



Adixen by Alcatel Vacuum Technology

HIGH VACUUM PUMPS

➤ Hybrid Turbomolecular Pumps
ATH series

Hybrid Turbomolecular Pumps

ATH series

Introduction

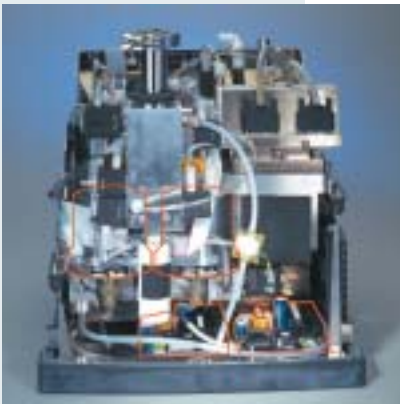
Alcatel offers the ATH series of hybrid turbomolecular pumps with pumping speeds ranging from 30 to 300 l/s. Some models have been optimized for instrumentation or R&D applications while others for heavy cycling applications.

Alcatel's knowledge of hybrid turbomolecular pumps has resulted in the design of the ATH series, optimizing vacuum performance, electronics functionality and reliability.

The ATH series also offers added value through features such as:

- Intermediate vacuum ports
- Efficient integration

To cover a wide range of application requirements, multiple pump monitoring options are available from OEM boards to complete user friendly controllers.



This mass spectrometer includes two ATH 31 (integrated nude version) and two miniboard controllers.



ATH series

Hybrid Turbomolecular Pumps

ATH series



ATH 31



ATH 200 I



ATH 300

TECHNOLOGY

The ATH series hybrid turbomolecular pump incorporates turbomolecular stages with molecular drag stages, resulting in the following benefits:

- High pumping speed,
- High compression ratio, resulting in high exhaust pressure tolerance.

ROBUSTNESS

The low rotational speed and the machined rotors of the ATH series make these pumps very robust against:

- Unexpected air inrushes,
- Shocks,
- Gyroscopic effects,
- Bearing failures.

OTHER ADVANTAGES

The patented designs of the ATH 31 and 300 allow integration of the pumps closer to the application, saving space and money. Additionally, the ATH pumps can be equipped with intermediate vacuum ports to offer application flexibility such as:

- Additional pumping capacity,
- Management of a pressure set point,
- Venting.

PUMP MONITORING

To control the pump, three types of electronics are available:

- A controller with minimum I/O interface: switches and logical interface,
- A sophisticated controller with a high level communication interface,
- Controller electronics that may be mounted on the pump or integrated into a system.

Hybrid Turbomolecular Pumps

ATH series

ATH 31

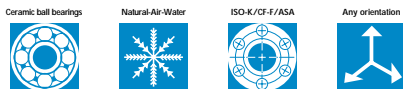
Exceptional performance

An ultimate pressure of 10^{-10} mbar with a dry forepump

The ATH 31+ produces a 10^{11} compression ratio for N₂ and a 10^5 compression ratio for H₂. High compression ratios and high backing pressure tolerance (up to 45 mbar) produce very stable performance, ideal for analytical instruments.

A 200 sccm flow rate at 0.5 mbar

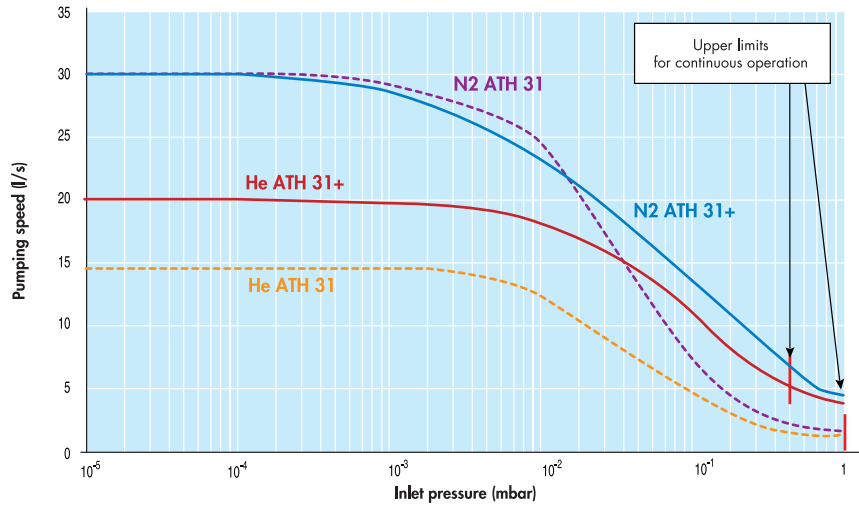
The ATH 31+ allows more than 200 sccm to be pumped continuously



