



MAGLEV HYBRID
TURBOMOLECULAR PUMPS
ATH-M SERIES



ATH-M: 400 l/s to 2100 l/s Magnetically levitated turbo pumps

The ATH-M series are hybrid magnetically levitated turbo pumps.

These very sophisticated high performance and extremely robust pumps are recognized as the new reference in the world of large turbomolecular pumps.



**MY PROCESS REQUIRES
A CLEAN, DRY TURBO PUMP**

**DO YOU OFFER MAINTENANCE
FREE TURBO PUMPS ?**

**HOW RELIABLE ARE
YOUR MAGLEV TURBO PUMPS ?**

**AND WHAT ABOUT
PERFORMANCE ?**

Maintenance-free, high-performance turbo pumps

These are some of the leading applications where our pumps are in use :

- Glass coating
- Micro machining systems
- Ion beam rectification
- Electron microscopy
- Space simulation chambers
- Particle accelerators
- Semiconductor processes (etch, CVD, ion implant)
- Coating and thin films deposition
- Ion milling
- R&D experiments



THE ATH-M ARE CLEAN, DRY PUMPS

The ATH-M magnetically levitated turbomolecular pumps are clean, dry pumps. The magnetic bearing is frictionless and does not require any grease.



THE ATH-M ARE MAINTENANCE FREE ON CLEAN PROCESSES

Because the magnetic bearing of the ATH-M series is maintenance free, the pumps can run for years without any interruption on a clean process. This gives the ATH-M series a significant cost of ownership advantage over ball bearing turbo pumps.



THE ATH-M ARE THE MOST RELIABLE TURBOS ON THE MARKET

The pumping cells of the ATH-M pumps are designed for minimal stress on difficult applications. Furthermore, the pump can accept up to 5 landings at full speed on the emergency dry, back-up bearings.



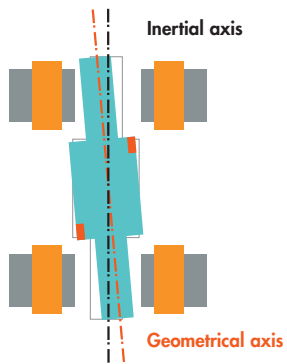
THE ATH-M OFFERS THE BEST PERFORMANCE/SIZE RATIO ON THE MARKET

Sophisticated software tools help us develop the highest performing pumps for a given size. The pumps offer either high flow at high pressure or very low ultimate pressures.

Rotor control

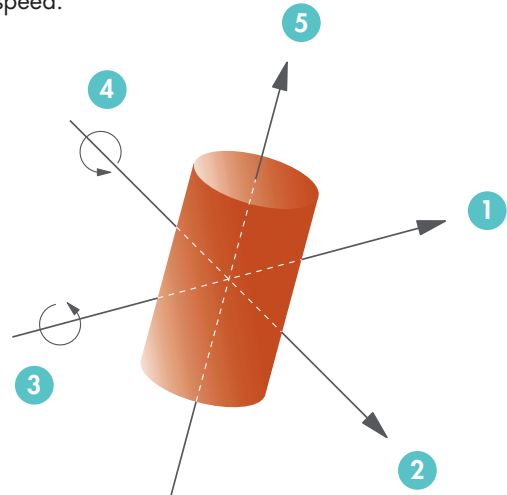
Automatic balancing system

This device compensates in real time for any imbalance of the rotor due to accumulation of deposits.



5-axis control

A 5-axis magnetic bearing provides control of the rotor at high speed.



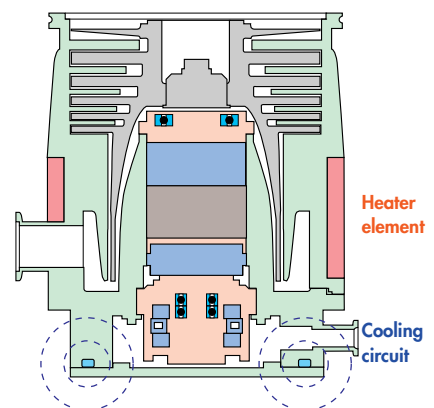
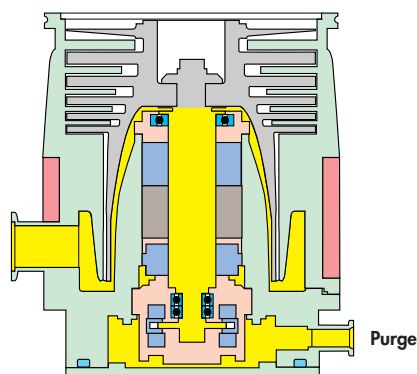
Pump protection

Purge

An inert gas purge is built into the pump. It may be used to prevent corrosive attack or deposition build-up inside the pumps.

