

***Hand-held
Terminal***

Model 969-9860

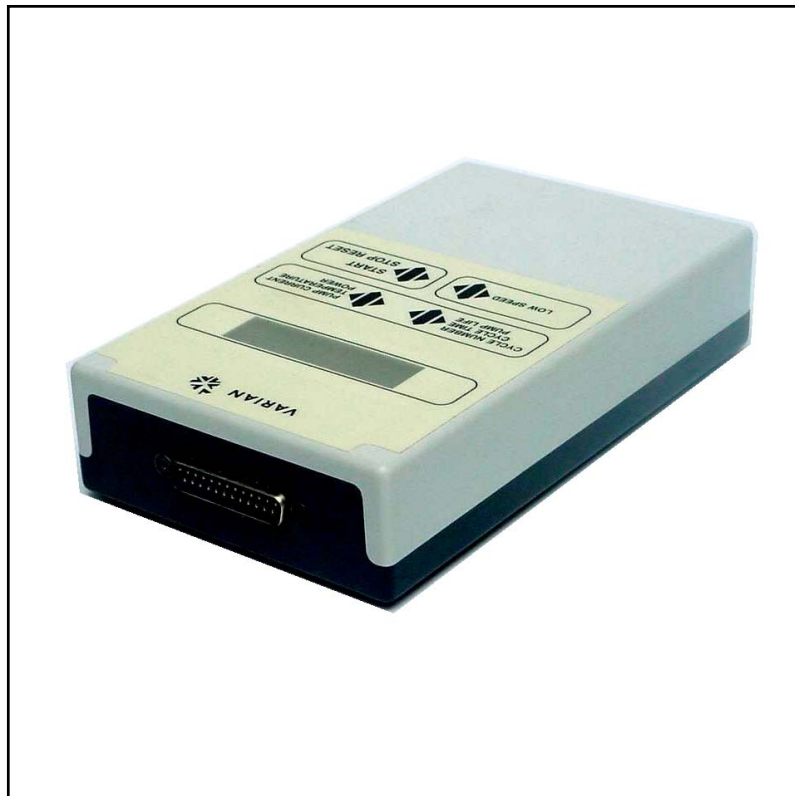
MANUALE DI ISTRUZIONI

BEDIENUNGSHANDBUCH

NOTICE DE MODE D'EMPLOI

INSTRUCTION MANUAL

Hand-held Terminal



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.)



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INFORMAZIONI GENERALI

Questa apparecchiatura è destinata ad uso professionale. L'utilizzatore deve leggere attentamente il presente manuale di istruzioni ed ogni altra informazione addizionale fornita dalla Varian prima dell'utilizzo dell'apparecchiatura. La Varian si ritiene sollevata da eventuali responsabilità dovute all'inosservanza totale o parziale delle istruzioni, ad uso improprio da parte di personale non addestrato, ad interventi non autorizzati o ad uso contrario alle normative nazionali specifiche.

Nei paragrafi seguenti sono riportate tutte le informazioni necessarie a garantire la sicurezza dell'operatore durante l'utilizzo dell'apparecchiatura. Informazioni dettagliate sono fornite nell'appendice "Technical Information".

Questo manuale utilizza le seguenti convenzioni:



PERICOLO!

I messaggi di pericolo attirano l'attenzione dell'operatore su una procedura o una pratica specifica che, se non eseguita in modo corretto, potrebbe provocare gravi lesioni personali.



ATTENZIONE

I messaggi di attenzione sono visualizzati prima di procedure che, se non osservate, potrebbero causare danni all'apparecchiatura.

NOTA

Le note contengono informazioni importanti estrapolate dal testo.

IMMAGAZZINAMENTO

Durante il trasporto e l'immagazzinamento dei controller devono essere soddisfatte le seguenti condizioni ambientali:

- temperatura: da -20 °C a +70 °C
- umidità relativa: 0 - 95% (non condensante)

PREPARAZIONE PER L'INSTALLAZIONE

Il dispositivo viene fornito in un imballo protettivo speciale; se si presentano segni di danni, che potrebbero essersi verificati durante il trasporto, contattare l'ufficio vendite locale.

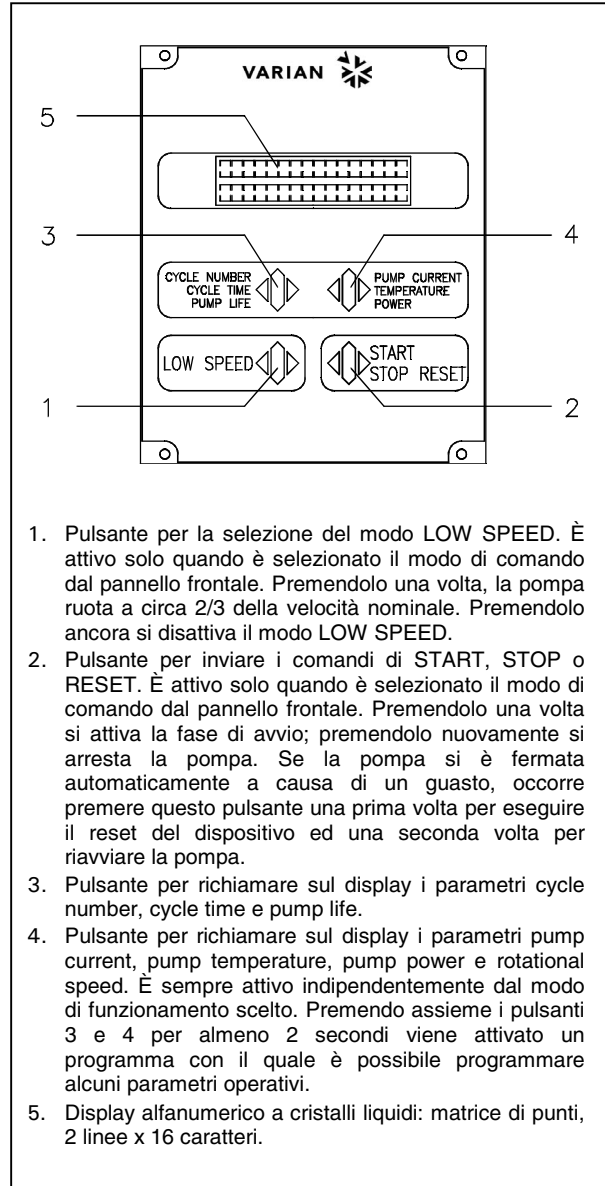
Durante l'operazione di disimballaggio, prestare particolare attenzione a non lasciar cadere l'Hand Held Terminal e a non sottoporlo ad urti.

