VARIAN

vacuum technologies

Ion Pumps Control Unit

(I) MANUALE ISTRUZIONI

(D) BEDIENUNGSHANDBUCH

(F) NOTICE DE MODE D'EMPLOI

(GB) INSTRUCTION MANUAL

Model 629-5001

87-900-124-01 (B)
JUNE 2007

Ion Pumps
Control Unit

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
_____	_____	_____

ADDRESS : _____

TEL. N° : _____ FAX N° : _____

E-MAIL : _____

PROBLEM / SUGGESTION :

_____

REFERENCE INFORMATION (model n°, serial n°, ordering information, time to failure after installation, etc.) :

_____

DATE _____

CORRECTIVE ACTION PLAN / ACTUATION LOG N° _____
(by VARIAN VTT)

_____

XXXX = Code for dialing Italy from your country (es. 01139 from USA; 00139 from Japan, etc.)

VARIAN

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INFORMAZIONI GENERALI

Questa apparecchiatura è destinata ad uso professionale. L'utilizzatore deve leggere attentamente il presente Manuale di Istruzioni e ogni altra informazione aggiuntiva fornita dalla Varian prima di utilizzare l'apparecchiatura. La Varian si ritiene sollevata da eventuali responsabilità dovute all'inosservanza totale, o parziale, delle istruzioni, all'uso improprio da parte di personale non addestrato, ad interventi non autorizzati o ad un utilizzo non conforme alle normative nazionali specifiche.
Nei paragrafi seguenti sono riportate tutte le informazioni necessarie per garantire la sicurezza dell'operatore durante l'utilizzo dell'apparecchiatura. Nell'Appendice "Informazioni tecniche" sono forniti maggiori dettagli.

Il presente manuale utilizza il seguente protocollo standard:

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.

NOTE

Le note contengono informazioni importanti estrapolate dal testo.

DESCRIZIONE DEL CONTROLLER

Controller della Varian per pompe ioniche, in grado di azionare fino a 2 pompe simultaneamente e in modo indipendente. Questo controller è progettato per fornire l'alta tensione alle pompe ioniche mediante collegamento all'alimentazione principale (tensione in uscita max. = 5000 Vcc). (Per maggiori dettagli, vedere paragrafo "Informazioni tecniche").

Questo controller può essere azionato in modalità operativa I/O remota/locale oppure in modalità seriale attraverso la porta RS232. La selezione della modalità operativa è eseguita per mezzo dell'interruttore remote-local/serial I/O presente sul pannello anteriore del controller.

Nella modalità I/O remota-locale, i comandi sono eseguiti agendo sul pannello anteriore oppure mediante collegamento al connettore "REMOTE" DB25 "REMOTE" presente nel pannello posteriore.

I dati inerenti le condizioni operative della pompa sono disponibili sulla linea seriale. Nella modalità seriale, i comandi sono eseguiti attraverso il collegamento seriale e tutti i dati relativi alle condizioni operative della pompa sono disponibili sul collegamento seriale.

IMMAGAZZINAMENTO

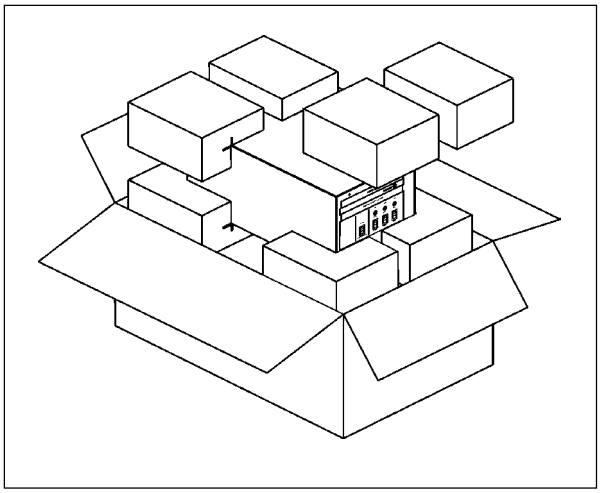
Durante il trasporto e l'immagazzinamento del controller, non devono essere superate le seguenti condizioni ambientali:

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

PREPARAZIONE PER L'INSTALLAZIONE

Il controller è fornito all'interno di un apposito imballo protettivo. In caso di segni evidenti di danneggiamento accorsi durante il trasporto, contattare l'ufficio vendite locale. In fase di disimballaggio del controller, fare attenzione a non lasciarlo cadere ed evitare di sottoporlo ad urti o vibrazioni.

Trattare il materiale di imballaggio secondo le apposite procedure autorizzate. Tali materiali sono 100% riciclabili e rispondono alla Direttiva EEC 85/399.



Disimballaggio

INSTALLAZIONE

PERICOLO!

Il controller è dotato di un cavo di alimentazione a 3 fili senza spina. Applicare una spina appropriata a seconda del paese di utilizzo del controller.
Si noti che il filo giallo/verde del cavo è il collegamento a massa del controller. Utilizzare sempre questo cavo di alimentazione ed inserire la spina in una presa con adeguato collegamento a massa onde evitare scariche elettriche. Verificare la correttezza dei collegamenti a massa. L'alta tensione generata nel controller può causare gravi danni o addirittura il decesso. Prima di eseguire qualsiasi intervento di manutenzione sull'unità, scollegare il cavo di alimentazione.

ATTENZIONE!

Il controller può essere utilizzato come unità da banco o modulo rack; in ogni caso deve essere posizionato in modo tale da consentire la circolazione d'aria attraverso le apposite aperture presenti sulla copertura superiore e laterale.
Se il controller è utilizzato come modulo rack, DEVE essere inserito in un adattatore per rack a 4 scomparti per evitare che il controller cada all'interno del rack. Il pannello anteriore del controller non è progettato per supportare il peso dell'unità. Non installare o utilizzare il controller in ambienti esposti ad agenti atmosferici (pioggia, gelo, neve), polveri, gas aggressivi, in ambienti esplosivi o ad elevato rischio di incendio.

NOTA

Se il controller è installato su un rack, rimuovere i quatto piedini e posizionarlo lasciando uno spazio minimo di 30 mm (1.2 pollici) in corrispondenza della superficie superiore e inferiore.

PERICOLO!

Il controller deve essere installato in modo tale da poter interrompere senza difficoltà la tensione (scollegamento della spina o interruzione mediante interruttore della linea generale del rack).

Durante il funzionamento dell'apparecchiatura è necessario che siano rispettate le seguenti condizioni ambientali:

- temperatura: da +5 °C a +40 °C
- umidità relativa: 0 - 95% (non condensante)

Per collegare il controller alla pompa, utilizzare gli appositi cavi forniti.

Per le informazioni dettagliate circa i collegamenti sopra indicati o di altra natura, fare riferimento all'Appendice "Informazioni tecniche".

USO

In questo paragrafo sono riportate le principali procedure operative. Per ulteriori dettagli e per le informazioni inerenti i collegamenti opzionali, fare riferimento al paragrafo "USO" dell'Appendice "Informazioni tecniche".

Prima di azionare il controller, eseguire tutti i collegamenti elettrici e verso la pompa e leggere il Manuale di Istruzioni della pompa collegata.

PERICOLO!

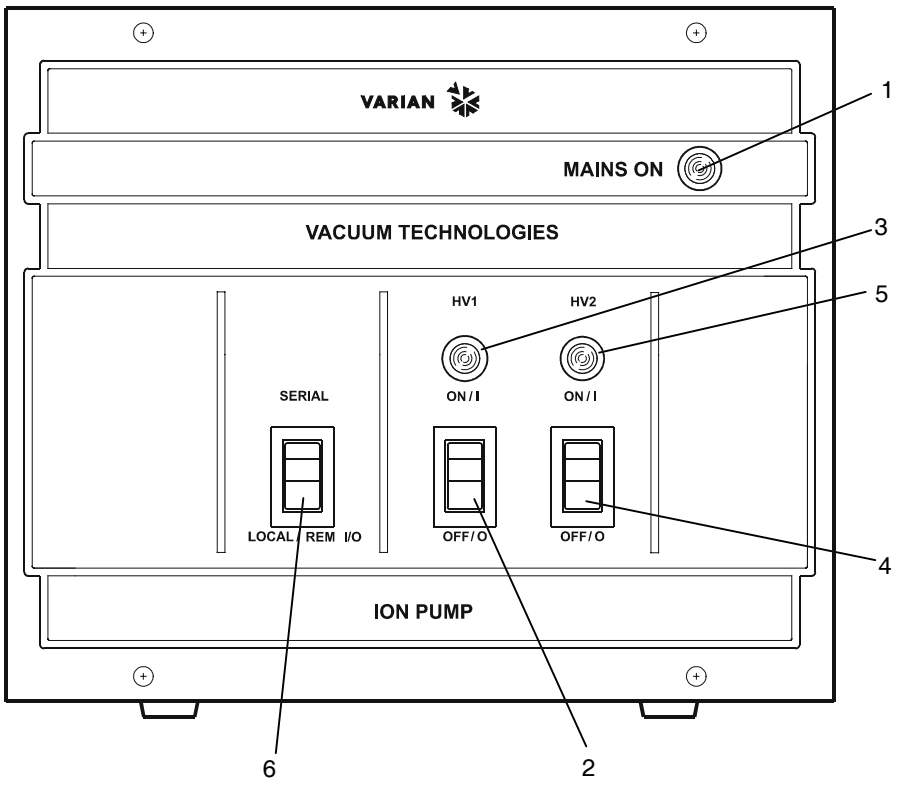
Per evitare danni personali o all'apparecchiatura, se la pompa è collocata su un tavolo, accertarsi che quest'ultimo sia stabile. Non azionare la pompa qualora la relativa presa sia scollegata dal sistema oppure sia ostruita.

Comandi e indicatori del pannello anteriore dell'unità controller per pompe ioniche

La figura e la tabella seguenti riportano i comandi e gli indicatori del pannello anteriore del controller, con le relative descrizioni e funzionalità.

NOTA

La funzionalità e il significato di alcuni comandi e indicatori cambia a seconda della posizione dell'interruttore HV ON OFF. La seguente tabella riporta tutte le funzionalità e tutti i significati dei segnali.

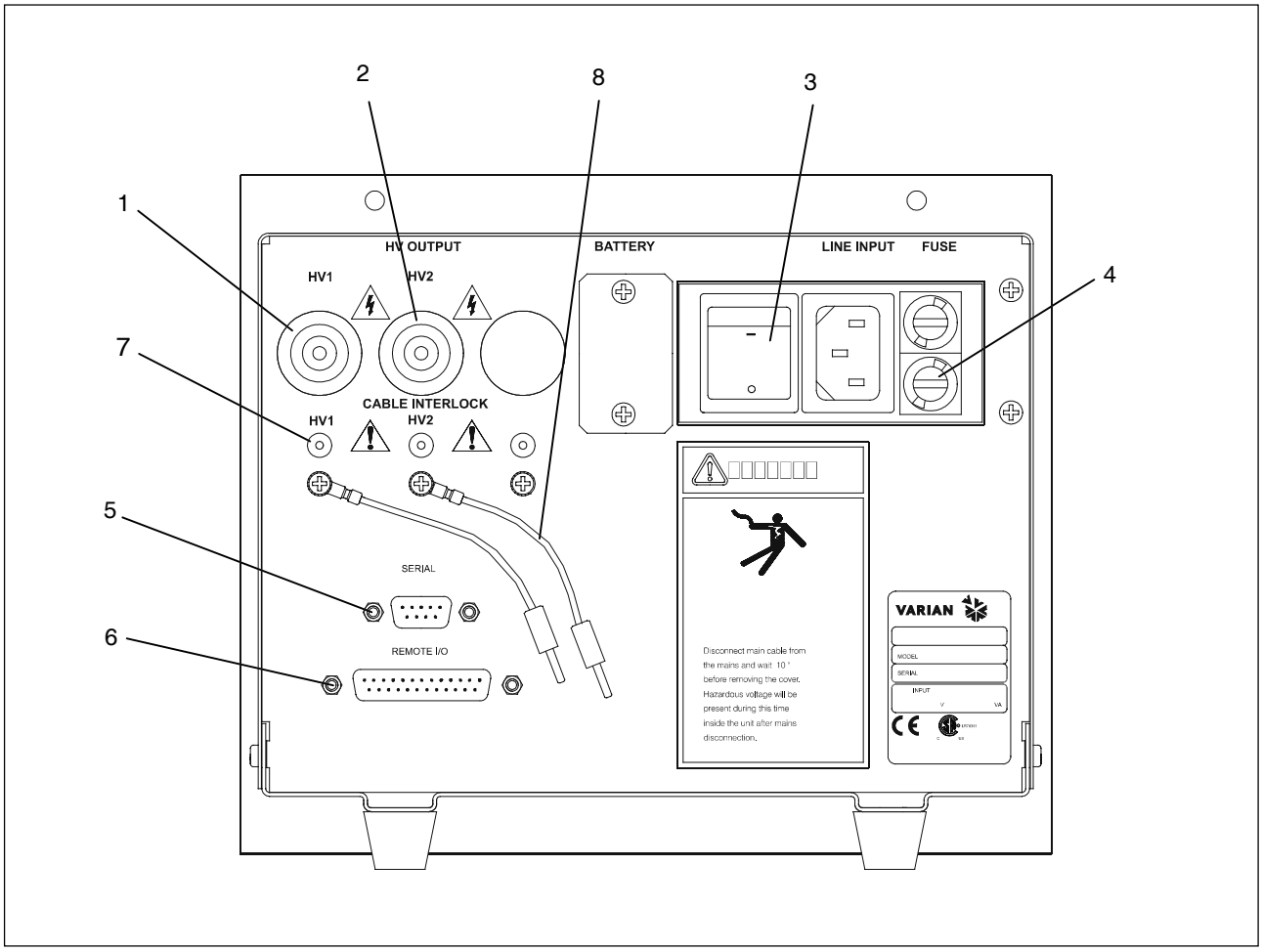


Comandi e indicatori del pannello anteriore dell'unità controller per pompe ioniche

RIF.	SEGNALE	DESCRIZIONE
1	MAINS ON LED	Quando è On, significa che l'unità è collegata alla linea di alimentazione e che l'interruttore Line sul pannello posteriore è in posizione ON (I).
2	HV1 ON/OFF SWITCH	Quando è in posizione ON (I), abilita l'alimentazione ad alta tensione per la pompa 1 se il controller è impostato in modalità operativa I/O remota/locale e gli interlock del cavo esterno e del cavo alta tensione sono chiusi.
3	HV1 LED	È On quando il controller fornisce l'alta tensione per la pompa 1. Lampeggia in caso di anomalia (vedere paragrafo "Informazioni tecniche" per maggiori dettagli).
4	HV2 ON/OFF SWITCH	Quando è in posizione ON (I), abilita l'alimentazione ad alta tensione per la pompa 2 se il controller è impostato in modalità operativa I/O remota/locale e gli interlock del cavo esterno e del cavo alta tensione sono chiusi.
5	HV2 LED	È On quando il controller fornisce l'alta tensione per la pompa 2. Lampeggia in caso di anomalia (vedere paragrafo "Informazioni tecniche" per maggiori dettagli).
6	SERIAL/LOCAL-REM I/O SWITCH	Consente di selezionare la modalità operativa: SERIALE: I comandi sono forniti tutti attraverso la linea seriale. I/O remota/locale: I comandi sono forniti tutti agendo sul pannello anteriore dell'unità oppure attraverso il connettore REMOTE a 25 pin presente sul pannello posteriore.

Pannello posteriore dell'unità controller per pompe ioniche

La seguente figura illustra i comandi e gli indicatori del pannello posteriore del controller. Per le informazioni dettagliate circa i collegamenti, fare riferimento all'Appendice "Informazioni tecniche".