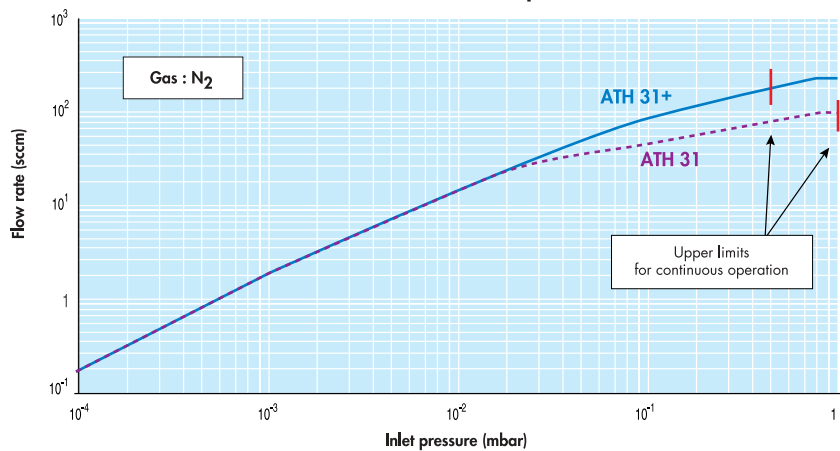
up to 0.5 mbar.



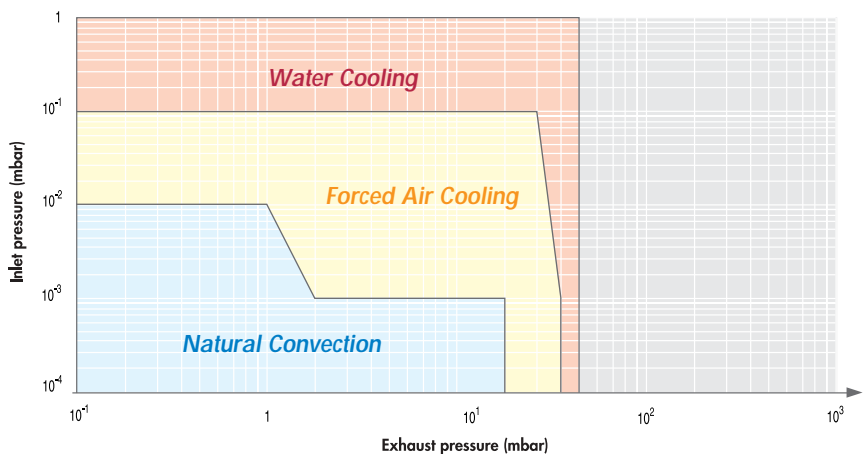
Pumping speed versus inlet pressure



Flow rate versus inlet pressure



Cooling requirements at (20°C ambient temperature)



Hybrid Turbomolecular Pumps

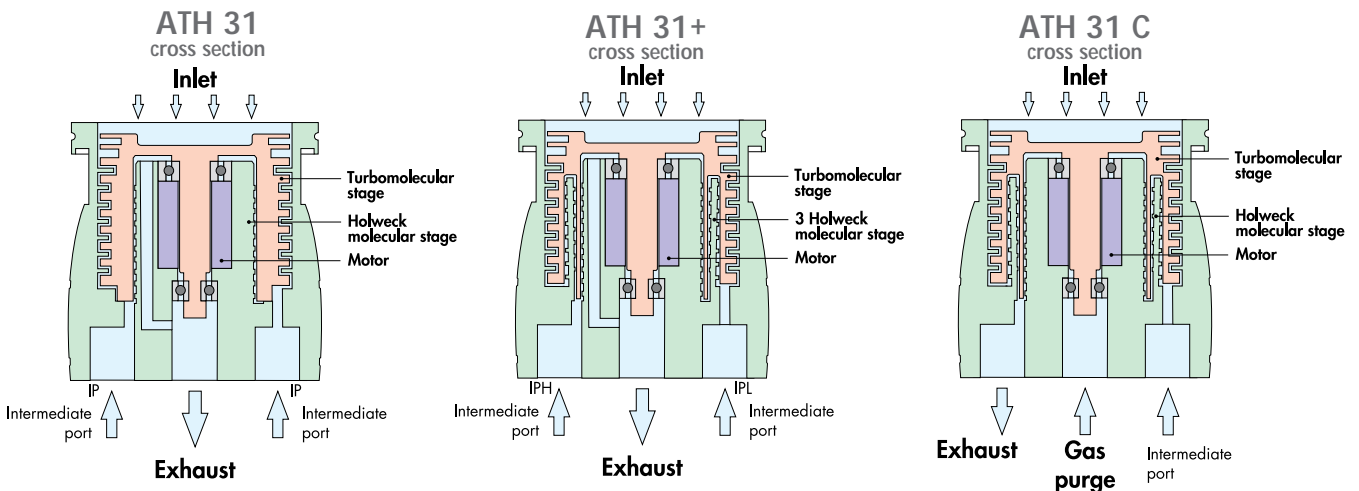
ATH series

ATH 31: Technical data (measured specifications per PNEUROP standards)

