



Agilent Technologies

UPGRADE PROGRAM

V60 Series Pumps

VS

Turbo 81-T Series Pumps

Technical Memo

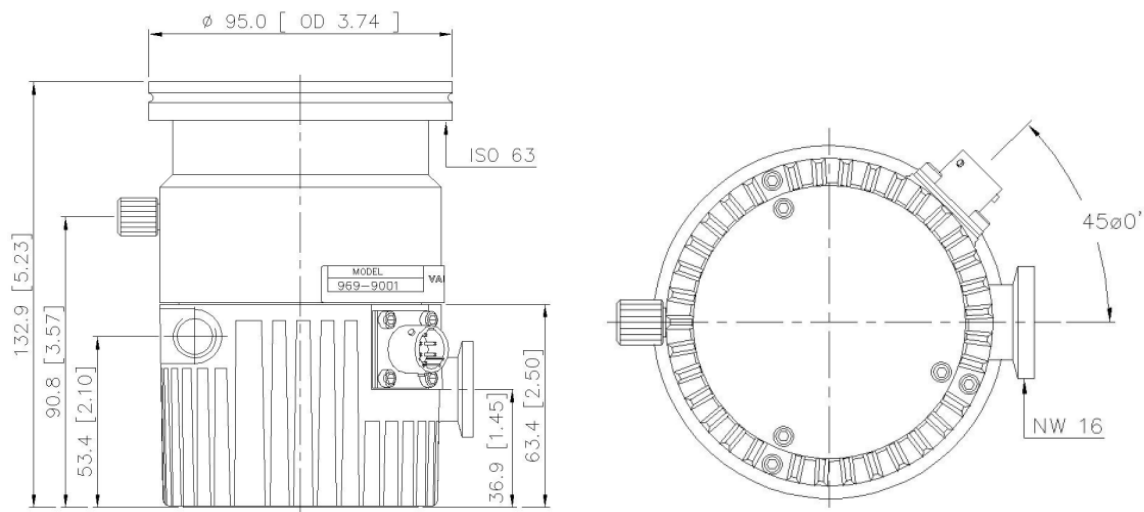
INDEX

Outline drawings ISO63	3
Outline drawings CF4-½	4
Technical Specification	7
Technical Advantages	8
Accessories	8
Controller comparison	9
Outline Drawing	12