Pannello posteriore dell'unità controller per pompe ioniche

RIF.	SEGNALE	DESCRIZIONE
1	HV1 Connector	Connettore HV per cavo di collegamento alla pompa ionica 1
2	HV2 Connector	Connettore HV per cavo di collegamento alla pompa ionica 2
3	LINE INPUT	Modulo contenente la spina del cavo di ingresso della linea e l'interruttore LINE
4	FUSE	Supporto fusibili (2 fusibili)
5	SERIAL Connector	Connettore DB9 per cavo seriale
6	REMOTE Connector	Connettore DB25 per collegamenti I/O remota
7	HV1 Cable Interlock	
8	HV2 Cable Interlock	

PROCEDURE DI USO

Questo paragrafo fornisce informazioni generiche inerenti l'uso del controller. Per i dettagli, fare riferimento al paragrafo "Informazioni tecniche". Collegando il cavo di alimentazione del controller alla linea di alimentazione e posizionando l'interruttore LINE presente nel pannello posteriore su ON (I), l'apparecchiatura è in grado di fornire le seguenti prestazioni:

- 2 canali HV indipendenti
- Tensione di uscita massima +5000 Vcc
- Potenza di uscita massima 40W per il canale 1
- Potenza di uscita massima 80W per il canale 2
- Corrente di uscita massima >30 mA (condizione di cortocircuito) per il canale 1
- Corrente di uscita massima >60 mA (condizione di cortocircuito) per il canale 2
- Modalità operativa I/O LOCALE-REMOTA SERIALE
- Modalità operativa START/PROTECT

MODALITÀ OPERATIVE

Collegamento alla linea di alimentazione

Modalità operativa I/O LOCALE-REMOTA

NOTA

I 2 switch HV nel pannello anteriore e i due input HV On/Off sul connettore DB25 "Remote" nel pannello posteriore funzionano in serie.

HV On/Off del canale 1 mediante il pannello anteriore:

Collegare un'alimentazione esterna isolata da 24 Vcc al: Pin 8 (+) e al pin 21 del connettore I/O remota e spostare lo switch HV1 sul pannello anteriore.

HV On/Off del canale 2 mediante il pannello anteriore:

Collegare un'alimentazione esterna isolata da 24 Vcc al:
Pin 9 (+)e al pin 22 del connettore I/O remota e spostare lo switch HV2 sul pannello anteriore.

I corrispondenti interlock del cavo HV devono essere chiusi.

HV On/Off del canale 1 mediante I/O remota:

Con lo switch HV1 sul pannello anteriore in posizione On,
Applicare (On) o rimuovere (off) l'alimentazione esterna isolata da 24 Vcc al pin 8 (+) e al pin 21 del connettore I/O remota.

HV On/Off del canale 2 mediante I/O remota:

Con lo switch HV2 sul pannello anteriore in posizione On,
Applicare (On) o rimuovere (off) l'alimentazione esterna isolata da 24 Vcc al pin 9 (+) e al pin 22 del connettore I/O remota.

Quando HV è ON, il corrispondente LED HV sul pannello anteriore si accende.

NOTA

Se il collegamento tra l'IPCU e la pompa è realizzato per mezzo di un cavo ad alta tensione con interlock di sicurezza, il cavo deve essere collegato all'F/T della pompa e il connettore unipolare di dimensioni ridotte deve essere inserito nella relativa spina "HV Cable Interlock" presente sul pannello posteriore dell'unità al fine di poter attivare l'alta tensione.

Se il collegamento è realizzato con un cavo alta tensione unipolare senza interlock di sicurezza, accertarsi che il ponticello fornito sul pannello posteriore dell'unità sia inserito nella spina "HV Cable Interlock".

Funzionamento SERIALE

NOTA

La modalità SERIALE è impostata per utilizzare il prodotto collegando il controller ad un PC esterno che utilizza il programma "HYPER TERMINAL" o *un programma equivalente (ad esempio un programma proprietary user) sotto Windows o altro sistema operativo. Per utilizzare il prodotto in modalità seriale, collegare la porta seriale al connettore "Serial" del controller sul pannello posteriore, eseguire il programma "HYPER TERMINAL" di Windows sul PC con le seguenti impostazioni di default:*

- *COM1*
- *9600 baud*
- *No parity*
- *8 data bits*
- *1 stop bit*

Questa modalità operativa consentirà di verificare la funzionalità dell'unità, lanciare i comandi e accedere a tutti i dati operativi.

NOTA

Durante il funzionamento seriale, a seconda dell'ambiente di utilizzo, il S.O. impiegato deve avere una capacità real time.

Per maggiori dettagli, fare riferimento al paragrafo "Informazioni tecniche".

Modalità operativa START/PROTECT

Il controller può funzionare nelle due seguenti modalità: Start e Protect.

In modalità Start, i 2 canali in uscita possono fornire tutta la potenza in uscita a prescindere dalle condizioni della pompa, fino allo stato di cortocircuito.
Questa modalità viene utilizzata per azionare la pompa a pressione elevata.

In Protect, il controller limita la corrente di uscita e disattiva l'HV quando la corrente supera il valore di soglia (8 mA per il canale da 40W e 16 mA per il canale da 80W) per più di 2 secondi.

MESSAGGI DI ERRORE

Sul pannello anteriore

Durante il funzionamento del controller, se è rilevato un errore, i LED alta tensione sul pannello anteriore forniranno le seguenti indicazioni:

HV 1,2,3
LED ON: Funzionamento normale = HV ON

Led HV 1,2 lampeggiante: condizione di errore:

1 lampeggio ogni 4 secondi = cavo Interlock HV
2 lampeggi ogni 4 secondi = Interlock remoto
3 lampeggi ogni 4 secondi = sovratensione HV (questa anomalia non disattiva l'HV)
4 lampeggi ogni 4 secondi = errore all'interno dell'ADC
5 lampeggi ogni 4 secondi = sovracorrente su HV (cortocircuito)
6 lampeggi ogni 4 secondi = lo switch Locale/Remoto è stato spostato con HV ON
7 lampeggi ogni 4 secondi = temperatura eccessiva all'interno dell'unità
8 lampeggi ogni 4 secondi = sovracorrente in Protect (I>8 mA per il canale da 40W e I>16 mA per il canale da 80W)
9 lampeggi ogni 4 secondi = sottotensione HV

In modalità I/O remota-locale, la condizione di anomalia è resettata posizionando su Off (0) l'interruttore del canale corrispondente presente sul pannello anteriore.

In modalità seriale, la condizione di anomalia è resettata inviando il comando "F0n" attraverso il computer.

NOTA

Nel caso in cui si verifichi una delle seguenti condizioni mentre l'alta tensione del canale è attiva, l'uscita del canale è impostata immediatamente su Off, il LED sul pannello anteriore indica la condizione di anomalia corrispondente e l'informazione inerente l'anomalia è inviata all'uscita seriale.

Intervento in Protect (I>8mA per più di 2 secondi per l'uscita 40 W– 16 mA per l'uscita 80 W) (8 lampeggi del LED)
Interlock del cavo HV aperto (1 lampeggio del LED)
Interlock remoto aperto (2 lampeggi del LED)
Errore interno durante la generazione di HV (4 lampeggi del LED)
Cortocircuito uscita (5 lampeggi del LED)
Modifica dello stato dello switch I/O locale-remota mentre HV era On (6 lampeggi del LED)
Temperatura eccessiva all'interno dell'unità (7 lampeggi del LED)

Sul connettore "Remote" nel pannello posteriore

Uscita "Fault": contatto N.C. (stato inattivo) =
Il contatto è aperto in condizione " Fault" (relè Off)
Il contatto è chiuso durante il normale funzionamento (relè On)

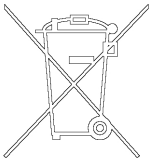
Uscita "HV 1,2": contatto N.O. (stato inattivo) =
Il contatto è aperto con HV in stato Off (relè Off)
Il contatto è chiuso con HV in stato On (relè On)

Punto di regolazione della corrente di uscita "HV 1,2": contatto N.O. (stato inattivo) =
Il contatto è aperto con un valore di corrente di uscita inferiore al punto di regolazione della corrente (relè Off)
Il contatto è chiuso con un valore di corrente di uscita superiore al punto di regolazione della corrente (relè On)

Potenza nominale dei relè di uscita: 2A@125Vca.
Carico minimo: 10mW (100mV@1mA).
Tempo di saltellamento: NO=1msec; NC=3msec.

SMALTIMENTO

Significato del logo "WEEE" presente sulle etichette.
Il simbolo qui sotto riportato è applicato in ottemperanza alla direttiva CE denominata "WEEE". Questo simbolo **(valido solo per i paesi della Comunità Europea)** indica che il prodotto sul quale è applicato, NON deve essere smaltito insieme ai comuni rifiuti domestici o industriali, ma deve essere avviato ad un sistema di raccolta differenziata. Si invita pertanto l'utente finale a contattare il fornitore del dispositivo, sia esso la casa madre o un rivenditore, per avviare il processo di raccolta e smaltimento, dopo opportuna verifica dei termini e condizioni contrattuali di vendita.



ALLGEMEINES

Dieser Apparat ist für Fachbetriebe bestimmt. Vor Gebrauch sollte der Benutzer dieses Handbuch sowie alle weiteren von Varian mitgelieferten Zusatzdokumente genau lesen. Bei - auch nur teilweisem - Nichtbeachtung der enthaltenen Hinweise, unsachgemäßem Gebrauch durch ungeschultes Personal, nicht autorisierten Eingriffen und Missachtung der einheimischen, hier zur Geltung kommenden Bestimmungen übernimmt die Fa Varian keinerlei Haftung. In den folgenden Abschnitten sind alle erforderlichen Informationen für die Sicherheit des Bedieners bei Anwendung des Geräts angeführt.
Ins einzelne gehende Informationen über das Gerät finden sich im Anhang "Technische Informationen".

In dieser Gebrauchanleitung werden Sicherheits hinweise wie folgthervorgehoben:

GEFAHR!

Der Gefahrenhinweise lenken die Aufmerksamkeit des Bedieners auf bestimmte Vorgänge oder Praktiken, die bei falscher Ausführung zu schweren Verletzungen führen können.

ACHTUNG!

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

ANMERKUNG

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

BESCHREIBUNG DES KONTROLLERS

Der Varian Kontroller dient zur Steuerung von Ionenpumpen. Er kann gleichzeitig bis zu 2 Ionenpumpen unabhängig voneinander bedienen und ist so entworfen, dass er die Ionenpumpen mit HV versorgt, wenn er an das Netz angeschlossen ist (max. Ausgangsspannung = 5000 V=). Weitere Einzelheiten finden sich im Anhang "Technische Informationen.
Der Varian Ionenpumpen-Kontroller kann in den Betriebsarten LOCAL-REMOTE I/O oder im seriellen Modus über eine serielle RS232 Schnittstelle benutzt werden. Die Betriebsart wird mit dem Schalter SERIAL/LOCAL-Remote I/O auf dem vorderen Bedienfeld des Kontrollers gewählt.
In der Betriebsart LOCAL-REMOTE I/O werden alle Befehle auf dem vorderen Bedienfeld oder durch Anschlüsse an den Stecker DB25 “REMOTE” auf der Rückseite gegeben.
Daten über die Betriebsbedingungen der Pumpen sind in jedem Fall über den seriellen Anschluss verfügbar. Im SERIELLEN Modus kommen die Befehle über die serielle Verbindung, die auch die Daten über die Betriebsbedingungen der Pumpen liefert.

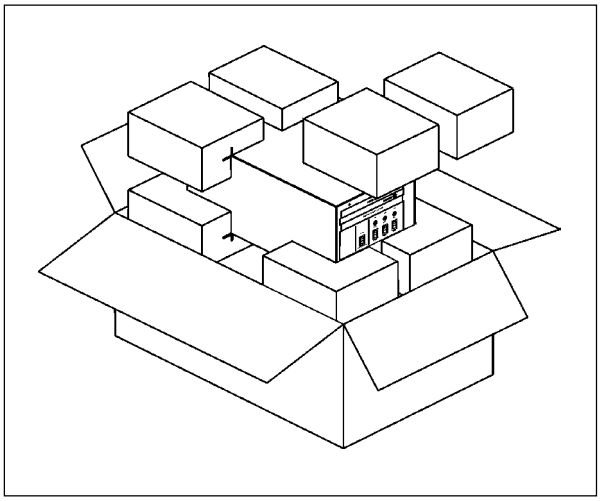
LAGERUNG

Bei Transport und Lagerung des Kontrollers müssen die folgenden Umgebungsbedingungen eingehalten werden:

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

INSTALLATIONSVORBEREITUNG

Der Kontroller wird in einer speziellen Schutzverpackung geliefert. Wenn diese Spuren von Beschädigung zeigt, die bei der Spedition erfolgt sein kann, kontaktieren Sie Ihr lokales Verkaufsbüro. Beim Auspacken des Kontrollers darauf achten, dass er nicht herunterfällt oder Stößen oder Vibrationen ausgesetzt wird.
Das Verpackungsmaterial umweltfreundlich entsorgen. Das Material kann zu 100% recycelt werden und entspricht der EU Richtlinie 85/399.



Verpackung

INSTALLATION

GEFAHR!

Der Kontroller hat ein dreiadriges Netzkabel ohne Stecker. Bringen Sie den richtigen Stecker für das Land an, in dem der Kontroller eingesetzt wird.
Der gelbgrüne Leiter des Kabels ist der Erdungsanschluss des Kontrollers. Benutzen Sie diesen Leiter und den angeschlossenen Stecker zusammen mit einer richtig geerdeten Steckdose, um elektrische Schläge zu verhindern. Prüfen Sie, dass die Erdungsverbindung richtig funktioniert. Die im Kontroller erzeugte Hochspannung kann zu schweren Verleztungen und zum Tode führen. Vor Wartungsarbeiten am Kontroller, das Netzkabel abziehen.

ACHTUNG!

Der Kontroller kann als Tisch- oder als Gestellmodul benutzt werden. Er muss aber so positioniert sein, dass Luft frei durch die Löcher in der Seitenwand und der oberen Abdeckung fließen kann.
Wenn der Kontroller in ein Gestell eingebaut ist, MUSS er in ein vier Einheiten hohes Adapterchassis eingebaut werden, damit er nicht in das Gestell kippen kann. Das vordere Bedienfeld ist nicht dafür ausgelegt, das Gewicht der Einheit zu halten. Den Kontroller nicht in einer Umgebung installieren, die Regen, Schnee, Eis, Staub, aggressiven Gasen usw. ausgesetzt, explosionsgefährdet oder stark feuergefährdet ist.

ANMERKUNG

Wenn der Kontroller in einem Gestell installiert wird, die vier Füße entfernen und oben und unten mindestens 30 mm Raum lassen.

GEFAHR!

Der Kontroller muss so installiert werden, dass er leicht von der Netzspannung getrennt werden kann (Abziehen des Netzsteckers oder Hauptschalter des Gestells).

Beim Betrieb müssen die folgenden Umgebungsbedingungen eingehalten werden:

- Temperatur: +5 °C bis +40 °C
- rel. Luftfeuchtigkeit: 0 - 95% (nicht kondensierend)

Zum Anschluss des Kontrollers an die Pumpen die mitgelieferten Kabel benutzen.

Für Einzelheiten über die erwähnten und andere Anschlüsse den Anhang "Technische Informationen" zu Rate ziehen.

BENUTZUNG

Dieser Abschnitt beschreibt die fundamentalen Betriebsprozeduren. Detaillierte Informationen und Betriebsprozeduren mit optionalen Anschlüssen oder Optionen werden im Abschnitt "GEBRAUCH" im Anhang "Technische Informationen" behandelt.

Vor Inbetriebnahme des Kontrollers alle elektrischen Anschlüsse und diejenigen an das Vakuumsammelrohr vornehmen und das Anleitungshandbuch für die angeschlossenen Pumpen zu Rate ziehen.

GEFAHR!

