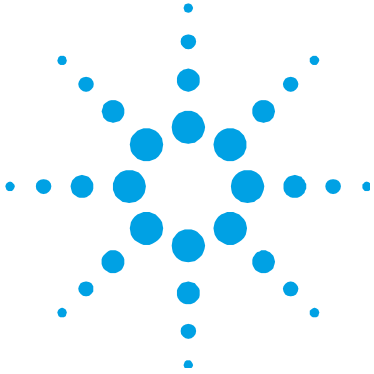

Ion Pumps Control Unit (No Battery)

Model
729-5001

Manuale di Istruzioni
Bedienungshandbuch
Notice de Mode D'Emploi
User Manual

87-900-123-01 (B)
05/2011

Agilent Technologies

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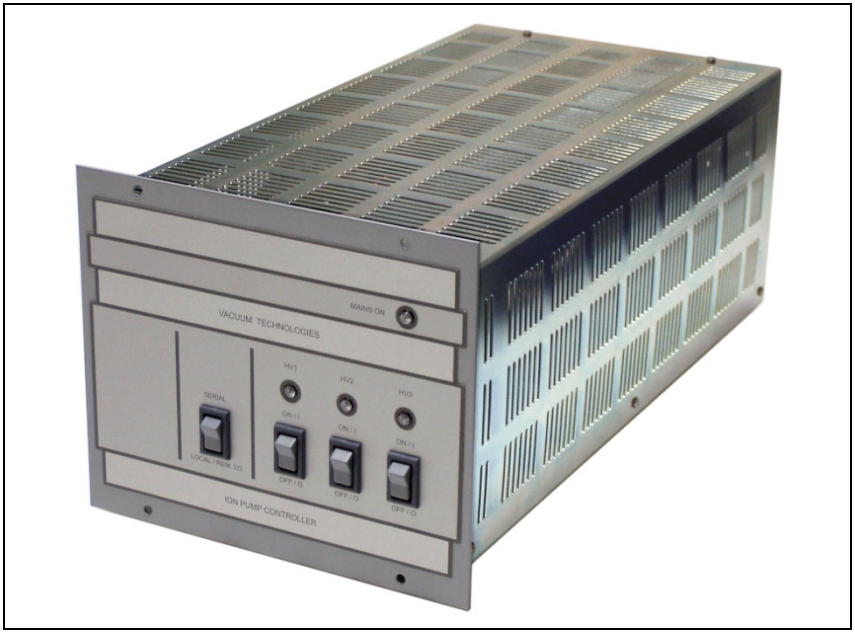
WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Ion Pumps Control Unit (No Battery)



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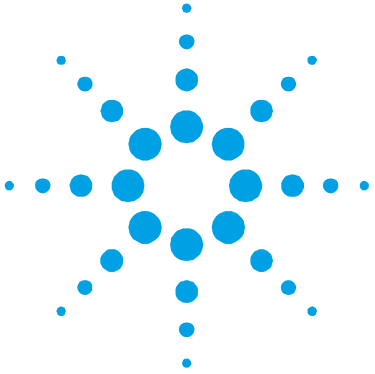


1 Procedura per l'installazione

Traduzione delle istruzioni originali

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 Agilent prima di utilizzare l'apparecchiatura. La Agilent 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 "Technical Information" sono forniti maggiori dettagli.

Il presente manuale utilizza il seguente protocollo standard:

AVVERTENZA!

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

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

NOTA Le note contengono informazioni importanti estrapolate dal testo.

Descrizione del controller

Controller della Agilent per pompe ioniche, in grado di azionare fino a 3 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 "Technical Information").

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.

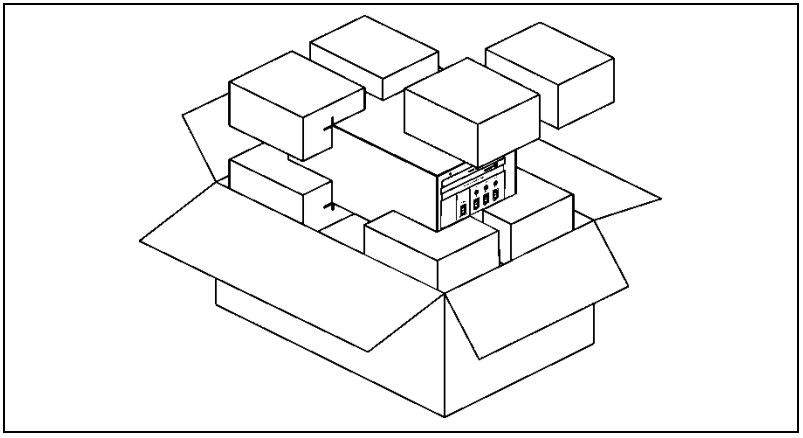


Figura 1 Disimballaggio

Installazione

AVVERTENZA!

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.

AVVERTENZA! **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 "Technical Information".

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 "Technical Information".

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

AVVERTENZA! **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.

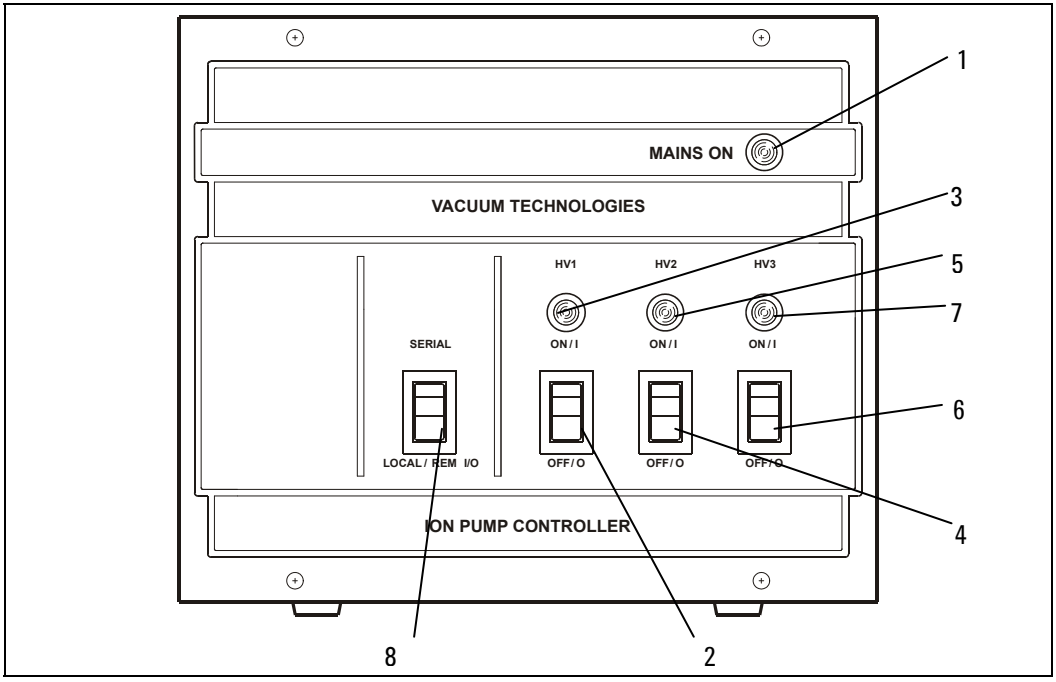


Figura 2 Comandi e indicatori del pannello anteriore dell'unità controller per pompe ioniche

Tab. 1

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 "Technical Information" 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 "Technical Information" per maggiori dettagli).
6	HV3 ON/OFF SWITCH	Quando è in posizione ON (I), abilita l'alimentazione ad alta tensione per la pompa 3 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.
7	HV3 LED	È On quando il controller fornisce l'alta tensione per la pompa 3. Lampeggia in caso di anomalia (vedere paragrafo "Technical Information" per maggiori dettagli).
8	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 "Technical Information".