Characteristics		ATH 31			ATH 31+			ATH 31 C		
Inlet flange		Nude	DN 40	DN 63	Nude	DN 40	DN 63	Nude	DN 40	DN 63
Pumping speed	N ₂ l/s	33	26	30	33	26	30	33	26	30
	He l/s	15	13	14	22	18	20	22	18	20
	H ₂ l/s	7	6	6	15	14	14	15	14	14
Compression ratio	N ₂	10 ⁸			10 ¹¹			2.10 ⁹		
	He	6.10 ³			2.10 ⁷			2.10 ⁶		
	H ₂	300			1.10 ⁵			1.10 ⁴		
Ultimate pressure (*)	mbar	< 10 ⁻⁸			< 5.10 ⁻¹⁰			< 5.10 ⁻¹⁰		
Ultimate pressure with purge	mbar	-			-			1.10 ⁻⁸		
Maximum N ₂ purge flow rate	sccm	-			-			25		
Maximum inlet pressure (**)	mbar	1			0.5			1		
Maximum exhaust pressure	mbar	25			45			45		
Recommended fore pump type		RVP, ACP, Membrane Pump								
Mounting orientation		Any								
Rotational speed	rpm	42,000								
Noise level	dBA	45								
Vibration level	mm/s	0.1								
Starting power	VA	100								
Nominal power	W	150								
Start-up time	s	120								
Pump weight	kg (lb)	1.2 (2.7)								
Controllers		ACT 101 H, ACT 201 H								
Cooling		Standard: ambient								
		Forced air cooling: optional								
		Water cooling: optional								

(*): measured following Pneurop standard (CFF flange, after 48 hours of baking with AMD primary pump).

(**): with a 4 m³/h membrane pump



ATH 31

The ATH 31 includes one turbo stage and one Holweck stage. With excellent compression ratios and a backing pressure tolerance of up to 25 mbar, it can be backed by a membrane pump. It features one intermediate pumping port.

ATH 31+

The ATH 31+, with one turbo stage and three Holweck stages, offers outstanding compression ratios. It is the ideal version for pumping light gases. Its exceptional performance can be achieved with a membrane pump as a fore

ATH 31 C

The ATH 31 C includes one turbo stage, and two Holweck stages. A purge offers protection against corrosive gases. It can be backed by a membrane pump. It features one intermediate pumping port.

Hybrid Turbomolecular Pumps

ATH series

ATH 200 - Optimized for low pressure applications

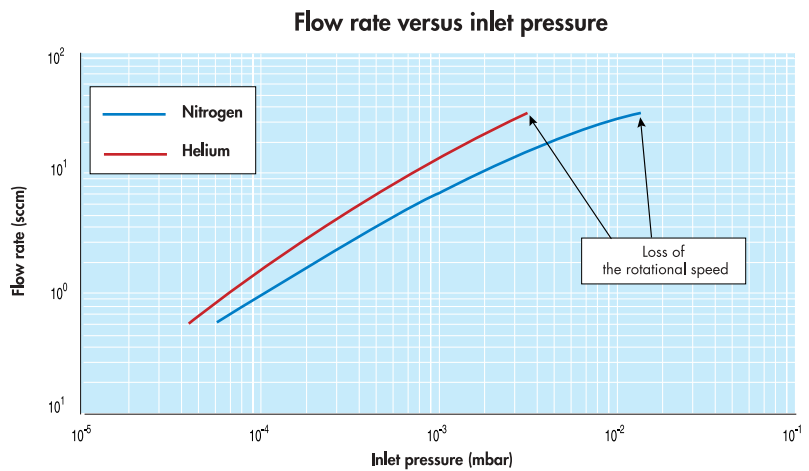
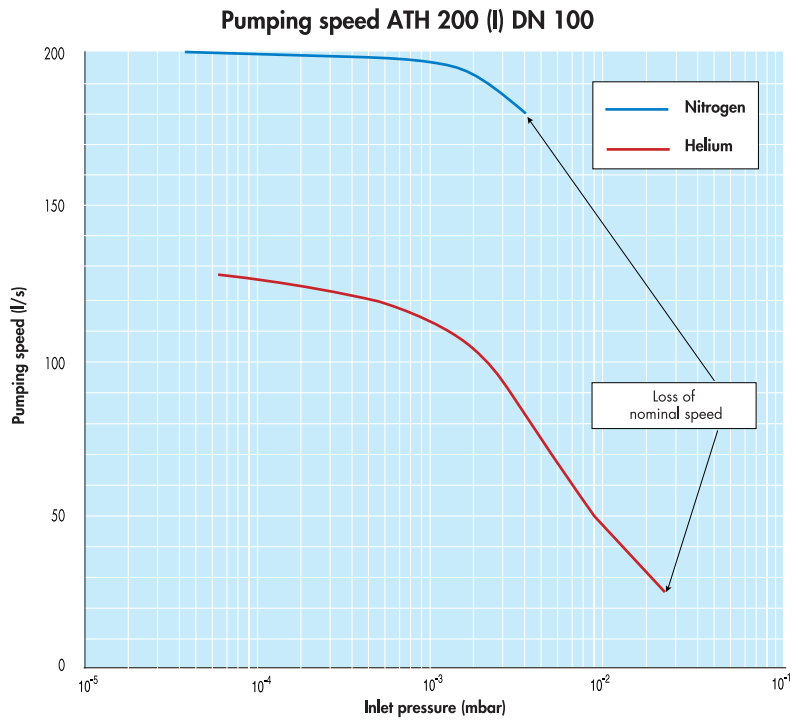
An ultimate pressure of 10^{-10} mbar

