

SQ505 Controller

(I) INSTRUCTION MANUAL

VARIAN



vacuum technologies

Dear Customer,

Thank you for purchasing a VARIAN vacuum product. At VARIAN Vacuum Technologies we make every effort to ensure that you will be satisfied with the product and/or service you have purchased.

As part of our Continuous Improvement effort, we ask that you report to us any problem you may have had with the purchase or operation of our product. On the back side you find a Corrective Action Request form that you may fill out in the first part and return to us.

This form is intended to supplement normal lines of communications and to resolve problems that existing systems are not addressing in an adequate or timely manner.

Upon receipt of your Corrective Action Request we will determine the Root Cause of the problem and take the necessary actions to eliminate it. You will be contacted by one of our employees who will review the problem with you and update you, with the second part of the same form, on our actions.

Your business is very important to us. Please, take the time and let us know how we can improve.

Sincerely,

Sergio PIRAS

*Vice President and General Manager
VARIAN Vacuum Technologies*

Note: Fax or mail the Customer Request for Action (see backside page) to VARIAN Vacuum Technologies (Torino) - Quality Assurance or to your nearest VARIAN representative for onward transmission to the same address.

CUSTOMER REQUEST FOR CORRECTIVE / PREVENTIVE / IMPROVEMENT ACTION

TO : VARIAN VACUUM TECHNOLOGIES TORINO - QUALITY ASSURANCE

FAX N° : XXXX - 011 - 9979350

ADDRESS: VARIAN S.p.A. - Via F.lli Varian, 54 - 10040 Leinì (Torino) - Italy

E-MAIL : marco.marzio@varianinc.com

NAME _____	COMPANY _____	FUNCTION _____
<p>ADDRESS : _____</p> <p>TEL. N° : _____ FAX N° : _____</p> <p>E-MAIL : _____</p>		
<p>PROBLEM / SUGGESTION :</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>		
<p>REFERENCE INFORMATION (model n°, serial n°, ordering information, time to failure after installation, etc.) :</p> <p>_____</p> <p>_____</p> <p>_____</p> <p style="text-align: right;">DATE _____</p>		

<p>CORRECTIVE ACTION PLAN / ACTUATION (by VARIAN VTT)</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>LOG N° _____</p>
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XXXX = Code for dialing Italy from your country (es. 01139 from USA; 00139 from Japan, etc.)



GENERAL INFORMATION

This equipment is destined for use by professionals. The user should read this instruction manual and any other additional information supplied by Varian before operating the equipment. Varian will not be held responsible for any events occurring due to non-compliance, even partial, with these instructions, improper use by untrained persons, non-authorized interference with the equipment or any action contrary to that provided for by specific national standards. The SQ405 is a high voltage feeder used to feed the ionic pumps.

The following paragraphs contain all the information necessary to guarantee the safety of the operator when using the equipment. Detailed information is supplied in the section "Technical Information".

This manual uses the following standard protocol:



The warning messages are for attracting the attention of the operator to a particular procedure or practice which, if not followed correctly, could lead to serious injury.

CAUTION!

The caution messages are displayed before procedures which, if not followed, could cause damage to the equipment.

NOTE

The notes contain important information taken from the text.

STORAGE

When transporting and storing the Controller, the following environmental requirements should be satisfied:

- temperature: from -20 °C to + 70 °C
- relative humidity: 0 - 95%
(without condensation)

PREPARATION FOR INSTALLATION

The controller is supplied in a special protective packing. If this shows signs of damage which may have occurred during transport, contact your local sales office. When unpacking, ensure that the module is not dropped or subjected to any form of impact. Do not dispose of the packing materials in an unauthorised manner. The material is 100% recyclable and complies with EEC Directive 85/399.

INSTALLATION



WARNING!

The controller is equipped with a 3-wire power cord. Use this power cord in conjunction with a properly grounded power socket to avoid electrical shock.

High voltage developed in the controller can cause severe injury or death. Before servicing the unit, disconnect the input power cable.

NOTE

The controller must be installed inside a rack module, but it must be positioned so that free air can flow through the holes. Do not install or use the controller in an environment exposed to atmospheric agents (rain, snow, ice), dust, aggressive gases, or in explosive environments or those with a high fire risk.