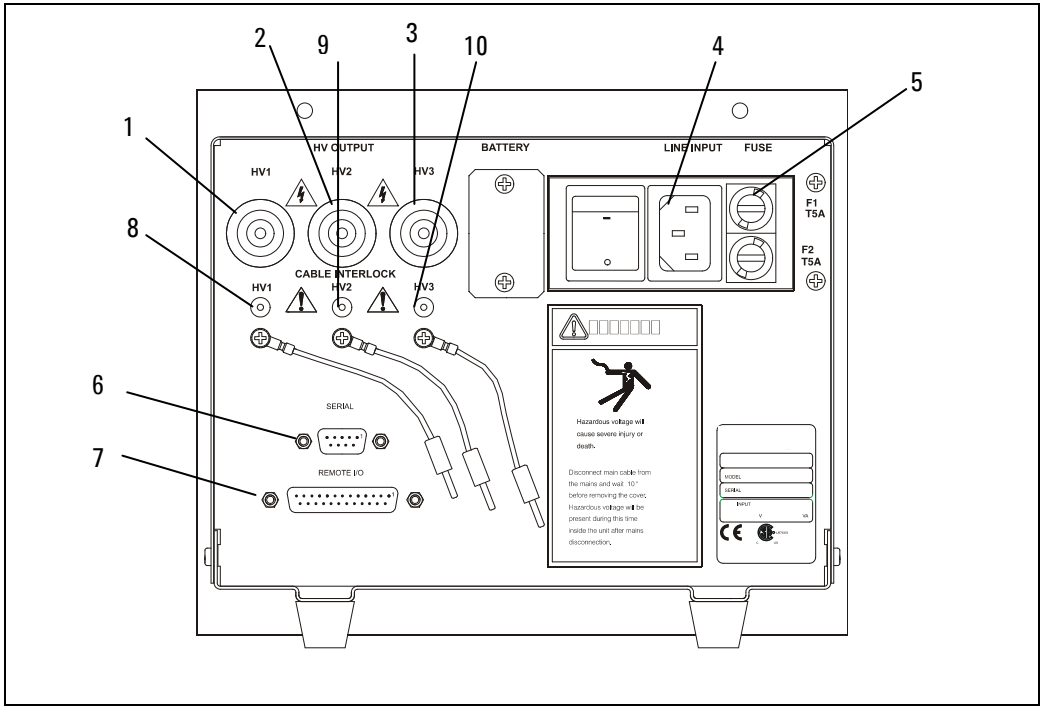


Figura 3 Pannello posteriore dell'unità controller per pompe ioniche

Tab. 2

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	HV3 Connector	Connettore HV per cavo di collegamento alla pompa ionica 3
4	LINE INPUT	Modulo contenente la spina del cavo di ingresso della linea e l'interruttore LINE
5	FUSE	Supporto fusibili (2 fusibili)
6	SERIAL Connector	Connettore DB9 per cavo seriale
7	REMOTE Connector	Connettore DB25 per collegamenti I/O remota
8	HV1 Cable Interlock	
9	HV2 Cable Interlock	
10	HV3 Cable Interlock	

Procedure di Uso

Questo paragrafo fornisce informazioni generiche inerenti l'uso del controller. Per i dettagli, fare riferimento al paragrafo "Technical Information". 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:

- 3 canali alta tensione indipendenti
- tensione in uscita max. di +5000 Vcc
- potenza in uscita max. di 40 W per ogni canale
- corrente in uscita max. >30 mA (condizione di cortocircuito) per ogni canale
- modalità operativa seriale/I/O remota-locale
- funzionamento START/PROTECT

Modalità Operative

Collegamento alla linea di alimentazione

Modalità operativa I/O LOCALE-REMOTA

NOTA I 3 interruttori alta tensione presenti sul pannello anteriore e i 3 ingressi On/Off HV sul connettore DB25 "Remote" sul pannello posteriore sono in serie.

L'HV alle 3 pompe può essere attivata o disattivata mediante i 3 switch HV (HV1, HV2 or HV3) nel pannello anteriore (in questo caso il relativo segnale HV ON-OFF sul connettore remoto DB25 e il relativo Interlock del cavo HV devono essere chiusi) oppure può essere attivata o disattivata mediante cortocircuito del segnale HV on-off sul connettore remoto (nel pannello posteriore) con il relativo riferimento GND (in questo cavo il rispettivo switch HV nel pannello anteriore deve essere in posizione ON e il rispettivo Interlock del cavo HV deve essere chiuso).

Quando l'alta tensione è ON, il relativo led 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.

NOTA 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 "Technical Information".

Modalità operativa START/PROTECT

Il controller può funzionare nelle due seguenti modalità: Start e Protect. In modalità Start, i 3 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 modalità Protect, il controller limita la corrente in uscita e disattiva l'alta tensione quando la corrente supera il valore di soglia (8 mA) per oltre 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:

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 1,2,3": 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 1,2,3": 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.

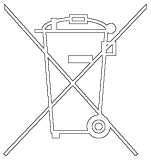
Smaltimento

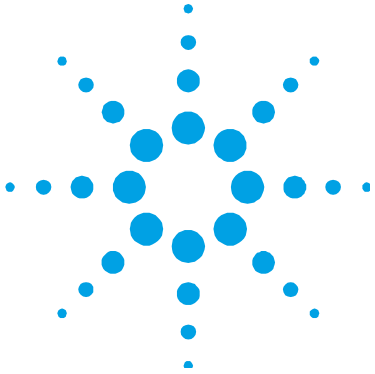
Significato del logo "WEEE" presente sulle etichette.

Il simbolo qui sotto riportato 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.





2 Anleitung zur Installation

Übersetzung der Originalanleitungen

Allgemeines

Dieser Apparat ist für Fachbetriebe bestimmt. Vor Gebrauch sollte der Benutzer dieses Handbuch sowie alle weiteren von Agilent 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 Agilent 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 "Technical Information".

In dieser Gebrauchanleitung werden Sicherheitshinweise wie folgt hervorgehoben:

WARNUNG!

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

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

HINWEIS Die Hinweise enthalten wichtige Informationen, die aus dem Text hervorgehoben werden.

Beschreibung des Kontrollers

Der Agilent Kontroller dient zur Steuerung von Ionenpumpen. Er kann gleichzeitig bis zu 3 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 "Technical Information.

Der Agilent 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.

