Agilent Technologies

UPGRADE PROGRAM

V300HT Series Pumps
vs
Turbo V301 Series Pumps

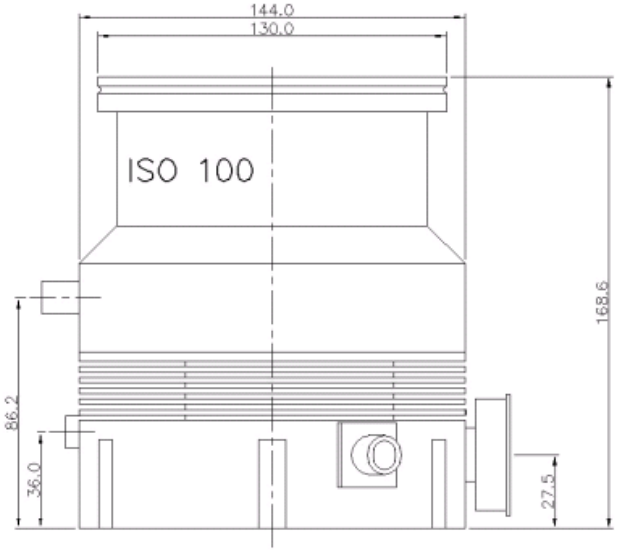
Technical Memo

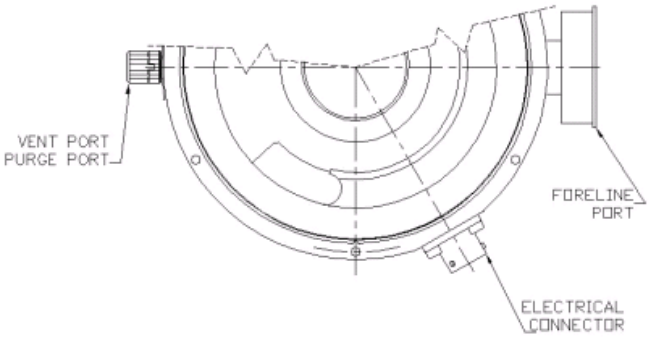
INDEX

Outline drawings ISO100	3
Outline drawings CF6	4
Outline drawings ISO160	7
Outline drawings CF8	9
Technical Specification	11
Technical Advantages	12
Accessories	12
Controller comparison	13
Outline Drawing	14

