar	
Starting time		mn	<1	
Rotational speed		rpm	27,000	
Maximum ambient temperature	ambiant air cooled	°C	35	
	forced air cooled	°C	35	
	water cooled	°C	50	
Exhaust flange			DN 16	
Controller			ACT 100	
Weight	ambiant 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



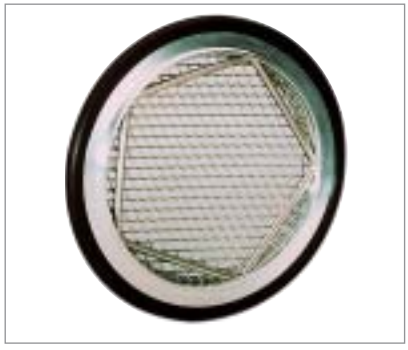
ACT 100 controller

- 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

Alcatel Vacuum Technology

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

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