NOTICE: This document contains references to Varian. Please note that Varian, Inc. is now part of Agilent Technologies. For more information, go to **www.agilent.com/chem.**

Agilent Technologies

vacuum technologies

UPGRADE PROGRAM

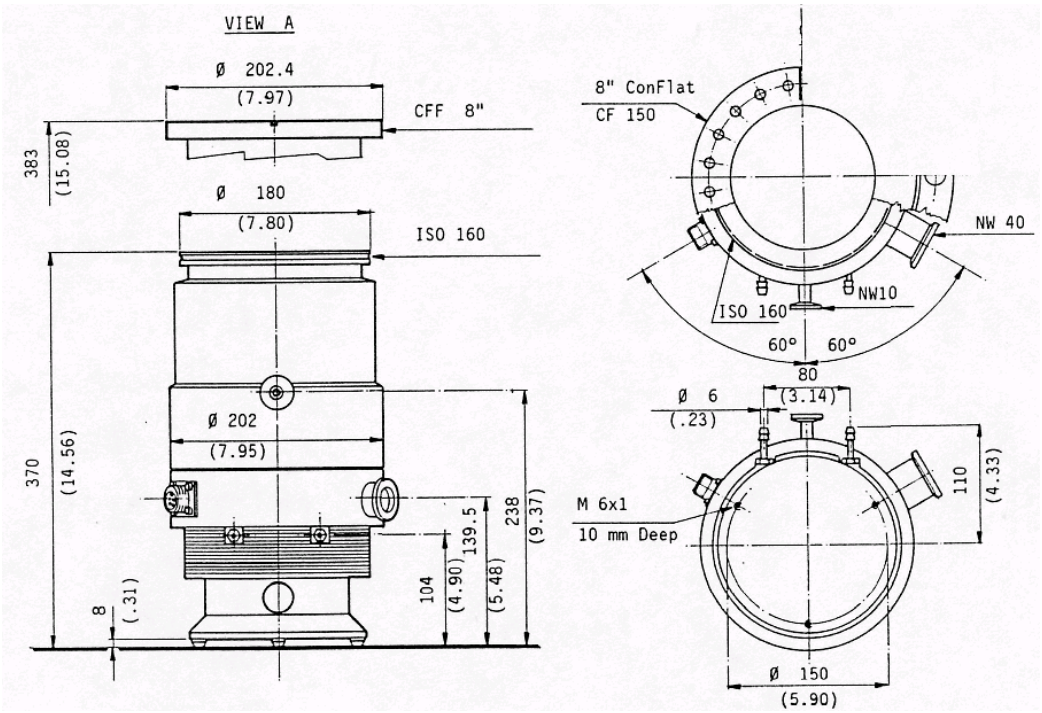
V450 Series Pumps
vs
V551 Series Pumps

Technical Memo

INDEX

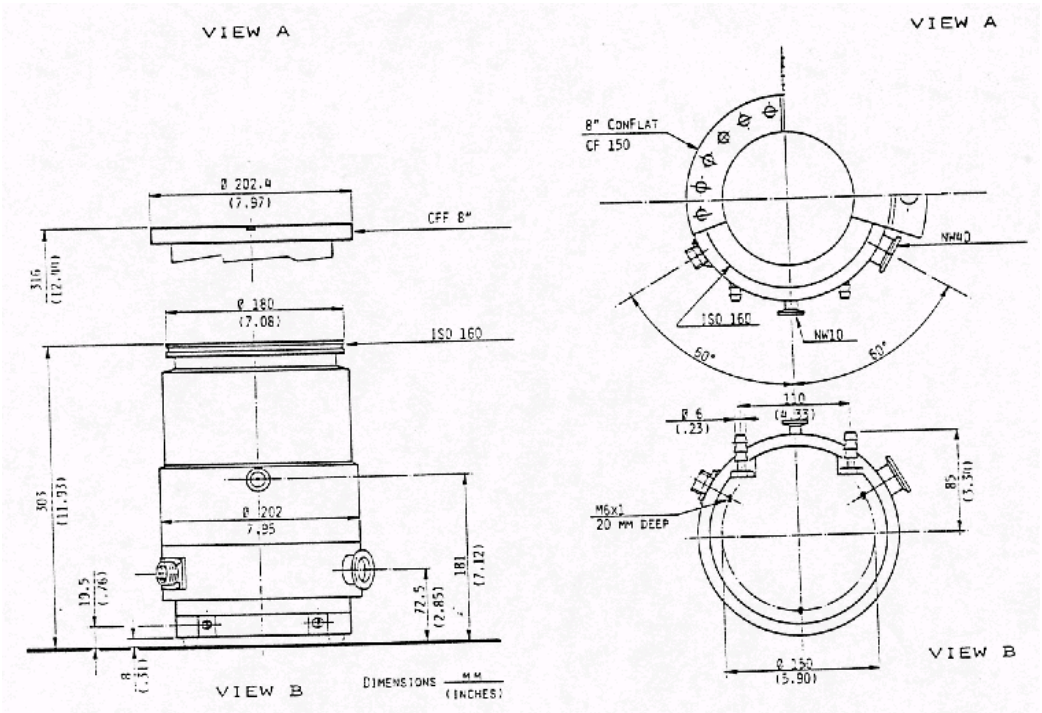
Outline Drawing

V450 ISO160 EX9699041



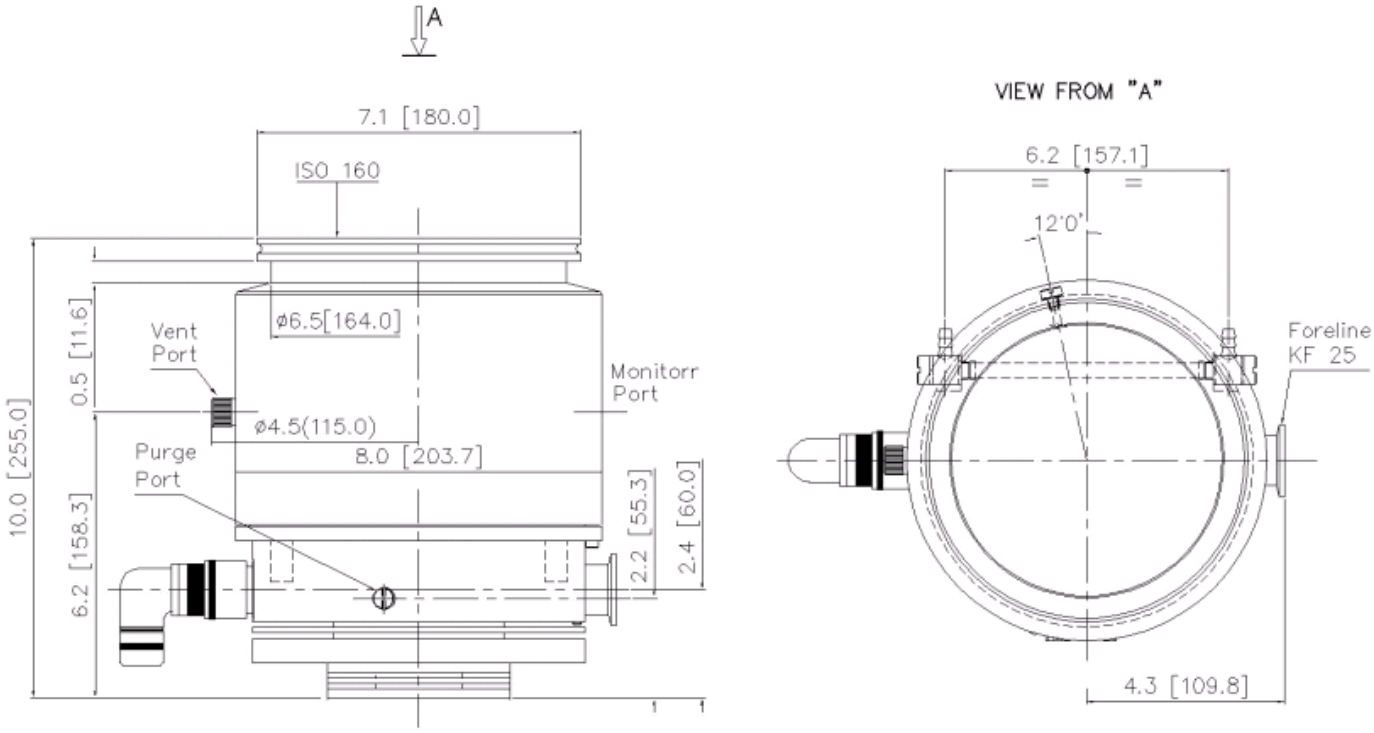
And

V450A ISO160 EX9699044S001



Replacement Suggested

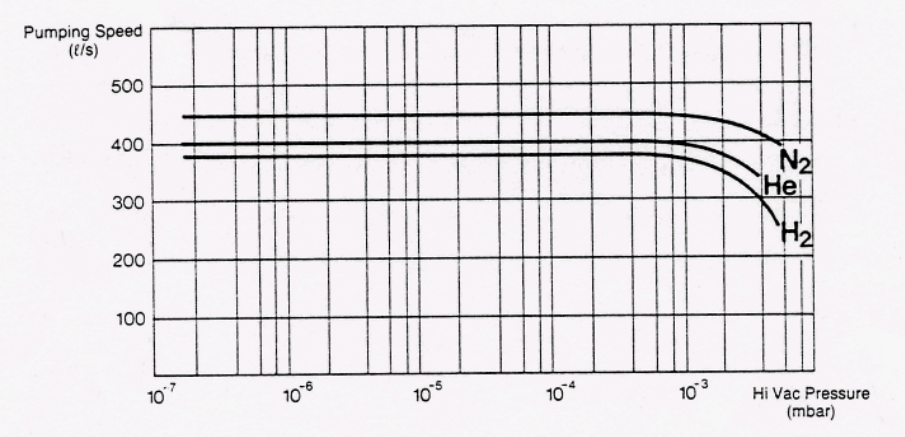
V551 ISO160 EX9698922



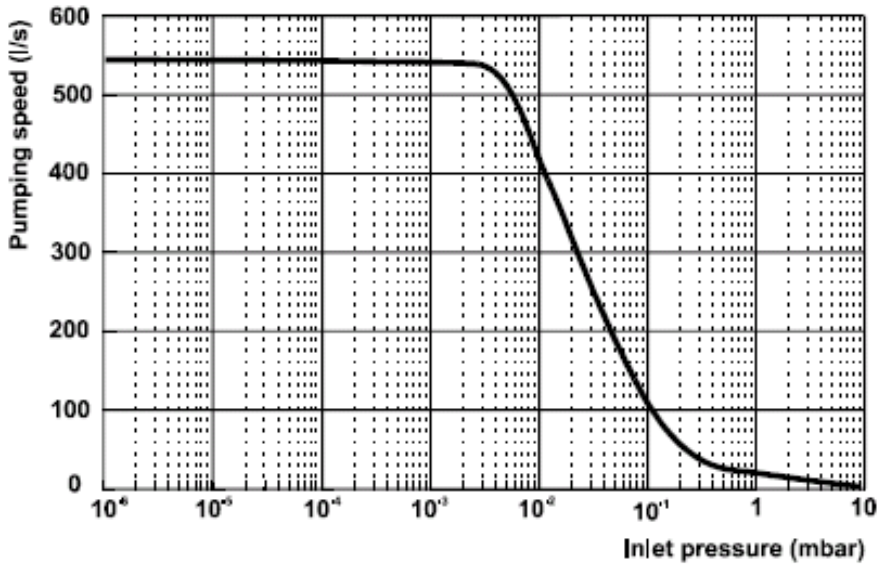
Technical Table

	V450 ISO160	V551 ISO160	V450A ISO160
Total height	370.00	255.00	303.00
Vent port height from bottom	1238.00	158.30	181.00
Foreline port height fm. bottom	139.50	60.00	72.50
Vent thread/port	KF10	M8	KF10
Purge thread	N.A.	Std: M12	KF16
Water fitting thread	2 riffled nozzles	1/8G	2 riffled nozzles
Inlet flange	ISO160	ISO160	ISO160