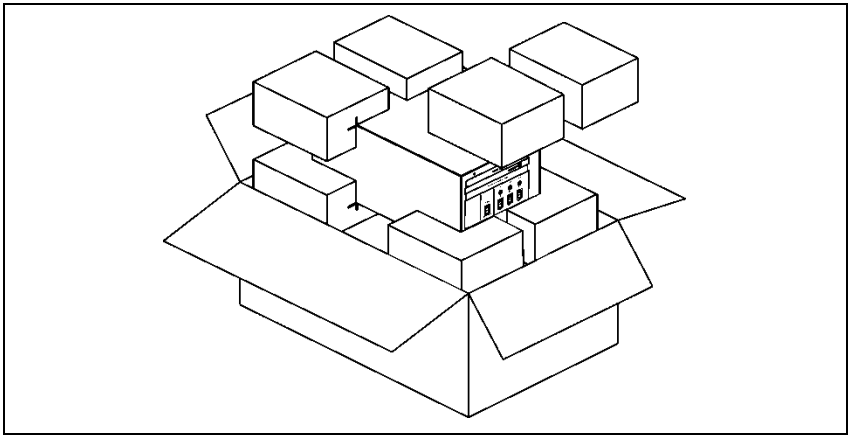


Abbildung 1 Verpackung

Installation

WARNUNG!

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 Verletzungen und zum Tode führen. Vor Wartungsarbeiten am Kontroller, das Netzkabel abziehen.

VORSICHT!

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.

HINWEIS

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

WARNUNG!

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 "Technical Information" 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 "Technical Information" behandelt.

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

WARNUNG!

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.

NOTA 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.

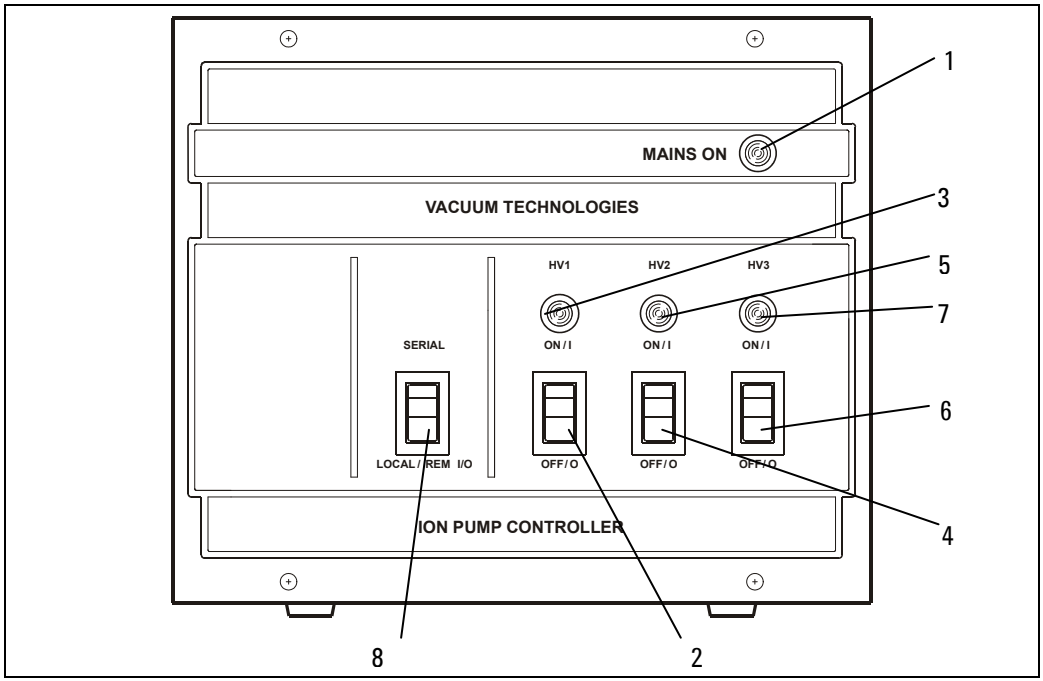


Abbildung 2 Steuerungen und Anzeigen auf dem vorderen Bedienfeld des Ionenpumpen-Kontrollers

Tab. 1

RIF.	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 "Technical Information").
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 "Technical Information").
6	HV3 ON/OFF SWITCH	Wenn auf ON (I), wird die HV für die Pumpe 3 geschaltet, sofern der Kontroller auf LOCAL/REMOTE I/O Betrieb gesetzt ist und die externen wie die HV Kabel-Verriegelungen geschlossen sind.
7	HV3 LED	Wenn an, versorgt der Kontroller die Pumpe 3 mit HV. Wenn blinkend, liegt ein Fehler vor (Einzelheiten finden sich im Anhang "Technical Information").
8	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 " Technical Information".

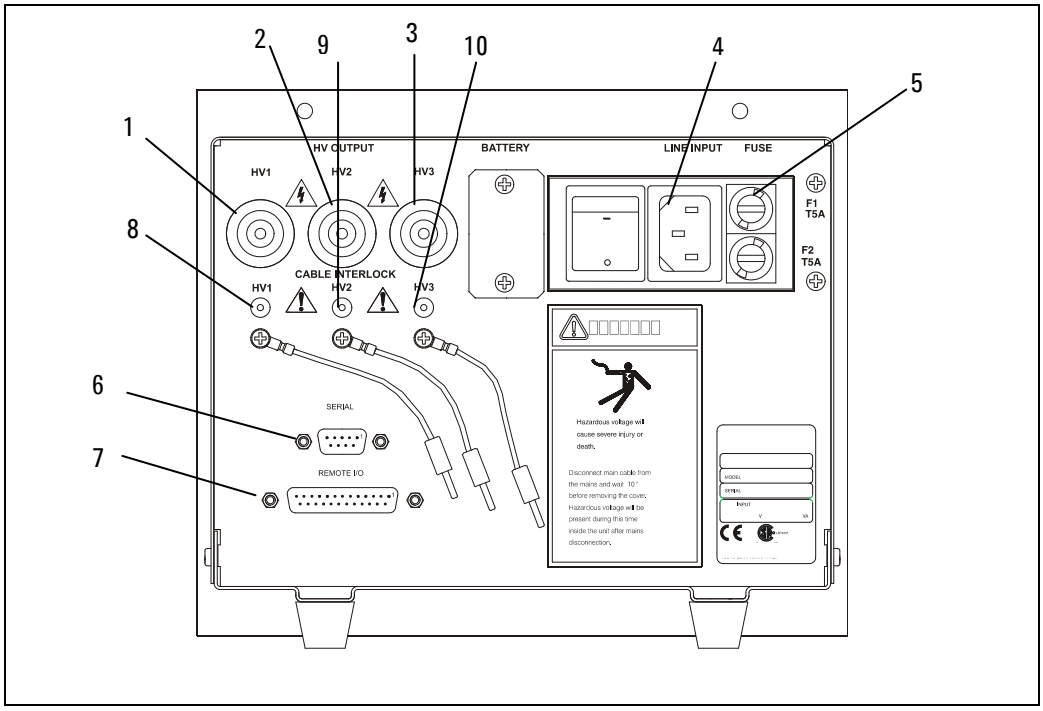


Abbildung 3 Rückseite des Ionenpumpen-Kontrollers

Tab. 2

RIF.	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	HV3 Connector	HV-Stecker für das Kabel zur Ionenpumpe 3
4	LINE INPUT	Modul mit dem Stecker für das Netzkabel und dem Netzschalter
5	FUSE	Halter für die Schmelzsicherungen (2 Sicherungen)
6	SERIAL Connector	DB9 Stecker für das serielle Kabel
7	REMOTE Connector	DB25 Stecker für die REMOTE I/O Anschlüsse
8	HV1 Cable Interlock	
9	HV2 Cable Interlock	
10	HV3 Cable Interlock	

Gebrauch

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

- 3 unabhängige HV Kanäle
- max. +5000 V= Ausgangsspannung
- max. 40 W Ausgangsleistung für jeden Kanal
- max. >30 mA Ausgangsstrom (Kurzschlussbedingung) für jeden Kanal
- Betriebsarten LOCAL-REMOTE I/O/SERIAL
- START/PROTECT Betrieb

Betriebsarten

Netzversorgung

Betrieb LOCAL-REMOTE I/O

HINWEIS Die 3 HV Schalter auf dem vorderen Bedienfeld und die 3 HV On/Off Eingänge auf dem Stecker DB25 “Remote” auf der Rückseite sind in Serie.