The ATH 200 can be backed with dry or rotary vane pumps.

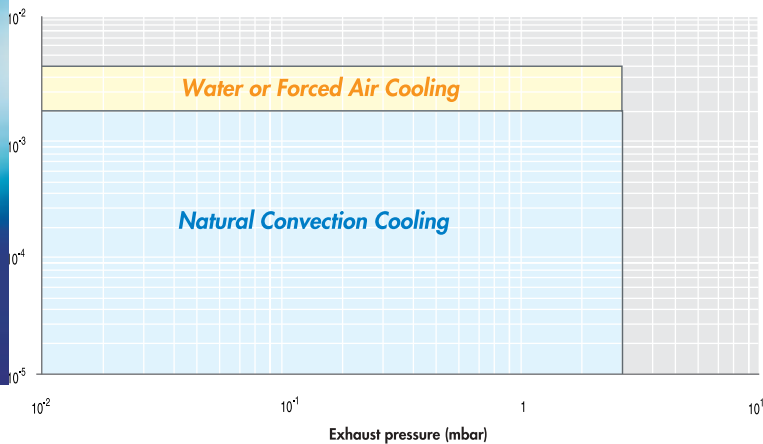
The pump may be equipped with nitrile seals for better resistance in a radiative environment.

The ATH 200 is available with an intermediate pumping port - ATH 200 I

The pumping speed for Nitrogen at



Cooling requirements at (20°C ambient temperature)



Hybrid Turbomolecular Pumps

ATH series

ATH 300 - Optimized for heavy duty applications

Wide operating pressure range from 10^{-10} mbar (torr) up to 0.1 mbar (torr) with a wet or dry fore pump

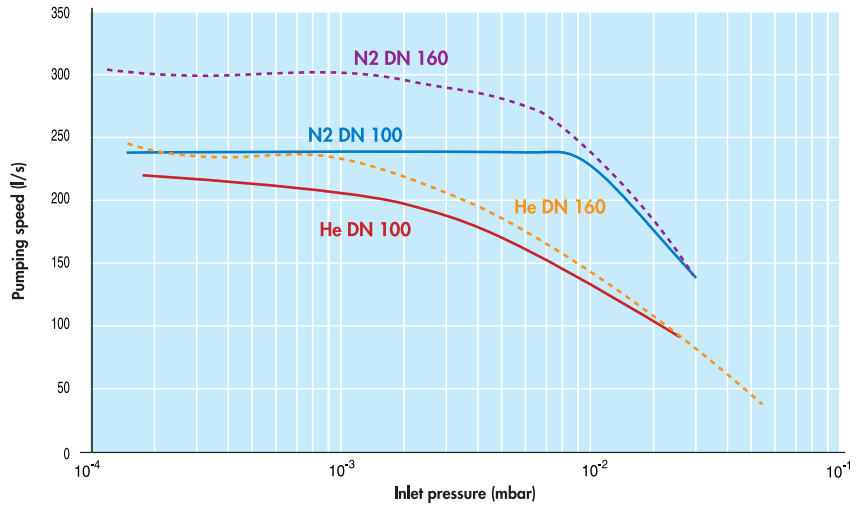
A chemical version equipped with a gas purge is available for pumping corrosive gases - ATH 300 CI.