During operation, the following environmental conditions must be respected:

- temperature: from 0 °C to +45 °C
- relative humidity: 0 - 95%
(without condensation)

To connect the controller to the pump use the specific cable supplied with the controller.

The following paragraph describes the fundamental operating procedures.

Make all vacuum manifold and electrical connections and refer to the pump instruction manual prior to operating the controller.

Power Failure

In the event of a power failure (momentary or long period) the controller is switched off. When power is restored, the controller will automatically restart.



WARNING

High voltage in the controller can cause severe injury or death. Before servicing, turn power off and remove the power cable.

DISPOSAL

Meaning of the "WEEE" logo found in labels

The following symbol is applied in accordance with the EC WEEE (Waste Electrical and Electronic Equipment) Directive.

This symbol (**valid only in countries of the European Community**) indicates that the product it applies to must NOT be disposed of together with ordinary domestic or industrial waste but must be sent to a differentiated waste collection system.

The end user is therefore invited to contact the supplier of the device, whether the Parent Company or a retailer, to initiate the collection and disposal process after checking the contractual terms and conditions of sale.



Technical Specifications

Mains Supply: Voltage Frequency Power	200Vac \pm 10% Single phase 50 Hz 800 VA max
Outputs: Voltage Current Power	7000 V max 100 mA nominal – 200mA short circuit 200 W max
Operating Temperature	From 0 to +40 °C
Storage Temperature	From -20 to+70 °C
Mains fuses	2 x T 6.3A

Connectors Description

The C.U. has connectors for the following functions:

- **Mains connection:** Plug IEC type with integrated fuses for 200V 50Hz supply
- **Connections to the Pump: J1,** Fisher D105A049 type connector

Connector/O: J2, Delta type 25 pin female:

N.Pin	Description	Type	
14	Output +24Vcc	Supply voltage	
15	GND	Supply voltage	
1	Input HV ON/OFF positive	Optically Insulated	
2	Input HV ON/OFF negative	Input (momentary)	
10	Input Fault Reset positive	Optically Insulated	
23	Input Fault Reset negative	Input (momentary)	
12	Set Point 1 n.o. output	RELAY output	
24	Set Point 1 n.o. output		
13	Set Point 2 n.o. output		
25	Set Point 2 n.o. output		
5	FAULT n.o. output		
18	FAULT n.o. output		
6	HV ON n.o. output		
19	HV ON n.o. output		
7	PROTECT/START n.o. output		
20	PROTECT/START n.o. output		
8	LOCAL/REMOTE n.o. output		
21	LOCAL/REMOTE n.o. output		
3	CURRENT analog output positive		Logarithmic analog output
16	CURRENT analog output GND		
4	PRESSURE analog output positive		
17	PRESSURE analog output GND	Analog Output	
9	RESERVED		

Notes:

- 1) The momentary inputs (HV ON/OFF and Fault Reset) are active only when the input optical insulator changes its status from Open to Close, the change of status from Close to Open will not cause any actions.
- 2) The Remote "Fault Reset input" is the only way to reset the Faults of the unit (The Reset of the Faults can not be done by Front Panel)

Set Points Operation:

- The Set-points relays will be activated (contact closure) when the Output Current is lower than the set threshold.
- A fixed hysteresis is applied to the Set Points operation (+5%, -0%) in order to avoid instabilities
- The operation of the Set Points is enabled only 5 seconds after the HV is switched on.

Front Panel Display:

The Front Panel has a 16 x 2 alphanumeric display and a 4 keys keyboard:

Tasto	Descrizione
H.V. ON/OFF	Pump supply ON/OFF
MODE	Working mode configuration
MEASURE	Selection of the displayed measurement
CHANGE	Current parameter value change

Display messages related to the pump working condition:

When the C.U. is switched on, the display shows:

				A	U	T	O	T	E	S	T			
							O	K						

Main page:
If in Local mode

P	U	M	P		R	E	A	D	Y		F	O	R	
L	O	C	A	L		S	T	A	R	T				

If in Remote mode

P	U	M	P	R	E	A	D	Y	F	O	R		
R	E	M	O	T	E	S	T	A	R	T			

From this page it is possible to Start the pump or to go to the C.U. configuration.