Outline Drawing

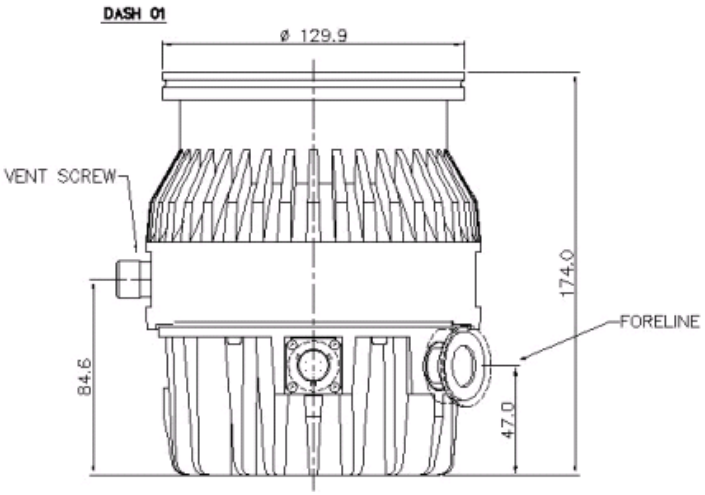
V300HT ISO 100 9699037

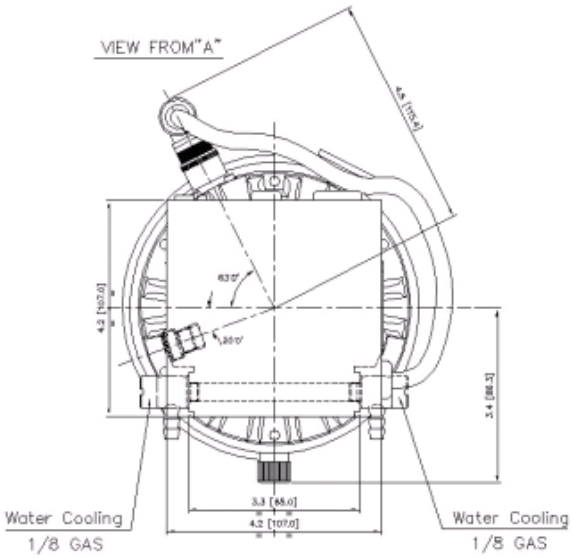




Replacement Suggested

V301 ISO100 EX9698918

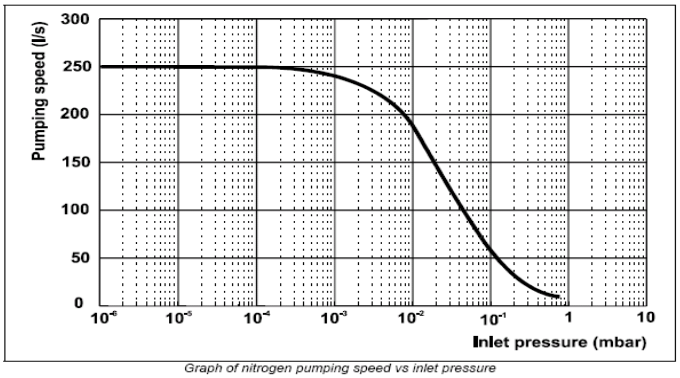




Technical Table

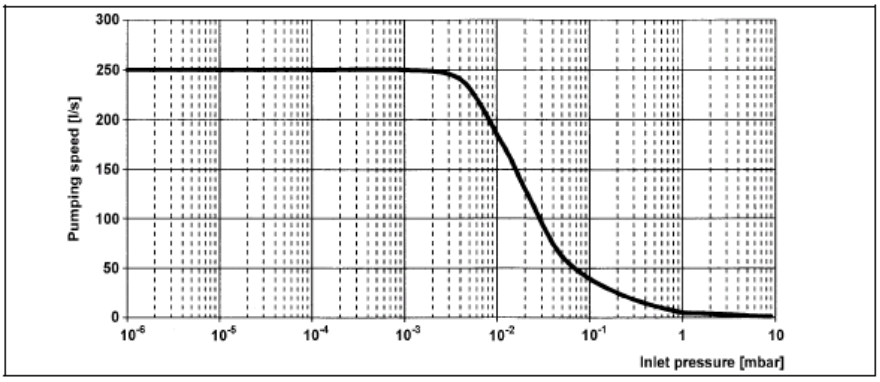
	V300HT ISO100	V301 ISO100
Total height	168.6	174.0
Vent port height from bottom	86.2	85.0
Foreline port height fm. bottom	27.5	47.0
Vent thread	M5	M8
Purge thread	M5	M12
Water fitting thread	1/8G	1/8G
Inlet flange	ISO100	ISO100
Foreline Flange	KF25	KF16 Optional KF25
Vent port position referring to Foreline Flange	180°	On the right 153°
Purge port position referring to Foreline Flange	180°	On the left 83°

Technical Specification:
Pumping Speed Curve:
V300HT ISO100

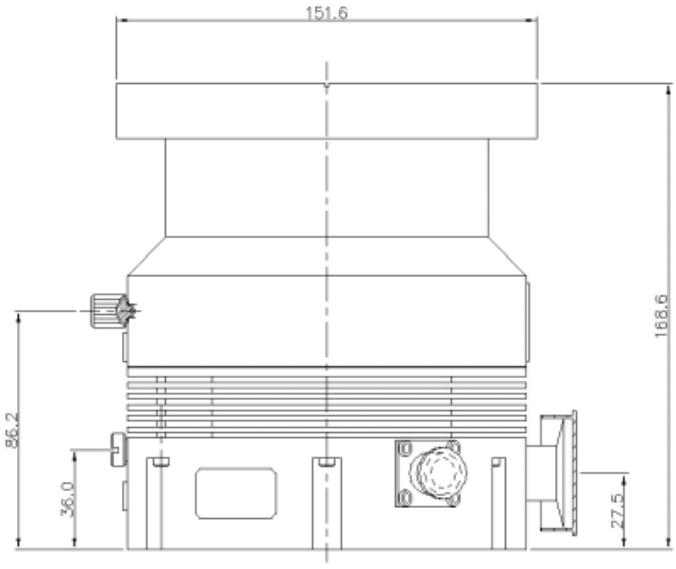


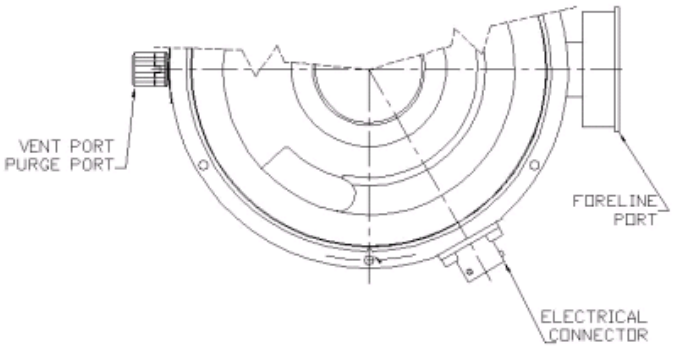
Graph of nitrogen pumping speed vs inlet pressure