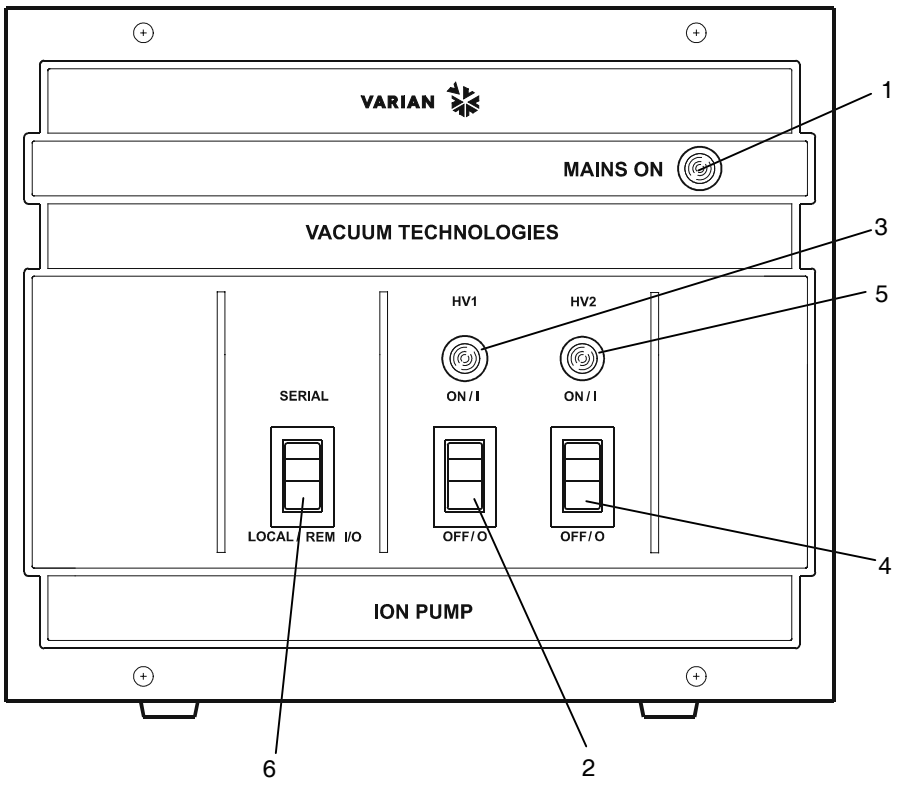
Wenn die Pumpe auf einem Tisch liegt, sicherstellen, dass sie ruhig liegt, um Verletzungen von Personen und Beschädigung des Geräts zu verhindern. Die Pumpe nie betreiben, wenn deren Einlass nicht am System angeschlossen oder verschlossen ist.

Steuerungen und Anzeigen auf dem vorderen Bedienfeld des Ionenpumpen-Kontrollers

Die Abbildung und die Tabelle auf der folgenden Seite zeigen die Steuerungen und Anzeigen auf dem vorderen Bedienfeld des Ionenpumpen-Kontrollers mit Beschreibung und Funktion.

ANMERKUNG

Bei einige Steuerungen und Anzeigen hängt die Funktion von der Stellung des Schalters HV ON OFF ab. Die Tabelle enthält all diese Funktionen und ihre Bedeutung.

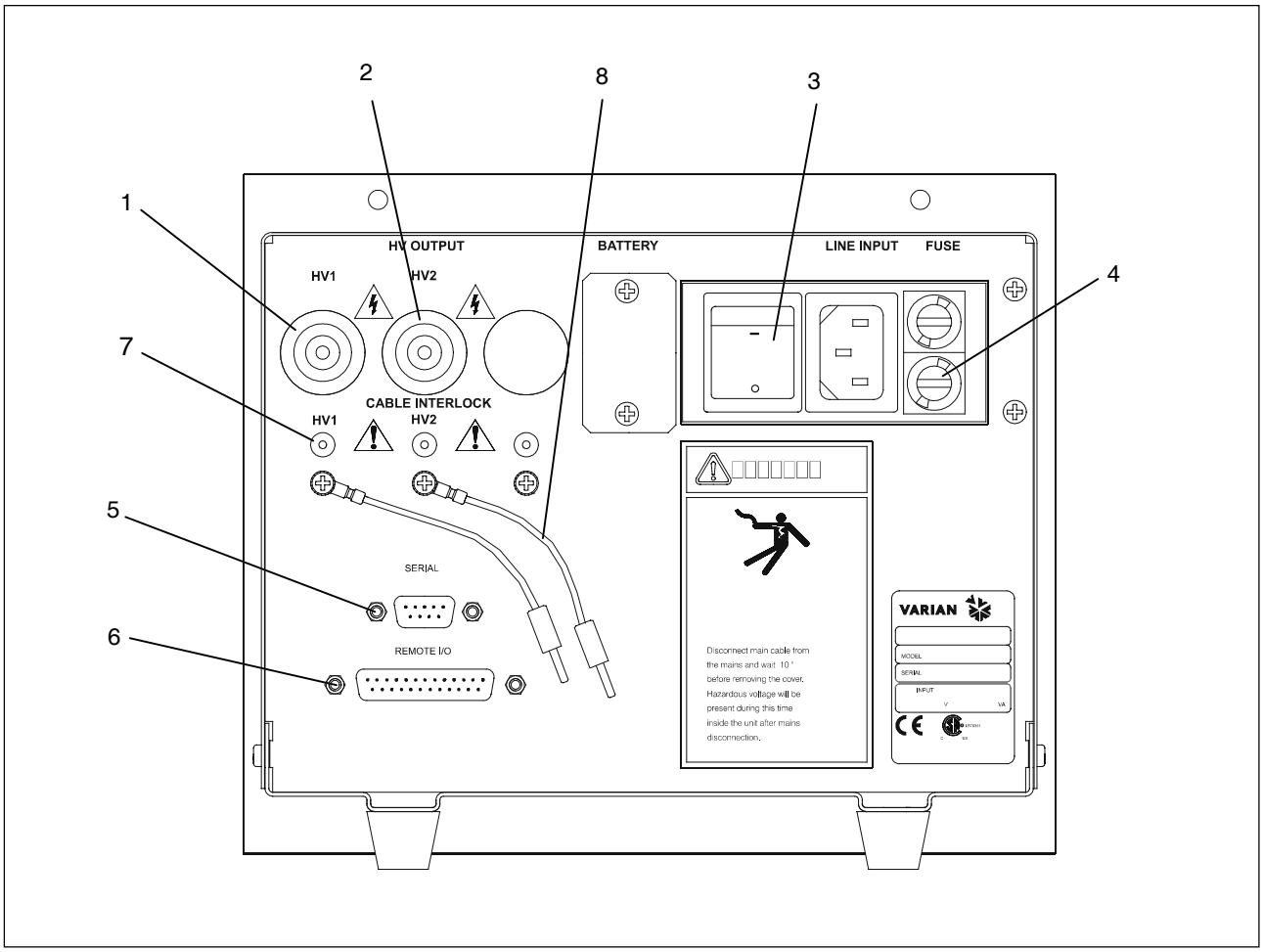


Steuerungen und Anzeigen auf dem vorderen Bedienfeld des Ionenpumpen-Kontrollers

REF.	SIGNAL	BESCHREIBUNG
1	MAINS ON LED	Wenn an, ist die Einheit ans Netz angeschlossen und der Netzschalter auf der Rückseite steht auf ON (I).
2	HV1 ON/OFF SWITCH	Wenn auf ON (I), wird die HV für die Pumpe 1 geschaltet, sofern der Kontroller auf LOCAL/REMOTE I/O Betrieb gesetzt ist und die externen wie die HV Kabel-Verriegelungen geschlossen sind.
3	HV1 LED	Wenn an, versorgt der Kontroller die Pumpe 1 mit HV. Wenn blinkend, liegt ein Fehler vor (Einzelheiten finden sich im Anhang "Technische Informationen").
4	HV2 ON/OFF SWITCH	Wenn auf ON (I), wird die HV für die Pumpe 2 geschaltet, sofern der Kontroller auf LOCAL/REMOTE I/O Betrieb gesetzt ist und die externen wie die HV Kabel-Verriegelungen geschlossen sind.
5	HV2 LED	Wenn an, versorgt der Kontroller die Pumpe 2 mit HV. Wenn blinkend, liegt ein Fehler vor (Einzelheiten finden sich im Anhang "Technische Informationen").
6	SERIAL/LOCAL-REM I/O SWITCH	Wählt die Betriebsart: SERIAL: alle Befehle kommen über die serielle Leitung. LOCAL-REM I/O: alle Befehle werden über das vordere Bedienfeld der Einheit oder über den 25-stiftigen Stecker REMOTE auf der Rückseite gegeben.

Rückseite des Ionenpumpen-Kontrollers

Die folgende Abbildung zeigt die Steuerungen und Stecker auf der Rückseite des Ionenpumpen-Kontrollers. Einzelheiten über die Anschlüsse finden sich im Anhang " Technische Informationen”.



Rückseite des Ionenpumpen-Kontrollers

REF.	SIGNAL	BESCHREIBUNG
1	HV1 Connector	HV-Stecker für das Kabel zur Ionenpumpe 1
2	HV2 Connector	HV-Stecker für das Kabel zur Ionenpumpe 2
3	LINE INPUT	Modul mit dem Stecker für das Netzkabel und dem Netzschalter
4	FUSE	Halter für die Schmelzsicherungen (2 Sicherungen)
5	SERIAL Connector	DB9 Stecker für das serielle Kabel
6	REMOTE Connector	DB25 Stecker für die REMOTE I/O Anschlüsse
7	HV1 Cable Interlock	
8	HV2 Cable Interlock	

GEBRAUCH

Dieser Abschnitt enthält allgemeine Informationen über den Gebrauch des Kontrollers. Einzelheiten finden sich im Anhang “Technische Informationen”. Wenn der Kontroller ans Netz angeschlossen ist und der Netzschalter auf der Rücksite auf ON (I) steht, können alle seine Funktionen genutzt werden:

- 2 unabhängige HV Kanäle
- max. +5000 V= Ausgangsspannung
- max. 40W Ausgangsleistung für Kanal 1
- max. 80W Ausgangsleistung für Kanal 2
- max. >30 mA Ausgangsstrom (Kurzschluss-bedingung) für Kanal 1
- max. >60 mA Ausgangsstrom (Kurzschluss-bedingung) für Kanal 2
- Betriebsarten LOCAL-REMOTE I/O/SERIAL
- START/PROTECT Betrieb

BETRIEBSARTEN

Netzversorgung

Betrieb LOCAL-REMOTE I/O

ANMERKUNG

Die beiden HV Schalter auf der Vorderkonsole und die beiden HV AN/AUS-Eingänge auf dem DB25 “Fern”-Stecker auf der Rückwand sind funktionell in Serie.

HV AN/AUS für Kanal 1 durch Vorderkonsole:

Die externe isolierte 24 V= Versorgung anschließen an: Pin 8 (+) und Pin 21 des Fern-E/A-Steckers und den HV1 Stecker auf der Vorderkonsole bewegen.

HV AN/AUS für Kanal 2 durch Vorderkonsole:

Die externe isolierte 24 V= Versorgung anschließen an: Pin 9 (+) und Pin 22 des Fern-E/A-Steckers und den HV2 Stecker auf der Vorderkonsole bewegen.

Die betreffenden HV Kabelverriegelungen müssen geschlossen sein.

HV AN/AUS für Kanal 1 HV durch Fern-E/A:

Mit dem Schalter HV1 auf der Vorderkonsole auf AN: die externe isolierte 24 V= Versorgung anlegen (AN) oder abnehmen (AUS) von Pin 8 (+) und Pin 21 des Fern-E/A-Steckers.

HV AN/AUS für Kanal 2 HV durch Fern-E/A:

Mit dem Schalter HV2 auf der Vorderkonsole auf AN: die externe isolierte 24 V= Versorgung anlegen (AN) oder abnehmen (AUS) von Pin 9 (+) und Pin 22 des Fern-E/A-Steckers.

Wenn die HV AN ist, ist die betreffende HV LED auf der Vorderkonsole AN.

ANMERKUNG

Wenn die Verbindung zwischen dem Kontroller und der Pumpe mit einem HV-Kabel mit Sicherungs-verriegelung realisiert ist, muss das Kabel mit dem F/T der Pumpe verbunden und der kleine Bananenstecker auf der Kontrollerseite des Kabels in die entsprech-enden HV-Kabel-Verriegelungsbuchse auf der Rückseite der Einheit eingesteckt sein, um die Hochspannung einschalten zu können.

Erfolgt der Anschluss mit einem einadrigen HV-Kabel ohne Sicherheitsverriegelung, sicherstellen, dass auf der Rückseite der Einheit die vorgesehene Brücke in die Buchse für HV-Kabelverriegelung eingesteckt ist.

SERIELLER Betrieb

ANMERKUNG

Die SERIELLE Verbindung wird eingestellt, um bei Anschluss des Controllers an einen externen PC zu arbeiten, der “HYPER TERMINAL“ oder ein gleichartiges Programm (z.B. ein Anwender-eignes Programm) unter Windows oder einem anderen Betriebssystem benutzt. Um im seriellen Modus zu arbeiten, die serielle Schnittstelle mit dem SERIELLEN Stecker auf der Rückwand verbinden und WINDOWS “HYPER TERMINAL” auf dem PC mit folgenden Einstellungen laufen lassen:

- *COM1*
- *9600 Baud*
- *keine Parität*
- *8 Datenbits*
- *1 Stopbit*

Bei dieser Betriebsart können die Funktion der Einheit im seriellen Betrieb getestet, die Befehle gegeben und alle Betriebsdaten empfangen werden.

ANMERKUNG

Abhängig von der Anwenderumgebung muss das Betriebssystem bei seriellem Betrieb Echtzeit-fähig sein.

Weitere Einzelheiten finden sich im Anhang “Technische Informationen”.

START/PROTECT Betrieb

Der Kontroller kann in zwei Betriebsarten arbeiten: Start und Protect.

In Start können die 2 Ausgangskanäle die ganze Ausgangsleistung unabhängig von dem Pumpen-zustand bis zur Kurzschlussleistung liefern.
Diese Betriebsart muss zum Starten der Pumpen bei hohem Druck benutzt werden.

Im Protect Betrieb begrenzt der Controller den Ausgangsstrom und schaltet die HV ab, wenn der Strom für mehr als 2 Sekunden den Grenzwert übersteigt (8 mA für den 40W Kanal und 16 mA für den 80W Kanal).

ERMELDUNGEN

em vo rderen Bedienfeld

Wenn während des Kontrollerbetriebs ein Fehler entdeckt wird, wird dieser von den HV-LEDs auf dem vorderen Bedienfeld angezeigt:

HV 1,2,3
LEDS AN: Normalbetrieb = HV AN

LED HV 1,2 blinkend: Fehlerbedingung:
1x Blinken alle 4 Sek. = HVKabelverriegelung
2x Blinken alle 4 Sek. = Fernverriegelung
3x Blinken alle 4 Sek. = HV Überspannung (bei diesem Fehler wird die HV nicht abgeschaltet)
4x Blinken alle 4 Sek. = Fehler im ADC
5x Blinken alle 4 Sek. = Überstrom auf HV (Kurzschluss)
6x Blinken alle 4 Sek. = der Schalter Local/Remote wurde bei HV AN bewegt
7x Blinken alle 4 Sek. = Überhitzung in der Einheit
8x Blinken alle 4 Sek. = Überstrom in Protect (I>8 mA für den 40W Kanal und I>16 mA für den 80W Kanal)
9x Blinken alle 4 Sek. = HV Unterspannung

In der Betriebsart Local-Remote I/O werden Fehlerbedingungen durch Schalten des betreffenden Kanals auf dem vorderen Bedienfeld in OFF (0) zurückgesetzt.

In der seriellen Betriebsart werden Fehlerbedingungen durch Übersenden des Befehls “F0n” vom PC zurückgesetzt.

ANMERKUNG

Wenn eine der folgenden Bedingungen auftritt, während die Hochspannung des Kanals AN ist, wird der Ausgang dieses Kanals sofort auf AUS gesetzt. Die LED auf dem vorderen Bedienfeld zeigt die Fehlerbedingung an und Fehlerinformationen werden zum seriellen Ausgang gesendet.