Configuration: In this condition it is possible to change the operating mode. The configuration is just possible with the HV off. To enter in the Configuration, press the Mode push button

L	O	C	A	L	/	R	E	M	O	T	E		
S	E	L	E	C	T	I	O	N	:	X	X	X	

Where XXX can be LOC, REM.

The corresponding output on the rear panel connector will be: open contact for LOC and closed contact for REM.

The CHANGE push button allows to change the present selection. To confirm the selection and proceed to the following page, press the MODE push button.

P	R	O	T	E	C	T	/	S	T	A	R	T	
S	E	L	E	C	T	I	O	N	:	X	X	X	X

Where XXXXX can be PROT or START. The selection is done by means of the CHANGE button.

The corresponding output on the I/O rear panel connector will be: open contact for PROT and closed contact for START.

Press the MODE button again to go to the Set Point 1 threshold setting.

S	E	T	P	O	I	N	T	1				
1	.	3	E	-	3	A						

INSTRUCTIONS FOR USE

The cursor will be positioned on the first number to be modified, the modification of the value is done by pressing the CHANGE push button (0...9, an additional pressure on the button will return to 0),
 Press the MODE button to position the cursor on the second number.
 Press the Change button to select the value.
 Press the MODE button to position the cursor on the exponent and repeat the selection with the Change button.

Press the MODE button again to go to the Set Point 2 threshold setting page and repeat the operations done for the Set Point 1.

Press the MODE push button again to go to the Pump Size selection .
 The pump size selection is needed in order to have a correct pressure indication.

P	U	M	P		S	I	Z	E		S	E	L		
				5	0	0		l	/	s				

The Pump Size can be changed between 500 and 150 l/s with the CHANGE push button.

Pump in Start: In the following pages the operating mode and the analog values are displayed.

The pump is switched on by pressing the HV ON/OFF push button in Local mode or through the HV ON/OFF input in REMOTE mode.

If the HV cable is disconnected from the pump, the Error (Fault) condition “Cable Interlock” will be generated.

When the HV cable is connected, the display shows:

H	V		O	N				P	R	O	T	E	C	T
1	.	3	E	-	7		P	a				X	X	X

The Protect indication is shown only if the Protect mode has been selected.

The HV ON output on the Remote I/O connector will be: open contact with HV OFF and closed contact with HV ON.

The MEASURE push button allows to change the page on the display.

H	V		O	N				P	R	O	T	E	C	T
1	.	3	E	-	6		A					X	X	X

Error Condition:

If an Error condition is detected, the FAULT contact on the I/O connector will close .

F	A	U	L	T															
I	N	T	E	R	L	O	C	K											

This message is displayed when the HV Cable is disconnected

F	A	U	L	T															
O	V	E	R	C	U	R	R	E	N	T									

This message appears if the measured pump current is continuously higher than 100 mA for a time of 500 msec or longer with the Protect mode selected

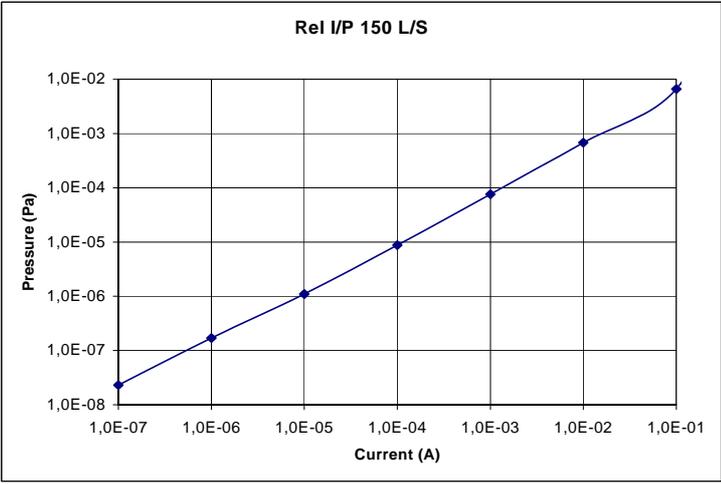
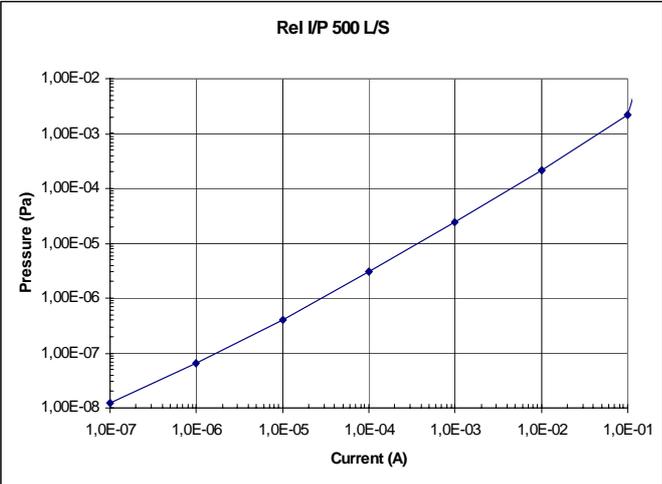
F	A	U	L	T															
O	V	E	R	T	E	M	P	E	R	A	T	U	R	E					

