Agilent Technologies

UPGRADE PROGRAM

V250 Series Pumps
vs
V301 Series Pumps

Technical Memo

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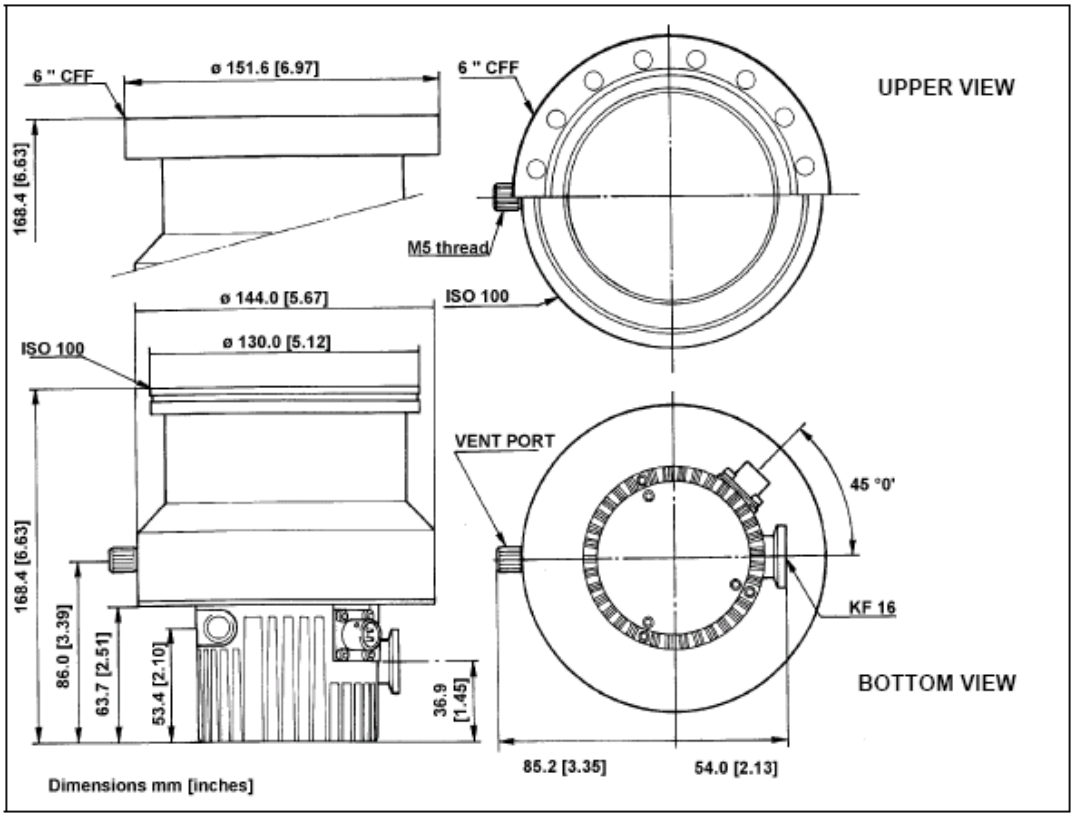
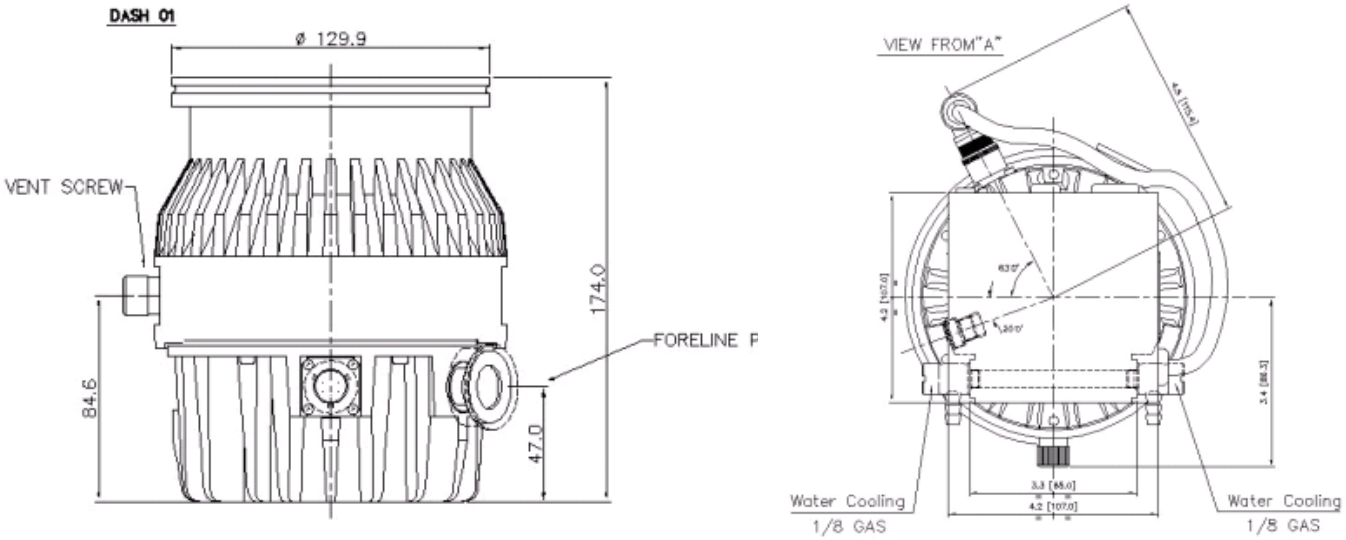
Outline Drawing