Non disperdere l'imballo nell'ambiente. Il materiale è completamente riciclabile e risponde alla direttiva CEE 85/399 per la tutela dell'ambiente.

Comandi, indicatori e connettori dell'Hand Held Terminal

Di seguito sono illustrati il pannello dell'Hand Held Terminal.

Per maggiori dettagli fare riferimento alla sezione "Technical Information".



1. Pulsante per la selezione del modo LOW SPEED. È attivo solo quando è selezionato il modo di comando dal pannello frontale. Premendolo una volta, la pompa ruota a circa 2/3 della velocità nominale. Premendolo ancora si disattiva il modo LOW SPEED.
2. Pulsante per inviare i comandi di START, STOP o RESET. È attivo solo quando è selezionato il modo di comando dal pannello frontale. Premendolo una volta si attiva la fase di avvio; premendolo nuovamente si arresta la pompa. Se la pompa si è fermata automaticamente a causa di un guasto, occorre premere questo pulsante una prima volta per eseguire il reset del dispositivo ed una seconda volta per riavviare la pompa.
3. Pulsante per richiamare sul display i parametri cycle number, cycle time e pump life.
4. Pulsante per richiamare sul display i parametri pump current, pump temperature, pump power e rotational speed. È sempre attivo indipendentemente dal modo di funzionamento scelto. Premendo assieme i pulsanti 3 e 4 per almeno 2 secondi viene attivato un programma con il quale è possibile programmare alcuni parametri operativi.
5. Display alfanumerico a cristalli liquidi: matrice di punti, 2 linee x 16 caratteri.

Pannello frontale dell'Hand Held Terminal

NOTA

Le funzioni LOW SPEED e START/STOP RESET sono attive solo se è selezionato il modo di comando dal pannello frontale (vedere "Technical Information").

ALLGEMEINES

Dieser Apparat ist für Fachbetriebe bestimmt. Vor Gebrauch sollte der Benutzer dieses Handbuch sowie alle weiteren mitgelieferten Zusatzdokumentationen genau lesen. Bei Nichtbeachtung - auch teilweise - der enthaltenen Hinweise, unsachgemäßem Gebrauch durch ungeschultes Personal, nicht autorisierten Eingriffen und Mißachtung der einheimischen, hier zur Geltung kommenden Bestimmungen übernimmt die Firma Varian keinerlei Haftung.

In den folgenden Abschnitten sind alle erforderlichen Informationen für die Sicherheit des Bedieners bei der Anwendung des Geräts aufgeführt. Detaillierte technische Informationen sind im Anhang "Technical Information" enthalten.

In dieser Gebrauchsanleitung werden Sicherheitshinweise folgendermaßen hervorgehoben:



GEFAHR!

Die Gefahrenhinweise lenken die Aufmerksamkeit des Bedieners auf eine bestimmte Prozedur oder Praktik, die bei unkorrekter Ausführung schwere Verletzungen hervorrufen können.



ACHTUNG!

Die Warnhinweise vor bestimmten Prozeduren machen den Bediener darauf aufmerksam, daß bei Nichteinhaltung Schäden an der Anlage entstehen können.

ANMERKUNG

Die Anmerkungen enthalten wichtige Informationen, die im Text hervorgehoben werden sollen.

LAGERUNG

Beim Transport und bei der Lagerung der Controller müssen folgende klimatische Verhältnisse eingehalten werden:

- Temperatur: von -20 °C bis +70 °C
- Relative Luftfeuchtigkeit: 0-95 % (nicht kondensierend)