This message appears if the temperature inside the controller is higher than set threshold.

The reset of any fault condition is accomplished by momentarily closing the “Fault Reset “ input on the Rear Panel I/O connector

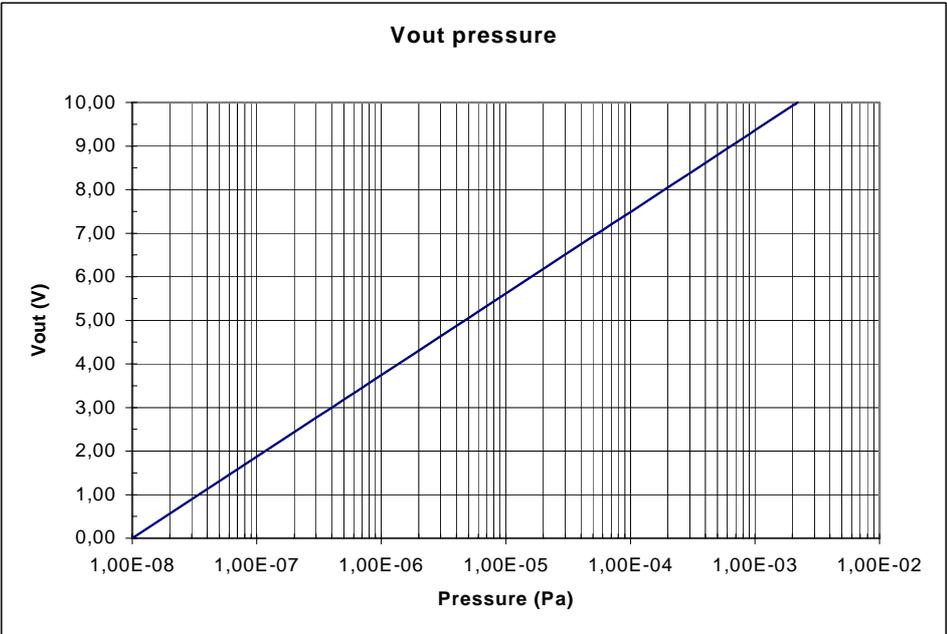
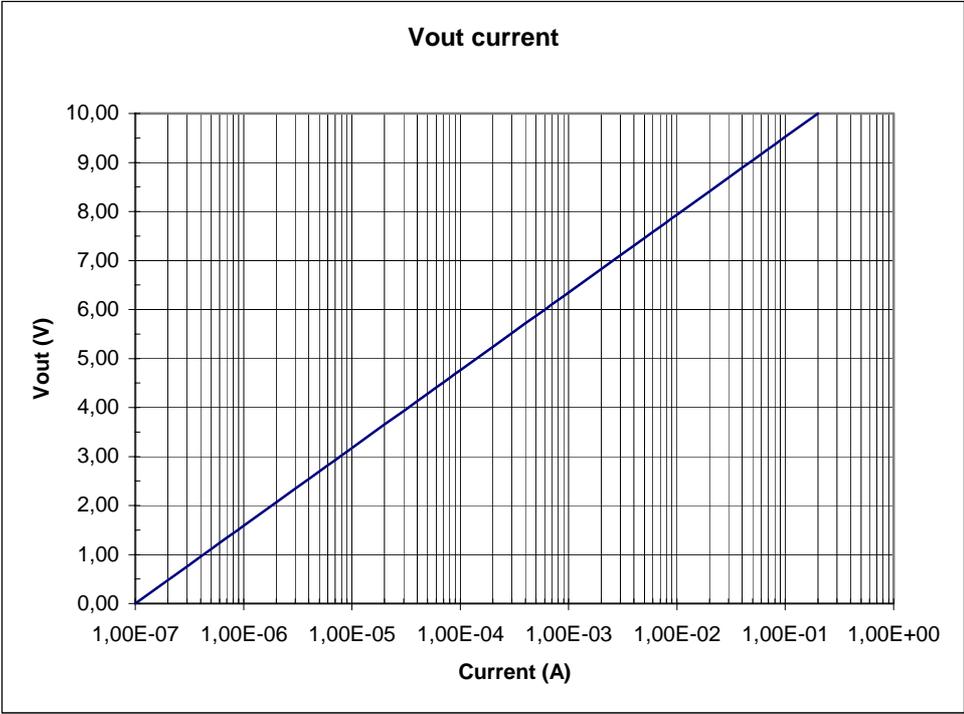
Pressure indication