V250 ISO100 969900



Replacement Suggested

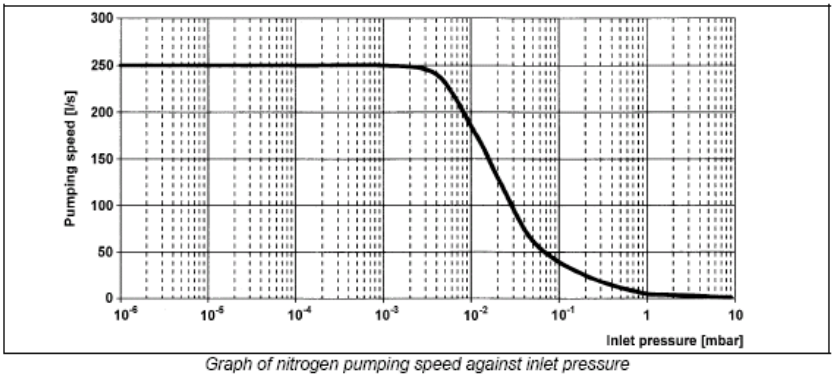
V301 SO100 EX9698918



Technical Table

	V250 ISO100	V301 ISO100
Total height	168.4	174.0
Vent port height from bottom	86.0	85.0
Foreline port height fm. bottom	36.9	47.0
Vent thread	M5	M8
Purge thread	Only modified std	Std: M12
Water fitting thread	1/8G	1/8G
Inlet flange	ISO100	ISO100
Foreline Flange	KF16	KF16
Vent port position referring to Foreline Flange	180°	On the right 153°
Purge port position referring to Foreline Flange	Only modified std	On the left 83°