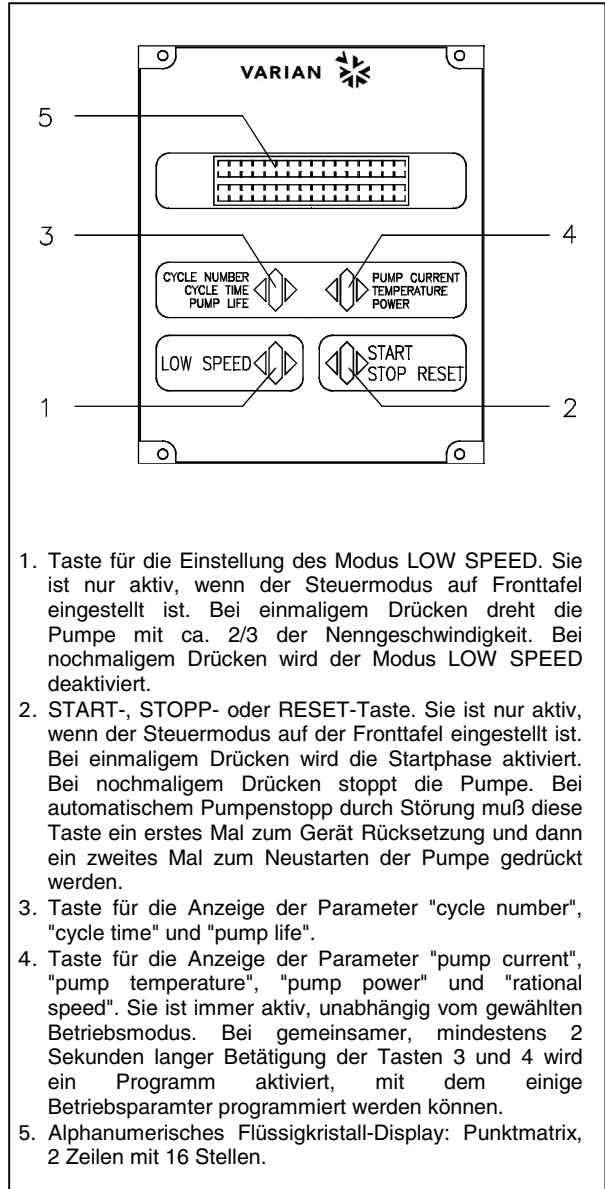
VOR DER INSTALLATION

Das Gerät wird mit einer speziellen Schutzverpackung geliefert. Eventuelle Transportschäden müssen der zuständigen örtlichen Verkaufsstelle gemeldet werden. Beim Auspacken vorsichtig vorgehen, damit dem Gerät nicht herunter fällt oder Stößen ausgesetzt wird. Das Verpackungsmaterial muß korrekt entsorgt werden. Es ist vollständig recyclebar und entspricht der EG-Richtlinie 85/399 für Umweltschutz.

Steuerungen, Anzeigen und Anschlüsse des Handterminals

Nachstehend werden die Steuertafel des Handterminals.

Für weitere Einzelheiten siehe den Anhang "Technical Information".



1. Taste für die Einstellung des Modus LOW SPEED. Sie ist nur aktiv, wenn der Steuermodus auf Fronttafel eingestellt ist. Bei einmaligem Drücken dreht die Pumpe mit ca. 2/3 der Nenngeschwindigkeit. Bei nochmaligem Drücken wird der Modus LOW SPEED deaktiviert.
2. START-, STOPP- oder RESET-Taste. Sie ist nur aktiv, wenn der Steuermodus auf der Fronttafel eingestellt ist. Bei einmaligem Drücken wird die Startphase aktiviert. Bei nochmaligem Drücken stoppt die Pumpe. Bei automatischem Pumpenstopp durch Störung muß diese Taste ein erstes Mal zum Gerät Rücksetzung und dann ein zweites Mal zum Neustarten der Pumpe gedrückt werden.
3. Taste für die Anzeige der Parameter "cycle number", "cycle time" und "pump life".
4. Taste für die Anzeige der Parameter "pump current", "pump temperature", "pump power" und "rational speed". Sie ist immer aktiv, unabhängig vom gewählten Betriebsmodus. Bei gemeinsamer, mindestens 2 Sekunden langer Betätigung der Tasten 3 und 4 wird ein Programm aktiviert, mit dem einige Betriebsparameter programmiert werden können.
5. Alphanumerisches Flüssigkristall-Display: Punktmatrix, 2 Zeilen mit 16 Stellen.

Fronttafel des Handterminals

ANMERKUNG

Die Funktionen LOW SPEED und START/STOP RESET sind nur aktiviert, wenn der Operationsmodus FRONT Panel gewählt ist (siehe "Technical Information").

INDICATIONS GENERALES

Cet appareillage a été conçu en vue d'une utilisation professionnelle. Il est conseillé à l'utilisateur de lire attentivement cette notice d'instructions ainsi que toute autre indication supplémentaire fournie par Varian, avant l'utilisation de l'appareil. Varian décline par conséquent toute responsabilité en cas d'inobservation totale ou partielle des instructions données, d'utilisation incorrecte de la part d'un personnel non formé, d'opérations non autorisées ou d'un emploi contraire aux réglementations nationales spécifiques.

Les paragraphes suivants donnent toutes les indications nécessaires à garantir la sécurité de l'opérateur pendant l'utilisation de l'appareillage. Des renseignements plus détaillés se trouvent dans l'appendice "Technical Information".

Cette notice utilise les signes conventionnels suivants:



DANGER!

Les messages de danger attirent l'attention de l'opérateur sur une procédure ou une manœuvre spéciale qui, si elle n'est pas effectuée correctement, risque de provoquer de graves lésions.



ATTENTION

Les messages d'attention apparaissent avant certaines procédures qui, si elles ne sont pas observées, pourraient endommager sérieusement l'appareillage.

NOTE

Les notes contiennent des renseignements importants, isolés du texte.

EMMAGASINAGE

Pendant le transport et l'emmagasinement des contrôleurs, il faudra veiller à respecter les conditions environnementales suivantes:

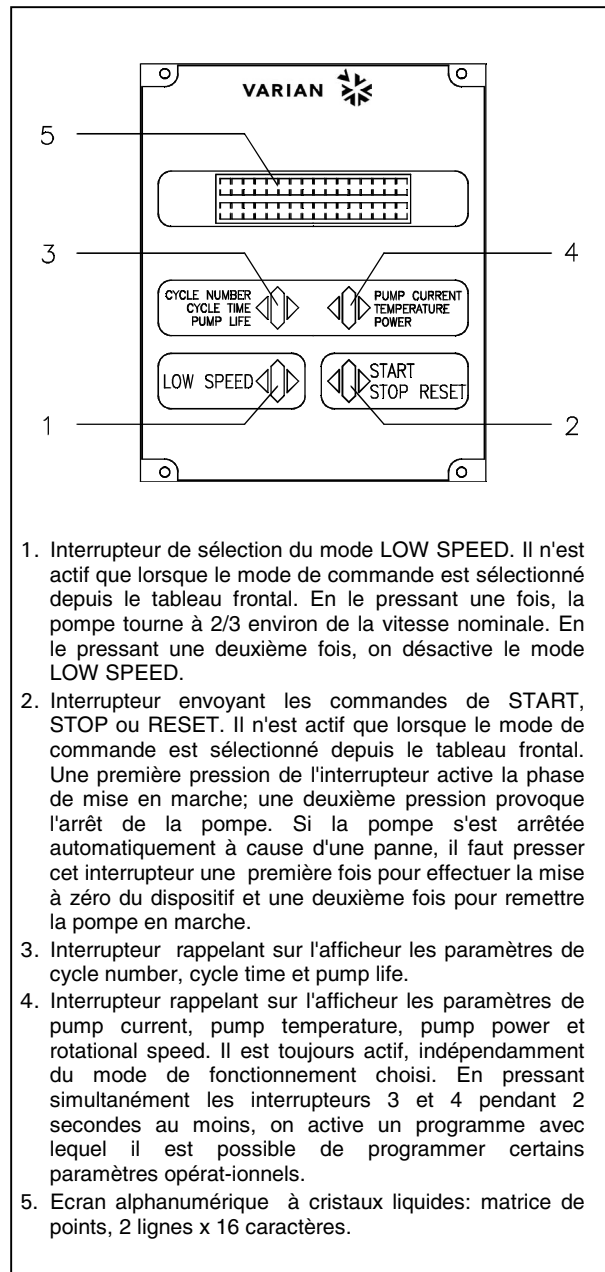
- Température: de - 20 °C à + 70 °C
- Humidité relative: 0 - 95% (non condensante).

PREPARATION POUR L'INSTALLATION

Le dispositif est fourni dans un emballage de protection spécial; si l'on constate des marques de dommages pouvant s'être produits pendant le transport, contacter aussitôt le bureau de vente local. Pendant l'opération d'ouverture de l'emballage du hand held terminal, veiller tout particulièrement à ne pas laisser tomber le contrôleur et à ne lui faire subir aucun choc. Ne pas jeter l'emballage dans la nature. Le matériel est entièrement recyclable et il est conforme aux directives CEE 83/399 en matière de protection de l'environnement.

Commandes, indicateurs et connecteurs du hand held terminal

On présente ci-dessous le tableau de commande du hand held terminal. Pour de plus amples détails, se reporter à la section "Technical Information".



1. Interrupteur de sélection du mode LOW SPEED. Il n'est actif que lorsque le mode de commande est sélectionné depuis le tableau frontal. En le pressant une fois, la pompe tourne à 2/3 environ de la vitesse nominale. En le pressant une deuxième fois, on désactive le mode LOW SPEED.
2. Interrupteur envoyant les commandes de START, STOP ou RESET. Il n'est actif que lorsque le mode de commande est sélectionné depuis le tableau frontal. Une première pression de l'interrupteur active la phase de mise en marche; une deuxième pression provoque l'arrêt de la pompe. Si la pompe s'est arrêtée automatiquement à cause d'une panne, il faut presser cet interrupteur une première fois pour effectuer la mise à zéro du dispositif et une deuxième fois pour remettre la pompe en marche.
3. Interrupteur rappelant sur l'afficheur les paramètres de cycle number, cycle time et pump life.
4. Interrupteur rappelant sur l'afficheur les paramètres de pump current, pump temperature, pump power et rotational speed. Il est toujours actif, indépendamment du mode de fonctionnement choisi. En pressant simultanément les interrupteurs 3 et 4 pendant 2 secondes au moins, on active un programme avec lequel il est possible de programmer certains paramètres opératoires.
5. Ecran alphanumérique à cristaux liquides: matrice de points, 2 lignes x 16 caractères.

Tableau avant du Hand Held Terminal

NOTE

Les fonctions de LOW SPEED et START/STOP RESET ne sont actives que lorsque le mode de commande est sélectionné depuis le tableau frontal (se reporter à la section "Technical Information").

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

This manual uses the following standard protocol:



WARNING!

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 devices, the following environmental requirements should be satisfied:

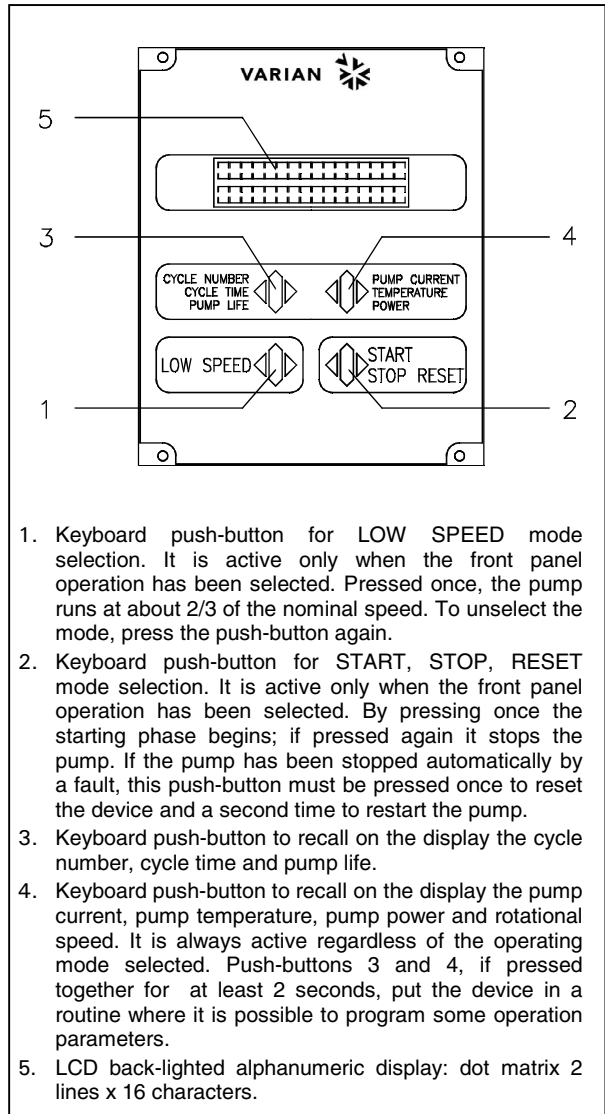
- temperature: from -20 °C to + 70 °C
- relative humidity: 0 - 95% (without condensation)