Outline Drawing

V60 ISO63

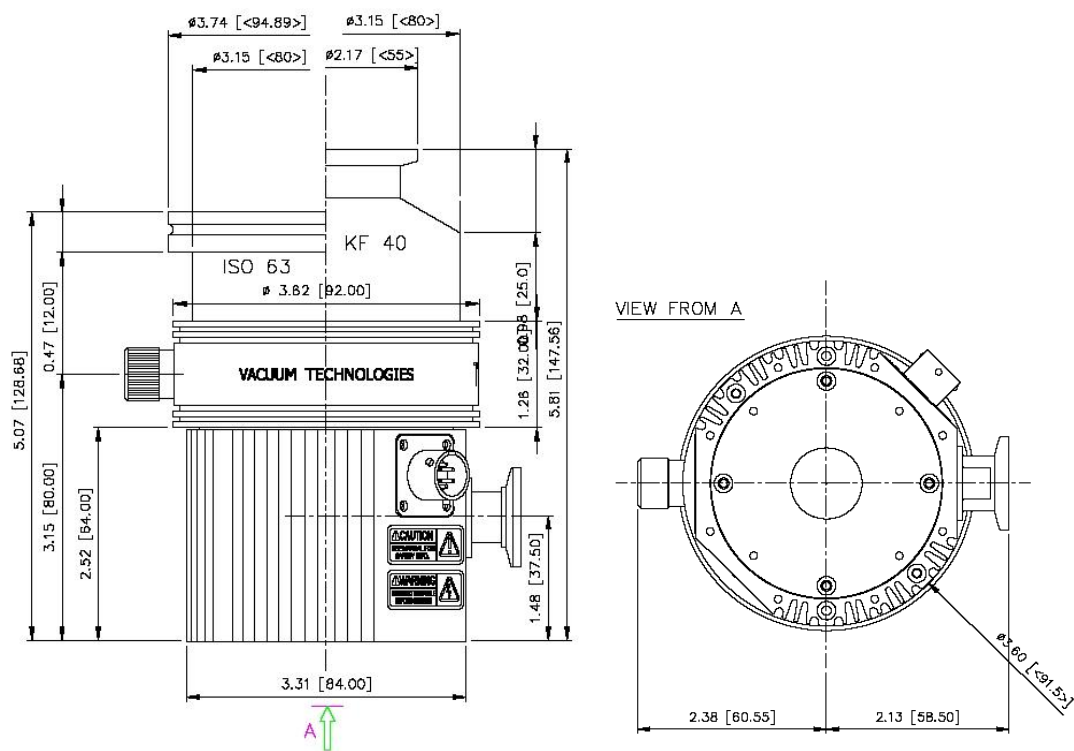
9699001



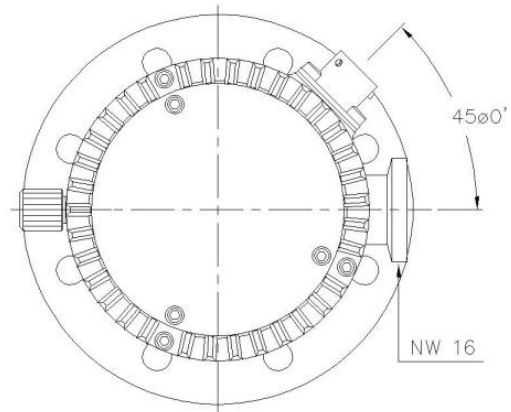
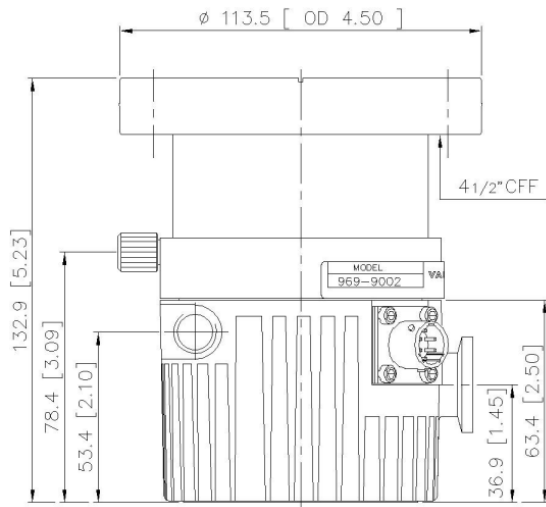
Replacement Suggested

Turbo 81-T ISO63

EX9698905

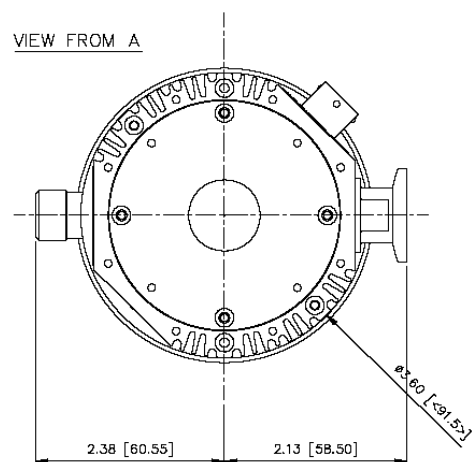
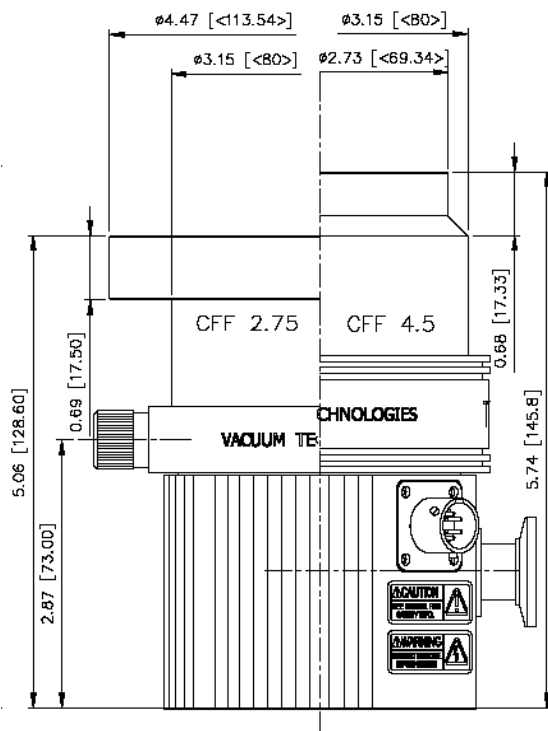