V301 ISO100



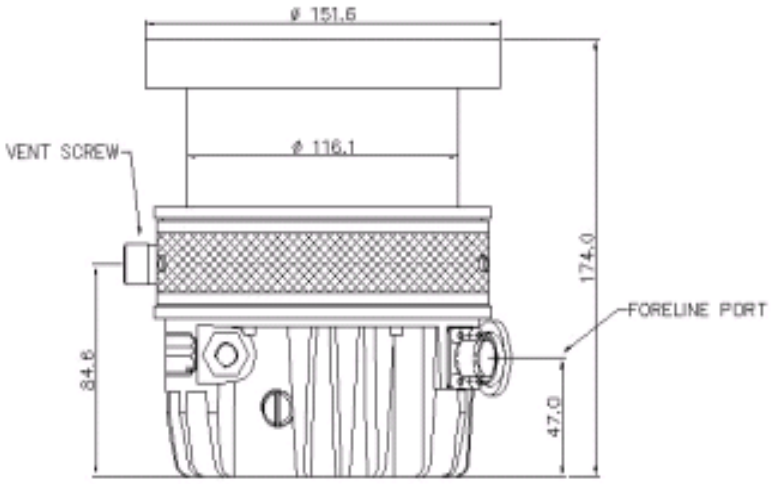
V300HT CFF6'' 9699038

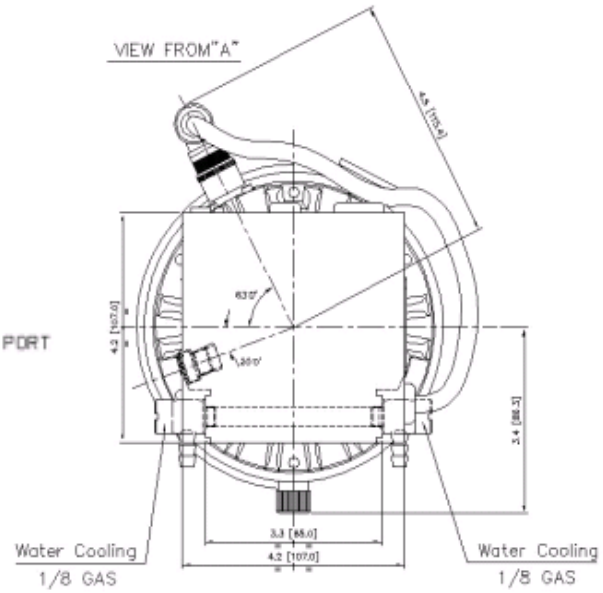




Replacement Suggested

V301 CFF6 EX9698919





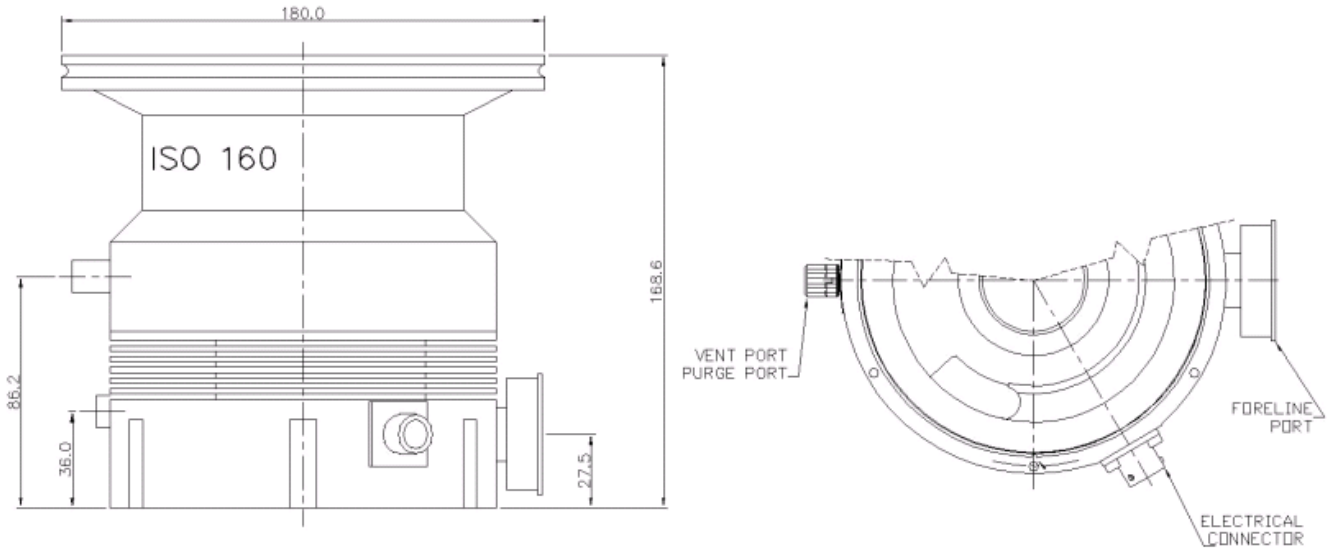
Technical Table

	V300HT CFF6	V301 CFF6
Total height	168.6	174.0
Vent port height from bottom	86.2	84.5
Foreline port height fm. bottom	27.5	47.0
Vent thread	M5	M8
Purge thread	M5	Std: M12
Water fitting thread	1/8G	1/8G
Inlet flange	CFF6	CFF6
Foreline Flange	KF25	KF16 std optional KF25
Vent port position referring to Foreline Flange	180°	On the right 153°
Purge port position referring to Foreline Flange	180°	On the left 83°

Technical Specification:

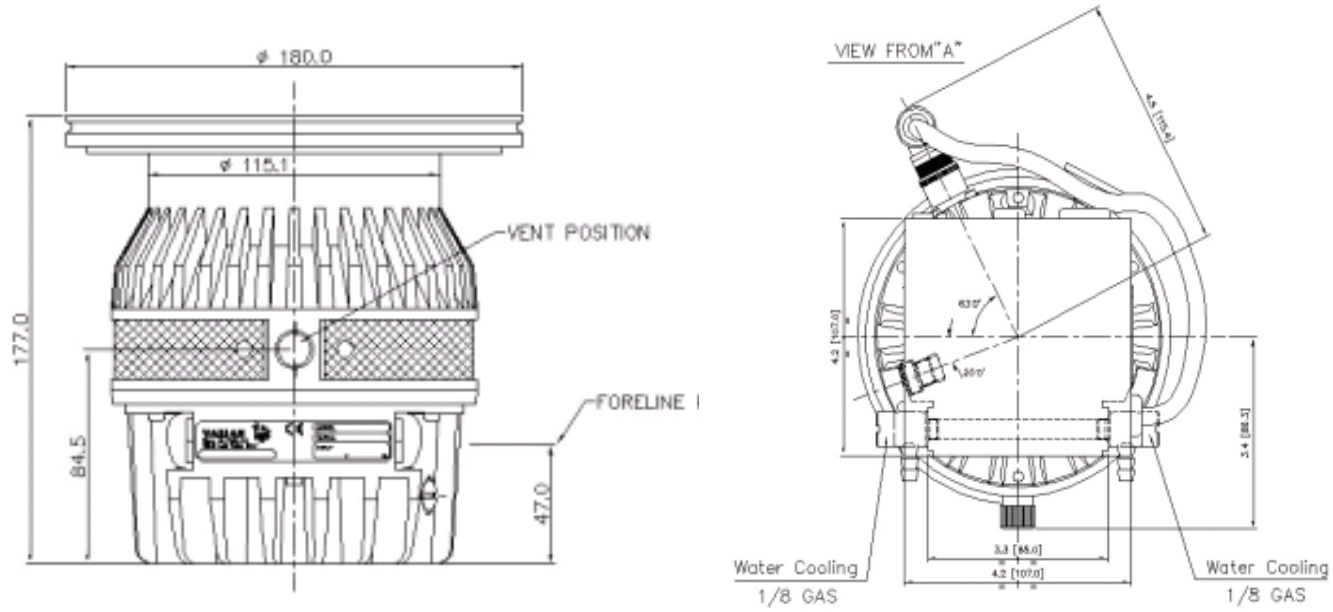
Pumping Speed Curve refer to pumping speed curves for ISO100

V300HT ISO160 9699039



Replacement suggested

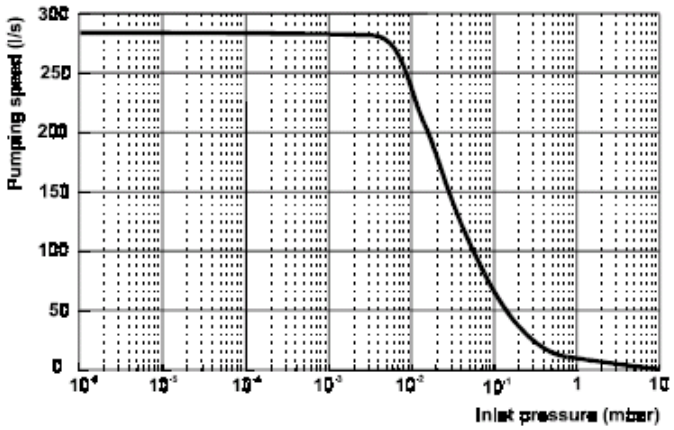
V301 ISO160 EX9698920



Technical Table

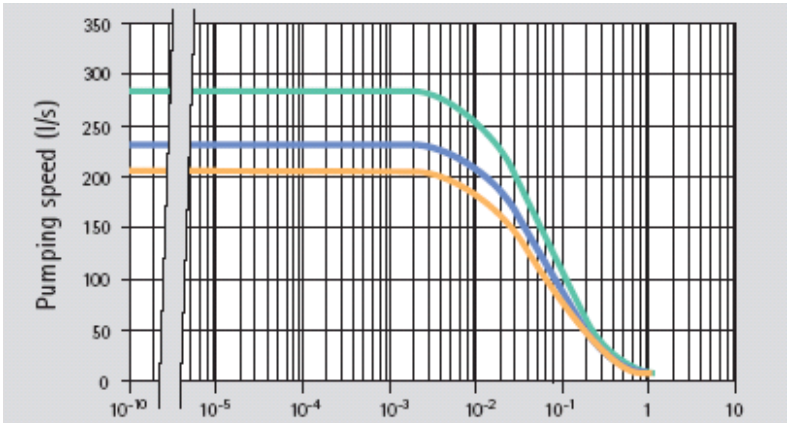
	V300HT ISO160	V301 ISO160
Total height	168.6	177.0
Vent port height from bottom	86.2	84.5
Foreline port height fm. bottom	27.5	47.0
Vent thread	M5	M8
Purge thread	M5	M12
Water fitting thread	1/8G	1/8G
Inlet flange	ISO160	ISO160
Foreline Flange	KF25	KF16 Optional KF25
Vent port position referring to Foreline Flange	180°	On the right 153°
Purge port position referring to Foreline Flange	180°	On the left 83°