Foreline Flange	KF40	KF25	KF40
Vent port position referring to Foreline Flange	60°	180°	60°
Purge port position referring to Foreline Flange	N.A.	102°	DWG N.A.

Technical Specification:
Pumping Speed Curve:
V450 ISO160



V551 ISO160



Technical Specifications:

	V450-V450A	V551
Connection nominal diameter Inlet Outlet	 ISO160 NW40KF	 ISO160 NW25KF
Pumping speed l/s N2 He H2	 450 400 380	 550 600 510
Compression ration for N2 He H2	 1x10e+9 2x10e+4 1x10e+3	 17x10e+9 1x10e+7 1x10e+6
Max Forevacuum pressure mbar N2	 N.A.	 18
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	 SD300	 DS402 Triscroll 300
Ultimate pressure mbar With rotary With dry	 5x10e-10	 <1x10e-10 <5x10e-9
Rotational speed	36000	42000
Run up time min.	3	5
Cooling	Forced Air Optional Water	Forced Air Optional water
Coolant water	Flow: 30 l/h (0.09 GPM) temperature: + 10° C to + 30° C pressure: 2 to 4 bar	flow: 200 l/h (0.89 GPM) temperature: + 10° C to + 30° C pressure: 3 to 5 bar
Power consumption W	320	325 with water cooling 220 with air cooling
Vibration level (displacement)	<0.02 µm at inlet flange	< 0.01 µm at inlet flange
Noise level	< 50 dB (A) at 1 meter	45 dB (A) at 1 meter
Motor technology	Asynchronus	Asynchronous
input	54 Vac, three phases, 600 Hz	54 Vac, three phase, 700 Hz
Weight Kg	25.0	19.4

Technical Advantages

The major technical advantage of the V551 is the higher and newer technology of the turbo pump, the better vacuum performances, the presence of MacroTorr® stages that allow a higher foreline pressure. Furthermore, the V551 has a more robust design, an improved efficiency motor and the possibility of mounting the MoniTorr, the autodiagnostic system that continuously monitors the pump's operating parameters and informs the service personnel about the state of the pump, ensuring maximum vacuum system uptime.

The inlet flange has not changed, ISO160, as the existing V450 series pump; the foreline flange of the V551 requires an adapter to NW40KF.

The water cooling fittings have changed; two water cooling kit are available (either 9699337 or 9699347); please contact our Tech.Support Office.

The controller is not compatible and must be exchanged. This is available in 2 versions, Navigator on board or Rack controller; in both cases, it's much more easier to see the pump operating parameters as current and power consumption; furthermore, the on board version offers as standard the serial communication RS232 /485 (contact Tech.Support for more details)

The V551 pump can be installed in any orientation.

Accessories

1. The fan and the water cooling kits for the V450-450A are not compatible with the new V301 Pump, they must be replaced (please contact the Tech.Support Office).

2. The vent valve (9699843 or the old one 9699833) has not changed if Rack controller willl be used; it has changed if the V301 on board controller will be used (new pn 9699834).