To increase the pump flow capability,

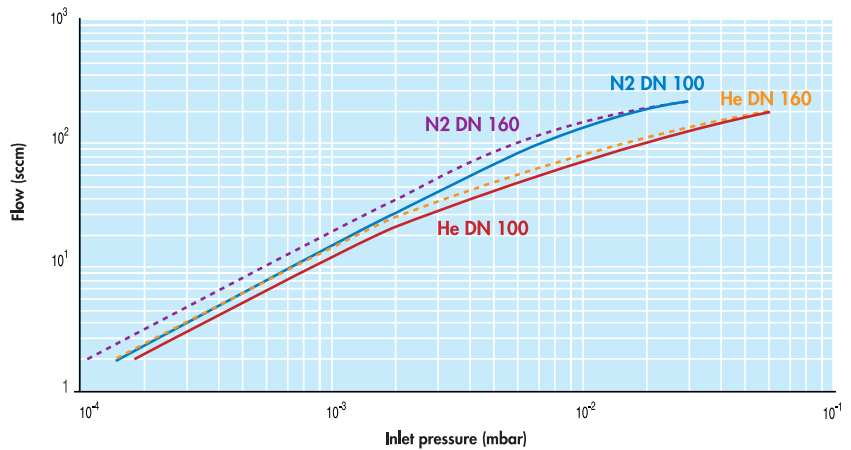
The ATH 300 is available with a DN160 flange or a nude configuration.



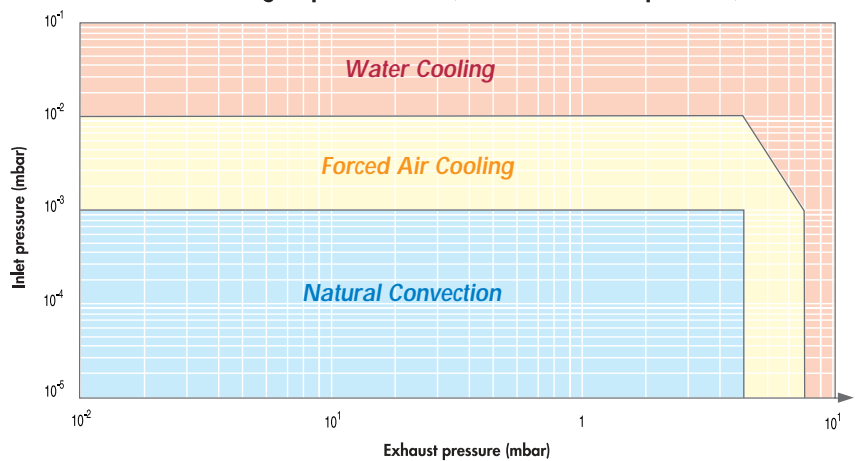
Pumping speed ATH 300 (CI)



Flow rate versus inlet pressure



Cooling requirements at (20°C ambient temperature)



Hybrid Turbomolecular Pumps

ATH series

ATH 200 - ATH 300: Technical data

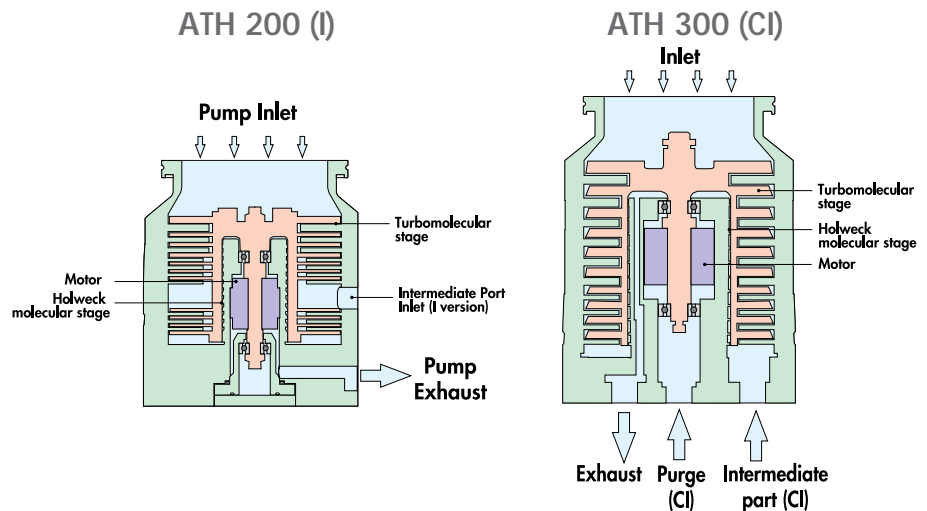
(measured specifications per PNEUROP standards)