The Pressure indication is calculated from the Current value according to the following relationship

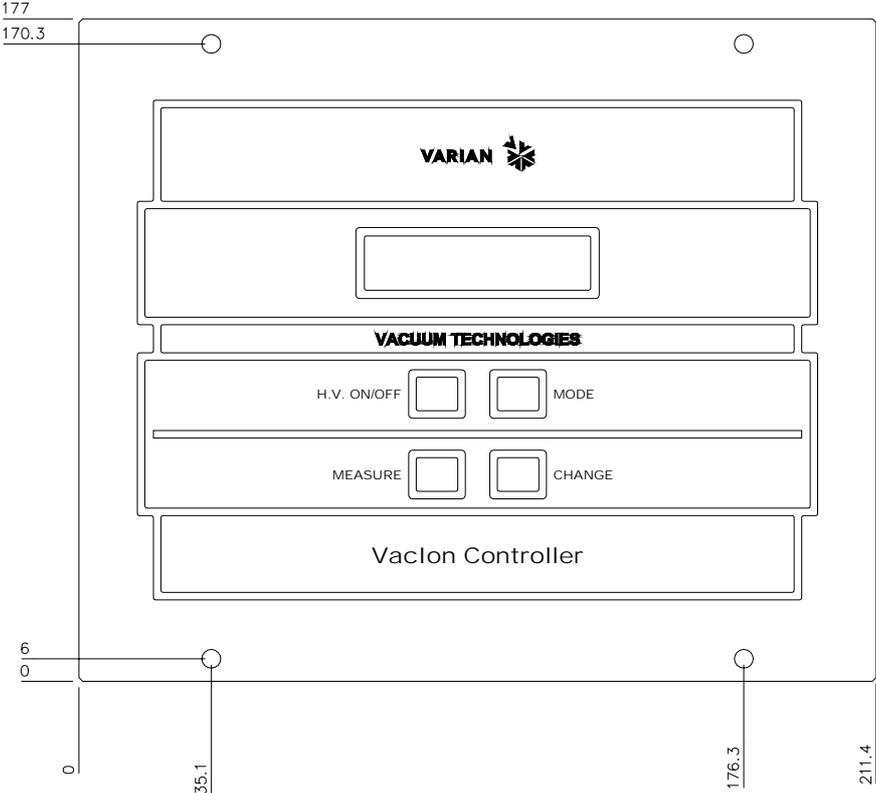


Analog Outputs

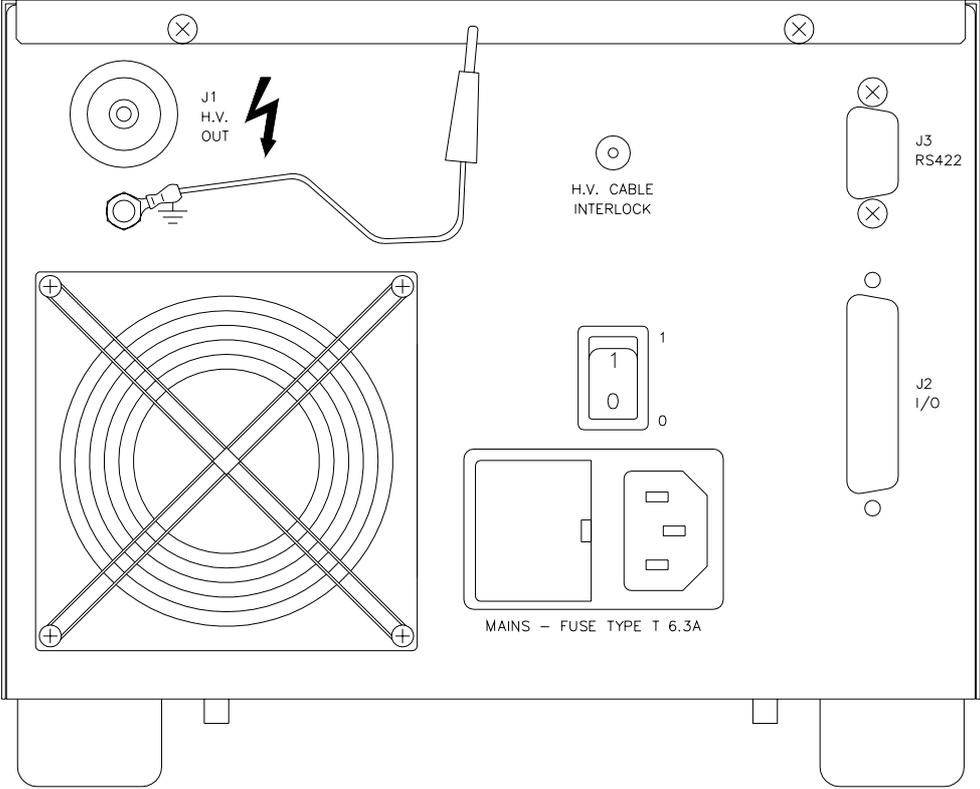
The following graphs give the relationship between the Current and the Pressure versus the Recorder Outputs values.