Heating / Cooling

The MT model features a temperature management system which controls an integrated heater band. The heater band and water cooling maintain the pump internal surface at a constant temperature (up to 75°C) in order to minimize the condensation of by-products inside the pump.



Pump safety

Power failure

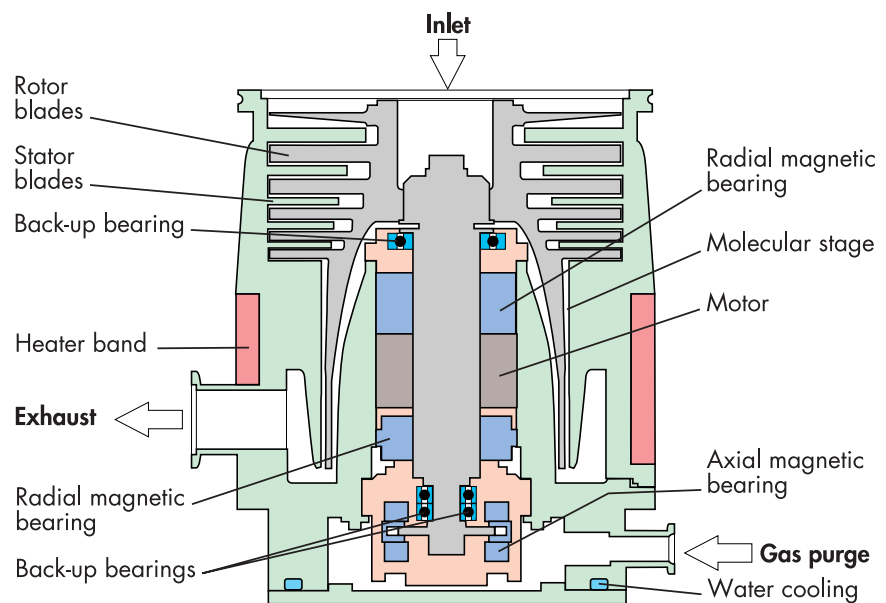
In the event of a power failure, the ATH-M motor acts as a generator to transform the rotor energy into electrical power to supply the controller. Thus, the rotor remains levitated and slows down, until gently landing on the back-up bearings. No battery is required.

Venting valve

The emergency venting valve opens in case of violent shocks or large air-inrushes. The valve brakes the rotor quickly and safely.

Landing

The pump emergency back-up bearings can withstand up to 5 landings at full speed in the exceptional event of an accidental cable disconnection, or a massive air inrush. The controller monitors the status of the back-up bearing life.