Characteristics		ATH 200 (I)	ATH 300 (CI)	ATH 300 (CI)
Inlet flange		DN 100	DN 100	DN 160
Pumping speed	N ₂ l/s	200	250	300
	He l/s	130	215	240
Compression ratio	N ₂	> 10 ⁹	> 10 ⁹	> 10 ⁹
	He	10 ⁵	10 ⁵	10 ⁵
Ultimate pressure (*)	mbar	< 5.10 ⁻¹⁰	< 5.10 ⁻¹⁰	< 5.10 ⁻¹⁰
Maximum inlet pressure	mbar	4.10 ⁻³	0.1	0.1
Maximum exhaust pressure	mbar	4	10	10
Intermediate port flange		DN 25 (I version)		DN 16
Intermediate port pumping speed	N ₂ l/s	10 (I)	2 - 5 (CI)	2 - 5 (CI)
	He l/s	8 (I)	3 - 5 (CI)	3 - 5 (CI)
Recommended fore pump		RVP, ACP, AMD	RVP, ACP, AMD	RVP, ACP, AMD
Exhaust port flange		DN 16	DN 25	DN 25
Mounting orientation		Any	Any	Any
Rotational speed	RPM	36000	42000	42000
Noise level	dB(A)	< 53	< 53	< 53
Vibration level	mm/s	0.3	0.3	0.3
Starting power	VA	100	250	250
Nominal power	W	150	300	300
Start-up time	mn	< 6	< 3.5	< 3.5
Pump weight ISO-K/CF-F	kg (lb)	5.5 / 9.7 (12.2 / 21.4)	6.5 / 10.5 (14.4 / 23.2)	6.5 / 10.5 (14.4 / 23.2)
Controllers		ACT 102 H, ACT 202 H	ACT 250, ACT 600 T	ACT 250, ACT 600 T
Cooling		Natural, air, water	Natural, air, water	Natural, air, water

(*) Measured following Pneuop Standards (CFF flange, after 48 hours of baking with a RVP primary pump).

Applications

Mass spectrometry, leak detectors, electron microscopes, R&D, general low inlet pressure requirements, deposition.



Hybrid Turbomolecular Pumps

ATH series

Controller options

ACT 101 H, ACT 102 H, ACT 250 designed with logical I/O interface

Controller	Pump
ACT 101 H	ATH 31
ACT 102 H	ATH 200
ACT 250	ATH 300

ACT 101 H, ACT 102 H

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

ACT 250

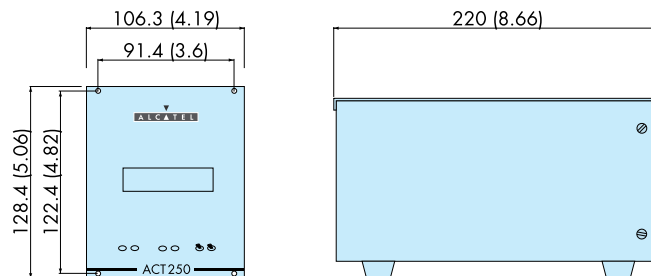
- 1/4 Rack 3U format
- Pump start - stop switches
- 4 leds :
 - power
 - pump starting
 - pump at speed
 - fault
- Hour counter
- Remote control: start, stop, standby, external safety, mode select
- Automatic power supply detection: 100 - 240 V (50/60 Hz)
- RS 232/485



HIGH VACUUM PUMPS

Controller dimensions

mm (inches)



Hybrid Turbomolecular Pumps

ATH series

ACT 201 H, ACT 202 H, ACT 600 T designed with a high level communication interface

Controller	Pump
ACT 201 H	ATH 31
ACT 202 H	ATH 200
ACT 600 T	ATH 300

Convenient interface

- Automatic power supply detection from 100 to 240 Volts 50/60 Hz single phase
- Menu operation



ACT 201 H, ACT 202 H

Sophisticated pump monitoring

Display of:

- Rotational speed
- Pump current consumption
- Pump and controller temperature
- Total running time
- Pump fault detection
- Diagnostic mode with last ten alarm codes

Control of:

- Rotational speed
- Venting
- Auto start
- Start delay

Multiple interfaces

- RS 232/RS 485 (configurable)
- Remote control

Inputs:

- Remote start/stop
- Remote stand-by
- External safety

Outputs:

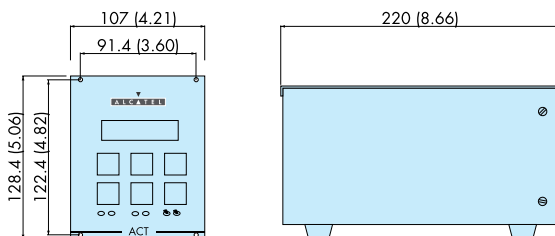
- Pump starting
- Pump at speed
- Stand-by on
- Vent valve on/off
- Power supply for air cooling kit
- Selectable 0 - 10 Volts output (speed/pump current/temperatures)



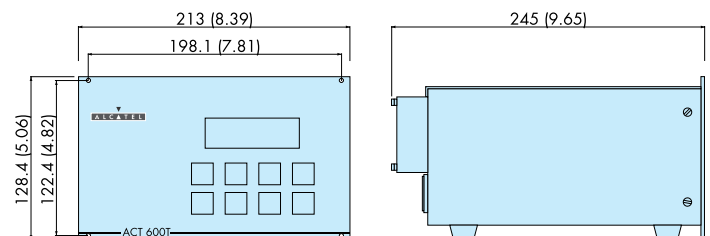
ACT 600 T

Dimensions

ACT 201 H / ACT 202 H



ACT 600 T



Hybrid Turbomolecular Pumps

ATH series

Alcatel has developed electronics and pumps designed specifically for integration into OEM equipment. For further information, please contact us.

ACT 250 brick



This electronic is a compact powerful controller for driving the ATP 150 or ATP 400.

ACT 201 H miniboard



This miniboard controls the ATH 31 or ATH 200.

EOB

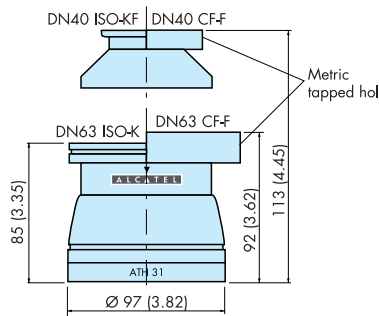


This EOB controls the ATH 31 or ATH 200.

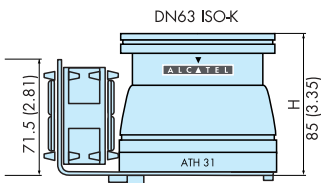
Pump dimensions

ATH 31

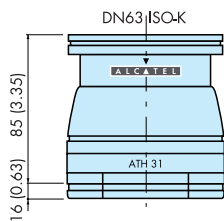
ATH 31 natural convection



ATH 31 with radial air cooling kit

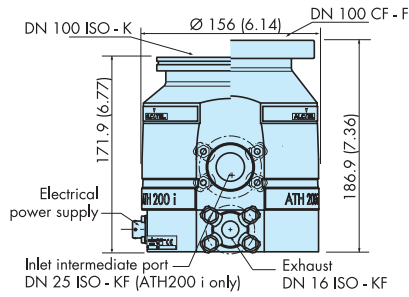


ATH 31 water cooled

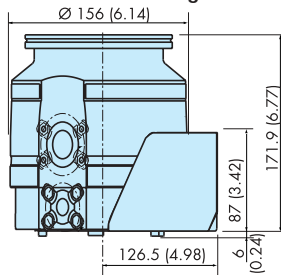


ATH 200

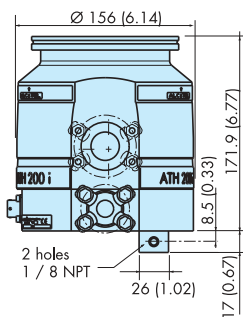
ATH 200 natural convection



ATH 200 with radial air cooling kit

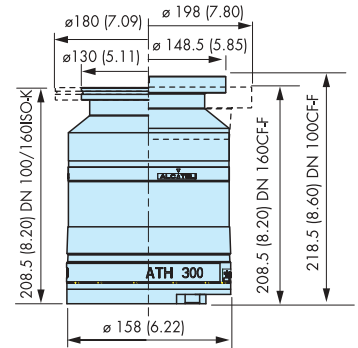


ATH 200 water cooled

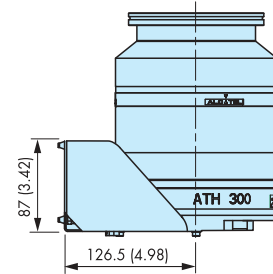


ATH 300

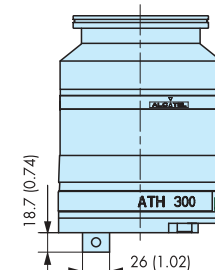
ATH 300 natural convection



ATH 300 with radial air cooling kit



ATH 300 water cooled



Hybrid Turbomolecular Pumps

ATH series

Ordering information

ATH 31 pump

(order controller, inlet screen and interconnecting cable separately)