Die HV zu den 3 Pumpen kann AN und AUS geschaltet werden:

- mit den 3 HV-Schaltern (HV1, HV2 oder HV3) auf der Vorderkonsole (dann müssen das betreffende HV AN/AUS Signal auf dem Fernstecker DB25 sowie die betreffende HV-Verriegelung geschlossen sein) oder
- durch Kurzschließen des HV AN/AUS Signals auf dem Fernstecker (auf der Rückwand) mit der Referenzerde. In letzterem Fall müssen das betreffende HV Schalter auf der Vorderkonsole auf AN sowie die betreffende HV-Verriegelung geschlossen sein.

Wenn die Hochspannung AN ist, ist die entsprechende HV-LED auf dem vorderen Bedienfeld erleuchtet.

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

HINWEIS 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

HINWEIS 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 Anwendereignes 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.

HINWEIS Abhängig von der Anwenderumgebung muss das Betriebssystem bei seriellem Betrieb Echtzeitfähig sein.

Weitere Einzelheiten finden sich im Anhang “Technical Information”.

START/PROTECT Betrieb

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

In Start können die 3 Ausgangskanäle die ganze Ausgangsleistung unabhängig von dem Pumpenzustand bis zur Kurzschlussleistung liefern.

Diese Betriebsart muss zum Starten der Pumpen bei hohem Druck benutzt werden.

In Protect begrenzt der Kontroller den Ausgangsstrom und schaltet die Hochspannung ab, wenn der Strom den Schwellwert (8 mA) für mehr als 2 Sek. übersteigt.

Fehlermeldungen

Auf dem vorderen Bedienfeld

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

LED HV 1,2,3 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 40 W Kanal und I>16 mA für den 80 W 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.

HINWEIS 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 40 W Kanal und I>16 mA für den 80 W 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 1,2,3” Ausgabe: Schließerkontakt (Leerlauf) =
Der Kontakt ist offen, wenn HV in AUS (Relais aus)
Der Kontakt ist geschlossen, wenn HV in AN (Relais an)

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

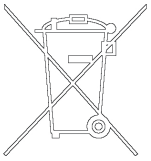
Entsorgung

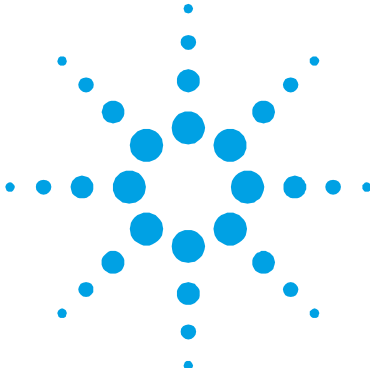
Bedeutung des "WEEE" Logos auf den Etiketten.

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.





3 Procédure pour l'installation

Traduction de la mode d'emploi original

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 Agilent, avant l'utilisation de l'appareillage. Agilent 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 "Technical Information" sont fournis de plus amples détails.

Le présent manuel utilise les signes conventionnels suivants:

AVERTISSEMENT!

Les messages d'avertissement 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.

NOTE Les notes contiennent des renseignements importants, extrapolés du texte.

Description du Controleur

Contrôleur de Agilent pour pompes ioniques en mesure d'actionner jusqu'à 3 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 "Technical Information".

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)

Préparation 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% ricyclables et sont conformes à la Réglementation EEC 85/399.

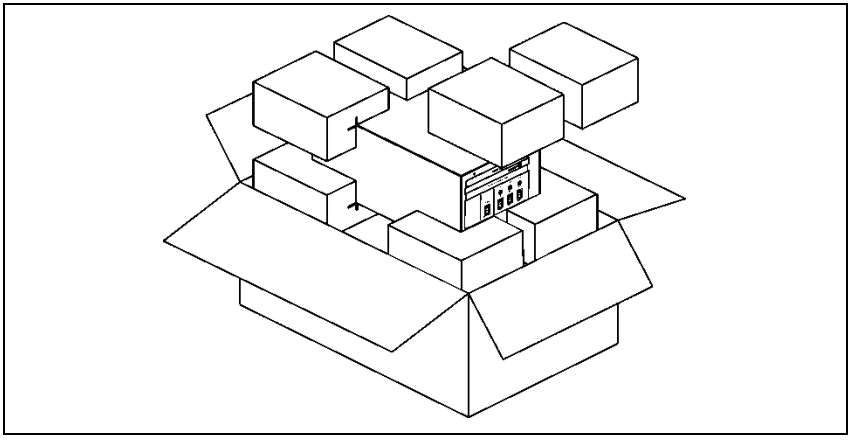


Figure 1 Ouverture de l'emballage

Installation

AVERTISSEMENT!

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.

AVERTISSEMENT! **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).**

Le fonctionnement de la pompe n'est optimisé que si celle-ci est utilisée avec l'une des unités de contrôle Agilent spécifiques (Dual, MidiVac ou MiniVac).

ATTENTION! Lors de l'utilisation des pompes, le respect des normes de sécurité est impérativement subordonné à l'emploi des unités de contrôle Agilent.

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 "Technical Information".

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 "Technical Information".

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.

AVERTISSEMENT!

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.

NOTA 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.