Protect Eingriff (I>8 mA für den 40W Kanal und I>16 mA für den 80W Kanal) (8x Blinken derLED)
HV Kabelverriegelung (1x Blinken der LED)
Fernverriegelung (2x Blinken der LED)
Fehler in der HV-Erzeugung (4x Blinken der LED)
Ausgangskurzschluss (5x Blinken der LED)
Umschalten des Local-Remote I/O Schalters bei HV AN (6x Blinken der LED)
Überhitzung in der Einheit (7x Blinken der LED)

Auf dem “Remote” Stecker auf der Rückseite

“Fehler” Ausgabe: Öffnerkontakt (Leerlauf) =
Der Kontakt ist bei Fehlerbedingung offen (Relais aus)
Der Kontakt ist bei Fehlerbedingung geschlossen (Relais an)

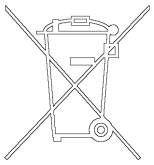
“HV 1,2” Ausgabe: Schließerkontakt (Leerlauf) =
Der Kontakt ist offen, wenn HV in AUS (Relais aus)
Der Kontakt ist geschlossen, wenn HV in AN (Relais an)

“HV 1,2” Ausgabe Stromeinstellpunkt: Schließerkontakt (Leerlauf) =
Der Kontakt ist offen, wenn der Ausgangsstrom unter dem Stromeinstellpunkt ist (Relais aus)
Der Kontakt ist geschlossen, wenn der Ausgangsstrom über dem Stromeinstellpunkt ist (Relais an)

Ausgangsrelais: 2A@125V~.
min. Last: 10mW (100mV@1mA).
Prellzeit: Schließer=1msec; Öffner =3msec.

ENTSORGUNG

Bedeutung des "WEEE" Logos auf den Etiketten.
Das folgende Symbol ist in Übereinstimmung mit der EU-Richtlinie WEEE (Waste Electrical and Electronic Equipment) angebracht.
Dieses Symbol (**nur in den EU-Ländern gültig**) zeigt an, dass das betreffende Produkt nicht zusammen mit Haushaltsmüll entsorgt werden darf sondern einem speziellen Sammelsystem zugeführt werden muss.
Der Endabnehmer sollte daher den Lieferanten des Geräts - d.h. die Muttergesellschaft oder den Wiederverkäufer - kontaktieren, um den Entsorgungsprozess zu starten, nachdem er die Verkaufsbedingungen geprüft hat.



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'appareillage. Varian décline 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. Dans l'Annexe "Informations techniques" sont fournis de plus amples détails.

Le présent manuel utilise les signes conventionnels suivants:

DANGER!

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

ATTENTION!

Les messages d'attention sont affichés avant les procédures dont le non respect pourrait endommager sérieusement l'appareillage.

NOTES

Les notes contiennent des renseignements importants, extrapolés du texte.

DESCRIPTION DU CONTROLEUR

Contrôleur de Varian pour pompes ioniques en mesure d'actionner jusqu'à 2 pompes simultanément et de manière autonome. Ce contrôleur est conçu pour fournir la haute tension aux pompes ioniques par l'intermédiaire d'une connexion à l'alimentation principale (tension en sortie max. = 5000 Vcc). Pour de plus amples détails, voir le paragraphe "Informations Techniques".

Ce contrôleur peut être actionné en modalité opérationnelle I/O a distance/locale ou bien en modalité sérielle à travers le port série RS232. La sélection de la modalité opérationnelle est effectuée au moyen de l'interrupteur remote-local/serial I/O présent sur le panneau antérieur du contrôleur.

En modalitéI/O à distance-locale, les commandes sont effectuées en agissant sur le panneau antérieur ou bien au moyen d'une connexion au connecteur "REMOTE" DB25 "REMOTE" présent sur le panneau postérieur.

Les données inhérentes aux conditions opérationnelles de la pompe sont disponibles sur la connexion sérielle. En modalité sérielle, les commandes sont effectuées à travers la connexion sérielle et toutes les données relatives aux conditions opérationnelles de la pompe sont disponibles sur la connexion sérielle.

EMMAGASINAGE

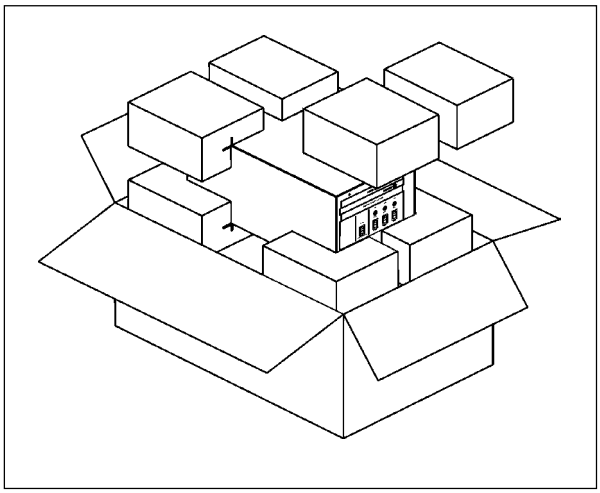
Durant le transport et l'emmagasinage du contrôleur, il faudra veiller à respecter les conditions environnementales suivantes:

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

PREPARATION POUR L'INSTALLATION

Le contrôleur est fourni dans un emballage de protection. En cas de signes évidents d'endommagements qui ont eu lieu durant le transport, contacter le bureau de vente local. Pendant la phase d'ouverture de l'emballage du contrôleur, veiller à ne pas le laisser tomber et éviter de le soumettre à des chocs ou des vibrations.

Traiter le matériel d'emballage suivant les procédures spéciales autorisées. Ces matériaux sont 100% recyclables et sont conformes à la Réglementation EEC 85/399.



Ouverture de l'emballage

INSTALLATION

DANGER!

Le contrôleur est pourvu d'un câble d'alimentation à 3 fils sans fiche. Appliquer une fiche appropriée selon le pays d'utilisation du contrôleur.
A remarquer que le fil jaune/vert du câble est la connexion à masse du contrôleur. Utiliser toujours ce câble d'alimentation et introduire la fiche dans une prise avec la connexion appropriée à masse afin d'éviter les décharges électriques. Vérifier le bon usage des connexions à masse. La haute tension générée dans le contrôleur peut provoquer de graves lésions voire le décès. Avant de procéder à toute opération de maintenance sur l'unité, débrancher le câble de l'alimentation.

ATTENTION!

Le contrôleur peut être utilisé comme unité de banc ou module rack; en tout cas, il doit être positionné de manière à permettre la circulation de l'air à travers les ouvertures appropriées présentes sur le cache supérieur et latéral.
Si le contrôleur est utilisé comme module rack, DIL DOIT ETRE introduit dans un adaptateur pour rack à 4 compartiments afin d'éviter que le contrôleur ne tombe à l'intérieur du rack. Le panneau antérieur du contrôleur n'est pas conu pour supporter le poids de l'unité. Ne pas installer ou utiliser le contrôleur dans des milieux exposés aux agents atmosphériques (pluie, gelée, neige), aux poussières, aux gaz agressifs, dans des milieux à risque d'explosion ou d'incendie.

NOTE

Si le contrôleur est installé sur un rack, enlever les quatre pieds et le positionner en laissant un espace minimum de 30 mm (1.2 pouces) en correspondance de la superficie supérieure ou inférieure.

DANGER!

Le contrôleur doit être installé de manière à pouvoir interrompre sans problèmes la tension (débranchement de la fiche ou interruption au moyen de l'interrupteur de la ligne générale du rack).

Durant le fonctionnement de l'appareillage, il est nécessaire que soient respectées les conditions environnementales suivantes:

- température: de +5 °C à +40 °C
- humidité relative: 0 - 95% (non condensante)

Pour brancher le contrôleur à la pompe, utiliser les câbles appropriés fournis.

Pour les informations détaillées à propos des connexions ci-dessus indiquées ou d'une autre nature, se référer à l'annexe "Informations Techniques".

UTILISATION

Dans ce paragraphe sont reportées les principales procédures opérationnelles. Pour de plus amples détails et pour les informations inhérentes aux connexions facultatives, se référer au paragraphe "UTILISATION" de l'Annexe "Informations Techniques".

Avant d'actionner le contrôleur, effectuer toutes les connexions électriques ainsi que vers la pompe et lire le Manuel d'Instructions de la pompe branchée.

DANGER!

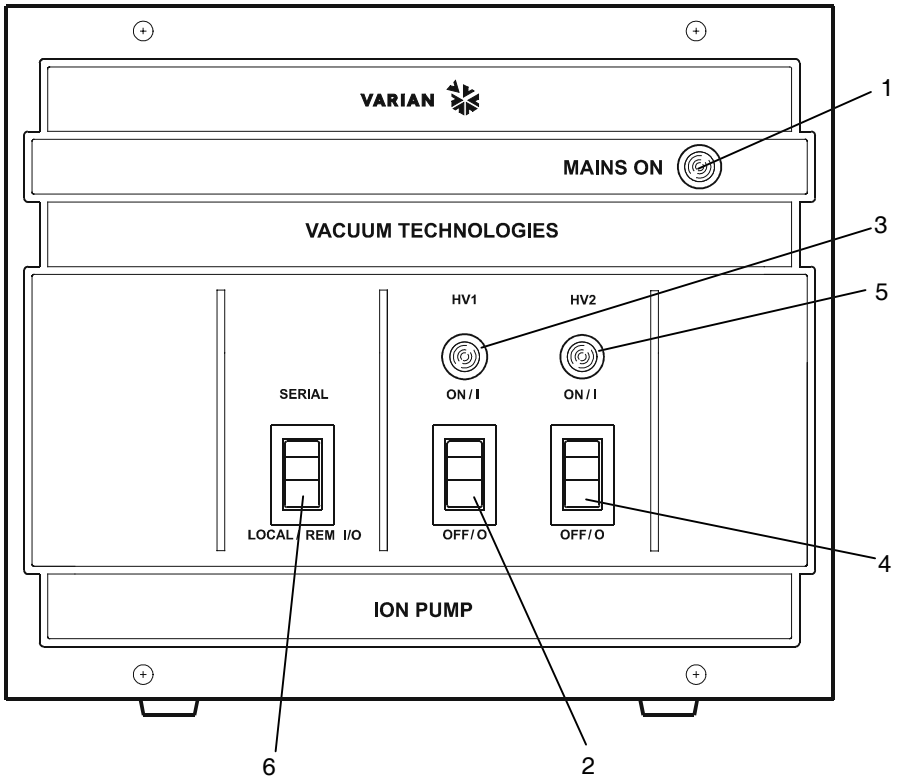
Afin d'éviter des lésions personnelles ou des endommagements à l'appareillage, si la pompe est placée sur une table, vérifier que cette dernière soit stable. Ne pas actionner la pompe au cas où la relative fiche est débranchée du système ou bien obstruée.

Commandes et indicateurs du panneau antérieur de l'unité contrôleur pour pompes ioniques

La figure et le tableau suivants indiquent les commandes et les indicateurs du panneau antérieur du contrôleur avec les relatives descriptions et fonctions.

NOTE

La fonctionnalité et la signification de certaines commandes et indicateurs changent selon la position de l'interrupteur HV ON OFF. Le tableau suivant montre toutes les fonctions et toutes les significations des signaux.

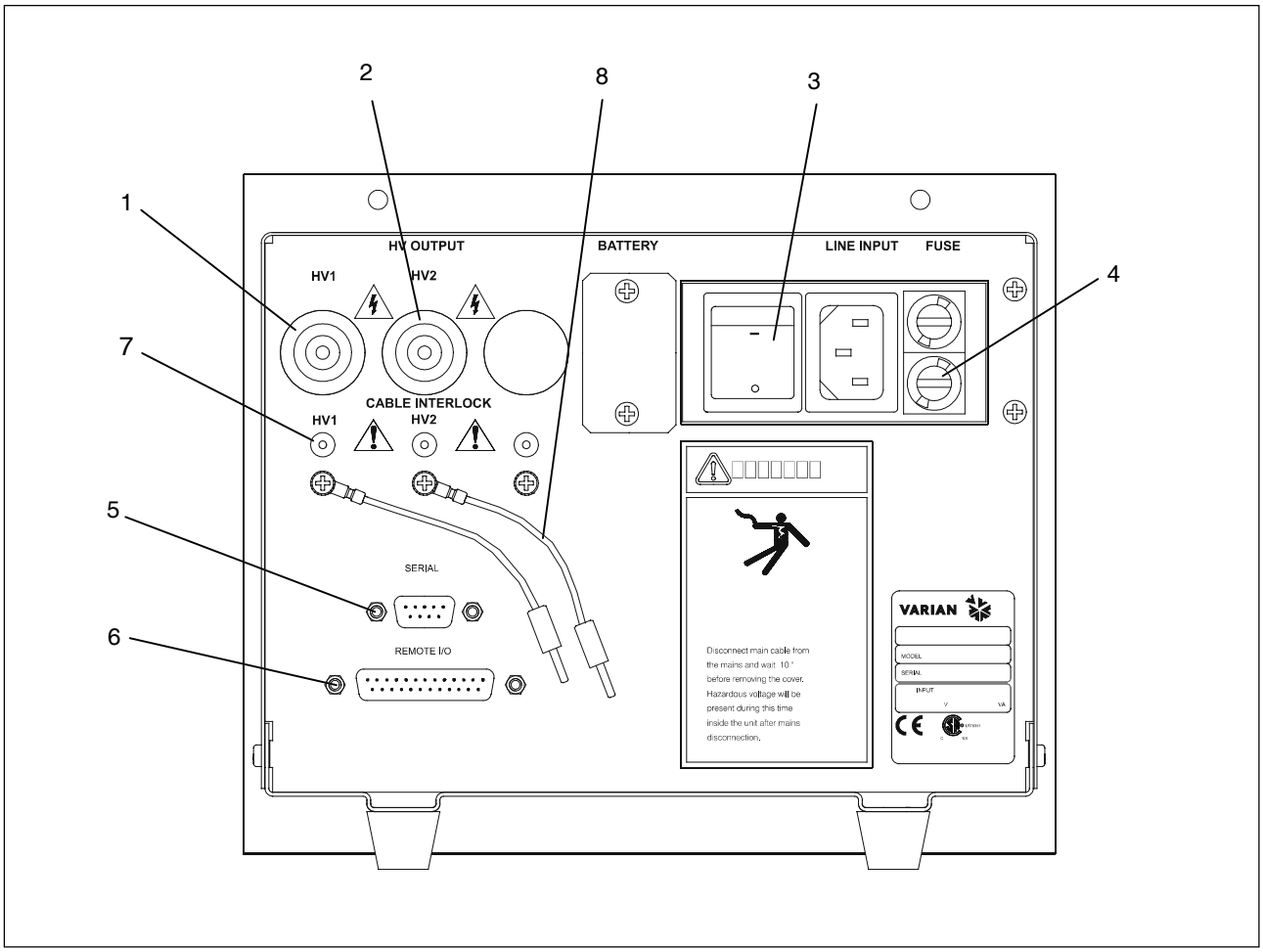


Commandes et indicateurs du panneau antérieur de l'unité contrôleur pour pompes ioniques

RIF.	SIGNAL	DESCRIPTION
1	MAINS ON LED	Lorsqu'il y a une condition de On, cela veut dire que l'unité est branchée à la ligne de l'alimentation et que l'interrupteur Line sur le panneau postérieur est en position ON (I).
2	HV1 ON/OFF SWITCH	Lorsqu'il est en position ON (I), il habilite l'alimentation à haute tension pour la pompe 1 si le contrôleur est sur modalité opérationnelle I/O à distance/locale et que les interlock du câble extérieur et du câble haute tension sont fermés.
3	HV1 LED	Il est surOn lorsque le contrôleur fournit la haute tension pour la pompe 1. Il clignote en cas d'anomalie (voir paragraphe "Informations techniques" pour de plus amples détails).
4	HV2 ON/OFF SWITCH	Lorsqu'il est sur ON (I), il habilite l'alimentation à haute tension pour la pompe 2 si le contrôleur est sur modalité opérationnelle I/O à distance/locale et que les interlock du câble extérieur et du câble à haute tension sont fermés.
5	HV2 LED	Il est sur On lorsque le contrôleur fournit la haute tension pour la pompe 2. Il clignote en cas d'anomalie (voir paragraphe "Informations techniques" pour de plus amples détails).
6	SERIAL/LOCAL-REM I/O SWITCH	Il permet de sélectionner la modalità opérationnelle: SERIELLE: Les commandes sont fournies à travers la ligne sérielle. I/O à distance/locale: Les commandes sont fournies en agissant sur le panneau antérieur de l'unité ou bien à travers le connecteur REMOTE à 25 pin présent sur le panneau postérieur.