	Model		
	ATH 31	ATH 31+	ATH 31 C
Code	8	1	2

	Flange Size		
	Nude	DN 40	DN 63
Code	0	1	2

	Flange Type		
	Nude	ISO-K	CF-F
Code	0	1	2

	Cooling	
	Ambient / Air	Water
Code	0	2

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ATH 200 pump

(order controller, inlet screen and interconnecting cable separately)

	ATH 200 I		ATH 200		
	DN100 ISO-K	DN100 CF-F	DN100 ISO-K	DN100 CF-F	DN63 ISO-K
Code	3C	3D	31	32	21

	Cooling		
	Natural	Air	Water
Code	0	1	2

	Seals material	
	Viton	Nitrile
Code	1	2

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Hybrid Turbomolecular Pumps

ATH series

ATH 300 pump

(order controller, inlet screen and interconnecting cable separately)

C				00
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	ATH 300	
	SD	CI
Code	1	2

	Housing				
	DN100 ISO-K	DN100 CF-F	DN160 ISO-K	DN160 CF-F	nude
Code	31	32	41	42	00

	Cooling		
	Natural	Air	Water
Code	0	1	2

	Seals material	
	Viton	Nitrile
Code	1	2

Controllers

Controller / Pump	PART NUMBER			
	100 V 50/60 Hz	115 V 50/60 Hz	200 V 50/60 Hz	230 V 50/60 Hz
ACT 101 H / ATH 31	111114	111115	111116	111117
ACT 102 H / ATH 200	111118	111119	111120	111121
ACT 250 / ATH 300	108320			

Model	Pump	PART NUMBER
ACT 201 H	ATH 31	108916
ACT 202 H	ATH 200	110787
ACT 600 T	ATH 300	102017

Power cords

The ACT 201 H, ACT 202 H and ACT 600 T controllers are supplied with one European power cord and one US low voltage power cord.

For ACT 101 H, ACT 102 H and ACT 250 controllers please order the convenient P/N below.

Designation	P/N
A USA low voltage USA high voltage	103567 103898
E Europe	103566
J Japan low voltage Japan high voltage	103567
K United Kingdom	104411
S Switzerland	A459212

Hybrid Turbomolecular Pumps

ATH series

Interconnecting cables (pump to controller)

Cable length	PART NUMBER	
	ACT 101 H straight connector	ACT 201 H straight connector
1 m	A460913-010	A460422-010
3 m	A460913-030	A460422-030
5 m	A460913-050	A460422-050
10 m	A460913-100	A460422-100
20 m	A460913-200	A460422-200

Cable length	PART NUMBER	
	ACT 102 H straight connector	ACT 202 H straight connector
1 m	A460913-010	A460422-010
3 m	A460913-030	A460422-030
5 m	A460913-050	A460422-050
10 m	A460913-100	A460422-100
20 m	A460913-200	A460422-200

Cable length	PART NUMBER
	to ACT 250 or ACT 600 T straight connector
1 m	A461237-010
3.5 m	A461237-035
5 m	A461237-050
10 m	A461237-100
20 m	A461237-200

Hybrid Turbomolecular Pumps

ATH series

Accessories

Inlet screens and dense mesh dust filters

For pumps	Inlet flange	Mesh size		PART NUMBER
		2.5 mm	20 m	
ATH 31	DN 40 ISO-KF	●		102670
	DN 40 CF-F	●	●	103078
	DN 63 ISO-K	●	●	102644
	DN 63 CF-F	●	●	102635
	DN 63 CF-F	●	●	102565
ATH 200, ATH 300	DN 100 ISO-K	●	●	102668
	DN 100 CF-F	●	●	102662
	DN 100 CF-F	●	●	102664
ATH 300	DN 160 ISO-K	●	●	056844
	DN 160 CF-F	●	●	063215
	DN 160 CF-F	●	●	056845
				102680
				056942
				063216
				056928
				102685



Dense mesh filters



Inlet screen



Electrical venting valve



Water cooling



Air cooling

HIGH VACUUM PUMPS

Electrical venting valves

Voltage	For ATH 31, ATH 200, ATH 300	For ATH 300
	DN 16	DN 25 ISO-K
24 VDC	108347	108348
100V - 50/60 Hz	063165	063175
115V - 50/60 Hz	063171	063089
200V - 50/60 Hz	063173	063176
220V - 50/60 Hz	063169	056994
240V - 50/60 Hz	063172	063177

Cooling kit

For pumps	Type	PART NUMBER
ATH 31	Air	107605
	Water	107593
ATH 200	Air	109258
	Water	109259
ATH 300	Air	109258
	Water	