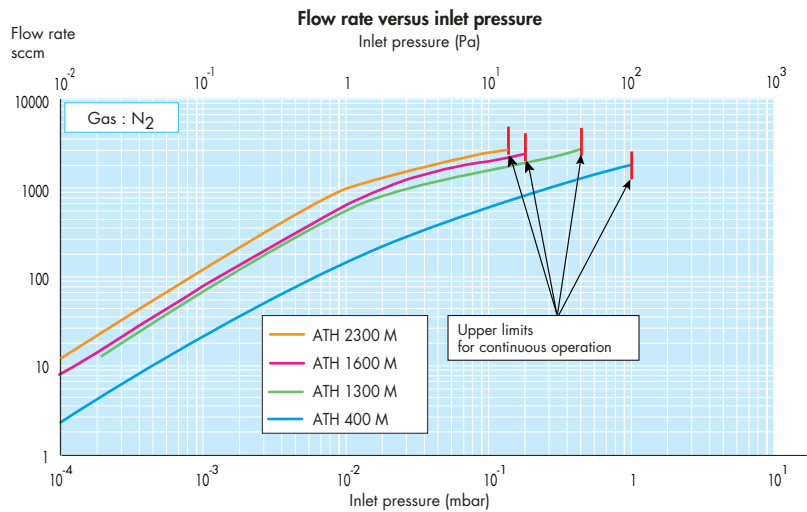
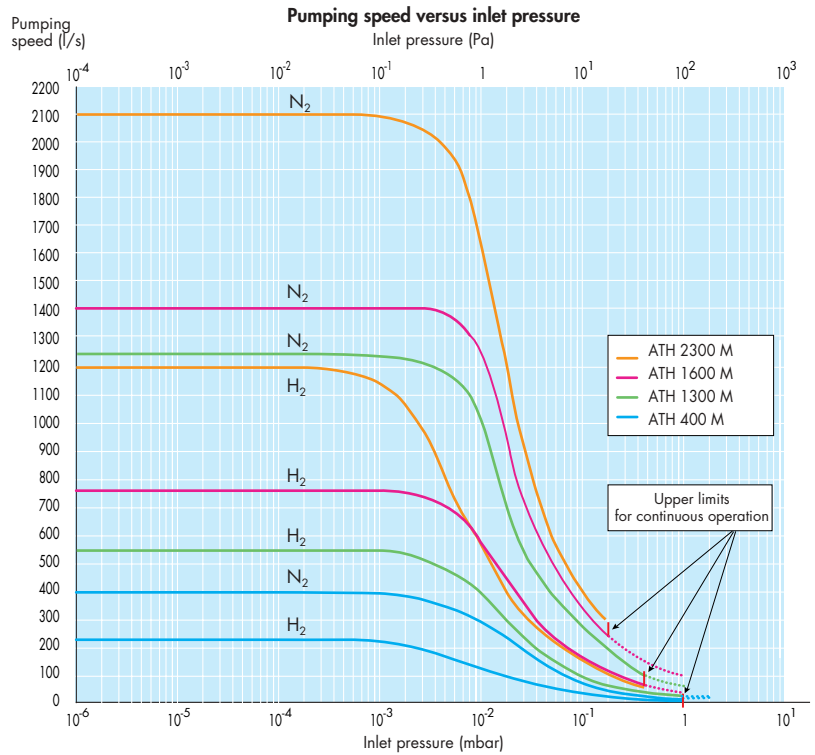
ATH-M SERIES

High throughput at high inlet pressure

The ATH-M are designed for high pressure and high throughput, but also provide a low ultimate pressure.

Adjustable rotational speed

The ATH-M series features adjustable rotational speed control, optimizing the pumping parameters. For instance, at high pressure, the throughput can be increased if the rotational speed is decreased.



Technical data (measured specifications per PNEUROP standards)

		ATH 400 M ATH 400 MT	ATH 1300 M ATH 1300 MT	ATH 1600 M ATH 1600 MT	ATH 2300 M ATH 2300 MT
Rotational speed	rpm	39000	34000	39000	31000
Inlet flange		DN100 ISO-K	DN160 ISO-K	DN160 ISO-F	DN200 ISO-F
Pumping speed	N ₂ l/s	320	410	920	1250
	He l/s	290	360	810	850
	H ₂ l/s	180	230	490	550
Compression ratio	N ₂	1x10 ⁷	1x10 ⁷	6x10 ⁷	> 10 ⁹
	He	2x10 ³	2x10 ³	8x10 ³	3x10 ⁴
	H ₂	1x10 ²	1x10 ²	3x10 ²	3x10 ³
Ultimate pressure	mbar	8x10 ⁻⁹	8x10 ⁻⁹	6x10 ⁻⁹	4x10 ⁻⁹
Purging nitrogen flow rate	sccm	50	50	50	50
Maximum continuous inlet pressure N ₂	mbar	1	0.5	0.2	0.15
Maximum continuous exhaust pressure N ₂	mbar	2	1.5	1.5	1.5
Maximum throughput N ₂	sccm	2000	3000	2500	2500
Maximum heating temperature (MT version)	°C	75	75	75	75
Maximum Baking temperature	°C	120	120	120	120
Power supply required for the heater band (MT version)		100 to 120V - 50/60Hz or 200 to 240V - 50/60 Hz			
Vibration level	µm	0.01	0.01	0.01	0.01
Recommended Alcatel backing pump		ADP/ADS	ADP/ADS	ADP/ADS	ADP/ADS
Cooling water flow rate	l/min	< 1			
Cooling water temperature	°C	from 15 to 30			
Mounting orientation		Any			
Exhaust flange		DN40 ISO-KF			
N ₂ purge flange		DN16 ISO-KF			
Start-up time	min	<3	<5	<6	<10
Pump weight	kg (lb)	19 (41.8)	34 (75.5)	35.5 (78.3)	46 (102)
Controller		ACT 600 M	ACT 1300 M	ACT 1300 M	ACT 2300 M
Controller weight	kg (lb)	8 (18)	8 (18)	8 (18)	8 (18)
Start-up power	VA	650	650	650	650
Nominal power	W	300	300	300	350
Power supply		100-240 V - 50/60 Hz Single phase			200-240 V - 50/60 Hz - Single phase