Panneau postérieur de l'unité contrôleur pour pompes ioniques

La figure suivante montre les commandes et les indicateurs du panneau postérieur du contrôleur. Pour de plus amples renseignements détaillés à propos des connexions, se référer à l'annexe "Informations techniques".



Panneau postérieur de l'unité contrôleur pour pompes ioniques

RIF.	SIGNAL	DESCRIPTION
1	HV1 Connector	Connecteur HV pour câble de connexion à la pompe 1
2	HV2 Connector	Connecteur HV pour câble de connexion à la pompe inique 2
3	LINE INPUT	Module contenant la fiche du câble d'entrée de la ligne et l'interrupteur LINE
4	FUSE	Support fusibles (2 fusibles)
5	Connecteur SERIAL	Connecteur DB9 pour câble sériel
6	REMOTE Connector	Connecteur DB25 pour connexion I/O à distance
7	HV1 Cable Interlock	
8	HV2 Cable Interlock	

PROCEDURES D'UTILISATION

Ce paragraphe fournit les informations générales relatives à l'utilisation du contrôleur. Pour les détails, se référer au paragraphe "Informations techniques" en branchant le câble d'alimentation du contrôleur à la ligne d'alimentation et en positionnant l'interrupteur LINE présent dans le panneau postérieur sur ON(I), l'appareillage est en mesure de fournir les prestations suivantes:

- 2 canaux HV indépendants
- Tension de sortie maximum +5000 Vcc
- Puissance de sortie maximum 40W pour le canal 1
- Puissance de sortie maximum 80W pour le canal 2
- Courant de sortie maximum >30 mA (condition de court circuit) pour le canal 1
- Courant de sortie maximum>60 mA (condition de court circuit) pour le canal 2
- Modalité opérationnelle I/O LOCALE- A DISTANCE SERIELLE
- Modalité opérationnelle START/PROTECT

MODALITE OPERATIONNELLE

Connexion à la ligne d'alimentation

Modalité opérationnelle I/O LOCALE-A DISTANCE

NOTES

Les 2 boutons HV dans le panneau antérieur et les deux entrées HV On/Off sur le connecteur DB25 "A DISTANCE" sur la panneau postérieur fonctionnent en série.

HV On/Off du canal 1 par l'intermédiaire du panneau antérieur:

Brancher une alimentation externe isole de 24 Vcc al: Pin 8 (+) et au pin 21 du connecteur I/O à distance et tournée le bouton HV1 sur le panneau antérieur.

HV On/Off du canal 2 par l'intermédiaire du panneau antérieur:

Brancher une alimentation externe isole de 24 Vcc au: Pin 9 (+)et au pin 22 du connecteur I/O à distance et tourner le bouton HV2 sur le panneau antérieur
Les interlock correspondants du câble HV doivent être fermés.

HV On/Off du canal 1 par l'intermédiaire du I/O à distance :

Avec le bouton HV1 sur le panneau antérieur en position On,
Appliquer (On) ou enlever (off) l'alimentation externe isole de 24 Vcc au pin 8 (+) et au pin 21 du connecteur I/O à distance.

HV On/Off du canal 2 par l'intermédiaire du I/O à distance :

Avec le bouton HV2 sur le panneau antérieur en position On, Appliquer (On) ou enlever (off) l'alimentation externe isole de 24 Vcc au pin 9 (+) et au pin 22 du connecteur I/O à distance.

Lorsque HV est sur ON, le LED HV correspondant sur le panneau antérieur s'allume.

NOTE

Si la connexion entre le IPCU et la pompe se fait par l'intermédiaire d'un câble haute tension avec interlock de sécurité, le câble doit être connecté au'F/T de la pompe et le connecteur unipolaire aux dimensions réduites doit être introduit dans la relative fiche "HV Cable Interlock" présente sur le panneau postérieur de l'unité afin de pouvoir activer la haute tension.

Si la connexion est réalisée avec un câble haute tension unipolaire sans interlock de sécurité, vérifier que le shunt fourni sur le pannneau postérieur de l'unité soit inséré dans la fiche "HV Cable Interlock".

Fonctionnement SERIEL

NOTE

La modalité SERIELLE est saisie pour utiliser le produit en tranchant le contrôleur à un PC externe qui utilise le programme"HYPER TERMINAL" ou un programme équivalent *(par exemple un programme proprietary user) sous Windows ou autre système opérationnel. Pour utiliser le produit en modalité sérielle, brancher le port série au connecteur "Serial" du contrôleur sur le panneau postérieur, procéder au programme "HYPER TERMINAL" de Windows sur PC avec les saisies suivantes de défaut:*

- *COM1*
- *9600 baud*
- *No parity*
- *8 data bits*
- *1 stop bit*

Cette modalité opérationnelle permet de vérifier la fonctionnalité de l'unité, lancer les commandes et accéder à toutes les données opérationnelles.

NOTE

Durant le fonctionnement sériel, selon le cadre où il est utilisé, le S.O employé doit avoir une capacité real time(temps réel).

Pour de plus amples détails, se référer au paragraphe "Informations techniques".

Modalité opérationnelle START/PROTECT

Le contrôleur peut fonctionner dans les deux modalités suivantes: Start et Protect.

En modalité Start, les 2 canaux en sortie peuvent fournir toute la puissance nécessaire en sortie sans tenir compte des conditions de la pompe jusqu'à la condition de court circuit.
Cette modalité est utilisée pour actionner la pompe à une pression élevée.

En Protect, le contrôleur limite le courant de sortie et désactive l'HV lorsque le courant dépasse la valeur de seuil (8 mA pour le canal de 40W et 16 mA pour le canal de 80W) pendant plus de 2 secondes.

MESSAGES D'ERREUR

Sur le panneau antérieur

Durant le fonctionnement du contrôleur, on a trouvé une erreur, les voyants LED haute tension sur le panneau antérieur fourniront les indications nécessaires suivantes:

HV 1,2,3
LED ON: Fonctionnement normal = HV ON

Led HV 1,2 clignotant: condition d'erreur:

1 clignotement toutes les 4 secondes = câble Interlock HV
2 clignotements toutes les 4 secondes = Interlock à distance
3 clignotements toutes les 4 secondes = surtension HV (cette anomalie ne déshabilite pas l'HV)
4 clignotements toutes les 4 secondes = erreur à l'intérieur de l'ADC
5 clignotements toutes les 4 secondes = surtension sur HV (court circuit)
6 clignotements toutes les 4 secondes = le bouton Local/A distance a été déplacé avec HV ON
7 clignotements toutes les 4 secondes = température excessive à l'intérieur de l'unité
8 clignotements toutes les 4 secondes = sur tension en Protect (I>8 mA pour le canal de 40W et I>16 mA pour le canal de 80W)
9 clignotements toutes les 4 secondes = surtension HV

En modalité I/O à distance-locale, la condition d'anomalie est remise à zéro en positionnant sur Off (0) l'interrupteur du canal correspondant présent sur le panneau antérieur.

En modalité sérlelle, la condition d'anomalie est remise à zéro en envoyant la commande "F0n" à travers l'ordinateur.

NOTE

Au cas où une des conditions suivantes s'avèrent tandis que la haute tension du canal est active, la sortie du canal est programmée immédiatement sur OFF, le voyant LED sur le panneau antérieur inique la condition d'anomalie correspondante et l'information inhérente à cette dernière est envoyée à la sortie sérielle.

Intervention en Protect (I>8mA pendant plus de 2 secondes pour la sortie 40 W– 16 mA pour la sortie 80 W) (8 clignotements du LED)
Interlock du câble HV ouvert (1 clignotement du LED)
Interlock à distance ouvert (2 clignotements du LED)
Erreur interne durant la production de HV (4 clignotements du LED)
Court circuit sortie (5 clignotements du LED)
Modification de la condition du bouton I/O local-à distance tandis que HV était sur On (6 clignotements du LED)
Température excessive à l'intérieur de l'unité (7 clignotements du LED)

Sur le connecteur "Remote" dans le panneau postérieur

Sortie "Fault": contact N.C. (condition inactive) =
Le contact est ouvert en condition " Fault" (relais Off)
Le contact est fermé durant le fonctionnement normal (relais On)

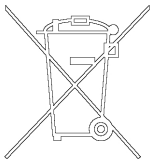
Sortie "HV 1,2": contact N.O. (condition inactive) =
Le contact est ouvert avec HV en condition Off (relais Off)
Le contact est fermé avec HV en condition de On (relais On)

Point de réglage du courant de sortie "HV 1,2": contact N.O. (condition inactive) =
Le contact est ouvert avec une valeur du courant de sortie inférieure au point de réglage du courant (relais Off)
Le contact est fermé avec une valeur du courant de sortie supérieure au point de réglage du courant (relais On)

Puissance nominale des relais de sortie: 2A@125Vca.
Chargement minimum 10mW (100mV@1mA).
Temps de sautillement: NO=1msec; NC=3msec.

MISE AU REBUT

Signification du logo "WEEE" figurant sur les étiquettes.
Le symbole ci-dessous est appliqué conformément à la directive CE nommée "WEEE".
Ce symbole **(uniquement valide pour les pays de la Communauté européenne)** indique que le produit sur lequel il est appliqué NE doit PAS être mis au rebut avec les ordures ménagères ou les déchets industriels ordinaires, mais passer par un système de collecte sélective.
Après avoir vérifié les termes et conditions du contrat de vente, l'utilisateur final est donc prié de contacter le fournisseur du dispositif, maison mère ou revendeur, pour mettre en œuvre le processus de collecte et mise au rebut.



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-authorised 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 appendix "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.

CONTROLLER DESCRIPTION

Varian's controller is an ion pumps controller.
It can drive up to 2 Ion Pumps simultaneously and independently. The controller is designed to give the HV to the Ion Pumps when it is connected to the Mains supply (Max. Output Voltage = 5000 Vdc). (See the paragraph "Technical Informations" for details).

Varian' s Ion Pump controller can be driven in Local/Remote I/O operating mode or in the Serial mode via the RS232 port. The selection of the operating mode is done by means of the SERIAL/LOCAL-Remote I/O switch on the controller front panel.

In the LOCAL-REMOTE I/O mode, all the commands are given by the front panel or by the connections to the DB25 "REMOTE" connector on the rear panel.

The pump operating conditions data are anyway available on the serial connection. In the SERIAL mode, all the commands are given through the serial connection and all the pump operating conditions data are available on the serial connection.

STORAGE

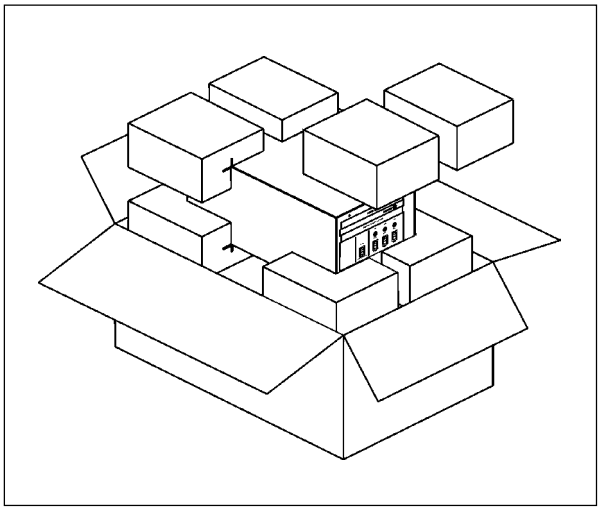
When transporting and storing the controller, the following environmental requirements should not be exceeded:

- temperature: from -20° to +70 °C
- relative humidity: 0 - 95% (non-condensing)

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 the controller, be sure not to drop it and avoid any kind of sudden impact or shock vibration to it.

Do not dispose of the packing materials in an unauthorized manner. The material is 100% recyclable and complies with EEC Directive 85/399.



Packing

INSTALLATION

WARNING!

The controller is equipped with a 3-wire power cord without plug. Install the proper plug foreseen by the country where the controller will be used.
Note that the Yellow/Green wire of the cable is the Ground connection of the controller. Use this power cord and the installed plug in conjunction with a properly grounded power socket to avoid electrical shock. Verify that the ground connections are properly connected. High voltage developed in the controller can cause severe injury or death. Before servicing the unit, disconnect the power cable.

CAUTION!

The controller can be used as a bench unit or as a rack module, but it must be positioned so that free air can flow through the holes of the top and the side cover.
If the controller is used as a rack module, it MUST be inserted in a 4 unit height rack adapter chassis to avoid the controller to fall inside the rack. The Controller front panel is not designed to support the unit weight. 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.

NOTE

If the controller is installed on a rack, remove the four feet and position it with at least 30 mm (1.2 inches) of clearance on top and bottom.

WARNING!

The controller must be installed in a way that allows an easy interruption of the line voltage (disconnection of the line plug or interruption on the rack general line switch).

During operation, the following environmental conditions must be respected:

- temperature: from +5 °C to +40 °C
- relative humidity: 0 - 95% (non-condensing)

To connect the controller to the pump use the specific cables supplied.

See the appendix “Technical Information” for detailed information about the above mentioned and the other connections.

USE

This paragraph describes the fundamental operating procedures. Detailed information and operating procedures that involve optional connections or options are supplied in the paragraph “USE” of the appendix “Technical Information”.

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

WARNING!

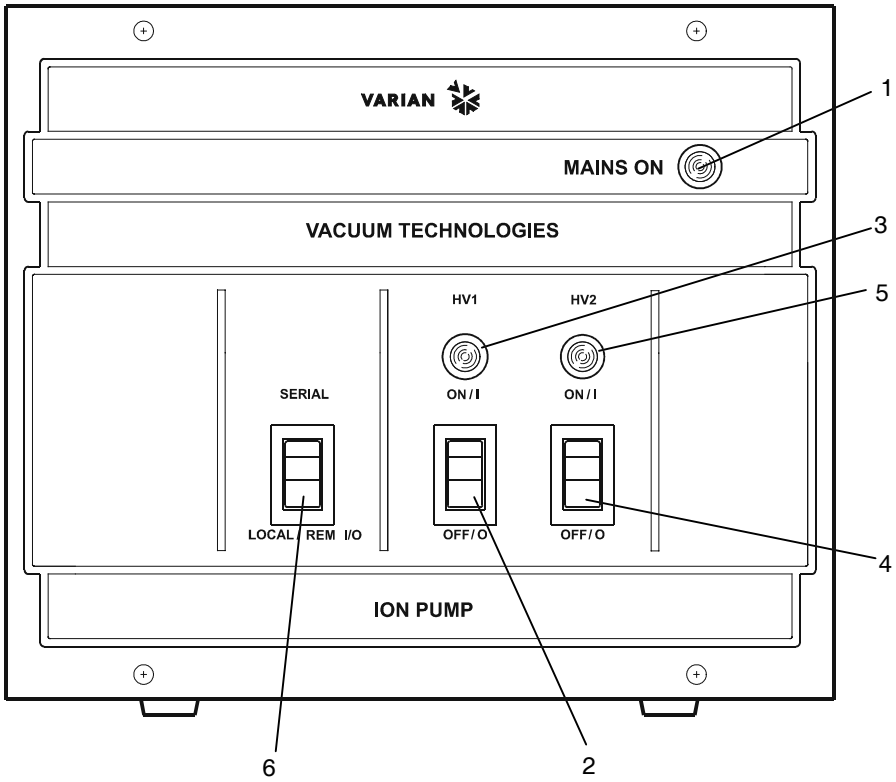
To avoid injury to personnel and damage to the equipment, if the pump is laying on a table make sure it is steady. Never operate the pump if the pump inlet is not connected to the system or blanked off.