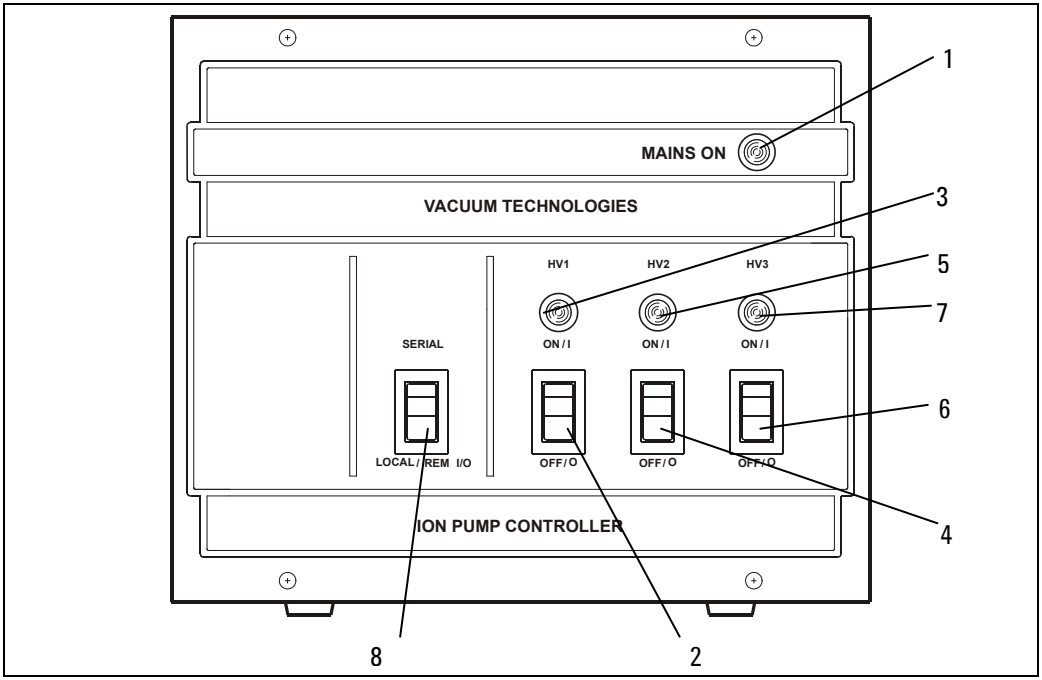


Figure 2 Commandes et indicateurs du panneau antérieur de l'unité contrôleur pour pompes ioniques

Tab. 1

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 "Technical Information" 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 "Technical Information" pour de plus amples détails).
6	HV3 ON/OFF SWITCH	Lorsqu'il est en position ON (I), il habilite l'alimentationa à haute tension pour la pompe 3 si le contrôleur est sur la modalità opérationnelle I/O à distance /locale et que les interlock du câble extérieur et du câble haute tension sont fermés.
7	HV3 LED	Il est sur On lorsque le contrôleur fournit la haute tension pour la pompe 3. Il clignote en cas d'anomalie (voir paragraphe "Technical Information" pour de plus amples détails).
8	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 "Technical Information".

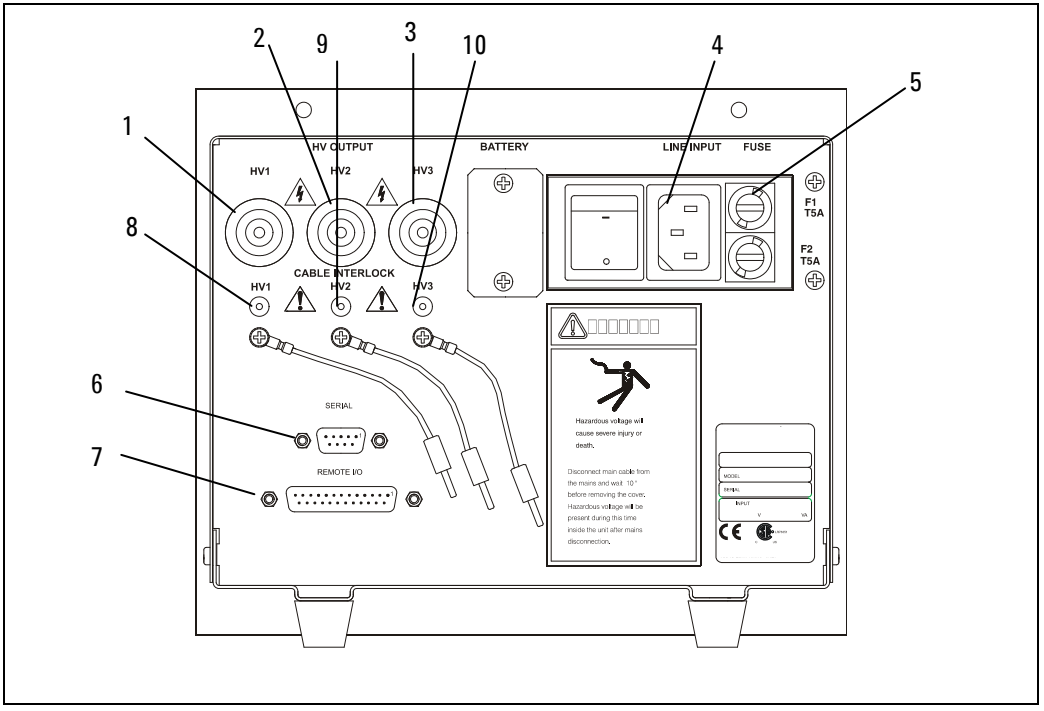


Figure 3 Panneau postérieur de l'unité contrôleur pour pompes ioniques

Tab. 2

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	HV3 Connector	Connecteur HV pour câble de connexion à la pompe inique 3
4	LINE INPUT	Module contenant la fiche du câble d'entrée de la ligne et l'interrupteur LINE
5	FUSE	Support fusibles (2 fusibles)
6	SERIAL Connector	Connecteur DB9 pour câble sériel
7	REMOTE Connector	Connecteur DB25 pour connexion I/O à distance
8	HV1 Cable Interlock	
9	HV2 Cable Interlock	
10	HV3 Cable Interlock	

Procedures d'utilisation

Ce paragraphe fournit les informations générales relatives à l'utilisation du contrôleur. Pour les détails, se référer au paragraphe"Technical Information" 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:

- 3 canaux haute tension indépendants
- tension en sortie max. di +5000 Vcc
- puissance en sortie max. di 40 W pour chaque canal
- courant en sortie max. >30 mA (condition de court circuit) pour chaque canal
- modalité opérationnelle sérielle I/O à distance-locale
- fonctionnement START/PROTECT

Modalite Operationnelle

Connexion à la ligne d'alimentation

Modalité opérationnelle I/O LOCALE-A DISTANCE

NOTE Les 3 interrupteurs haute tension présents sur le panneau antérieur et les 3 entrées On/Off HV sur le connecteur DB25 "Remote" sur le panneau postérieur sont en série.

L'HV aux 3 pompes peut être activée ou désactivée au moyen des 3 boutons HV (HV1, HV2 ou HV3) sur le panneau antérieur (dans ce cas le signal relatif HV ON-OFF sur le connecteur à distance DB25 et le relatif Interlock du câble HV doivent être fermés) ou bien peut être activée ou désactivée au moyen d'un court circuit du signal HV on-off sur le connecteur à distance (sur le panneau postérieur) avec la référence GND (dans ce cas le bouton HV sur le panneau antérieur doit être en position ON et l'Interlock du câble HV doit être fermé).

Lorsque la haute tension est sur ON, le relatif voyant LED 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 permetta de vérifier la fonctionnalité de l'unité, lancer les commandes et accéder à toutes les données oprérationnelles.

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 "Technical Information".

Modalité opérationnelle START/PROTECT

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

En modalité Start, les 3 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 modalité Protect, le contrôleur limite le courant en sortie et désactive la haute tension lorsque le courant dépasse la valeur de seuil (8 mA) pour 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:

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 sérIelle, 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 1,2,3": 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 1,2,3": 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)

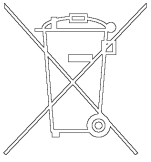
Puissance nominale des relais de sortie: 2 A@125 Vca.
Chargement minimum 10 mW (100 mV@1 mA).
Temps de sautillement: NO=1 msec; NC=3 msec.