Pumping speed curve for N2



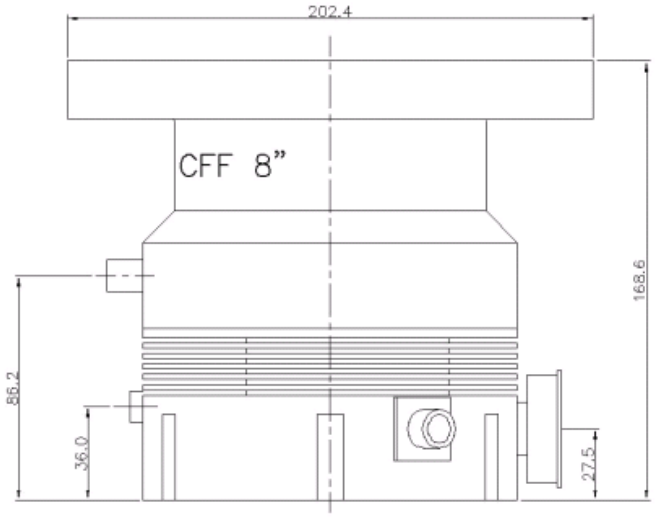
V300HT ISO160

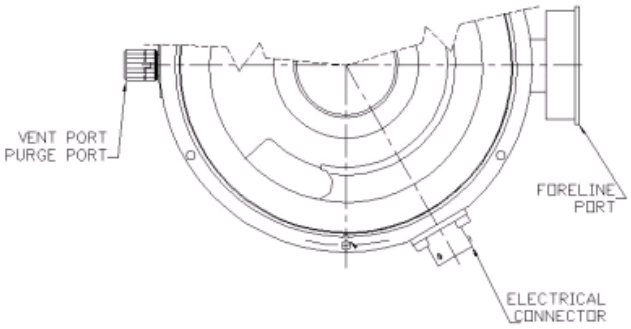
V301 ISO160



(green = N2)