Ion Pumps C.U. Front Panel Controls and Indicators

The figure and the table of the following page illustrate the Controller front panel controls and indicators with relevant description and function.

NOTE

Some controls and indicators change their function and meaning according to the position of HV ON OFF switch. The table describes all function and meaning.

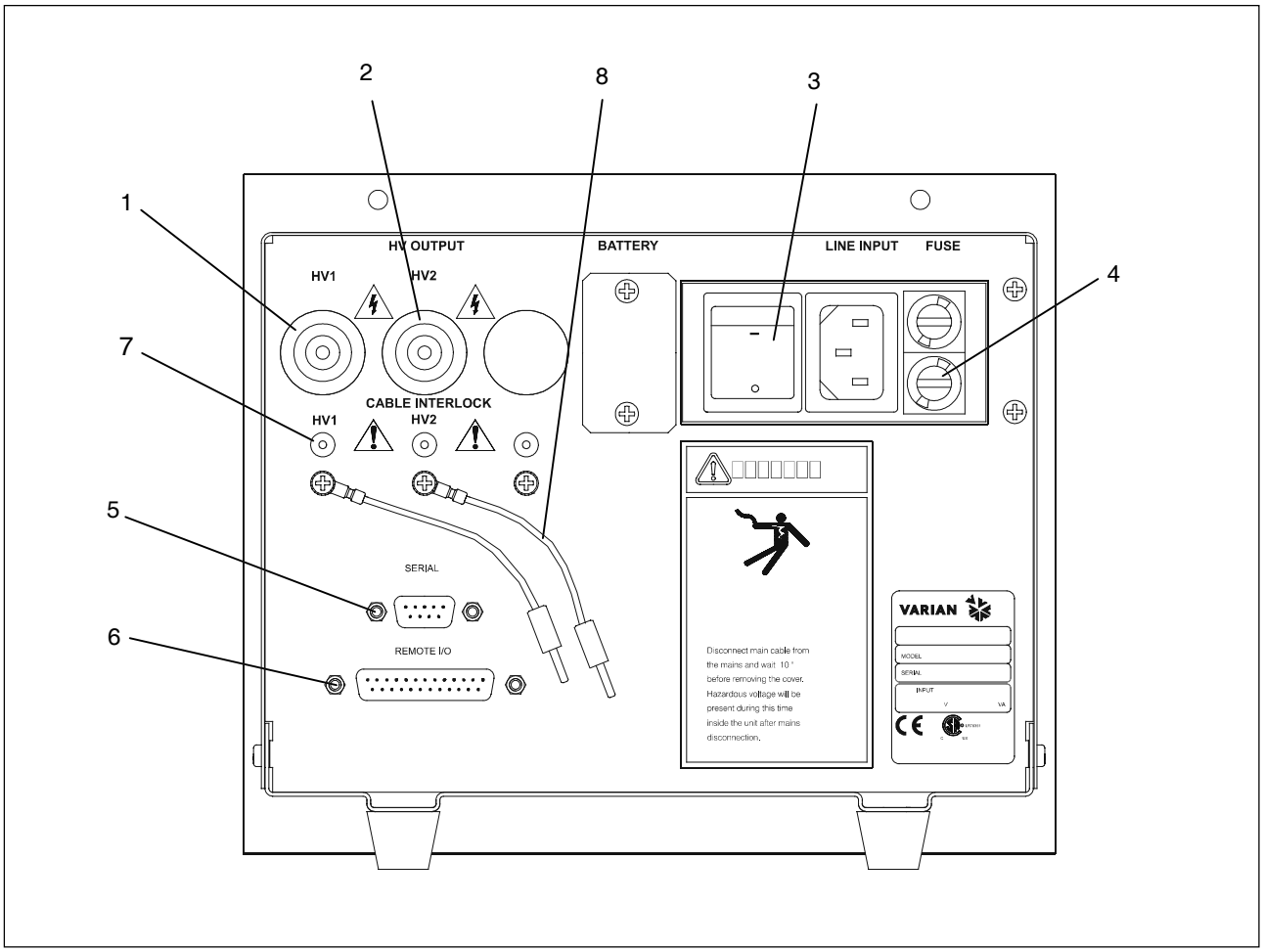


Ion Pumps C.U. Front Panel Controls and Indicators

REF.	SIGNAL	DESCRIPTION
1	MAINS ON LED	When On it means that the unit is connected to the Power Line and the Line Switch on the rear panel is in ON (I) position.
2	HV1 ON/OFF SWITCH	When in ON (I) position, it switches On the HV to the pump 1 if the controller is set for LOCAL/REMOTE I/O operation and the external and HV Cable interlocks are closed
3	HV1 LED	It is On when the controller is supplying the HV to the pump 1. It is flashing in case of Fault (see paragraph “Technical Information” for details)
4	HV2 ON/OFF SWITCH	When in ON (I) position, it switches On the HV to the pump 2 if the controller is set for LOCAL/REMOTE I/O operation and the external and HV Cable interlocks are closed
5	HV2 LED	It is On when the controller is supplying the HV to the pump 2. It is flashing in case of Fault (see paragraph “Technical Information” for details)
6	SERIAL/LOCAL-REM I/O SWITCH	It allows to select the operating mode: SERIAL: all the commands are given through the serial line LOCAL-REM I/O: all the commands are given through the unit front panel or through the 25 pin REMOTE connector on the rear panel

Ion Pumps C.U. Rear Panel

The controller rear panel controls and connections are shown in the following figure. For detailed information about the connections see the appendix “Technical Information”.



Ion Pumps C.U. Rear Panel

REF.	SIGNAL	DESCRIPTION
1	HV1 Connector	HV Connector for Cable to Ion Pump 1
2	HV2 Connector	HV Connector for Cable to Ion Pump 2
3	LINE INPUT	Module containing the Line Input cable plug and the Line Switch
4	FUSE	Protection Fuse holder (2 fuses)
5	SERIAL Connector	DB9 connector for the Serial cable
6	REMOTE Connector	DB25 connector for the REMOTE I/O connections
7	HV1 Cable Interlock	
8	HV2 Cable Interlock	

USAGE

This paragraph gives a general information on the use of the controller. For details refer to the "Technical Information" paragraph. When the controller is plugged to the Power Line and the Line Switch on the rear panel is ON (I), it is able to operate with its full set of features:

- 2 independent HV channels
- +5000 Vdc maximum output Voltage
- 40W maximum output Power for channel 1
- 80W maximum output Power for channel 2
- >30 mA maximum output current (short circuit condition) for channel 1
- >60 mA maximum output current (short circuit condition) for channel 2
- LOCAL-REMOTE I/O/SERIAL operating mode
- START/PROTECT operation

OPERATING MODES

Power Line supply

LOCAL-REMOTE I/O Operation

NOTE

The 2 HV switches on the front panel and the 2 HV On/Off inputs on the DB25 "Remote" connector on the rear panel are functionally in series.

HV On/Off of channel 1 by front panel:

Connect an external insulated 24 Vdc supply to:
Pin 8 (+) and pin 21 of the Remote I/O connector and move the HV1 switch on the front panel.

HV On/Off of channel 2 by front panel:

Connect an external insulated 24 Vdc supply to:
Pin 9 (+) and pin 22 of the Remote I/O connector and move the HV2 switch on the front panel.

The correspondent HV cable Interlocks must be closed.

HV On/Off of channel 1 by Remote I/O:

With the HV1 switch on the Front Panel in On position, Apply (On) or remove (off) the external insulated 24 Vdc supply to pin 8 (+) and pin 21 of the Remote I/O connector.

HV On/Off of channel 2 by Remote I/O:

With the HV2 switch on the Front Panel in On position, Apply (On) or remove (off) the external insulated 24 Vdc supply to pin 9 (+) and pin 22 of the Remote I/O connector.

When the HV is ON, the corresponding HV LED on the front panel, will be ON.

NOTE

If the connection between the IPCU and the pump is done by means of an HV Cable with Safety Interlock, the cable must be connected to the pump F/T and the small banana connector on the cable controller side must be inserted in the corresponding "HV Cable Interlock" plug on the unit rear panel in order to be able to switch on the HV.

If the connection is done with a single pole HV Cable without the Safety Interlock, ensure that the jumper provided on the unit rear panel is inserted in the "HV Cable Interlock" plug.

SERIAL Operation

NOTE

The SERIAL is set in order to operate by connecting the controller to an external PC that uses the "HYPER TERMINAL" or equivalent program (for example a proprietary user program) running under Windows Operating System or other. To operate in serial mode, connect the serial port to the controller "Serial" connector on the rear panel, run the Windows "HYPER TERMINAL" program on the PC with the following default settings:

- *COM1*
- *9600 baud*
- *No parity*
- *8 data bits*
- *1 stop bit*

This way of operation will allow to verify the functionality of the unit in the "SERIAL" operating mode, give the commands and get all the operating data.

NOTE

In the serial operation, depending on the user environment, the O.S. used must have real time capability.

See the "Technical Information" paragraph for details.

START/PROTECT Operation

The controller can operate in two modes: Start and Protect.

In Start, the 2 output channels can provide all the output power regardless of the pump condition up to the short circuit condition.
This operating mode must be used to start the pump at high pressure.

In Protect, the controller limits the output current and switches off the HV when the current exceeds the threshold value (8 mA for 40W channel and 16 mA for 80W channel) for more than 2 seconds.

ERROR MESSAGES

On Front Panel

During the controller operation, if an error condition is detected, the HV LEDs on the front panel will give the indication:

HV 1,2
LEDS ON: Normal Operation = HV ON

Led HV 1,2 flashing: error condition:

1 flash every 4 seconds = Interlock HV cable
2 flashes every 4 seconds = remote Interlock
3 flashes every 4 seconds = HV Over voltage (This Fault doesn' t switch-off the HV)
4 flashes every 4 seconds = error inside ADC
5 flashes every 4 seconds = overcurrent on HV (short circuit)
6 flashes every 4 seconds = the Local/Remote switch was moved with HV ON
7 flashes every 4 seconds = over temperature inside unit
8 flashes every 4 seconds = overcurrent in Protect (I>8 mA for 40W channel and I>16 mA for 80W channel)
9 flashes every 4 seconds = HV Under voltage

In Local-Remote I/O mode, the Reset of the Fault condition is accomplished by switching to Off (0) the front panel switch of the corresponding channel.

In Serial mode, the Reset of the Fault condition is accomplished by sending the “F0n” command by the computer.

NOTE

If one of the following conditions happens while the HV of the channel is On, the output of the channel is immediately set to Off, the LED on the front panel indicates the corresponding Fault condition and the Fault information is sent to the Serial output.

Protect intervention (I>8mA for more than 2 seconds for 40 W output – 16 mA for 80 W output) (8 flashes of the LED)
HV Cable Interlock open (1 flash of the LED)
Remote Interlock open (2 flashes of the LED)
Internal error on the HV generation (4 flashes of the LED)
Output short circuit (5 flashes of the LED)
Change of the Local-Remote I/O switch status while HV was On (6 flashes of the LED)
Overtemperature inside the unit (7 flashes of the LED)

On “Remote” connector on Rear Panel

“Fault” output: N.C. contact (idle state) =
The contact is Open in “ Fault” condition (relay Off)
The contact is Close in normal operation (relay On)

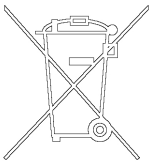
“HV 1,2” output: N.O. contact (idle state) =
The contact is Open with HV in Off state (relay Off)
The contact is Closed with HV in On state (relay On)

“HV 1,2” output current set point: N.O. contact (idle state) =
The contact is Open with output current value is below the current set point (relay Off)
The contact is Closed with output current value above the current set point (relay On)

Output relays rating: 2A@125Vac.
Minimum load: 10mW (100mV@1mA).
Bouncing Time: NO=1msec; NC=3msec.

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.



ION PUMP CONTROLLER DESCRIPTION

The Ion Pump controller is composed of a number of printed circuit boards:

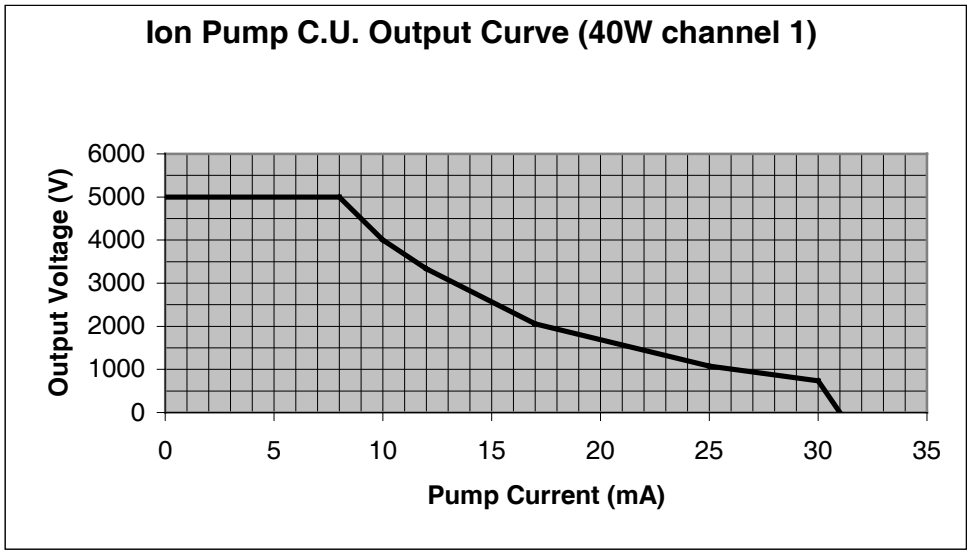
- 1 board: (Power Supply), it converts the Line Voltage to the 24 Vdc that is used to generate the HV
- 1 board: (Auxiliary Power Supply), it generates the + and – 12 Vdc for the analog circuitry, the 5 Vdc for the digital circuitry.
- 2 boards: (HV generation), they generate the HV for the 2 output channels
- 1 board: (CPU), it contains all the digital circuitry and the microprocessor.