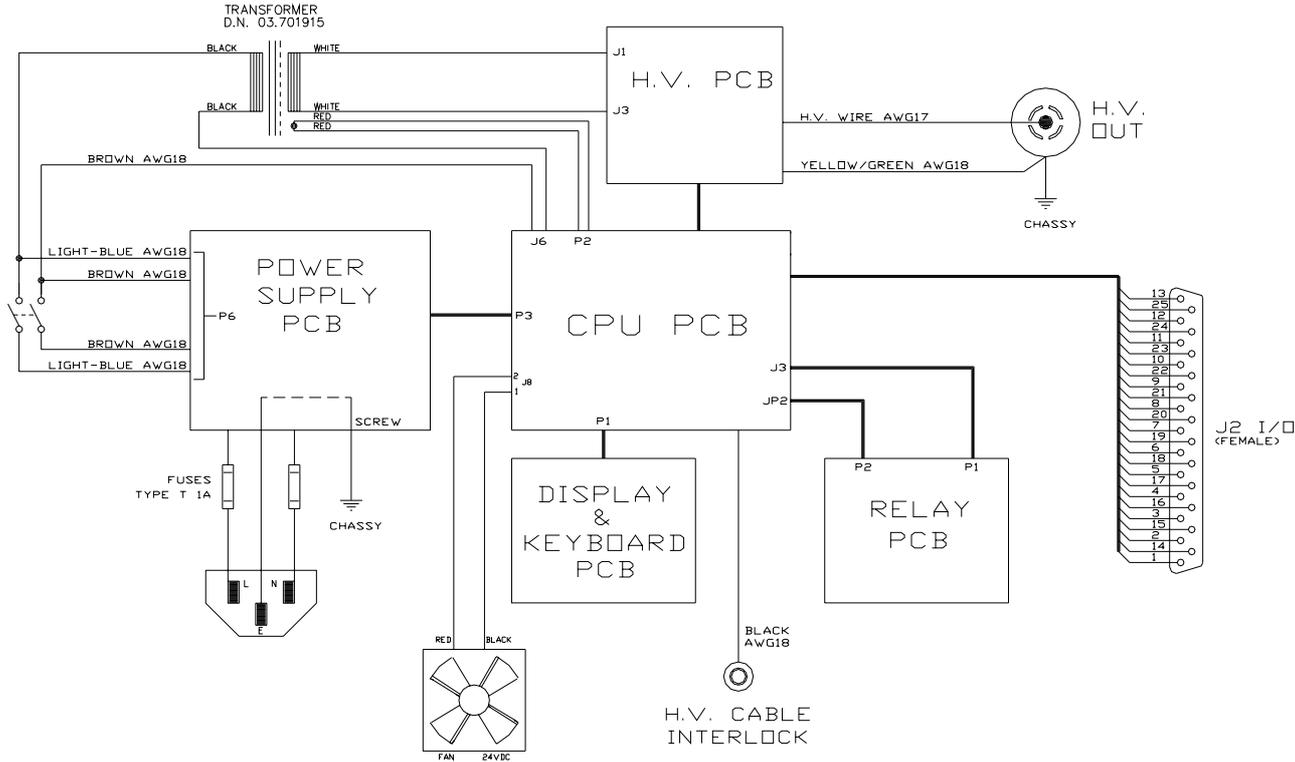
Front Panel



Rear panel



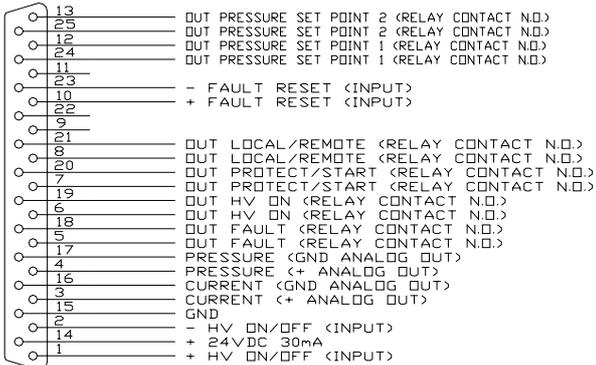
Block Diagram



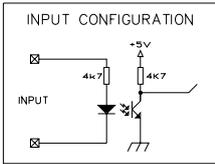
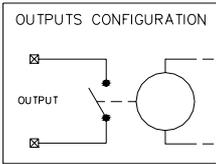
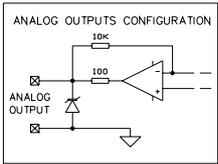
Interconnections schematic:

J2
I/O

FEMALE CONNECTOR



CURRENT LOGARITHMIC OUTPUT : 0V=100nA ; 6V=100mA
 PRESSURE LOGARITHMIC OUTPUT :
 RELAY CONTACT : 24V 100mA





Request for Return



1. A Return Authorization Number (RA#) **WILL NOT** be issued until this Request for Return is completely filled out, signed and returned to Varian Customer Service.
2. Return shipments shall be made in compliance with local and international **Shipping Regulations** (IATA, DOT, UN).
3. The customer is expected to take the following actions to ensure the **Safety** of workers at Varian: (a) Drain any oils or other liquids, (b) Purge or flush all gasses, (c) Wipe off any excess residues in or on the equipment, (d) Package the equipment to prevent shipping damage, (for Advance Exchanges please use packing material from replacement unit).
4. Make sure the shipping documents clearly show the RA# and then return the package to the Varian location nearest you.

North and South America