PREPARATION FOR INSTALLATION

The device 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 the Hand-held terminal, ensure that it is not dropped or subjected to any form of impact. Do not dispose of the packing materials in an unauthorized manner. The material is 100% recyclable and complies with EEC Directive 85/399.

Hand-held Terminal Controls, Indicators and Connectors

The following paragraph illustrates the Hand-held terminal panel. More details are contained in the appendix "Technical Information".



1. Keyboard push-button for LOW SPEED mode selection. It is active only when the front panel operation has been selected. Pressed once, the pump runs at about 2/3 of the nominal speed. To unselect the mode, press the push-button again.
2. Keyboard push-button for START, STOP, RESET mode selection. It is active only when the front panel operation has been selected. By pressing once the starting phase begins; if pressed again it stops the pump. If the pump has been stopped automatically by a fault, this push-button must be pressed once to reset the device and a second time to restart the pump.
3. Keyboard push-button to recall on the display the cycle number, cycle time and pump life.
4. Keyboard push-button to recall on the display the pump current, pump temperature, pump power and rotational speed. It is always active regardless of the operating mode selected. Push-buttons 3 and 4, if pressed together for at least 2 seconds, put the device in a routine where it is possible to program some operation parameters.
5. LCD back-lighted alphanumeric display: dot matrix 2 lines x 16 characters.

Hand Held Terminal Front Panel

NOTE

LOW SPEED and START/STOP RESET functions are active only if the FRONT panel mode of operation is selected (see "Technical Information").

HAND-HELD TERMINAL DESCRIPTION

The Hand-held terminal is on LCD alphanumeric display and keyboard, which provides useful real time indications of the operating conditions/parameters of the Turbo-V 60 pump series when connected to a Turbo-V 60 controller without front panel.

Moreover, it is possible to reprogram the controller parameters or troubleshooting pump/controller.

The Hand-held terminal, 188 mm height x 110 mm wide x 41 mm deep (7.4" x 4.3" x 1.6"), is connected and powered to the Turbo-V controller via a 1.5 meters (5 ft) cable.

USE

General

Make all vacuum manifold and electrical connections and refer to Turbo-V pump instruction manual before to operating the Turbo-V controller.



WARNING!

To avoid injury to personnel and damage to the equipment, if the pump is laying on a table make sure it is steady. Never operate the Turbo-V pump if the pump inlet is not connected to the system or blanked off.

Connect the hand-held terminal to the Turbo-V controller. Plug the controller power cable into a suitable power source.

If the hand-held terminal is used to monitor the pump operating conditions, follow paragraph "Monitor Mode"; if reprogramming or trouble shooting is required, follow paragraph "Program Mode"; and the following paragraph.

Monitor Mode

By pressing the CURRENT push-button, the display shows:

I	=	0	.	0	0	A				P	=			0	W
X			.	.		K	R	P	M		X	X	°	C	

where:

- **I** = is the DC current drawn by the pump range (0.00 to 9.99 Ampere)
- **P** = is the DC power drawn by the pump (range 0 to 999 Watt)
- **KRPM** = is the theoretical rotational speed of the pump as a function of the controller output frequency (range 17 to 99 KRPM)
- **°C** = is the temperature of the outer ring of the upper bearing (range 00 to 99 °C)
- **X** = during operation a selected set point condition (1 or 2 contrast inverted) appears when the programmed threshold speed value is not reached.

- Press the CYCLE NUMBER once and the display shows:

X	X	X	X	C	Y	C	L	E		X	X	X	X	X	m
P	U	M	P		L	I	F	E		X	X	X	X	X	h

where:

- **CYCLE** = are the cycles performed (range 0 to 9999)
- **m** = is the elapsed time related to the cycle number displayed (range 0 to 99999 minutes)
- **PUMP LIFE** = is the total operation time of the pump (range 0 to 99999 hours).

Program Mode

Refer to paragraph "Speed Adjustment" to program/adjust the high and low speed values. This feature is only applicable when a dedicated software is installed on the Turbo-V 60 controller microprocessor (e.g. for leak detector operation).

FRONT / REMOTE/ 232 Selection

- Press CYCLE NUMBER and PUMP CURRENT push-buttons together for at least 2 seconds and the processor enters in a routine where it is possible to program the controller. In this routine, the CYCLE push-button is used for choosing/changing the value or condition; the PUMP CURRENT push-button is used to enter and confirm the value. At any time it is possible to exit this routine by pressing the CYCLE and PUMP CURRENT push-buttons at the same time for at least 2 seconds.

The display shows:

F	R	O	N	T	/	R	E	M	O	T	E	/	2	3	2
S	E	L	E	C	T	I	O	N	:	X	X	X	X	X	X

where: **XXXXXX** = means the word FRONT or REMOTE, or RS 232 depending on the last selection.

Select the FRONT panel operation if the front panel command is used.

After choosing the desired selection by pressing the CYCLE push-button, press the PUMP CURRENT push-button to enter the value.