9699002



Turbo 81-T CFF 4-½

EX9698907



Technical Tables

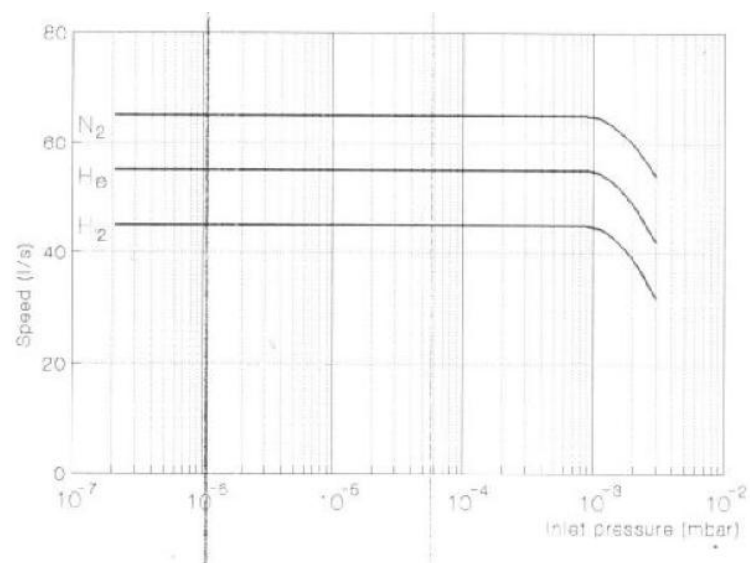
	V60 ISO63	Turbo 81-T ISO63
Total height	132.9	128.68
Vent port height from bottom	90.8	80.0
Foreline port height fm. bottom	36.9	37.5
Vent thread	M5	M8
Purge thread	Only S001 version	Only MSP* version
Water fitting thread	1/8 G	Plate with 1/8G
Inlet flange	ISO63	ISO63
Foreline Flange	KF16	KF16
Vent port position referring to Foreline Flange	180°	180°

* for pump with purge port, please contact Marketing for special quotation

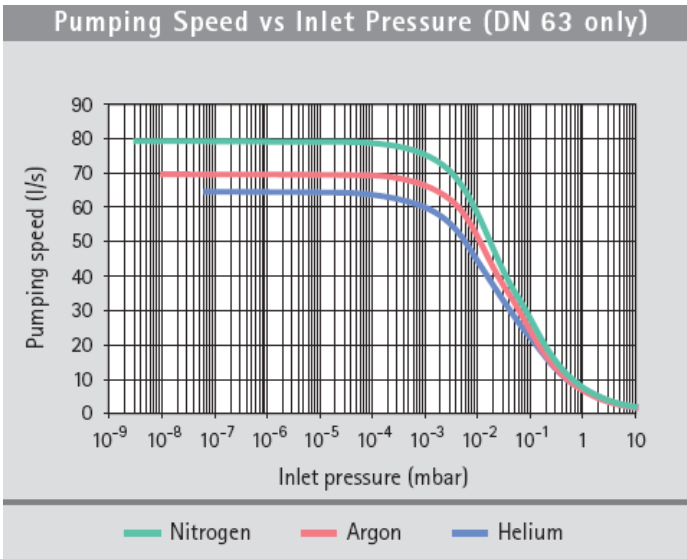
	V60 CFF 4½	Turbo 81-T CFF 4½
Total height	132.9	128.6
Vent port height from bottom	78.4	73.0
Foreline port height fm. bottom	36.9	37.5
Vent thread	M5	M8
Purge thread	Only S001 version	Only MSP* version
Water fitting thread	1/8 G	Plate with 1/8G
Inlet flange	CFF 4 ½	CFF 4 ½
Foreline Flange	KF16	KF16
Vent port position referring to Foreline Flange	180°	180°

* for pump with purge port, please contact Marketing for special quotation

Pumping Speed Curve:
V60 ISO63



Turbo 81-T ISO63



Technical Specification

	V60	Turbo 81-T
Connection nominal diameter		
Inlet	ISO63	ISO63
Outlet	CFF4 ½ NW16KF	CFF4½ NW16KF
Pumping speed l/s		
N2	65	77
He	55	65
H2	45	50
Compression ration for		
N2	5x10e+7	>7x10e+6
He	4x10e+3	3x10e+3
H2	4x10e+2	3x10e+2
Max Forevacuum pressure mbar	10e-1 mbar range	0.2 mbar (N2)
Recommended baking pump		
Rotary	SD40	DS102
Dry		SH110
Ultimate pressure mbar		
With rotary	1x10e-9	< 5x10e-10
With dry		<5x10e-9
Rotational speed	70 KRPM	80 KRPM
Run up time min.	< 60 sec	< 60 sec
Cooling	Air (optional water)	Air (optional water)
Coolant water	Flow: 10 l/h Temp: +10°C to 30°C Press: 2 - 4 bar	Flow: 10 l/h Temp: +15°C to 35°C Press: 2 - 4 bar
Power consumption W	150	100
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	54 Vac, three phase, 1250 Hz	76 Vac, three phase, 1350 Hz
Weight Kg	ISO 63 1.6 CFF 4 ½ 2.3	ISO 63 1.8 CFF 4 ½ 2.6
Operating position	Any	Any