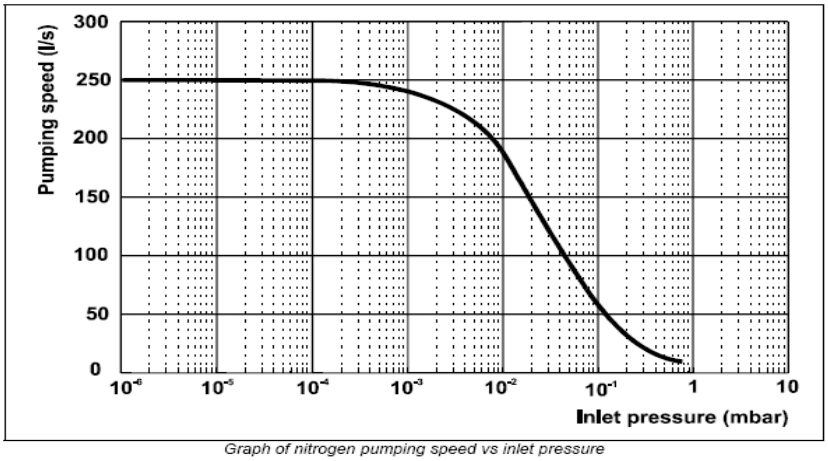
Technical Specification:
Pumping Speed Curve:



Graph of nitrogen pumping speed against inlet pressure

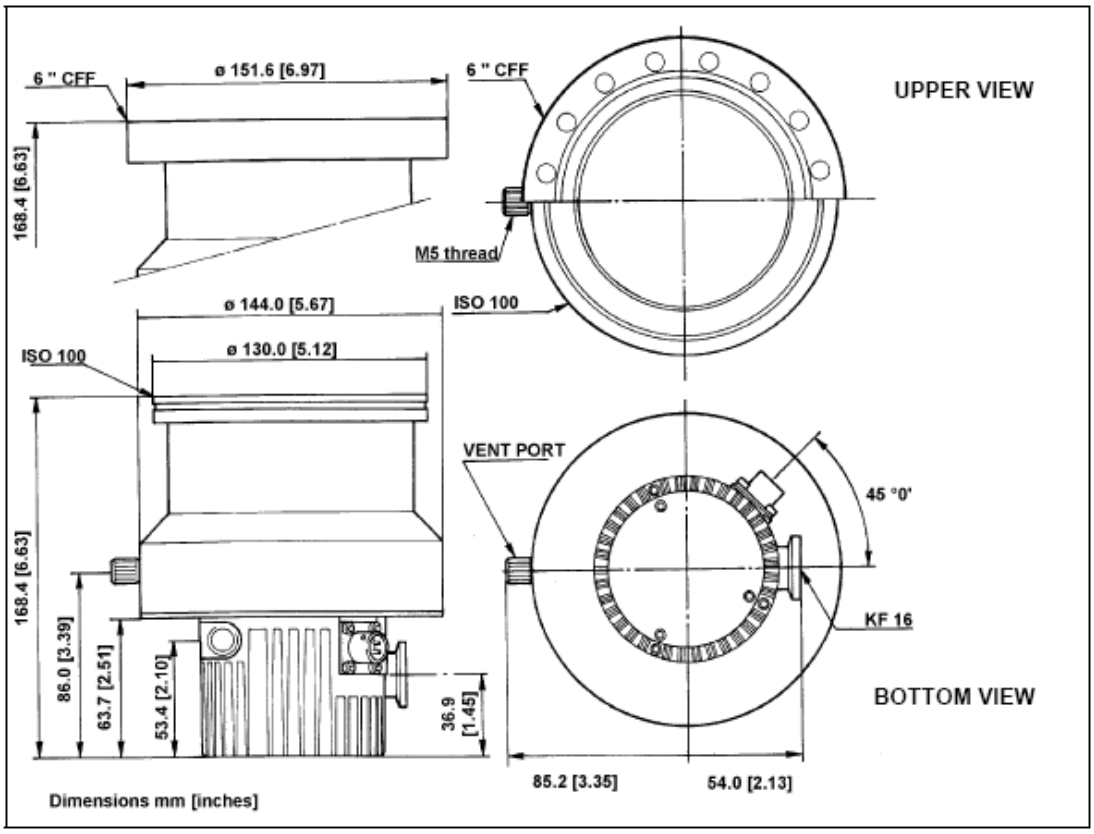
V250 ISO100

V301 ISO100



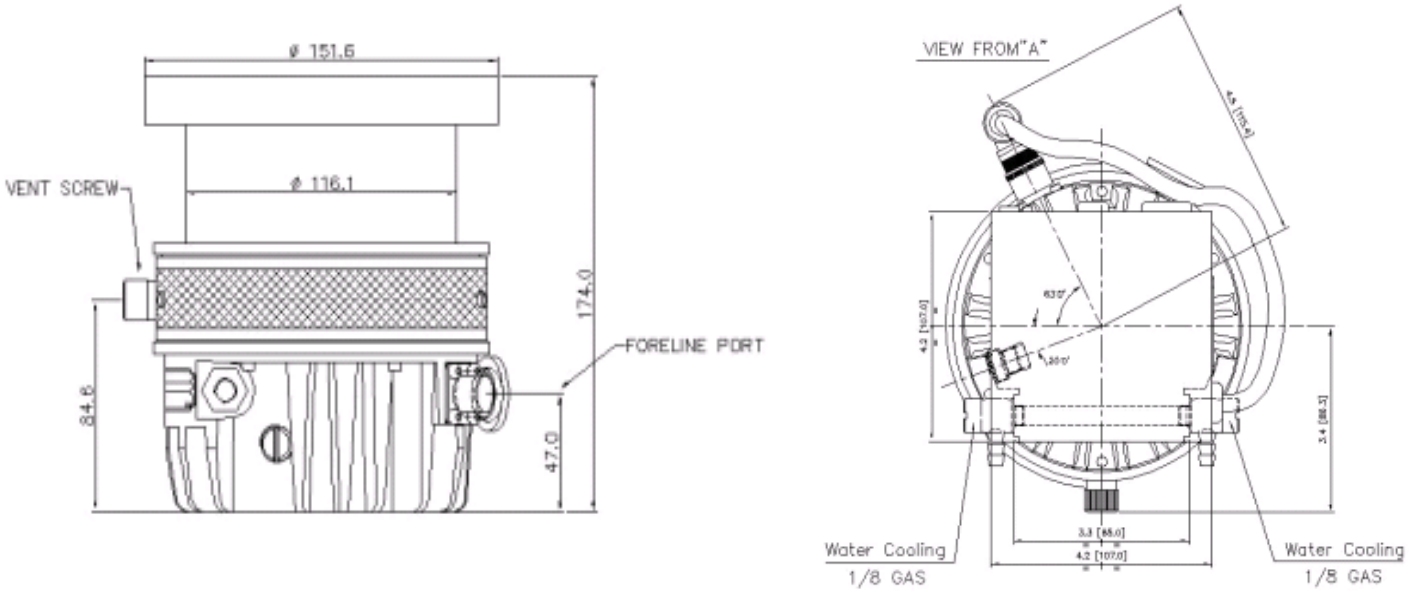
Graph of nitrogen pumping speed vs inlet pressure