3. Vent port has changed from KF10 to M8 thread; anyway an optional vent flange is available, pn 9699108.

4. Inlet screen has not changed (DN160 old pn 9699303, new pn 9699304)

5. Purge port is now available with M12 thread; a KF16 purge flange is available as option (please contact the Tech.Support Office)

6. For controllers, please refer to following section.

Controller Comparison

V450 controllers 9699442-9699542 are not able to operate the V551 pump, it must be exchanged. This is available in 2 versions, either ½ Rack V550 pn 9699444-9699544 or Navigator on board pn 9698976.

V550 Rack controller

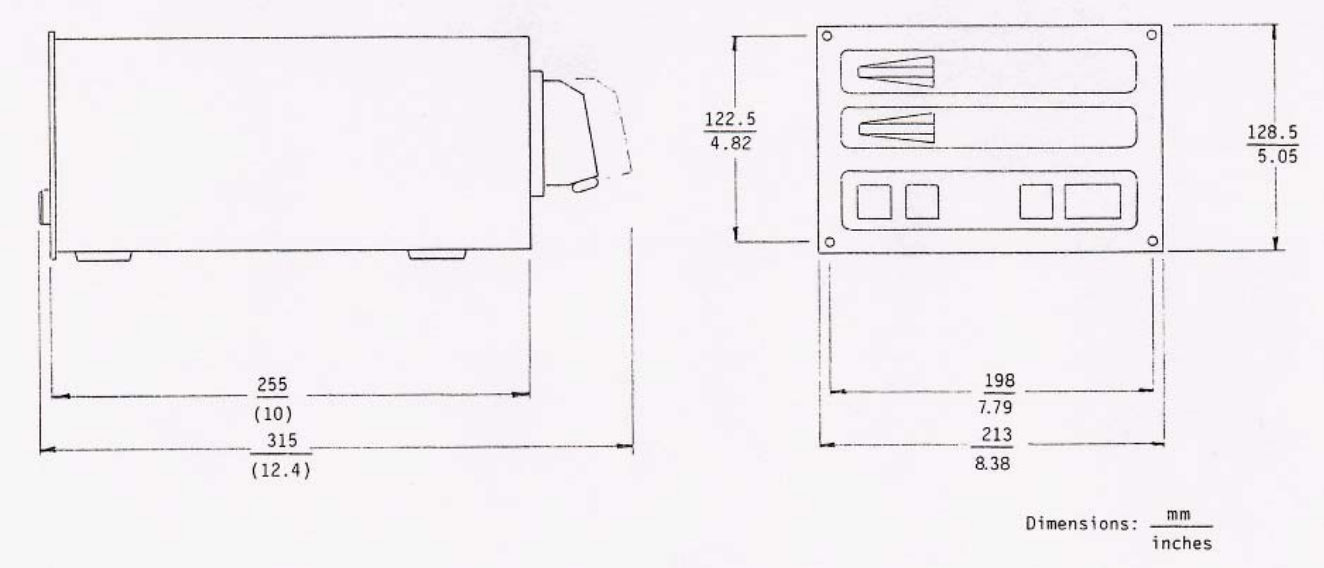
The V550 Rack controller has a multifunction alphanumeric display for pump status and error code diagnostic; at any time during the pump operation , the speed, current, power and bearing temperature can be displayed; remote operation can be accomplished with logic level contact closures and with optional computer interfaces. Improved logic output interconnections, the V550 controller offers also the possibility to operate via computer with RS232-485 communication kits (optional; please contact Tech.Support Office). If the customer was using the remote I/O devices on the old V450 controller, this interface can still be used thanks to the adapter box pn 9699859 (Contact Technical Support)