Technical Advantages

The Turbo 81-T pump has been designed in order to have better performances of the present V60 but in a smaller package. It has been designed according to the technical improvements of the drag pump having, as main target, a cost reduction; furthermore, the fins for air cooling have been optimized and the operating temperatures can be substantially lower, for optimized performances.

The most important advantage of the Upgrade is the possibility to replace the existing – non compatible - controller with the 81-AG series controller, either Rack or Navigator.

The Turbo 81-AG series Controller are very innovative 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 EyeSys Mini-IMG 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 controllers are available in different models: rack base version, with RS232-485 option, with Profibus option or Navigator on board.

Accessories

Inlet screen has not changed (DN63 9699300 or KF40 9699309).

All other accessories must be replaced (please get in touch to Technical Support for more details).

Controller Comparison

The existing V60 series controllers cannot drive a Turbo 81-T pump; the rotational speed is limited to 70 KRPM instead of 80 KRPM and consequently the performances. This is not recommended.

The V60 series controllers can be replaced by the 81-AG series controllers, that are available in following configurations:

81-AG Navigator on Board controller 120-220 V, pn 9698996.

81-AG, ¼ Rack controller, pn 9698988 (base), 9698989 (with RS232-485) and 9698990 (with Profibus), with input voltage from 100 V to 240 V.

81-AG Navigator on board controller

The Turbo 81-AG Navigator controller is a microprocessor based solid-state frequency converter with new-enhanced features allowing for further improved control and communication capabilities. The Navigator controller can be mounted on the bottom of our 81-T family of Turbo Molecular Pumps. In order to mount the controller a specific mounting kit is provided together with the controller unit. The units are fully controllable by a remote host computer via the serial connection by means of a Windows based dedicated software.

The main improvements are:

1) Output: Programmable Analog Signal 0-10Vdc Proportional to

or Frequency (existing)

or Power (existing)

or Temperature (new)

or pressure (new)

2) Output: Programmable set point (O.C.)

or Frequency (existing)

or Current (existing)

or Time (new)

or Pressure (new)

3) Able to read an External Gauge (new Feature)

To the new controllers an EyeSys Mini-IMG gauge or the Full Range Gauge FRG700 can be connected by means of its extension cable. (See orderable parts table).

The pressure can be read by serial line or by Remote I/O on Programmable analog Out, in this case the controller replicates the signal coming from the gauge.

4) Multilayer 4-Layer PCB design

In order to have major Immunity to EMI the new controller PCB has been designed with 4 Layers (former design had 2 layers). This is today's state of the Art electronics design.

5) Internal fan for 24Vdc version

In the new 24Vdc controller the improved design allows to work without internal FAN. This new solution eliminates potential vibration issues due to FAN.

6) Connectors

The new controller comes with shielded connectors only (DB15, DB9 & USB). This improvement respect to the former Molex type connectors has been introduced in order to reduce eventual Electro Magnetic Interference (EMI) issues.

7) Stop Speed Reading (new feature)

This is a new Feature available via RS232 connection. The benefits of this feature are:

Continued reading of pump speed after the STOP command.

Allows monitoring of pump slow down and specific shut down time.

81-AG Rack controller

The Turbo 81-AG Rack Controller will be very innovative 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 EyeSys Mini-IMG Gauge or the 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, with RS232-485 option, with Profibus option.