V250 CFF 6 **9699008**



Replacement Suggested

V301 CFF 6 **EX9698919**

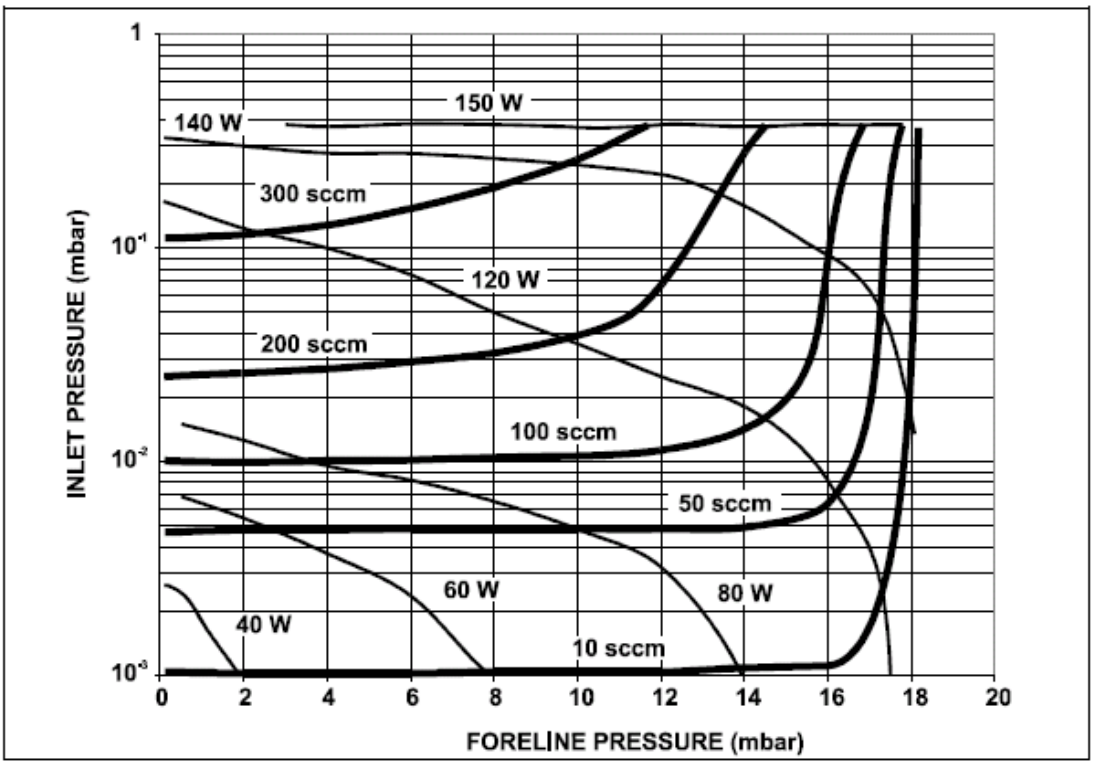


Technical Table

	V250 CFF6	V301 CFF6
Total height	168.4	174.0
Vent port height from bottom	86.0	84.5
Foreline port height fm. bottom	36.9	47.0
Vent thread	M5	M8
Purge thread	Only modified std	Std: M12
Water fitting thread	1/8G	1/8G
Inlet flange	CFF6	CFF6
Foreline Flange	KF16	KF16
Vent port position referring to Foreline Flange	180°	On the right 153°
Purge port position referring to Foreline Flange	Only modified std	On the left 83°

Technical Specification:
Pumping Speed Curve refer to pumping speed curves for ISO100

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



Technical Specifications

	V250	V301
Connection nominal diameter		
Inlet	ISO100 CFF6	ISO100 CFF6
Outlet	NW16KF	NW16KF
Pumping speed l/s		
N2	250	250
He	220	220
H2	200	200
Compression ration for		
N2	2x10e+8	7x10e+8
He	1x10e+5	1x10e+5
H2	1x10e+4	1x10e+4
Max Forevacuum pressure mbar		
N2	5	18
He		16
H2		10
Gas Throughput mbar.l/s		
N2	No limit	No limit
He	No limit	No limit
H2	No limit	No limit
Recommended baking pump		
Diaphragm	MDP30	
Rotary	SD40	DS102
Dry		SH100
Ultimate pressure mbar		
With rotary	2x10e-10	<5x10e-10
With diaphragm	2x10e-9	
With dry		<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	90	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	58 Vac, three phase, 933 Hz	75 Vac, three phase, 963 Hz
Weight Kg	ISO 7.5 CFF 11.4	ISO 4.5 CFF 8

Technical Advantages

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 V250, 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 V250 (better thermal dissipation).
3. The V301 can make the customer save energy providing better performances.
4. The clogging of water cooling lines has been solved: the water cooling channels is now made of Stainless Steel.
5. The pump offers as standard the possibility to install a purge valve if something changes in the process, whereby the V250 had a purge port only as modified std.
6. The V301 pump can work in presence of high gas flow due to the improved geometry of the Macrotorr® Stages.