Controller Specifications

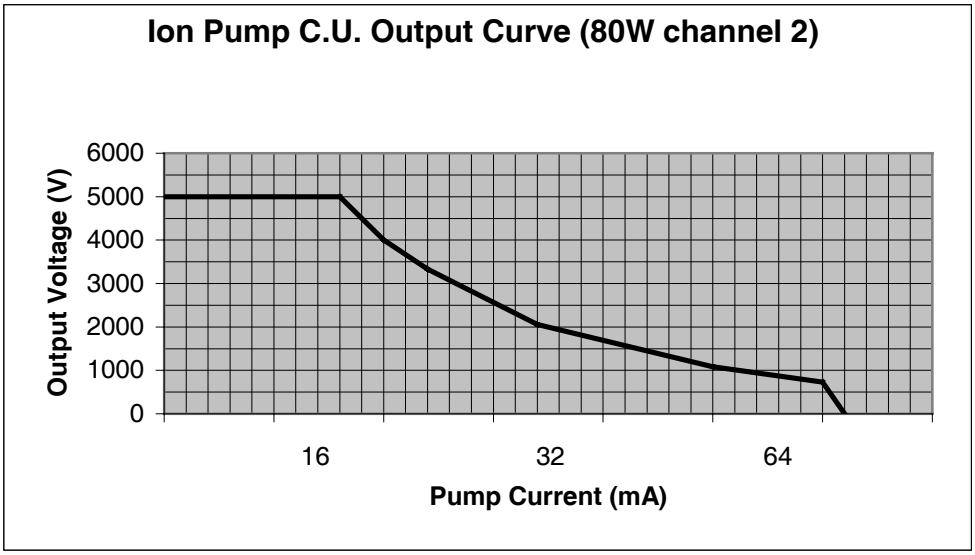
Line: Voltage Frequency Power	 100 - 240 Vac ± 10% 50 / 60 Hz ± 5% 200 VA
Operating conditions: Internal use only Max Altitude: Max Line Voltage variation:	 3000 m ± 10%
Installation category:	II
Pollution degree:	2
External Battery specifications (*)	12 Vdc 24 Ah Lead Acid Type
Output for the pumps: With Line Supply: Output Voltage (each channel) Output Current (each channel) Maximum Output Power (channel 1) Maximum Output Power (channel 2)	 Default value =+5000V +1/-5%, settable from +3000 to +5000Vdc at steps of +/- 50V by Serial Line command 30 mA ± 10 % for 40 W output, 60 mA +/- 10% for 80 W output 40 W 80 W
Current Recorder Output signal	0 to 5 Vdc logarithmic, proportional to 1.0e-8 to 1.0e-1 A 1 recorder output for each pump. Minimum recorder input impedance: 1MOhm Precision: Better than 1% Current Measurement Resolution: 10nA under 100uA; 1uA over 100uA
Operating Temperature	5 °C to 40 °C
Storage Temperature	-20 °C to 70 °C
Compliance to Norms	Radio Interference: EN55011 Class A Group 1 Harmonics: EN61000/3/2 Flickers: EN61000/3/3 ESD: EN61000/4/2 Burst: EN61000/4/4 Radiated RF Immunity: EN61000/4/3 Surge: EN61000/4/5 Conducted noise imm.: EN61000/4/6 Line supply interruptions: EN61000/4/11 Safety: EN61010-1
Line Cable	3 m long cable (3 wires), no plug
Line fuse	Two T5A
High Voltage Connection	2 High Voltage Fischer connectors
Battery Connection (*)	3 pin connector (for Lead Acid Battery 12 Vdc 24 Ah)

(*) HV Battery Back-Up Option if available for the model.

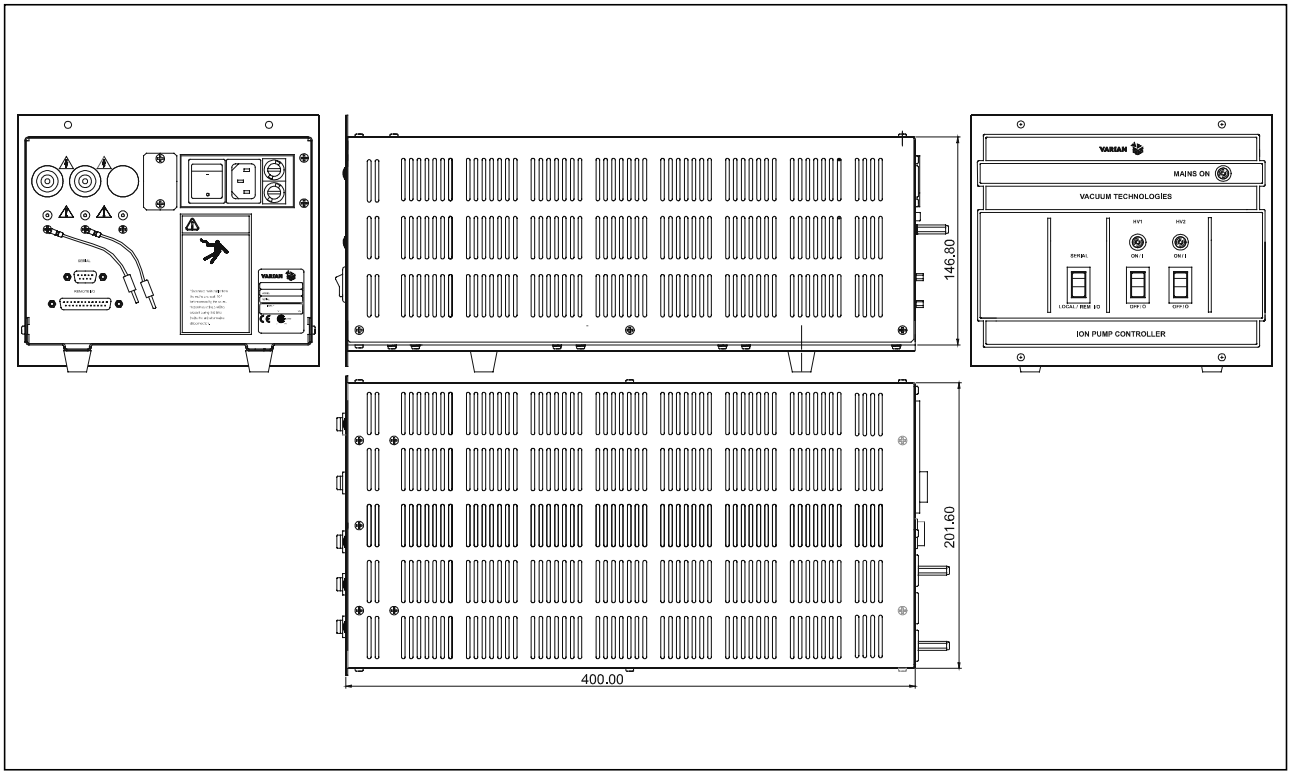
NOTE: All connecting cables for remote I/O and serial connections, if longer than 3 m, must be of the shielded type.



Output Voltage Curve for Line Supply

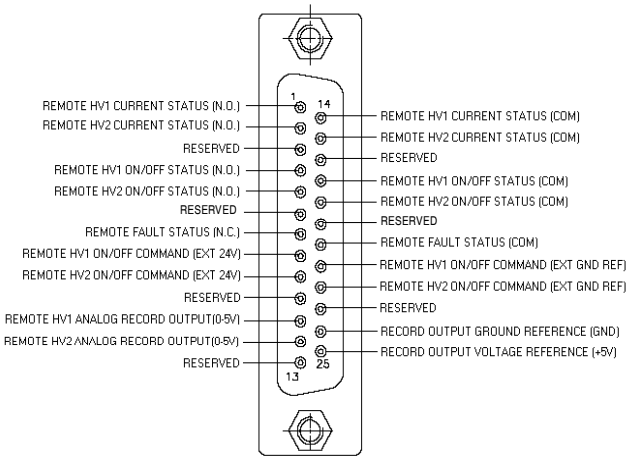


Output Voltage Curve for Line Supply



Controller Outline

Remote I/O Connector Pinout

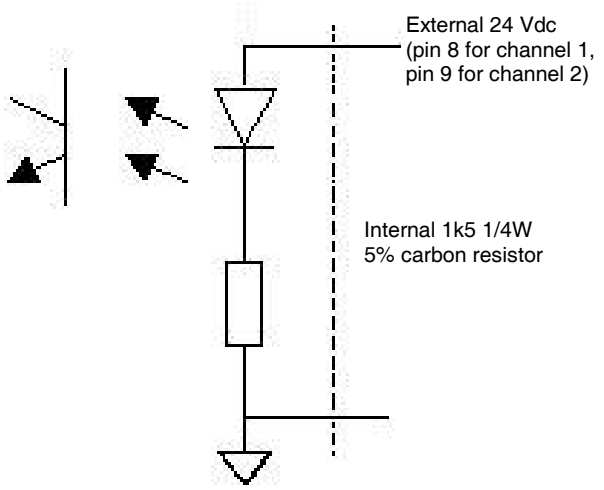


Remote I/O Pinout Rear Panel
D-Shell Female 25P

The controller is shipped with a DB25 mating (male) connector with shielded metal or plastic cover.
In case there is the need to use the Remote Interlock function or to switch On and Off the HV on the 2 pumps by Remote, follow the indications given in the above input commands connection pin out drawing.

Input Commands Connection

Input signals: Optically Insulated
External Insulated 24 Vdc (+10%, -50%) supply for input signal.



Isolated 24Vdc Reference GND (pin 21 or 22)

- Remote Interlock (Remote HV On/off)
  Ch1 HV input: Pin 8, Pin 21
  Ch2 HV input: Pin 9, Pin 22

Output Signals Connection

Relay outputs: Single contact

Output relays rating: 2A@125Vac.
Minimum load: 10mW (100mV@1mA).
Bouncing Time: NO=1msec; NC=3msec

- Set-Point Relay Outputs:
  Ch1 Set Point: Pin 1 (NO), Pin 14 (COM)
  Ch2 Set Point: Pin 2 (NO), Pin 15 (COM)

Relay contact “Closed” when I>Iset-point
Relay contact “Open” when I<Iset-point
Relay Idle State: “Open” when unit in main power OFF condition

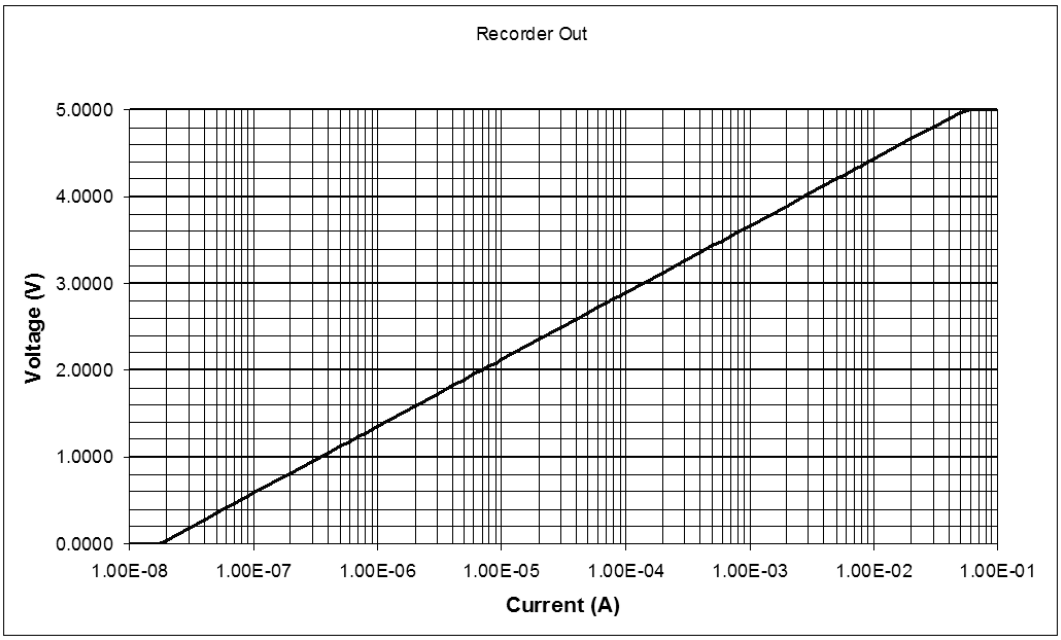
- HV Status Relay Outputs
  Ch1 HV status: Pin 4 (NO), Pin 17 (COM)
  Ch2 HV Status: Pin 5 (NO), Pin 18 (COM)

Relay contact “Closed” when HV = ON
Relay contact “Open” when HV = Off
Relay Idle State: “Open” when unit in main power OFF condition

- Fault status relay contact:
  Fault status: Pin 7 (NC), Pin 20 (COM)

Relay contact “Closed” (Relay deactivated) when unit in normal operation
Relay contact “Open” (relay activated) when unit in Fault condition
Relay Idle State: “Closed” when unit in main power OFF condition

Analog Recorder Outputs



Analog Recorder Output:
Ch1: Pin 11 (+), Pin 24 (0V) Ch2: Pin 12 (+), Pin 24 (0V)

Note: At Pin 25 a reference voltage corresponding to the 2 recorder outputs full-scale value (5V +/- 5%) is given. This reference allows getting a more precise reading from the 2 recorder outputs. It allows the scaling of the actual reading to the real value of the full scale.

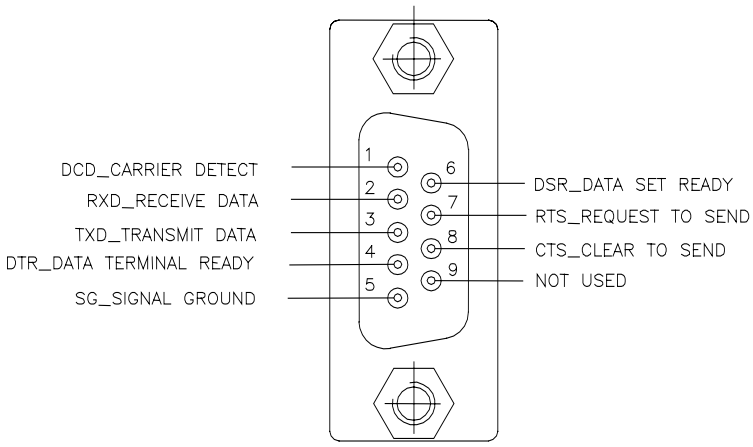
SERIAL Operation

The Controller works on RS232 DCE Mode (like a Modem with DB9 FEMALE connector).

The Host/Terminal/Personal Computer works always on RS232 DTE Mode (like a PC with DB9 MALE connector).

The Cable Interconnections are 1 to 1 signals (DB9 Male/Female Standard CABLE).

Controller RS232 Standard Serial Pin outs (DB9 Female Connector)



RS232 D-Shell Female 9P

D-Type-9 Pin No.	Abbreviation	Full Name
Pin 3	TXD	Transmit Data
Pin 2	RXD	Receive Data
Pin 7	RTS	Request To Send
Pin 8	CTS	Clear To Send
Pin 6	DSR	Data Set Ready
Pin 5	SG	Signal Ground
Pin 1	DCD	Carrier Detect
Pin 4	DTR	Data Terminal Ready
Pin 9	RI	Ring Indicator

Table 1 - D Type 9 Pin FEMALE Connector

PIN FUNCTIONS

Abbreviation	Full Name	Function
TXD	Transmit Data	DTE Serial Data Output (TXD), IPCU Serial Data Input
RXD	Receive Data	DTE Serial Data Input (RXD), IPCU Serial Data Output
CTS	Clear to Send	This line indicates that the Modem (Controller) is ready to exchange data.
DCD	Data Carrier Detect	When the Modem (IPCU) detects a "Carrier" from the other end of the line, this line becomes active.
DSR	Data Set Ready	This tells the DTE that the Modem (IPCU) is ready to establish a link.
DTR	Data Terminal Ready	This is the opposite of DSR. This tells the Modem (Controller) that the DTE is ready to link.
RTS	Request To Send	This line informs the Modem (IPCU) is ready to exchange data.
RI	Ring Indicator	Goes active when Modem detects a ringing signal from the PSTN. Not used on the Controller.

RTS / CTS are jumpered together on the Controller connector and DTR is jumpered to DSR / DCD on IPCU connector. The DTE sees the IPCU like a Standard MODEM.

Ion Pump Control Unit - Operator / Host Serial Communication

The Controller Report and Operator/Host Command are ASCII strings CR (0D hexadecimal, 13 decimal) terminated.

Default Communication Parameters are 9600 bits/sec, no parity, 8 bits data, 1 stop bit.

Usually the human interface of the controller is a terminal emulator (Windows "HyperTerminal" communication program for example) running on Personal Computer.

Software program on PC or PLC can use the same ASCII protocol described below for human interface for doing automatic control and monitoring of the controller.

Every 100 (min) to 1000 (max) msec, if the controller is in Report mode (default), all the 2 Report strings made of 30 characters each, corresponding to the 2 HV channels are sent by the IPCU.
The string is made of different length depending on the report tipe selected for each HV channel (independently by the channel status).

A transmission from the external PC, turns the IPCU to the Command Mode.
To go back to the Report Mode complete the command string with CR (0x0D) or ESC (0x1B).

Every single received character is Echoed back in order to allow a control by the operator.