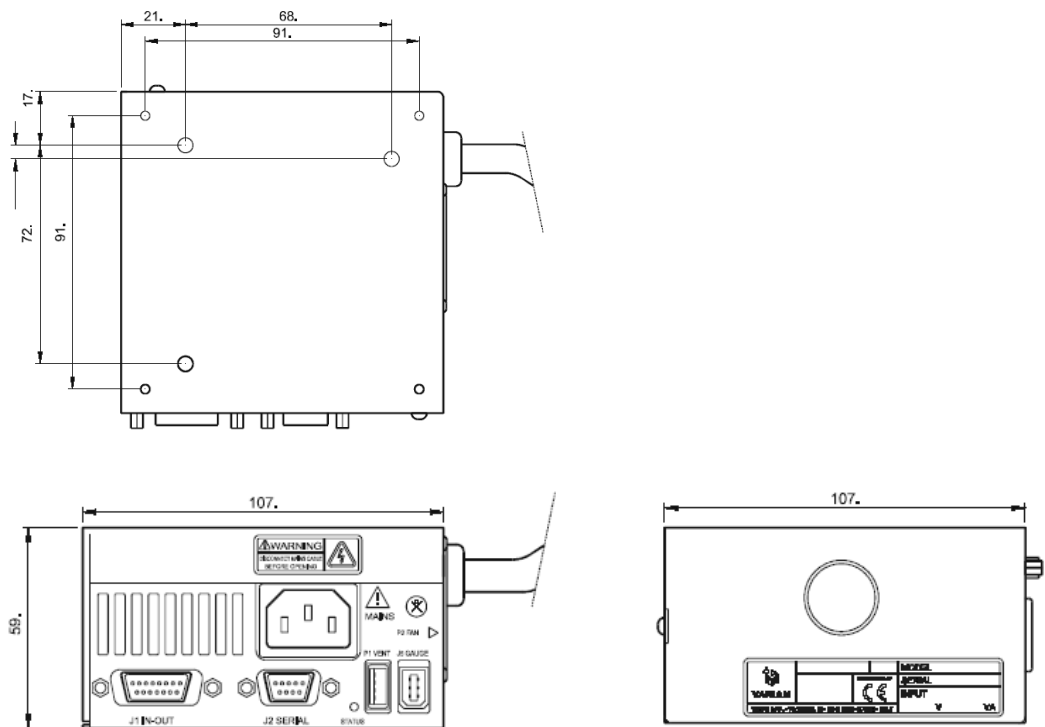
Advantages

The advantages are listed below:

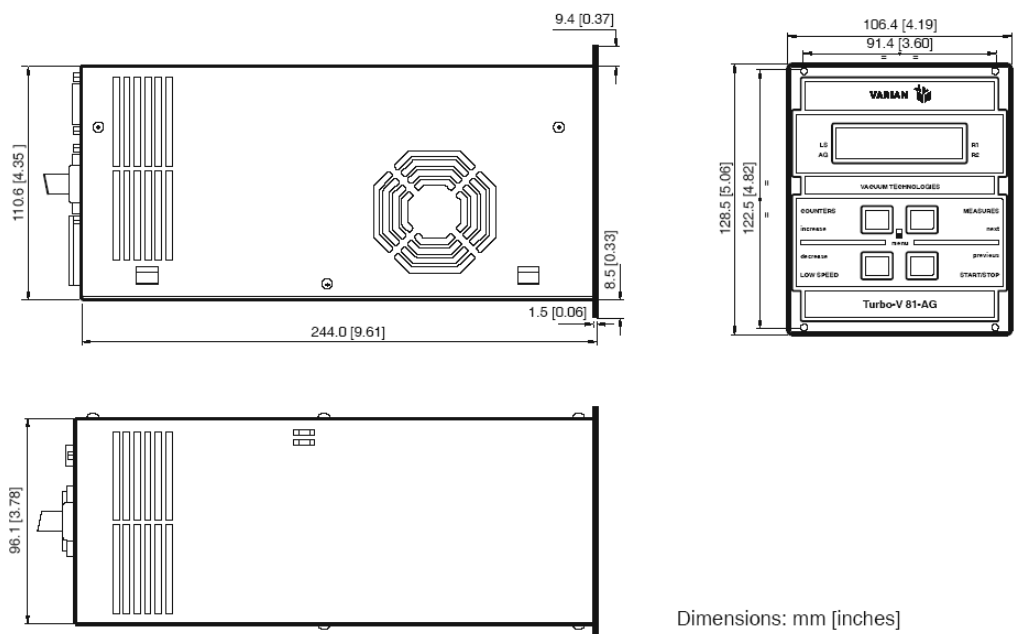
- valve delay and opening time are adjustable (it was fixed on V60 rack controller)
- pump speed reading after stop command (not available on V60 controller)
- regenerative braking (not available on V60 controller)
- pressure reading through EyeSys Mini-IMG Gauge or through the Full Range Gauge (not available on V60 controller)
- input voltage auto setting (manually selectable on V60 rack controllers)
- remote I/O compatible with previous version
- Profibus interface (optional)
- Navigator default serial compatible with the previous RS232 and RS485 version

Controller outline:

81-AG Navigator on board:



81-AG ¼ rack controller



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

Please refer to the Instruction Manual for further technical details (accessories connections, vent valve driving, RS232 protocol, Eyesy Mini IMG operation, etc).