Accessories

1. air cooling kit has changed from 9699310: order 9699299 if Navigator on board controller is used; order 9699291 + 9699940 (ext.cable) if V301 AG rack controller is used; order 9699299 + 9699949 (ext.cable) if existing V250 controller is used to run the V301 Upgrade pump
2. vent valve has changed: order 9699834 if Navigator on board controller is used; order 9699844 + 9699941 (ext.cable) is rack AG controller is used; keep existing vent valve if V250 controller is used to run the Upgrade V301 pump
3. inlet screen has not changed (DN100 9699302)
4. damper has not changed (ISO100 pn 9699344 or CFF6 pn 96993349)
5. water cooling kit has not changed (9699337 or 9699347)

Controller Comparison

Considering that the existing V250 controller can be used to operate a new V301 pump with no compatibility problem, the customer always has the chance to:

- Keep his controller operating with the V301 pump;
- upgrade his system by converting the V250 controller with a V301 Navigator on board controller, thanks to this special agreement;
- upgrade his system by converting the V250 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 V250 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:

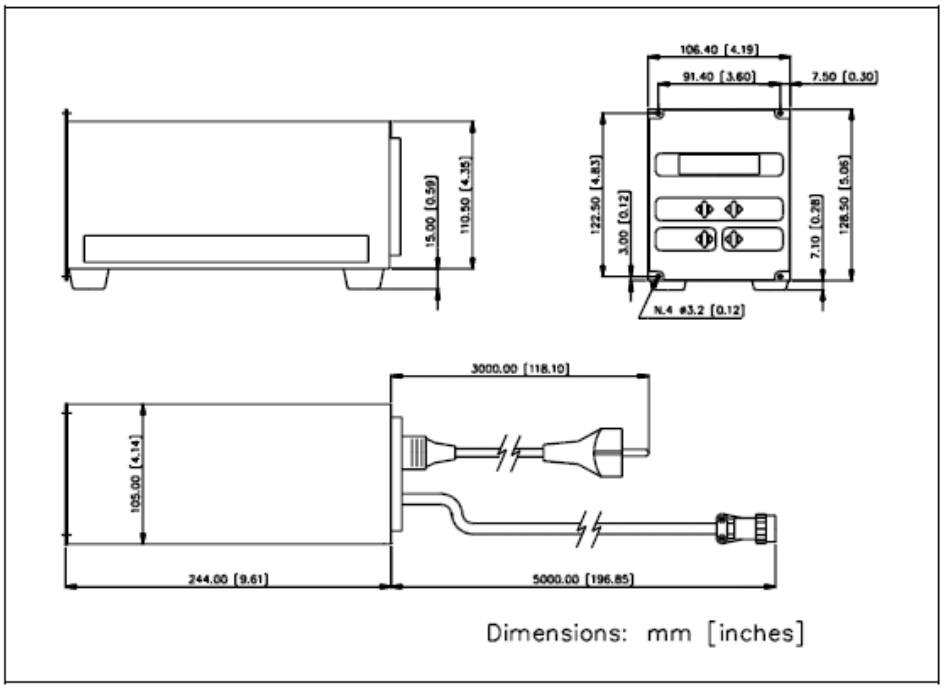
- Front/remote/serial operation,
- 24Vdc pump fan cooling drive,
- Vent valve drive (valve delay and opening time are adjustable),

- 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 Full Range Gauge
- 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).