Controller Report Mode

"HVn status fault start/protect current voltage"

HV	[HV]	2 characters 'HV'
n	[1, or 2]	1 character
' '	[0x20]	1 character SPACE
status	[OFF__, FAULT, ON___]	5 characters
' '	[0x20]	1 character SPACE
fault	[00, .., FF]	2 characters
' '	[0x20]	1 character SPACE
start/protect	[0, 1] *0=Start(default), 1=Protect*	1 character
' '	[0x20]	1 character SPACE
current	[10 ... 99999nA, 100 ... 60000uA]	7 characters
' '	[0x20]	1 character SPACE
voltage	[3000 ... 5000V]	6 characters 'CR '
	[0x0D]	1 character CR

Controller Commands Mode

HV Channel On/Off Setting
"A0ns"[Enter] where :
A0 = HV Channel Serial Command for Status Set
N = HV Channel Number 1 or 2
s = 0 for OFF, 1 for ON

HV Channel Start/Protect Mode Setting
"C0ns"[Enter] where :
C0 = HV Channel Serial Command for Start/Protect Setting
n = HV Channel Number 1 or 2
s = 0 for START mode, 1 for PROTECT mode

Clear Fault (Reset)
"F0n"[Enter] where:
F0 = HV Channel Serial Command for Fault reset
n = HV Channel number 1 or 2

Bit positional Fault table when HV ON:

Err # Description	Front Panel Led
[0001] Cable Interlock when HV On	1 blink of 200 ms every 4 s
[0002] Remote Interlock when HV On	2 blink of 200 ms every 4 s
[0004] HV Over Voltage when HV On	3 blink of 200 ms every 4 s
[0008] Bad Current Offset starting HV On	4 blink of 200 ms every 4 s
[0010] HV Over Power when HV On	5 blink of 200 ms every 4 s
[0020] Panel Switch Moved when HV On	6 blink of 200 ms every 4 s
[0040] HV Over Temperature when HV On	7 blink of 200 ms every 4 s
[0080] HV Over Current – Protect=Enable	8 blink of 200 ms every 4 s
[0100] HV Under Voltage when HV On	9 blink of 200 ms every 4 s

Bit positional Event table when HV On or OFF:

Err # Description	Front Panel Led
[0001] Cable Interlock when HV Off	No blink
[0002] Remote Interlock when HV Off	No blink
[0004] HV Over Voltage when HV On	No blink
[0008] Bad Current Offset when HV Off	No blink
[0010] HV Over Power when HV On	No blink
[0020] Spare	No blink.
[0040] Over Temperature	No blink
[0080] HV Over Current – Protect=Disable	No blink
[0100] HV Under Voltage when HV On	No blink
[0200] Current Below Threshold when HV On	No blink

Max Output Voltage setting
"H0nxxxx"[Enter] where:
H0 = HV Channel Serial Command for Voltage Target
n = HV Channel number 1 or 2
xxxx = Voltage Target (min 3000V, max 5000V in 50 V steps)

Set-Point Current Threshold Setting
(Minimum Access Level Required: "0")
"WR[space]Y[space] xxxxxx"[Enter]
WR = Write
Y = 14 for channel 1
15 for channel 2
xxxxxx = Current Set-Point value in nA
(from 0 to 100000000)

Set-Point Current Threshold reading
"RD[space]Y"[Enter]
RD = Read
Y = 14 for Channel 1
15 for Channel 2

Report Setting
"RT[space]X"
or
"RT[space]X[space]Y"[Enter]
or
"RT[space]X[space]Y[space]Z"[Enter]
X = type [0, …, 5]
(see detailed description on "About Report" chapter)
Y = time rate[0, …, 255]
based on 100 msec tick, default is "3".
For time rate = 0, to stop continuous reporting mode and start report on request (see Request Report Command)
Z = mode[0, …, 4]
where:
'0' only Remarks, no channel reports
'1' reports only channel 1
'2' reports only channel 2
'4' reports all channels

Report Type Read
"RT"[Enter]

Request Report (in NON Continuous Report Mode)
"RR" [Enter]

Enable, Disable Receiving Input ECO
(Access Level 1 Required).
"WR[space]Y[space]X"[Enter]
WR = Write
Y = 29 (parameter number)
X = 0 for No input ECO
1 for input ECO (default value)

Enable, Disable Remark Line Reporting
(Access Level 1 Required).
"WR[space]Y[space]X"[Enter]
WR = Write
Y = 30 (parameter number)
X = 0 for No remark lines (except the first three)
1 for Remark Line (default value)

Enable, Disable Value in Floating Point Report Mode
(Access Level 1 Required).
"WR[space]Y[space]X"[Enter]
WR = Write
Y = 31 (parameter number)
X = 0 for Standard Report Mode (default value)
1 for Floating Point Report Mode

About Report

The continuous report sent by the IPCU protocol communication is structured as follow:
At each main power on start up six remarking lines are sent.

- The first line sent is the firmware release, for instance:
  "* REL [20051117 ICPU]".
- The second line is the notification that the EEPROM's parameter are wrote into RAM:
  * EVT [LOAD_EEPROM_PARAMETERS_INTO_RAM]
- The third line is the notification that the calibration of the Analog to Digital Convert used for the measurement of output high voltage and current are done:
  * EVT [ADC_CALIBRATION]
- The fourth line is reporting that the internal I/O BUS are initialized:
  * EVT [IO_BUS_INIT]
- The fifth line is the notification that a main power on cold system startup reset is happened:
  * EVT [COLD_RESET_SYSTEM_STARTUP]
- The sixth and last line reports the number "n" of Power On Cold Reset happened up to that moment:
  * POR [n]

These six lines are sent also if the EEPROM's parameter n. 30 are set to "0" = Disable Remark Lines.
After these six lines, the normal report sequence starts, accordingly to the report type chosen notifying the user about the values of voltage, current and power, faults and events status for each channel.
When an ion pump discharge happens, the unit performs a warm system start reset automatically bringing to 0 V the HV to stop the discharge, then it sends again the first five remarking lines with the fifth changed to:
* EVT [WARM_RESET_SYSTEM_RESTART]
to inform that a warm reset system restart is happened and the HV output, that was in the ON state before the discharge, is automatically restarted.
After these five lines, the normal report sequence starts, accordingly to the report type chosen.

Enable – Disable Remark Lines

These five lines are sent also if the EEPROM's parameter n. 30 are set to "0" = Disable Remark Lines.
If the EEPROM's parameter n. 30 is set to "1", all the remark lines, the lines that begin with the symbol "*", are sent.
For EEPROM's parameter n. 30 = "0", all the remark lines are NOT sent, except the first six lines at the main power on reset (cold reset) and the first five lines after an ion pump discharge reset (warm reset) sent anyway.

Continuous and NON continuous report mode

IPCU is able to send report only on request.
To do this, it is necessary to set the report mode with the time rate = 0.
After the "enter", the continuous report mode stops immediately.
According to the report type and mode, the unit sends one instantaneous report each time a "Request Report" (RR) command is received.
To return in the continuous report mode it is necessary to send a new "Report Setting" (RT) command with time rate ≠ 0.
After the "enter" the continuous report mode starts immediately.

Enable - Disable Input ECO characters

By default, the unit transmits the ECO of all characters received from the host.
If required, It is possible to disable this feature.
See the command "Enable, Disable Receiving Input ECO" to do this.
The ECO of input characters may be used to understand that the physical communication between the unit and host is good so, disabling the ECO this feature is lost.

About commands

When the unit receives a command, it transmits the plus symbol: "+" to confirm the command is executable.
If the command is not correct, the unit transmits the minus symbol: "-".
When the parameter of a command is out of range, the unit sends:
"- [PARAMETER_ERROR]".
The unit receives continuously input characters from host but they are hold only if the panel switch "Local-Remote/Serial" is on Serial.
If this switch is on Local-Remote and a character is received, the unit sends:
"- [LOCAL_MODE]"
to inform that a character is received but it is not possible to execute commands coming from the serial line.

When a command received is formally correct but can no be executed because the status of the unit does not allow this, (for instance a command: "A011" is sent but the cable interlock is not OK) the unit sends:
"- [COMMAND_UNEXECUTABLE]"
to inform that the request is not coherent with the status of the unit.

Report TYPE 0…6

The User Operator Reports Type 0, 2, 4 and 6 display the 'continuous average value' for the HV Channel Current, Voltage and Power, both in normal or scientific notation and the 'instantaneous measured or control values' in the hexadecimal format.

Technical Reports Type 1, 3 and 5 report the 'instantaneous measured values' for the HV Channel Current, Voltage and Power, both in normal or scientific notation and the 'continuous average measured values' in the hexadecimal format.

User Operator Report Type 0 and User Technician Report Type 1

Report Format: "HVc sssss iiiiixA vvvvV F=ffff E=eeee <CR>"
Report Fields:

HVc	HV Channel c= 1 or 2
sssss	HV Channel Status ['OFF__', 'ON___', 'FAULT']
iiiii	HV Channel Current in xA
xA	nA or uA (nano Ampere or micro Ampere)
vvvv	HV Channel Voltage in V (Volts)
ffff	Hexadecimal representation of HV Channel Faults
eeee	Hexadecimal representation of HV Channel Events

Example:

```
RT 0[Enter]
+
HV2 OFF        0uA    0V F=0000 E=0000

HV1 OFF        0uA    0V F=0000 E=0000
HV2 OFF        0uA    0V F=0000 E=0000
```

User Operator Report Type 2 and User Technician Report Type 3

Report Format:
"HVc sssss iiiiixA vvvvV F=ffff E=eeee pppppmW i=yyyy v=zzz c=www <CR>"

Report Fields:

HVc	HV Channel c= 1 or 2
sssss	HV Channel Status ['OFF__', 'ON___', 'FAULT']
iiiii	HV Channel Current in nA or uA
vvvv	HV Channel Voltage in V
ffff	Hexadecimal representation of HV Channel Faults
eeee	Hexadecimal representation of HV Channel Events
ppppp	HV Channel Power in mW
yyyy	16 Bits hexadecimal Current
zzz	10 Bits hexadecimal Voltage
www	12 Bits hexadecimal Control Output

Example:

```
RT 2[Enter]
+
HV2 OFF       0uA    0V F=0000 E=0000     0mW i=0001 v=000 c=D80

HV1 OFF       0uA    0V F=0000 E=0000     0mW i=0003 v=000 c=D80
HV2 OFF       0uA    0V F=0000 E=0000     0mW i=0001 v=000 c=D80
```

User Operator Report Type 4 and User Technician Report Type 5

Report Format:
"HVc sssss iiiiixA vvvvV F=ffff E=eeee pppppmW i=yyyy v=zzz c=www in=hhhh dac=dd <CR>"
Report Fields:

HVc	***HV Channel c= 1 or 2***
sssss	HV Channel Status ['OFF__', 'ON___', 'FAULT']
iiiii	HV Channel Current in nA or uA
vvvv	HV Channel Voltage in V
ffff	hexadecimal representation of HV Channel Faults
eeee	hexadecimal representation of HV Channel Events
ppppp	HV Channel Power in mW
yyyy	16 Bits hexadecimal Current
zzz	10 Bits hexadecimal Voltage
www	12 Bits hexadecimal Control Output
hhhh	16 Bits hexadecimal Digital Debounced Inputs
dd	8 Bits hexadecimal DAC Output

Example:

```
RT 4[Enter]
+
HV2 OFF       0uA    0V F=0000 E=0000     0mW i=0001 v=000 c=D80 d=7407 r=00

HV1 OFF       0uA    0V F=0000 E=0000     0mW i=0003 v=000 c=D80 d=7407 r=00
HV2 OFF       0uA    0V F=0000 E=0000     0mW i=0001 v=000 c=D80 d=7407 r=00

HV1 OFF       0uA    0V F=0000 E=0000     0mW i=0003 v=000 c=D80 d=7407 r=00
HV2 OFF       0uA    0V F=0000 E=0000     0mW i=0001 v=000 c=D80 d=7407 r=00
```

Old IPCU Releases - Compatibility Report Type 6

Report Format: "HVc sssss ff p iiiiixA vvvvV <CR>"
Report Fields:

HVc	HV Channel c= 1 or 2
sssss	HV Channel Status ['OFF__', 'ON___', 'FAULT']
ff	8 bits HEX representation of HV Channel Faults
p	'0'=Start, '1'=Protect
iiiii	HV Channel Current in xA
xA	nA or uA (nano Ampere or micro Ampere)
vvvv	HV Channel Voltage in V (Volts)

Example:

```
RT 6
+
HV2 OFF   00 0      0uA    0V

HV1 OFF   00 0      0uA    0V
HV2 OFF   00 0      0uA    0V

HV1 OFF   00 0      0uA    0V
HV2 OFF   00 0      0uA    0V
```

Floating Point Notation

The floating point notation follows the ANSI/IEEE Standard 754-1985, for Binary Floating Point Arithmetic.

Example:

```
AL 1 11111111[Enter] (to grant access level 1)
1
wr 31 1[Enter] (set parameter n. 31 to 1)
+
RT 0 (select report type "0")
+
HV2 OFF   0.0E-9A 0.0E+0V F=0000 E=0000

HV1 OFF   0.0E-9A 0.0E+0V F=0000 E=0000
HV2 OFF   0.0E-9A 0.0E+0V F=0000 E=0000

HV1 OFF   0.0E-9A 0.0E+0V F=0000 E=0000
HV2 OFF   0.0E-9A 0.0E+0V F=0000 E=0000

HV1 OFF   0.0E-9A 0.0E+0V F=0000 E=0000
HV2 OFF   0.0E-9A 0.0E+0V F=0000 E=0000

HV1 OFF   0.0E-9A 0.0E+0V F=0000 E=0000
HV2 OFF   0.0E-9A 0.0E+0V F=0000 E=0000
```

Cleaning

For safety reasons, before cleaning the controller:
Turn the controller off;
disconnect the controller power plug from the electrical outlet
disconnect all cables.
If the exterior of the controller becomes dirty, use a dry soft cloth.

The internal cleaning must be done only by Varian operator.

VARIAN

Request for Return

ISO 9001 REGISTERED

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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10040 Leini (TO) – ITALY
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Fax: +39 011 9979330

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.#: ……

Europe only: VAT reg. Number: …… *USA only*: ☐ Taxable ☐ 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)*

☐ Paid Exchange ☐ Paid Repair ☐ Warranty Exchange ☐ Warranty Repair ☐ Loaner Return
☐ Credit ☐ Shipping Error ☐ Evaluation Return ☐ Calibration ☐ 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 #: ……

VARIAN

Request for Return

ISO 9001 REGISTERED

FAILURE REPORT

TURBO PUMPS and TURBOCONTROLLERS

		POSITION	PARAMETERS	
☐ Does not start	☐ Noise	☐ Vertical	Power:	Rotational Speed:
☐ Does not spin freely	☐ Vibrations	☐ Horizontal	Current:	Inlet Pressure:
☐ Does not reach full speed	☐ Leak	☐ Upside-down	Temp 1:	Foreline Pressure:
☐ Mechanical Contact	☐ Overtemperature	☐ Other:	Temp 2:	Purge flow:
☐ Cooling defective		……	OPERATION TIME:	

TURBOCONTROLLER ERROR MESSAGE:

ION PUMPS/CONTROLLERS

☐ Bad feedthrough	☐ Poor vacuum
☐ Vacuum leak	☐ High voltage problem
☐ Error code on display	☐ Other

Customer application:

VALVES/COMPONENTS

☐ Main seal leak	☐ Bellows leak
☐ Solenoid failure	☐ Damaged flange
☐ Damaged sealing area	☐ Other

Customer application:

LEAK DETECTORS

☐ Cannot calibrate	☐ No zero/high backround
☐ Vacuum system unstable	☐ Cannot reach test mode
☐ Failed to start	☐ Other

Customer application:

INSTRUMENTS

☐ Gauge tube not working	☐ Display problem
☐ Communication failure	☐ Degas not working
☐ Error code on display	☐ Other

Customer application:

PRIMARY PUMPS

☐ Pump doesn't start	☐ Noisy pump (describe)
☐ Doesn't reach vacuum	☐ Over temperature
☐ Pump seized	☐ Other

Customer application:

DIFFUSION PUMPS

☐ Heater failure	☐ Electrical problem
☐ Doesn't reach vacuum	☐ Cooling coil damage
☐ Vacuum leak	☐ 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 Aufrage ist diese Unterlage auch auf Deutsch, Italienisch und Französisch erhältlich.

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