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 Fax: +1 781 8609252

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 Phone: +39 011 9979111
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Asia and ROW

Varian Vacuum Technologies
 Local Office

CUSTOMER INFORMATION

Company name:	
Contact person: Name:	Tel:
Fax:	E-Mail:
Ship Method:	Shipping Collect #: P.O.#:
<i>Europe only:</i> VAT reg. Number:	<i>USA only:</i> <input type="checkbox"/> Taxable <input type="checkbox"/> Non-taxable
Customer Ship To:	Customer Bill To:
.....
.....

PRODUCT IDENTIFICATION

Product Description	Varian P/N	Varian S/N	Purchase Reference

TYPE OF RETURN (check appropriate box)

<input type="checkbox"/> Paid Exchange	<input type="checkbox"/> Paid Repair	<input type="checkbox"/> Warranty Exchange	<input type="checkbox"/> Warranty Repair	<input type="checkbox"/> Loaner Return
<input type="checkbox"/> Credit	<input type="checkbox"/> Shipping Error	<input type="checkbox"/> Evaluation Return	<input type="checkbox"/> Calibration	<input type="checkbox"/> Other

HEALTH and SAFETY CERTIFICATION

Varian Vacuum Technologies **CAN NOT ACCEPT** any equipment which contains **BIOLOGICAL HAZARDS** or **RADIOACTIVITY**. Call Varian Customer Service to discuss alternatives if this requirement presents a problem.