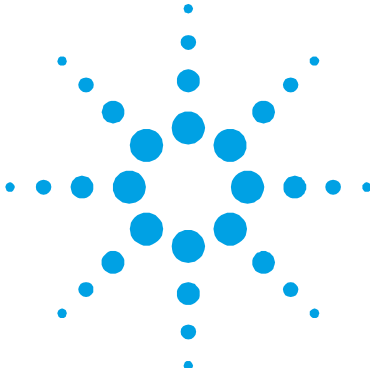
Mise au rebut

Signification du logo "WEEE" imprimé 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.





4
Installation Procedure

Original Instructions

General Information

This equipment is destined for use by professionals. The user should read this instruction manual and any other additional information supplied by Agilent before operating the equipment. Agilent 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

Agilent's controller is an ion pumps controller.

It can drive up to 3 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).

Agilent' 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.

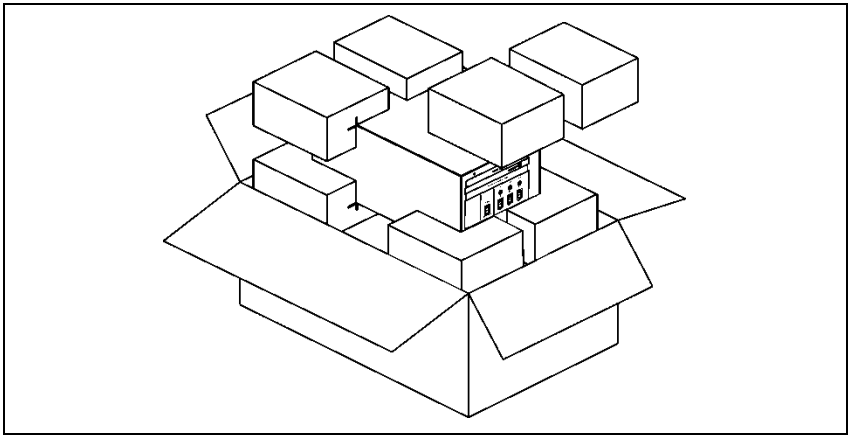


Figure 1 Packing

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.

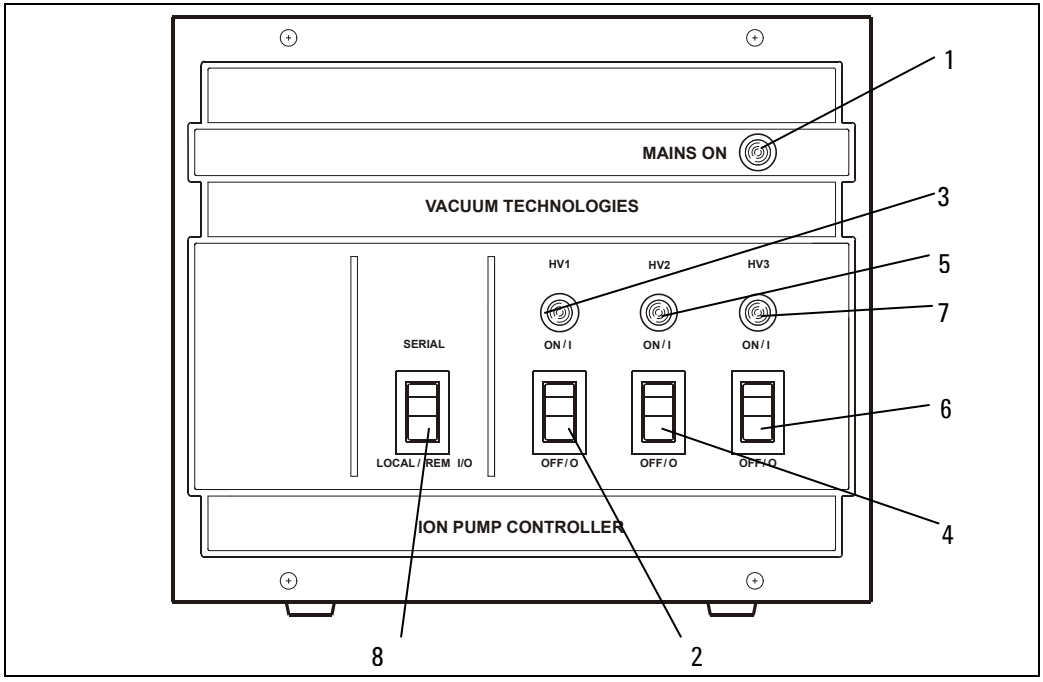


Figure 2 Ion Pumps C.U. Front Panel Controls and Indicators

Tab. 1

RIF.	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	HV3 ON/OFF SWITCH	When in ON (I) position, it switches On the HV to the pump 3 if the controller is set for LOCAL/REMOTE I/O operation and the external and HV Cable interlocks are closed
7	HV3 LED	It is On when the controller is supplying the HV to the pump 3. It is flashing in case of Fault (see paragraph “Technical Information” for details)
8	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”.

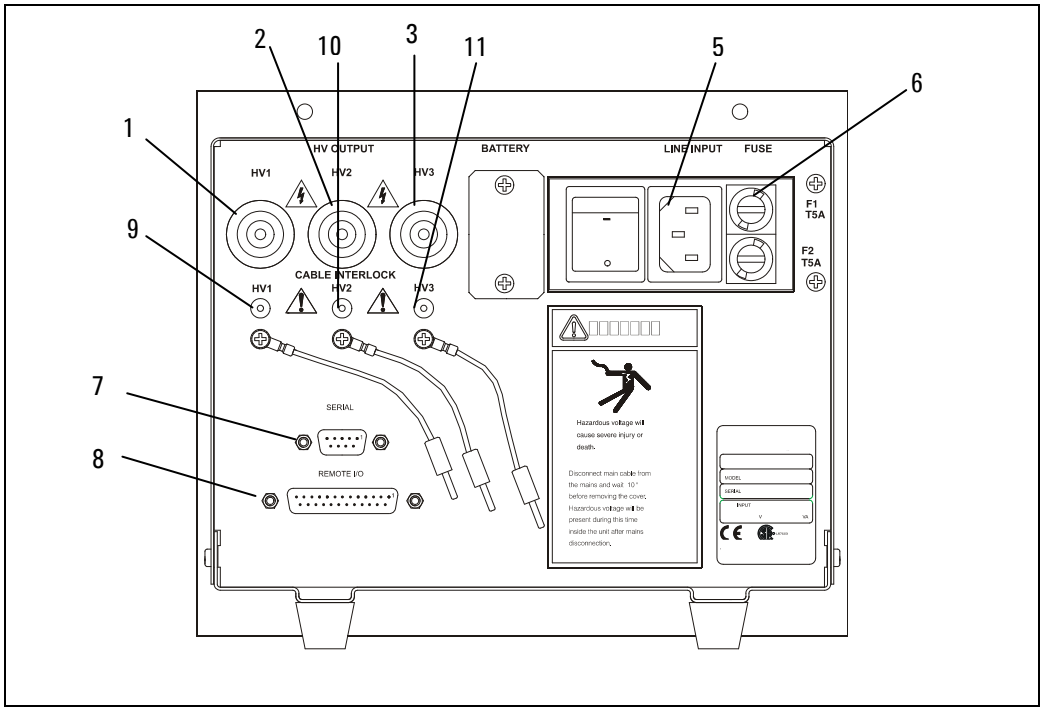


Figure 3 Ion Pumps C.U. Rear Panel

Tab. 2

RIF.	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	HV3 Connector	HV Connector for Cable to Ion Pump 3
4	LINE INPUT	Module containing the Line Input cable plug and the Line Switch
5	FUSE	Protection Fuse holder (2 fuses)
6	SERIAL Connector	DB9 connector for the Serial cable
7	REMOTE Connector	DB25 connector for the REMOTE I/O connections
8	HV1 Cable Interlock	
9	HV2 Cable Interlock	
10	HV3 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:

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

Operating Modes

Power Line Supply

LOCAL-REMOTE I/O Operation

NOTE The 3 HV switches on the front panel and the 3 HV On/Off inputs on the DB25 "Remote" connector on the rear panel are in series.