ACT 600 M, ACT 1300 M and ACT 2300 M: compact and highly effective electronic monitoring



Especially designed for maglev turbopumps

- Very compact: only 1/2 Rack
- Very light: only 8 kg (18 lb)
- All functions for monitoring the ATH-M are integrated into the controllers
- Battery free: built-in generator
- ACT 600 M compatible with ATH 400 M
- ACT 1300 M compatible with ATH 1300 M and ATH 1600 M
- ACT 2300 M compatible with ATH 2300 M

Convenient interface

- Handy keyboard
- Convenient menu with back lit display of:
 - rotational speed
 - pump current
 - pump and controller temperatures

Modern pump monitoring

- Microprocessor controlled
- Adjustable low speed mode
- Pump and controller monitoring
- Pump fault detection
- Standard RS 232 / RS 485

The RS 232 serial link is used to control and monitor the pump using a computer.

Inputs

- remote start-stop
- remote stand-by
- remote interlock

Outputs

- pump starting
- pump at speed
- stand-by on
- venting valve on/off
- selectable 0 - 10 volts output for speed, pump current or temperature

Full interchangeability: no pump to controller matching

Any controller may be used with any ALCATEL maglev pump, without the need for tuning or adjustment.

Built-in heating device to 75°C

All the ACT controllers are equipped with heater band control output and pump temperature sensor inputs.

A simple interconnection between the controller and the ATH 2300 MT, ATH 1600 MT, ATH 1300 MT or ATH 400 MT is necessary to monitor and control the heater band.



Ordering information

ATH 400 M (unheated pump)
ATH 400 MT (heated pump)

Model	ATH 400 M	ATH 400 MT	
Inlet flange DN	PART NUMBER	PART NUMBER	
		Heater voltage (50/60 Hz)	
		100-120 V	200-240 V
100 ISO-K	D23121	D43121	D53121
100 CF-F	D23221	D43221	D53221
160 ISO-K	D24121	D44121	D54121
160 CF-F	D24221	D44221	D54221
6" ASA	D28321	D48321	D58321

Note: Air inlet braking valve, 1 m. valve cable and purge flow restrictor included with the ATH 400 M/MT

Interconnecting cables (pump to controller)

Length	PART NUMBER
1 m	104624
3.5 m	103719
5 m	103720
10 m	103721
15 m	104587
20 m	A214574

Inlet screen for ATH 400 M

Inlet flange DN	PART NUMBER
100 ISO-K	056844
100 CF-F	056845
160 ISO-K	056942
160 CF-F	056928
6" ASA	102933

Note

In order to operate the ATH 400 M/MT pumps, the following accessories have to be ordered: Inlet screen, Interconnecting cable, ACT controller and heater cable for MT models.

ACT Controller (power supply 100-240 V / 50-60 Hz)

Model	For pump	PART NUMBER
ACT 600 M	ATH 400 M/MT	102539

Note: Power cord is included with ACT 600 M

Optional cables for 12 VDC air inlet braking valve

Length	PART NUMBER
3.5 m	105172
5 m	105173
10 m	105174
15 m	105175
20 m	A459362

Heater cables for ATH 400 MT

(pump heater and water valve to controller)

Length	VOLTAGE/PART NUMBER	
	110-120 V - 50/60 Hz	200-240 V - 50/60 Hz
1 m	104627	105206
3.5 m	103728	103729
5 m	103730	103731
10 m	103732	103733
15 m	105202	105204
20 m	On request	On request

Ordering information

ATH 1300 M (unheated pump)