The display shows:

				R	S	2	3	2						
B	A	U	D	R	A	T	E		X	X	X	X		

where: **XXXX** = means 600, 1200, 2400, 4800, 9600 baud rate for the host computer or printer communication.

If necessary, select the desired value by pressing the CYCLE NUMBER, then enter the value by pressing the PUMP CURRENT push-button.

The display shows:

R	S	2	3	2		H	O	S	T	/	P	R	I	N	T
S	E	L	E	C	T	I	O	N	:		X	X	X	X	X

where: **XXXX** = means HOST or PRINT.

Select HOST or PRINT by pressing the CYCLE push-button.

With the RS 232 connected, a bidirectional communication is established by selecting HOST. Data are sent to an external computer every time the external computer asks for the values.

The data available are:

- Pump/controller operating condition
- Cycle time
- Pump life
- Pump temperature
- Pump current
- Pump voltage
- Controller output frequency
- Cycle number
- R1 condition
- R2 condition

If PRINT is selected and a printer is connected on RS 232 line, a unidirectional communication is established and every minute the data are sent to the printer, even if the pump is not running.

The set of data available are:

- Pump speed KRPM
- Pump temperature
- Pump current A
- Pump power W
- R1 condition
- R2 condition

Confirm the selection by pressing the PUMP CURRENT pushbutton.

The display will be as shown in the following figure.

Monitor Relay Programming

- The display shows:

S	P	E	E	D		T	H	R	E	S	H	O	L	D	
S	E	L	E	C	T	I	O	N	:	X	X	K	R	P	M

where: **XXKRPM** = is the switch point of relay R1 at the preset turbopump speed, adjustable from 00 to 99 KRPM.

The speed threshold will condition the R1 and R2 operation (see the following cycle diagram).

Select the first number by pressing the CYCLE NUMBER push-button, then enter the value by pressing the PUMP CURRENT push-button.

Do the same for the second number.

After pressing the PUMP CURRENT the second time, the display will be as shown in the following figure.

R	U	N	-	U	P		T	I	M	E					
S	E	L	:		X	X	h		X	X	m		X	X	s

where: **RUN-UP TIME** = is the interval time from start to speed threshold value in hours, minutes, seconds. Select from 00 to 99 hours, and from 00 to 59 minutes or seconds.

Select the run-up time according to the chamber volume and/or operating cycle feature by pressing the CYCLE NUMBER push-button to select the desired number, then press the PUMP CURRENT to enter the data.

When the last digit is entered, the display will be as shown in the following figure.

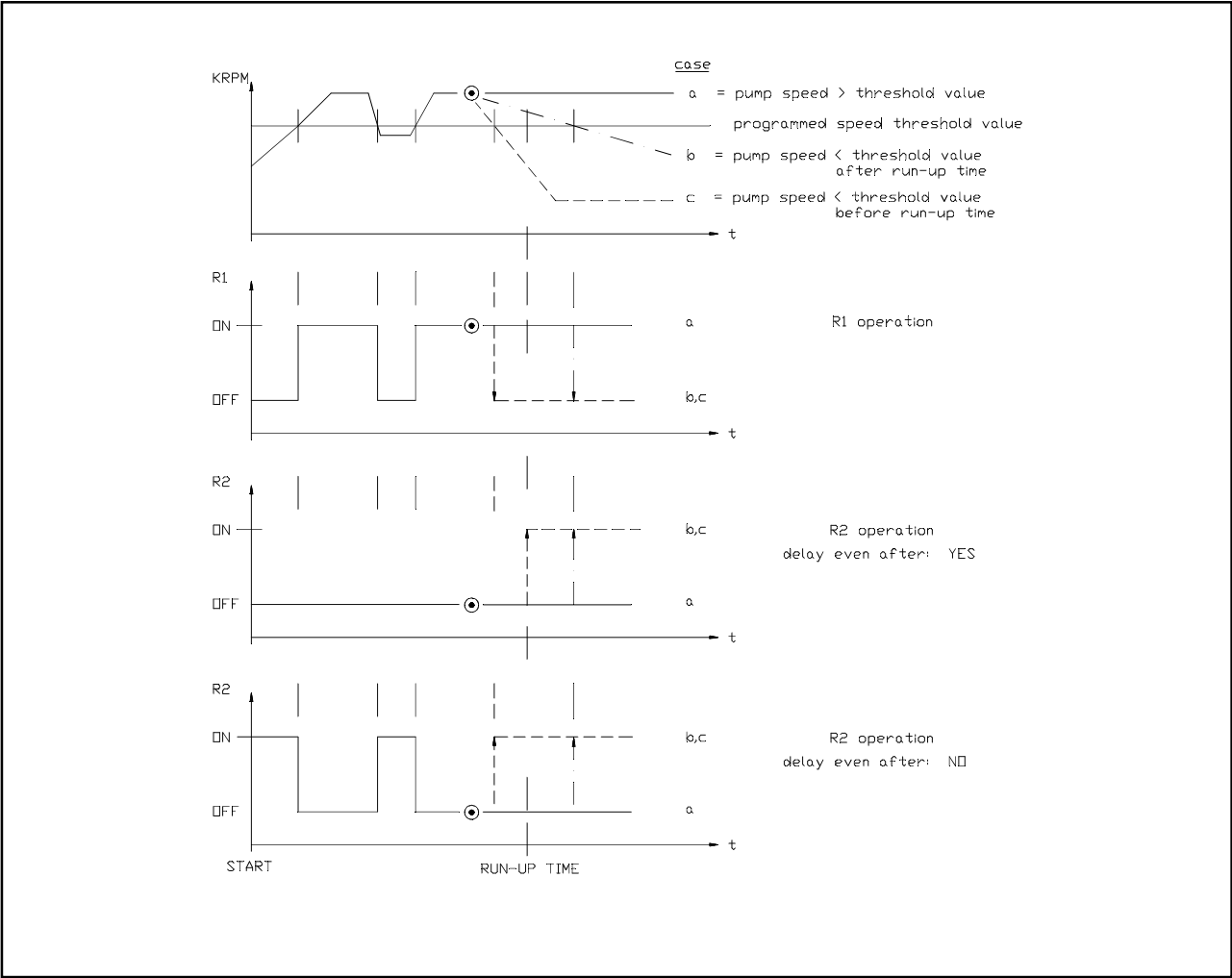
D	E	L	A	Y		E	V	E	N		A	F	T	E	R
	T	H	R	E	S	H	O	L	D	:		X	X	X	

where:

XXX = YES or NO.