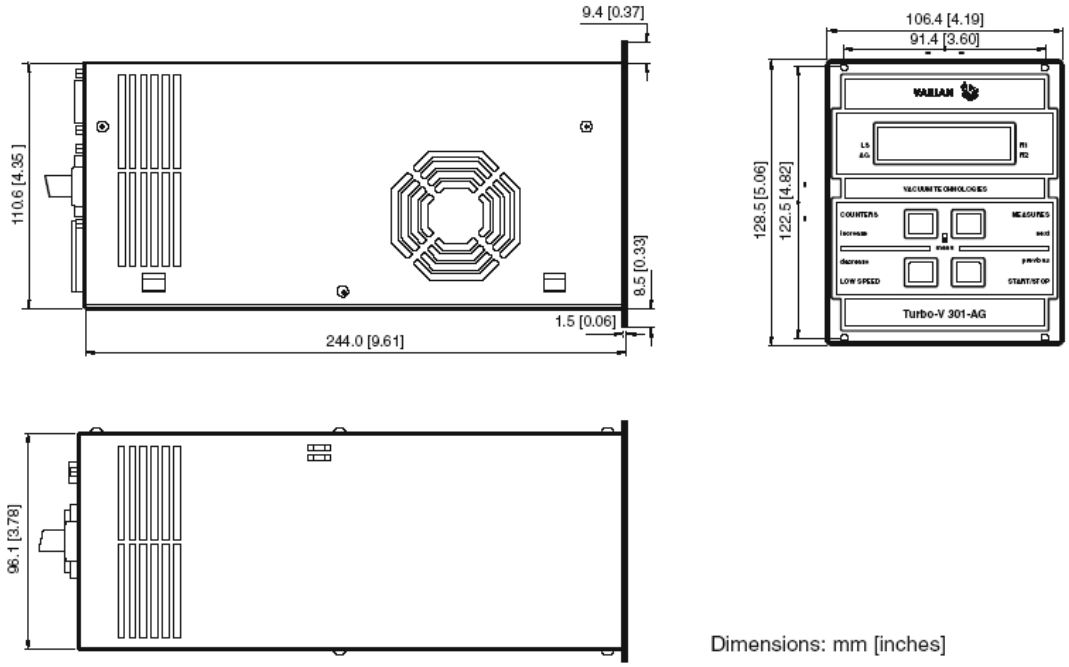
Controller outline

V250 ¼ rack

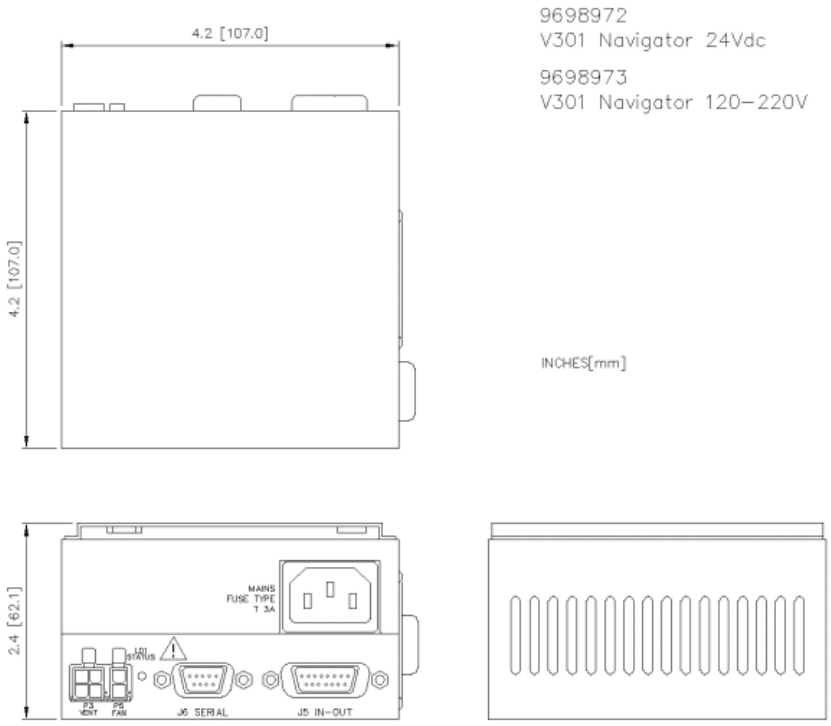


Controller models 969-9423 and 969-9523 outline

V301 ¼ AG rack controller:



V301 Navigator on board:



Interconnection schematic

	V250 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.

Controller-to-pump cable is supplied; main cable must be specified (9699957 EU plug or 9699958 US plug).