ATH 1300 MT (heated pump)

Model	ATH 1300 M	ATH 1300 MT
		PART NUMBER
Inlet flange DN	PART NUMBER	Heater voltage 100-240 V - 50/60 Hz Single phase
160 ISO-K	M2412100	M6412100
160 ISO-F	M2462100	M6462100
160 CF-F	M2422100	M6422100
6" ASA	M2832100	M6832100
200 ISO-K	M2512100	M6512100
200 ISO-F	M2562100	M6562100
200 CF-F	M2522100	M6522100
250 ISO-K	M2612100	M6612100

Note

In order to operate the ATH 1300 M/MT and ATH 1600 M/MT pumps, the following accessories have to be ordered: Inlet screen, Interconnecting cable, ACT controller, optional air inlet braking valve and cable, and heater cable for MT models.

ATH 1600 M (unheated pump)

ATH 1600 MT (heated pump)

Model	ATH 1600 M	ATH 1600 MT
		PART NUMBER
Inlet flange DN	PART NUMBER	Heater voltage 100-240 V - 50/60 Hz Single phase
6" ASA	P2832100	P6832100
200 ISO-K	P2512100	P6512100
200 ISO-F	P2562100	P6562100
200 CF-F	P2522100	P6522100
250 ISO-K	P2612100	P6612100
250 ISO-F	P2662100	P6662100
250 CF-F	P2622100	P6622100

Note: Purge flow restrictor is included with the ATH 1300 M/MT and ATH 1600 M/MT pumps.

ACT Controller and power cords for ATH 1300 M/MT and ATH 1600 M/MT

(Order controller and power cord USA/EUROPE, separately)

Item	PART NUMBER
Controller ACT 1300 M 100-240 V	112123
Power cord 2.5 m for EUROPE 100-240 V	A328405
Power cord 2.5 m for USA 100-240 V	802366

Interconnecting cables

(pump to controller)

Length	PART NUMBER
1 m	104624
3.5 m	103719
5 m	103720
10 m	103721
15 m	104587
20 m	A214574

Mounting Bolts

for ATH 1300 M/MT and ATH 1600 M/MT DN 200 and DN 250 flanges**

For safety reasons we recommend ordering the high strength bolts and washers specified below

Pump mounting configuration	Item	PART NUMBER
ISO-F flange - Without Centering Ring	Set of 12 ea. M10*30 Grade 12-9 bolts and washers	110675
ISO-F flange - With Centering Ring	Set of 12 ea. M10*35 Grade 12-9 bolts and washers	110676
ISO-K - With Rotatable Flange	Set of 12 ea. M10*50 Grade 12-9 bolts, nuts and washers	802415

** For DN 160 ISO-K / ISO-F / CFF and DN 160 / DN 200 / DN 250 CFF flanges, consult factory

Ordering information

Heater cables for ATH 1300 MT and ATH 1600 MT

Length	PART NUMBER	
	110-120 V - 50/60 Hz	200-240 V - 50/60 Hz
1 m	A328698A	A328697A
3.5 m	A328698B	A328697B
5 m	A328698C	A328697C
10 m	A328698D	A328697D
15 m	A328698E	A328697E
20 m	A328698F	A328697F

For the pumps built before Oct. 99, consult factory.

Optional air inlet braking valve for ATH 1300 M/MT and ATH 1600 M/MT

Item	PART NUMBER
Air inlet valve assembly 12 VDC/DN 16	106866

Cables for 12 VDC air inlet braking valve

Length	PART NUMBER
1 m	106052
3.5 m	105172
5 m	105173
10 m	105174
15 m	105175
20 m	A459362

Inlet screen for ATH 1300 M/MT and ATH 1600 M/MT

Inlet flange DN	PART NUMBER	
	Stainless Steel	Aluminium
6" ASA	107820	-
160 ISO-K/ISO-F/CF-F	107747	-
200 ISO-K/ISO-F/CF-F	108872	109200
250 ISO-K/ISO-F/CF-F	108762	109199

Ordering information

ATH 2300 M (unheated pump)

ATH 2300 MT (heated pump)

Model	ATH 2300 M	ATH 2300 MT
Inlet flange DN	PART NUMBER	PART NUMBER Heater voltage 100-240 V - 50/60 Hz Single phase
200 CF-F	Q2522100	Q6522100
200 ISO-K	Q2512100	Q6512100
200 ISO-F	Q2562100	Q6562100
250 CF-F	Q2622100	Q6622100
250 ISO-K	Q2612100	Q6612100
250 ISO-F	Q2662100	Q6662100

Note

In order to operate the ATH 2300 M/MT pumps, the following accessories have to be ordered: Inlet screen, Interconnecting cable, ACT controller, optional air inlet braking valve and cable, and heater cable for MT models.