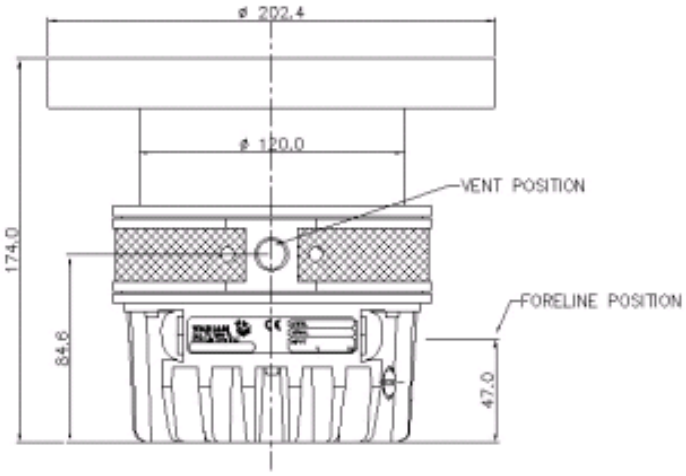
V300HT CFF8 9699040

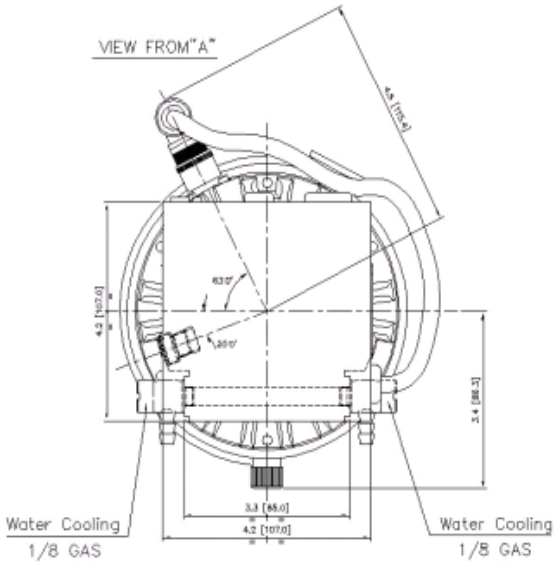




Replacement suggested

V301 CFF8 EX9698921



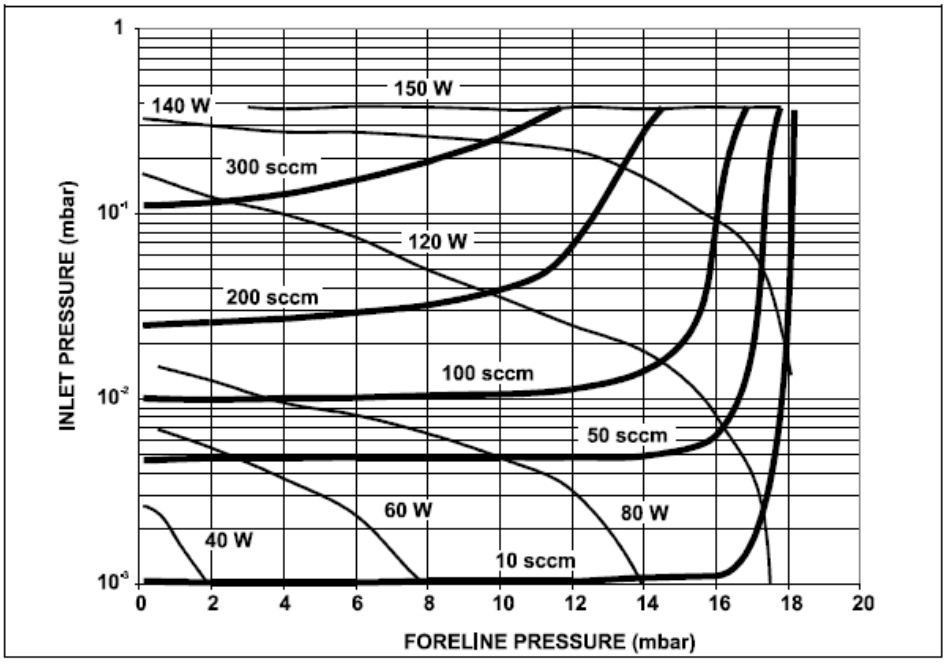


Technical Table

	V300HT CFF8	V301 CFF8
Total height	168.6	174.0
Vent port height from bottom	86.2	84.6
Foreline port height fm. bottom	27.5	47.0
Vent thread	M5	M8
Purge thread	M5	M12
Water fitting thread	1/8G	1/8G
Inlet flange	CFF8	CFF8
Foreline Flange	KF25	KF16 Optional KF25
Vent port position referring to Foreline Flange	180°	On the right 153°
Purge port position referring to Foreline Flange	180°	On the left 83°

Pumping speed curve: refer to curves for ISO160 pumps

Power consumption curve for V301 pump depending on the gas flow on the inlet



Technical Specification

	V300HT		V301	
Connection nominal diameter Inlet Outlet	 ISO100 CFF6 ISO160 CFF8 NW16KF		 ISO100 CFF6 ISO160 CFF8 NW16KF	
Pumping speed l/s N2 He H2	DN100 250 220 200	DN160 280 230 210	DN100 250 220 200	DN160 280 230 210
Compression ration for N2 He H2	 2x10e+8 1x10e+5 1x10e+4		 7x10e+8 1x10e+5 1x10e+4	
Max Forevacuum pressure mbar N2 He H2	 10		 18 16 10	
Gas Throughput mbar.l/s N2 He H2	 No limit No limit No limit		 No limit No limit No limit	
Recommended baking pump Diaphragm Rotary Dry	 MD60 SD300		 DS102 SH100	
Ultimate pressure mbar With rotary With diaphragm With dry	 2x10e-10 2x10e-8		 <5x10e-10 <5x10e-9	
Rotational speed	56000		56000	
Run up time min.	<3		2.5	
Cooling	Air Optional water		Air Optional water	
Coolant water	flow: 30 l/h (0.13 GPM) temperature: + 10° C to + 30° C pressure: 3 to 4 bar		flow: 200 l/h (0.89 GPM) temperature: + 10° C to + 30° C pressure: 3 to 5 bar (45 to 75 Psi)	

Power consumption W	150 air cooling 250 water cooling	150
Vibration level (displacement)	< 0.01 µm at inlet flange	< 0.01 µm at inlet flange
Noise level	45 dB (A) at 1 meter	45 dB (A) at 1 meter
Motor technology	Asynchronous	Asynchronous
input	90 Vac, three phase, 933 Hz	75 Vac, three phase, 963 Hz
Weight Kg	ISO 4.5 CFF 8	ISO 4.5 CFF 8

Technical Advantages

Notes:

The major technical advantage of the V301 is the low power consumption for improved performances at higher foreline pressure, with following conclusions:

1. The pump dissipates less heat even under higher foreline pressure, what ensures a better reliability; in other words the working temperature of the V301 pump is lower if compared to the working temperature of the V300HT, which induces a lower bearing temperature, consequently to a better reliability.
2. A noteworthy fact is that the finned envelope ISO version helps in cooling the system since the thermal exchange surface is increased up to 50% respect to the V300HT (better thermal dissipation).
3. The V301 can make the customer save energy providing better performances: max 150W than the V300HT that absorbs 250W max.
4. The clogging of water cooling lines has been solved: the water cooling channels is now made of Stainless Steel.
5. The V301 pump can work in presence of high gas flow due to the improved geometry of the Macrotorr® Stages; while the V300HT maintains a constant throughput up to 50 sccm till 13 mbar, the V301 Navigator can produce the same performances till 16 mbar; consequently you can use the pump with high and stable performances at higher foreline pressure

Accessories:

1. air cooling kit has changed from 9699314 to 9699299
2. vent valve has changed if Navigator on board controller is used (9699834); it has not changed if Rack controller is used (9699843)
3. inlet screen has not changed (DN100 9699302 or DN160 9699304)
4. damper has not changed (ISO100 pn 9699344, CFF6 pn 9699334, ISO160 9699345 and CFF8 9699335)
5. water cooling kit has not changed (9699337 or 9699347)
6. purge port thread has changed from M5 to M12.
7. include on request NW25 foreline flange optional 9699130

Controller Comparison

Considering that the existing V300HT controller can be used to operate a new V301 pump ONLY IF AIR COOLING has been setted on the controller menu, the customer always has the chance to:

- Keep his controller operating with the V301 pump;
- upgrade his system by converting the V300HT controller with a V301 Navigator on board controller, thanks to this special agreement;
- upgrade his system by converting the V300HT controller with a V301 AG Rack controller, thanks to this special agreement.