The HV to the 3 pumps can be switched ON or OFF by the 3 HV (HV1, HV2 or HV3) switches on the front panel (in this case the respective HV ON-OFF signal on DB25 remote connector must be closed and the respective HV Cable Interlock must be closed) or can be switched ON or OFF by short-circuiting the HV on-off signal on the remote connector (on the rear panel) with the related GND reference (in this case the respective HV switch on the front panel must be in the ON position and the respective HV Cable Interlock must be closed).

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 3 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 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:

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 1,2,3” 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 1,2,3” 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 is above the current set point (relay On)

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

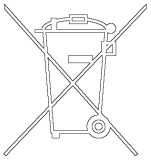
Disposal

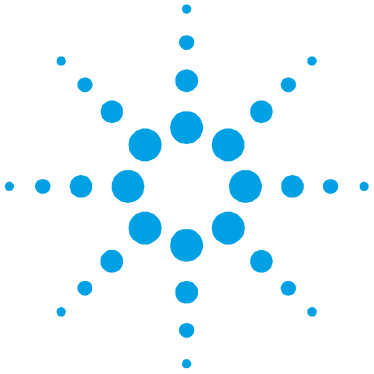
Meaning of the "WEEE" logo found in labels.

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.





5 Technical Information

Original Instructions

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.
- 3 boards: (HV generation), they generate the HV for the 3 output channels
- 1 board: (CPU), it contains all the digital circuitry and the microprocessor.

Controller Specifications

Tab. 3

Line:	
Voltage	100 - 240 Vac ± 10 %
Frequency	50 / 60 Hz ± 5 %
Max Power	200 VA
Operating conditions:	
Internal use only	
Max Altitude:	3000 m
Max Line Voltage variation:	± 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)	Default value = +5000 V +1/-5 %, settable from	
Output Current (each channel)	+3000 – +5000Vdc +1, -5 %, step +/- 50 V by serial line command	
Maximum Output Power (each channel)	>30 mA ± 10 %	
	40 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	3 High Voltage Fischer connectors	