Heater cables for ATH 2300 MT

Length	PART NUMBER	
	110-120 V 50/60 Hz	200-240 V 50/60 Hz
1 m	A328698A	A328697A
3.5 m	A328698B	A328697B
5 m	A328698C	A328697C
10 m	A328698D	A328697D
15 m	A328698E	A328697E
20 m	A328698F	A328697F

ACT Controller for ATH 2300 M/MT

(Order controller and power cord, USA/EUROPE, separately)

Item	PART NUMBER
Controller ACT 2300 M 200-240V	109015
Power cord 2.5 m for EUROPE 200-240 V	A328405
Power cord 2.5 m for USA 200-240 V	802366

Interconnecting cables

(pump to controller)

Length	PART NUMBER
1 m	104624
3.5 m	103719
5 m	103720
10 m	103721
15 m	104587
20 m	A214574

Ordering information

Optional air inlet braking valve for ATH 2300 M/MT

Item	PART NUMBER
Air inlet valve assembly 12 VDC/DN 16	106866

Cables for 12 VDC air inlet braking valve

Length	PART NUMBER
1 m	106052
3.5 m	105172
5 m	105173
10 m	105174
15 m	105175
20 m	A459362

Inlet screen - Aluminum for ATH 2300 M/MT

Inlet flange DN	PART NUMBER	
	Aluminium	Stainless Steel
200 ISO-K/ISO-F/CF-F	109200	108872
250 ISO-K/ISO-F/CF-F	109199	108762

Mounting Bolts for ATH 2300 M/MT DN 250 flanges*

For safety reasons we recommend ordering the high strength bolts and washers specified below

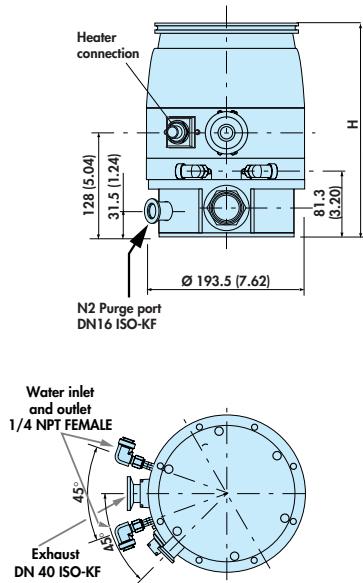
Pump mounting configuration	Item	PART NUMBER
ISO-F flange - Without Centering Ring	Set of 12 ea. M10*30 RDS Grade 12-9 bolts and washers	110034
ISO-F flange - With Centering Ring	Set of 12 ea. M10*35 Grade 12-9 bolts and washers	110676
ISO-K - With Rotatable Flange	Set of 12 ea. M10*50 Grade 12-9 bolts, nuts and washers	802415

* For DN 200 ISO-K / ISO-F / CFF and DN 250 CFF flanges: consult factory.

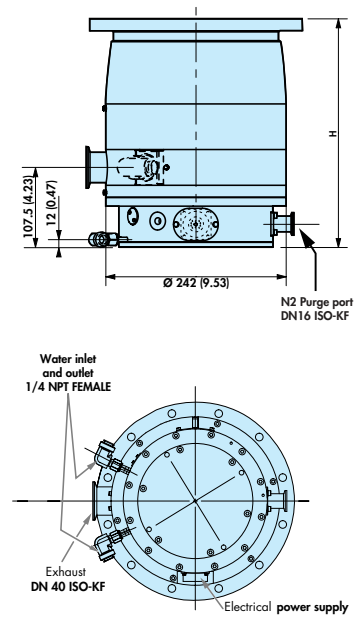
ATH-M SERIES

Dimensions mm (inches)