V301 Navigator on board controller

Agilent offers a compact on-board controller, 120-220V automatically switched according to the local main voltage. It allows as standard the serial communication RS232/485, the communication via Navigator Software (Contact Technical Support), for parameters setting and downloading through a PC ; more features in the I/O signals if compared to previous V300HT controller; easy to install due to the small size and easy to use with the new concept plug-and-pump.

It can be mounted either on the bottom or on the side using the dedicated bracket.

V301 AG Rack controller

Agilent offers also the possibility to have a ¼ Rack AG (Active Gauge) controller that is very innovative from the operational point of view, and with increased control and communication capabilities.

The new rack controller is micro-processor-controlled, solid-state, frequency converter with self-diagnostic and self-protection features.

The most important features are:

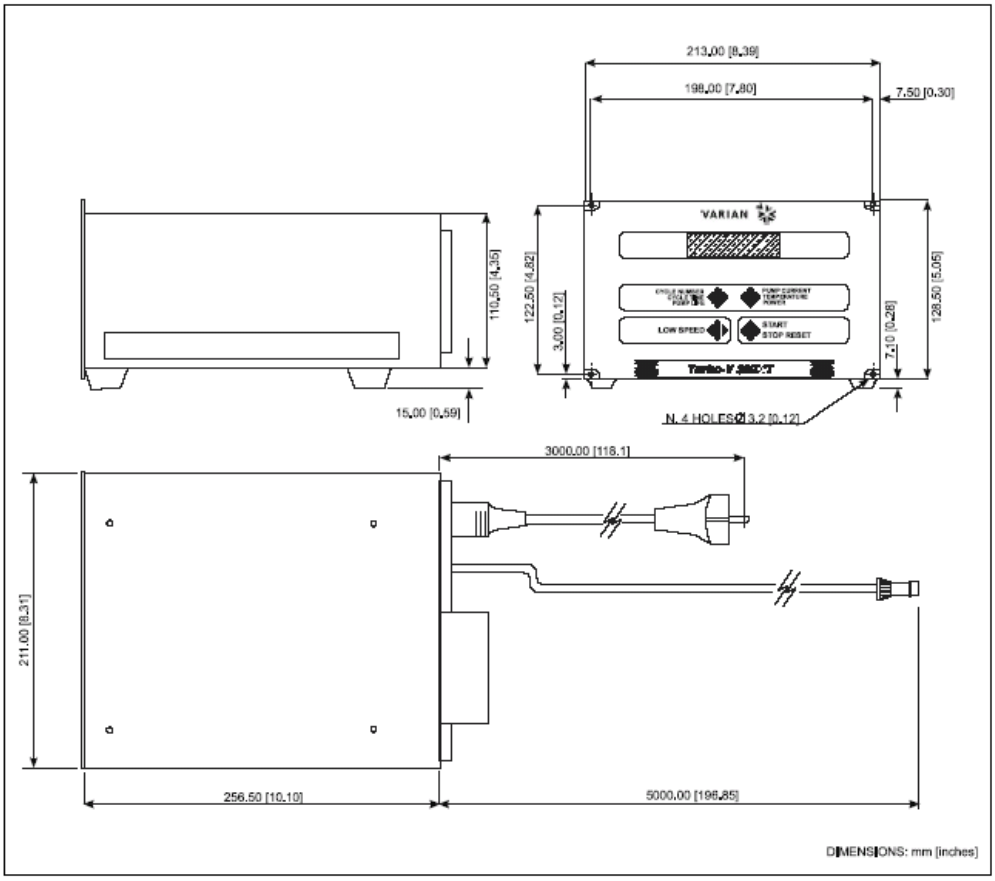
- Front/remote/serial operation,
- 24Vdc pump fan cooling drive,
- Vent valve drive (valve delay and opening time are adjustable),
- Pump speed reading after stop command (allows monitoring of pump slow down time after the stop command during the venting phase),
- Regenerative braking (most effective pump deceleration without heat generation at the motor level),

- Pressure reading through the EyeSys Mini-IMG Gauge or the new FRG700
- Input voltage auto setting,
- Remote I/O compatible with previous version,
- Navigator default serial compatible with the previous RS232 and RS485 version,
- Profibus interface (optional).