The equipment listed above (check one):

HAS NOT been exposed to any toxic or hazardous materials

OR

HAS been exposed to any toxic or hazardous materials. In case of this selection, check boxes for any materials that equipment was exposed to, check all categories that apply:

Toxic Corrosive Reactive Flammable Explosive Biological Radioactive

List all toxic or hazardous materials. Include product name, chemical name and chemical symbol or formula.

.....

Print Name: Customer Authorized Signature:

Print Title: Date:/...../.....

NOTE: If a product is received at Varian which is contaminated with a toxic or hazardous material that was not disclosed, **the customer will be held responsible** for all costs incurred to ensure the safe handling of the product, and **is liable** for any harm or injury to Varian employees as well as to any third party occurring as a result of exposure to toxic or hazardous materials present in the product.

Do not write below this line

Notification (RA)#: Customer ID#: Equipment #:

FAILURE REPORT

TURBO PUMPS and TURBOCONTROLLERS

<input type="checkbox"/> Does not start <input type="checkbox"/> Does not spin freely <input type="checkbox"/> Does not reach full speed <input type="checkbox"/> Mechanical Contact <input type="checkbox"/> Cooling defective	<input type="checkbox"/> Noise <input type="checkbox"/> Vibrations <input type="checkbox"/> Leak <input type="checkbox"/> Overtemperature	POSITION <input type="checkbox"/> Vertical <input type="checkbox"/> Horizontal <input type="checkbox"/> Upside-down <input type="checkbox"/> Other:	PARAMETERS Power: Rotational Speed: Current: Inlet Pressure: Temp 1: Foreline Pressure: Temp 2: Purge flow: <hr/> OPERATION TIME:
TURBOCONTROLLER ERROR MESSAGE:			

ION PUMPS/CONTROLLERS

<input type="checkbox"/> Bad feedthrough <input type="checkbox"/> Vacuum leak <input type="checkbox"/> Error code on display	<input type="checkbox"/> Poor vacuum <input type="checkbox"/> High voltage problem <input type="checkbox"/> Other
Customer application:	

VALVES/COMPONENTS

<input type="checkbox"/> Main seal leak <input type="checkbox"/> Solenoid failure <input type="checkbox"/> Damaged sealing area	<input type="checkbox"/> Bellows leak <input type="checkbox"/> Damaged flange <input type="checkbox"/> Other
Customer application:	

LEAK DETECTORS

<input type="checkbox"/> Cannot calibrate <input type="checkbox"/> Vacuum system unstable <input type="checkbox"/> Failed to start	<input type="checkbox"/> No zero/high background <input type="checkbox"/> Cannot reach test mode <input type="checkbox"/> Other
Customer application:	

INSTRUMENTS

<input type="checkbox"/> Gauge tube not working <input type="checkbox"/> Communication failure <input type="checkbox"/> Error code on display	<input type="checkbox"/> Display problem <input type="checkbox"/> Degas not working <input type="checkbox"/> Other
Customer application:	

PRIMARY PUMPS

<input type="checkbox"/> Pump doesn't start <input type="checkbox"/> Doesn't reach vacuum <input type="checkbox"/> Pump seized	<input type="checkbox"/> Noisy pump (describe) <input type="checkbox"/> Over temperature <input type="checkbox"/> Other
Customer application:	

DIFFUSION PUMPS

<input type="checkbox"/> Heater failure <input type="checkbox"/> Doesn't reach vacuum <input type="checkbox"/> Vacuum leak	<input type="checkbox"/> Electrical problem <input type="checkbox"/> Cooling coil damage <input type="checkbox"/> Other
Customer application:	

FAILURE DESCRIPTION

(Please describe in detail the nature of the malfunction to assist us in performing failure analysis):

NOTA: Su richiesta questo documento è disponibile anche in Tedesco, Italiano e Francese.
REMARQUE : Sur demande ce document est également disponible en allemand, italien et français.
HINWEIS: Auf Anfrage ist diese Unterlage auch auf Deutsch, Italienisch und Französisch erhältlich.

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www.varianinc.com

Representative in most countries