ATH 400 M/MT



ATH 1300 M/MT

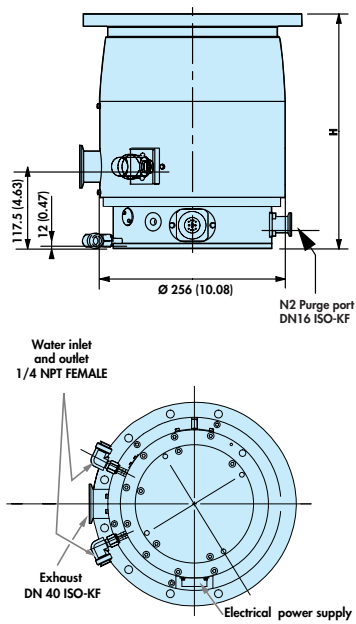


Inlet flange	H
DN 100 ISO-K	292.5 (11.52)
DN 160 ISO-K	272.8 (10.74)
DN 100 CF-F	298.9 (11.77)
DN 160 CF-F	294.5 (11.59)
ASA - 6"	279.8 (11.02)

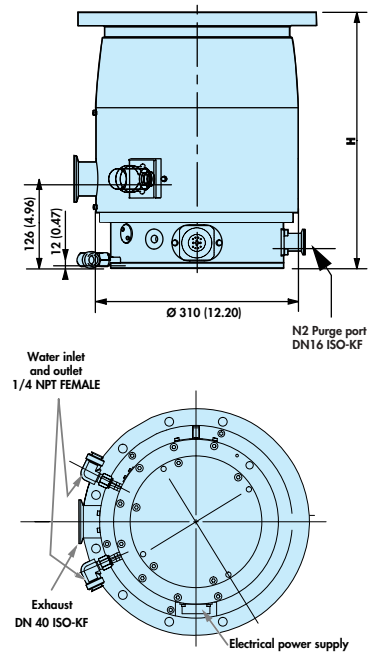
Inlet flange	H
DN 200 ISO-K	306.9 (12.08)
DN 200 CF-F	316.9 (12.48)
ASA - 6"	346.9 (13.66)
DN 250 ISO-K	309.9 (12.20)
DN 200 ISO-F	306.9 (12.08)
DN 160 ISO-K	352.7 (13.89)
DN 160 ISO-F	342.7 (13.49)
DN 160 CF-F	365.1 (14.37)

Dimensions mm (inches)

ATH 1600 M/MT



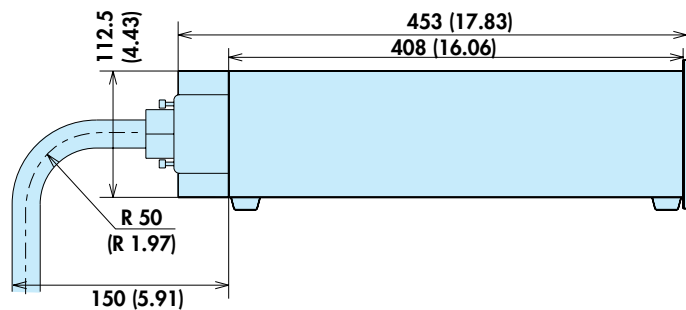
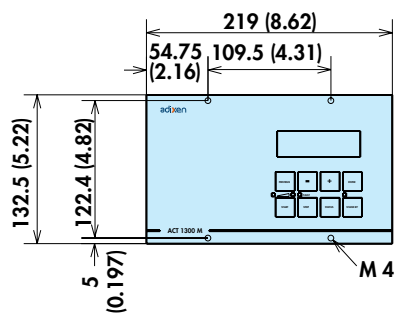
ATH 2300 M/MT



Inlet flange	H
ASA - 6"	356.9 (14.05)
DN 200 ISO-K	316.9 (12.48)
DN 200 CF-F	343.4 (13.52)
DN 200 ISO-F	316.9 (12.48)
DN 250 ISO-K	316.9 (12.48)
DN 250 ISO-F	316.9 (12.48)
DN 250 CF-F	328.9 (12.95)

Inlet flange	H
DN 200 ISO-F	402.5 (15.85)
DN 200 ISO-K	402.5 (15.85)
DN 250 ISO-F	358.5 (14.11)
DN 250 ISO-K	358.5 (14.11)
DN 250 CF-F	402.5 (15.85)

ACT Controllers



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