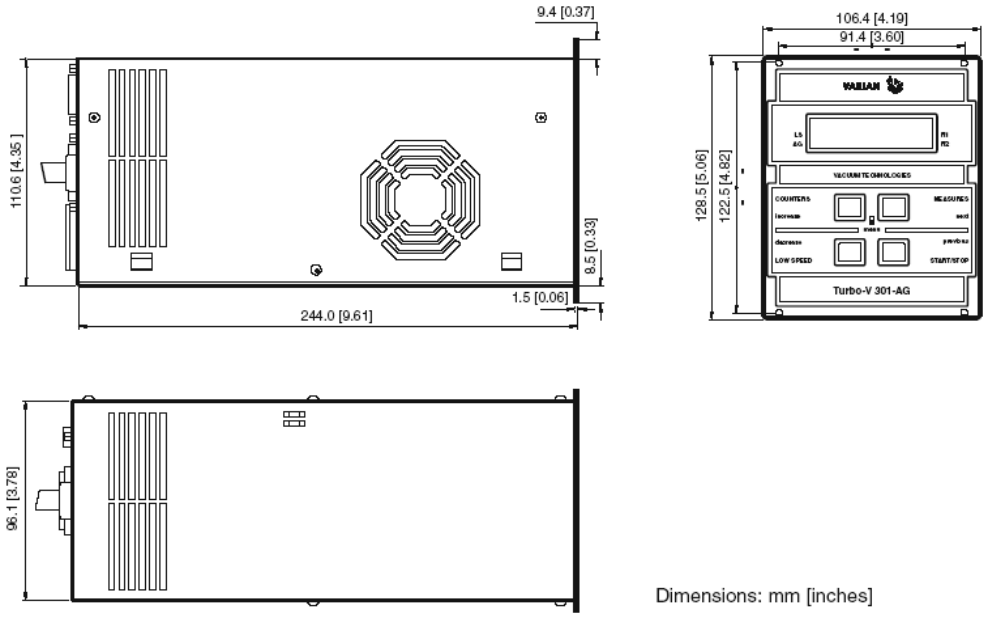
The controller is available in three models: base version (pn 9698991), with RS232-485 option (pn 9698992), with Profibus option (pn 9698993).

Controller outline:

V300HT ½ Rack

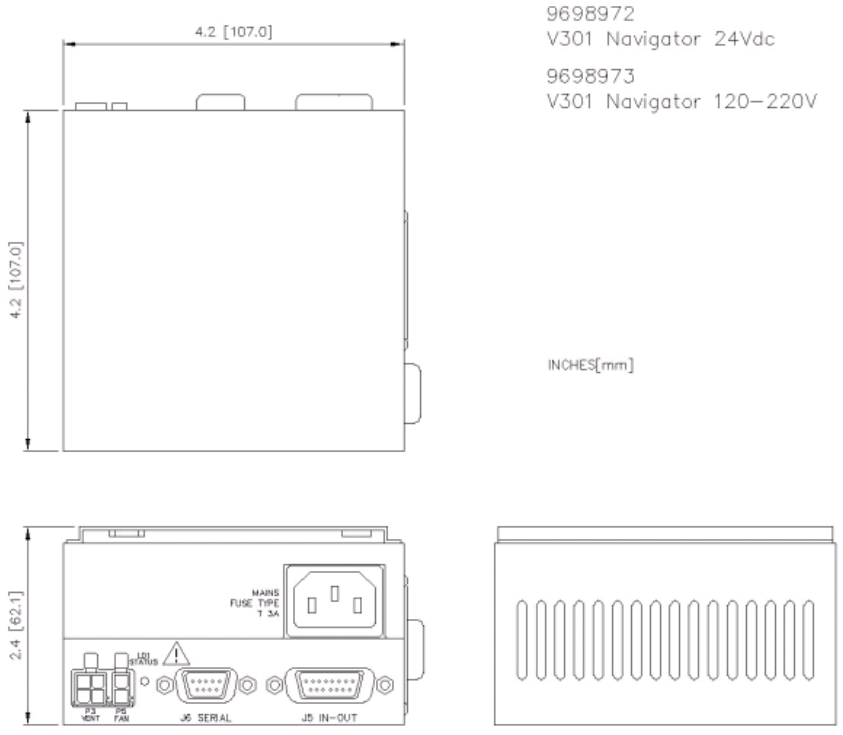


V301 ¼ rack AG controller:



Dimensions: mm [inches]

V301 Navigator on board:



9698972
V301 Navigator 24Vdc

9698973
V301 Navigator 120–220V

INCHES[mm]

Interconnection schematic:

	V300HT rack	**V301 AG rack**
Signal Description	On P1 connector:	
Remote START/STOP	1-6	1-6
Remote LOW SPEED	2-7	2-7
INTERLOCK	3-8	3-8
SYSTEM OVERRIDE	4-9	4-9
SOFT START	N.A.	5-9
	On P2 connector:	On J1 connector:
Analog output 2Vdc = 1A	1-2	1-2 (programmable)
R1 signal 24V, 60mA	4-11	4-11
LOW SPEED signal 24V, 60mA	5-12	5-12
START signal 24V, 60mA	6-13	6-13
R2 signal 24V, 60mA	7-14	7-14
FAULT signal 24V, 60mA	8-15	15-8
ANALOG OUTPUT (0-10V) frequency Analog output	1-9	1-9

On V301 Navigator on board controller all signals are available on the same connector J5:

1	START/STOP (+)	IN
2	START/STOP (-)	IN
3	INTERLOCK (+)	IN
4	INTERLOCK (-)	IN
5	SPEED SETTING (+)	IN
6	SPEED SETTING (-)	IN
7	SOFT START(+)	IN
8	SOFT START(-)	IN
9	+ 24 Vdc	OUT
10	SPARE	OUT
11	PROGRAMMABLE SET POINT	OUT
12	SPARE	OUT
13	FAULT	OUT
14	PROGRAMMABLE ANALOG SIGNAL (+)	OUT
15	• GROUND • PROGRAMMABLE ANALOG SIGNAL (-)	OUT

For signal complete description, please refer to instruction manual.

Main cable must be specified (9699957 EU plug; 9699958 US plug); controller-to-pump cable is supplied.