V551 Navigator on board controller

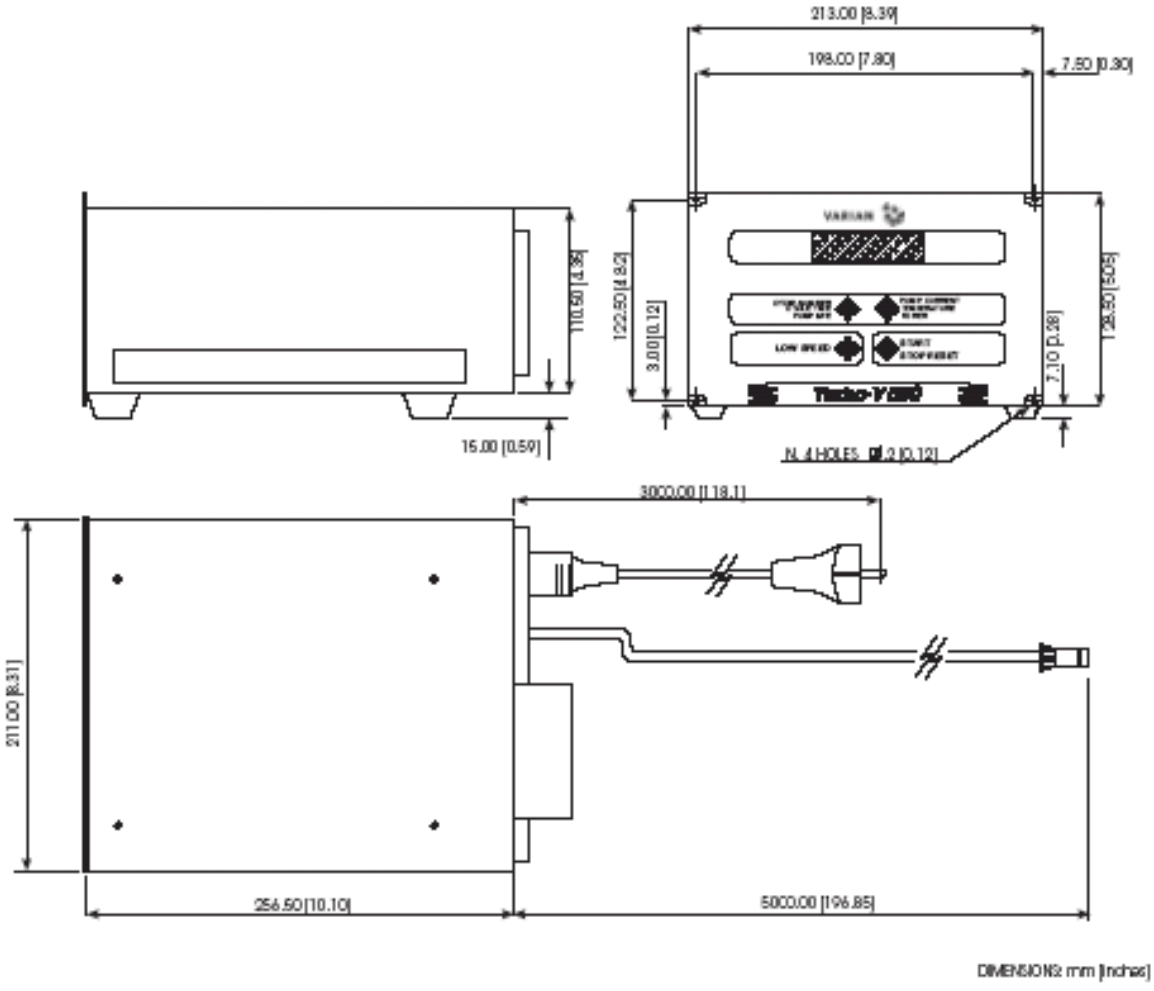
The V551 Navigator on board controller is more compact than any other controller; furthermore, it can be easily installed and disinstalled from the pump; it can be either mounted on the bottom or on the side of the turbo pump using the dedicated bracket.; it offers as std both serial communication options, RS232 and RS485; it offers the communication via Navigator Software (Contact Technical Support), for parameters setting and downloading through a PC.

The V551 Navigator on board controller offers more features in the I/O signals if compared to the previous V450 controller, it’s easy to use with the new concept plug-and-pump.