By pressing the CYCLE NUMBER pushbutton, select YES if relay R2 must operate only after the run-up time or select NO when the R2 operation is needed right from start of the turbopump and after the rotational speed of the turbopump exceeds for the first time the speed threshold value as shown in the following figure.

After selection, press PUMP CURRENT to confirm; the display will be as show in the following figure.



Cycle diagram

Reset Command

- The display shows:

P	U	M	P	L	I	F	E	X	X	X	X	X	h
			R	E	S	E	T	?	X	X	X		

where:

- PUMP LIFE** = is the elapsed operating time range 000 to 99999 hours.
- RESET XXX** = YES or NO.

If YES is selected, the pump life shall be reset to 000. After selecting YES, press the PUMP CURRENT push-button to enter the command and the display shows as follows:

I	=	0	.	0	0	A			P	=			0	W
X			.	.		K	R	P	M		X	X	°	C

NOTE

When PUMP LIFE is reset to 000, the CYCLE number is also reset to 000.

Starting the Pump

If the forepump and vent device are not operated by the controller, close the vent valve and switch on the forepump.

NOTE

With the FRONT panel operation selected, the REMOTE and RS232 operations are inoperative; conversely, the CYCLE NUMBER and PUMP CURRENT pushbuttons are always active, even when the operating mode selected is REMOTE or RS 232.

- Press the START push-button or use the remote or RS 232 start signal, the display shows:

P	U	M	P		I	S		S	T	A	R	T	I	N	G
1	2			X	X			K	R	P	M				

where:

1 2 = contrast inverted identifies the set point condition:

- **1** is displayed when relay R1 is de-energized.
- **2** is displayed when relay R2 is energized.

XX KRPM = indicates the actual theoretical rotational speed of the pump as a function of the controller output frequency (range 3 to 99 KRPM).

- After START command, frequency output will be at the maximum level, then the frequency will decrease to a value proportional to the pump rotational speed (1/4 of nominal frequency if the pump is completely stopped).

The pump will accelerate to its normal rotational speed and when this speed is reached, the display will be as follows, even if any previous display selection was made, and the normal condition has been reached.

N	O	R	M	A	L		O	P	E	R	A	T	I	O	N
			X	X				K	R	P	M				

where: **XX** = indicates the rotational speed.

During acceleration of the pump or during any operating condition, it is always possible to select the other parameters to be displayed (PUMP CURRENT or CYCLE NUMBER push-buttons).

If this is the case when the pump reaches the normal speed, the display reverts to the previous figure.

Operating the Pump

After the starting period, if the system has a vacuum leak or the pressure in the pump/chamber is high (from 1 mbar to atmosphere), the pump continues to operate indefinitely. If the gas load at the turbopump inlet flange continues to stay high, the power drawn by the turbopump increases up to the maximum value. Then the Turbo-V pump is slowed down in proportion to the gas load at least until it reaches 3 KRPM.

Even if any previous display selection was made. This will occur either in NORMAL operation or with the LOW SPEED selected. As soon as the gas load decreases, the pump will automatically accelerate to reach normal operation. The pump can be stopped at any rotational speed and can be restarted at any rotational speed from either the front panel buttons or the remote connections. The controller automatically synchronizes the output to the rotational speed of the pump and then accelerates linearly up to the nominal speed or within steps if the Soft Start has been selected.

Low Speed Operation

NOTE

With the FRONT panel operation selected, the remote and RS 232 operations are inoperative; conversely, the CYCLE NUMBER and PUMP CURRENT pushbuttons are always active, even when the operating mode selected is REMOTE or RS 232.

This feature is provided for operating the pump at moderate high pressure with high gas throughput. To operate in this low speed mode, engage the LOW SPEED push-button, either before starting the pump or after it is operating.

If LOW SPEED is selected before starting the pump, the display shows as follows:

P	U	M	P		R	E	A	D	Y	:		P	U	S	H				
					S	T	A	R	T		B	U	T	T	O	N		L	S

where: **LS** = means low speed mode is selected.

After starting, a **LS** appears on the right bottom corner of the following displays.

With normal LOW SPEED operation, the pump will run at about 2/3 of its nominal speed and achieves a base pressure somewhat higher than the standard specifications. If the gas load becomes higher, the controller output frequency and voltage start to decrease automatically, and the Turbo-V pump is slowed down in proportion to the gas load until it reaches about 25% of the nominal speed.

If the LOW SPEED mode is selected after normal operating condition is reached, the display shows:

A	P	P	R	O	A	C	H	I	N	G		L	S
			X	X		K	R	P	M			L	S

while approaching the low speed value.

When the low speed mode is deselected, the display shows:

N	O	R	M	A	L		O	P	E	R	A	T	I	O	N
			X	X		K	R	P	M						

The pump starts to accelerate to its rotational speed.

Speed Adjustment

For some dedicated applications (e.g. leak detection) where high and low speed need to be changed and adjusted, a dedicated software is installed on the Turbo-V controller microprocessor.