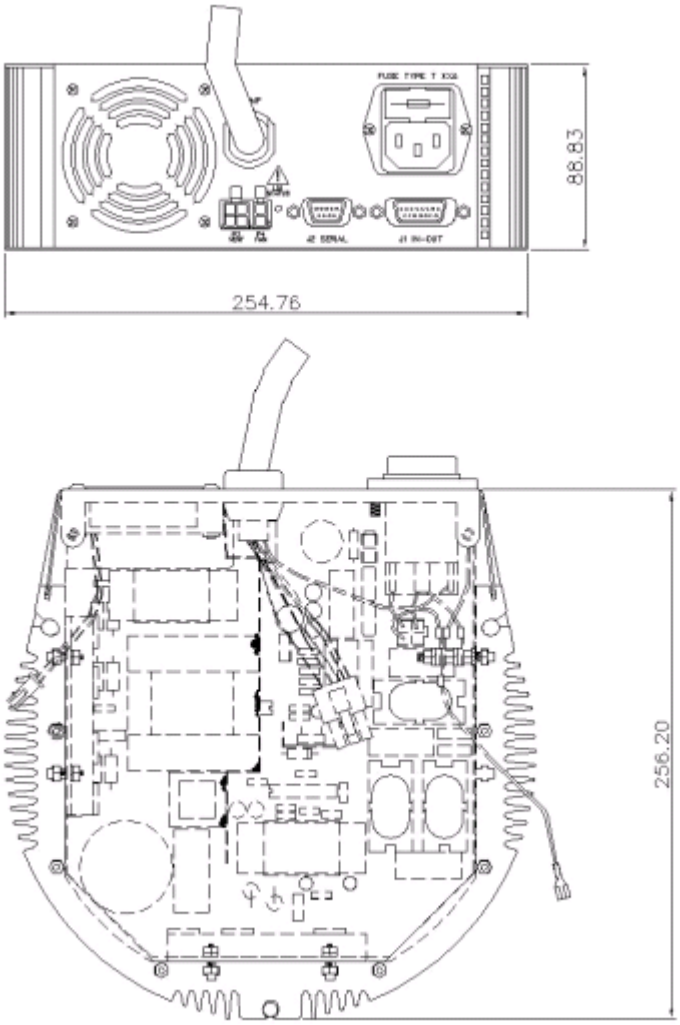
Outline 9699442-9699542:



Outline 9699444-9699544:



V551 Navigator on board:



Interconnection schematic:

	V450	V550 rack
	On P21	On J7
Accessories and Option interconnections (forepump, vent valve, fan, etc)	1b-3a, 3b-3a, 2b-2a 120 Vac, 0.4 A	120 Vac, 1 A fan on P6 (24 Vdc)
	On P22	On P1
Remote START	14-5	1-6
Remote LOW SPEED	12-4	2-7
Interlock	13-5	3-8
System override	N.A.	4-9
		On P2
Analog output voltage	15-8 (0.1 Vdc proportional to 4A)	1-2 (1 Vdc proportional to 1A)
R1 signal	N.A.	4-11
LOW SPEED signal	7-6 (5 Vdc)	5-12 (24Vdc)
Remote START signal	1-9 (5 Vdc)	6-13 (24 Vdc)
FAULT signal	2-10 (N.O. contact)	8-15 (24Vdc)
Remote NORMAL SPEED	11-3 (open collector transistor)	N.A.
R1	N.A.	4-11 (24 Vdc)
R2	N.A.	7-14 (24 Vdc)

NOTE:

Considering the incompatibility of the I/O devices, the customer can use the adapter box pn 9699859, that will reproduce the input/output signals where an interface between the existing system and the new controller Rack Type was used.

On V551 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

No adapter box is available from existing I/O devices to the navigator ones.

For signal complete description, please refer to instruction manual.

Main cable is supplied; controller-to-pump cable is supplied