By pressing CYCLE NUMBER and PUMP CURRENT pushbuttons together for at least 4 seconds, the processor enters in a routine where it is possible to adjust the rotational speed.

The display shows:

H	I	G	H		S	P	E	E	D					
S	E	L	E	C	T	:	X	X	X	X	X	R	P	M

where:

- **XXXXX** = is the pump rotational HIGH SPEED value selected.

In this routing the CYCLE pushbutton is used to increase the speed value and the LOW SPEED pushbutton is used to decrease the value. When the right value is chosen use the PUMP CURRENT pushbutton to enter and confirm the value.

The display shows:

L	O	W		S	P	E	E	D						
S	E	L	E	C	T	:	X	X	X	X	X	R	P	M

where:

- **XXXXX** = is the pump rotational LOW SPEED value selected.

After choosing the desired value by pressing the CYCLE pushbutton for increasing, and LOW SPEED pushbutton for decreasing, press the PUMP CURRENT pushbutton to enter the value.

NOTE

If different values of high or low speed are selected, the pump rotational speed will change (increase or decrease) only when the routing program ends.

The display shows:

F	R	O	N	T	/	R	E	M	O	T	E	/	2	3	2
S	E	L	E	C	T	I	O	N	:	X	X	X	X	X	X

Continue until the end of the paragraph "Front/Remote/ 232 Selection" the proceed to paragraph "Reset Command".

Monitor relay programming not applicable when the speed adjustment software is installed.

Pump Shutdown

Press the front panel STOP pushbutton or remove the remote signal; the power from the turbopump will be removed and the pump will begin to slow down.

An emergency stop signal is provided via a remote contact. This signal is active in any of the three operation selections: FRONT, REMOTE, RS 232; when activated, the display will be as shown in the following figure.

				S	Y	S	T	E	M					
				O	V	E	R	R	I	D	E			

Power Failure

In the event of a power failure (momentary or long term), the Turbo-V controller will stop the turbopump and all the interconnected pumps/devices. The Turbo-V vent valve device, if used, will vent the turbopump only if the power failure is longer than the preset delay time.

When power is restored, the Turbo-V controller automatically restarts the interconnected devices and the turbopump in the proper sequence.

The display shows:

P	U	M	P		I	S		S	T	A	R	T	I	N	G
1	2			X	X			K	R	P	M				

until normal operation achieved.

Remote Control Mode Operation

If remote signals are used to operate the controller, it must be programmed for remote operation (see paragraph "Program Mode") and when ready to start, the display shows as in the following figure.

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

START/STOP and LOW SPEED pushbuttons are inoperative, while the CYCLE NUMBER and PUMP CURRENT pushbuttons are always active.

RS 232 Control Mode Operation

If the RS 232 option is installed and the controller has been programmed for RS 232 operation, the controller may be driven by a computer and when ready to operate the display shows as in the following figure.

P	U	M	P		R	E	A	D	Y	:		U	S	E
					R	S	2	3	2		L	I	N	E

The START/STOP and LOW SPEED functions are under computer control, while the CYCLE NUMBER and PUMP CURRENT front panel pushbuttons are always active.

ERROR MESSAGES

For a certain type of failure, the controller will self-diagnose the error and the following messages will be displayed.

NOTE

If the pump is not connected, the display will be as shown in the following figure.

C	H	E	C	K		C	O	N	N	E	C	T	I	O	N
			T	O		P	U	M	P						

Check connection between controller and pump, then press START RESET pushbutton twice to start the pump.

NOTE

If the P1 input connector is not in position with the link or the external interlock connections are open, when the START pushbutton is pressed the display will be as shown in the following figure.

P	U	M	P		W	A	I	T	I	N	G				
I	N	T	E	R	L	O	C	K							

Disconnect the input connector and check the link or the external interlock, then install the connector to start the pump.

NOTE

If the upper bearing/pump temperature exceed 60 °C, the pump is shut off, and the display will be as shown in the following figure.

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

The message will stay on until the temperature decreases below threshold value. Press the STOP RESET pushbutton twice to start the pump.

NOTE

If the controller transformer temperature exceeds 90°C, the pump is shut off, and the display will be as shown in the following figure.

F	A	U	L	T	:	C	O	N	T	R	O	L	L	E	R
	O	V	E	R	T	E	M	P	E	R	A	T	U	R	E

The message will stay on until the temperature decreases below threshold value. Press the STOP RESET pushbutton twice to start the pump.

NOTE

If in normal condition the current drawn by the pump is higher than programmed (1.5 A), the pump and the interconnected devices are switched off and the display will be as shown in the following figure.

F	A	U	L	T	:										
T	O	O		H	I	G	H		L	O	A	D			

Check that pump rotor is free to rotate then press the STOP RESET pushbutton twice to start the pump.

NOTE

If the output connection is shorted or the pump rotor is locked, the display will be as shown in the following figure.

F	A	U	L	T	:										
S	H	O	R	T		C	I	R	C	U	I	T			

Check connections and shortages between pump and controller, then press the STOP RESET pushbutton twice to start the pump.

NOTE

If the pump is stopped by an emergency stop signal provided via a remote contact, the display will be as shown in the following figure.

				S	Y	S	T	E	M						
				O	V	E	R	R	I	D	E				

Remove the controller power cable and check the emergency condition. Then reconnect the power cable and press the START pushbutton to start the pump.



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.

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 Local Office

CUSTOMER INFORMATION

Company name:	
Contact person: Name:	Tel:
Fax:	E-Mail:
Ship Method:	Shipping Collect #: P.O.#:
<u>Europe only</u> : VAT reg. Number:	<u>USA only</u> : <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:
TURBOCONTROLLER ERROR MESSAGE:			OPERATION TIME:

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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