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

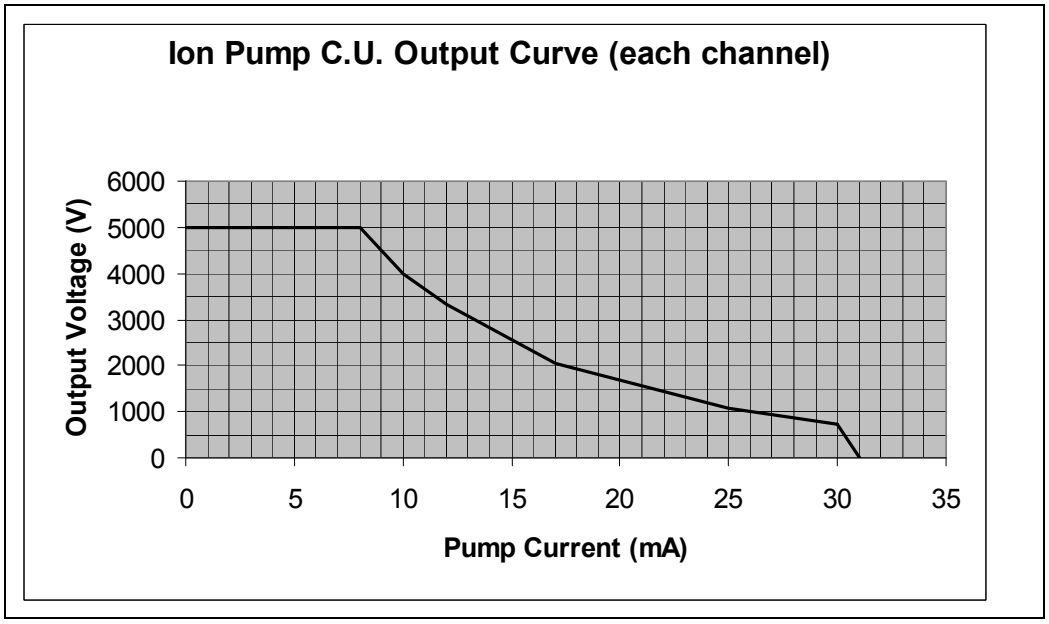


Figure 4 Output Voltage Curve for Line Supply

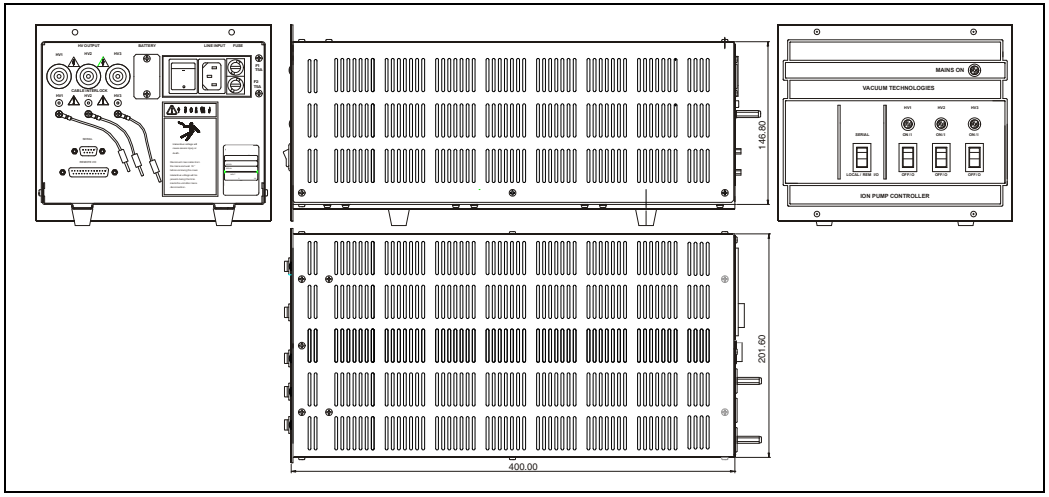


Figure 5 Controller Outline

Remote I/O Connector Pinout

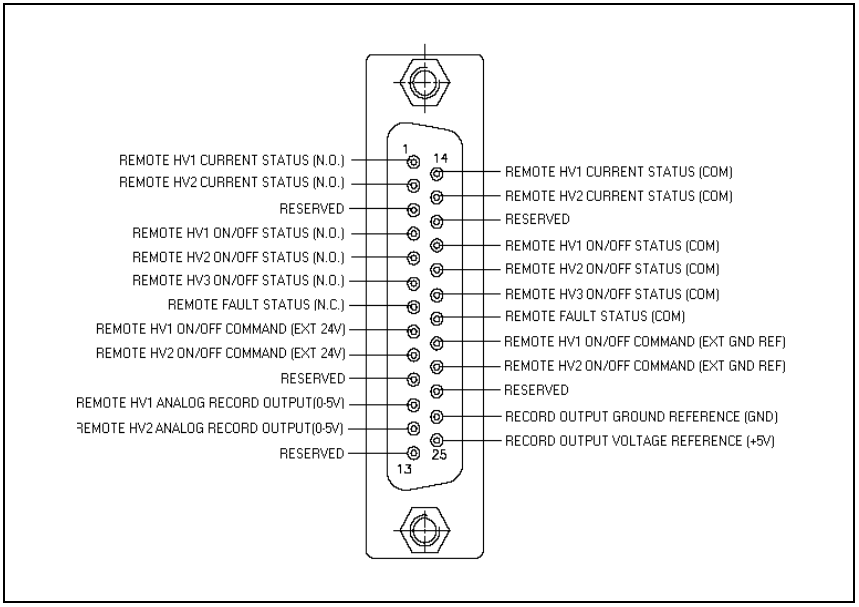


Figure 6 Remote I/O Pinout Rear Panel D-Shell Female 25P

The controller is shipped with the mating (male) connector with the 3 jumpers on the HV 1,2,3 On/Off (External Interlock) inputs in order to allow to switch the HV On and Off by the unit front panel.

In case there is the need to use the Remote Interlock function or to switch On and Off the HV on the 3 pumps by Remote, remove the 3 jumpers and connect the appropriate connections.

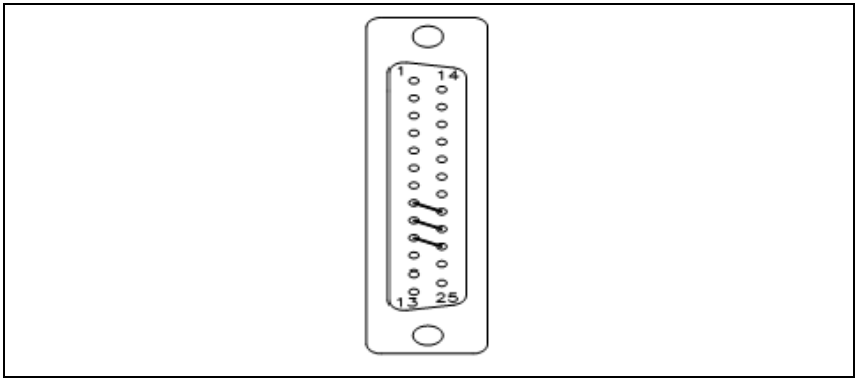


Figure 7 Remote I/O Jumpers Conn. D-Shell Male 25 Pin

Input Commands Connection

Input signals:Optically Insulated

Insulated 24 Vdc (+10 %, -50 %) supply for input signal:
Internally generated.

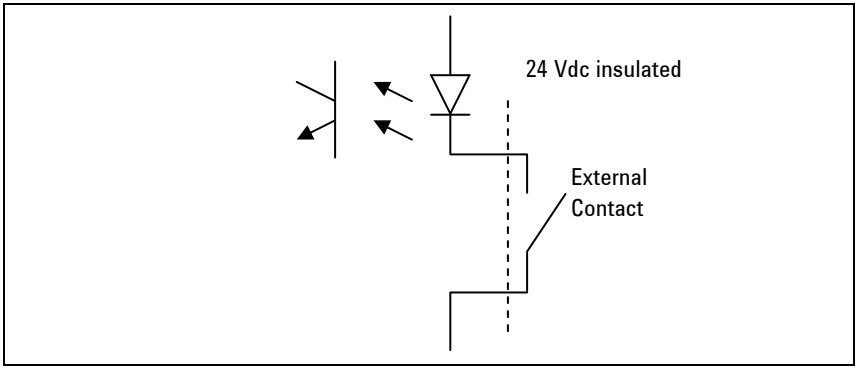


Figure 8

- Remote Interlock (Remote HV On/off)
  - Ch1 HV input: Pin 8, Pin 21
  - Ch2 HV input: Pin 9, Pin 22
  - Ch3 HV input: Pin 10, Pin 23

Output Signals Connection

Relay outputs: Single contact
Output relays rating: 2 A @ 125 Vac.
Minimum load: 10 mW (100 mV @ 1 mA).
Bounucing 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)

CH3 Set-Point: Pin 3 (NO), Pin 16 (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)

Ch3 HV Status: Pin 6 (NO), Pin 19 (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 normal operation
Relay Idle State: “Closed” when unit in main power OFF condition

Analog Recorder Outputs (Proportional Analog Recorder to Pump Current)

- Analog Recorder Output:
  - Ch1: Pin 11 (+), Pin 24 (0 V)
  - Ch2: Pin 12 (+), Pin 24 (0 V)
  - Ch3: Pin 13 (+), Pin 24 (0 V)

Note: At Pin 25 a reference voltage corresponding to the 3 recorder outputs full scale value (5 V +/- 5 %) is given.

This reference allows getting a more precise reading from the 3 recorder outputs. It allows the scaling of the actual reading to the real value of the full scale.

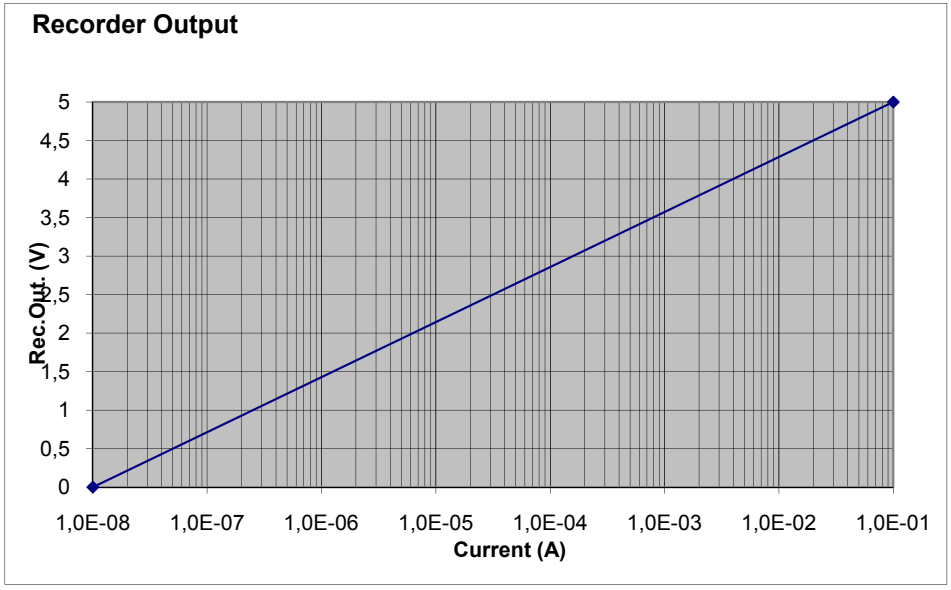


Figure 4

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 Pinouts (DB9 Female Connector)

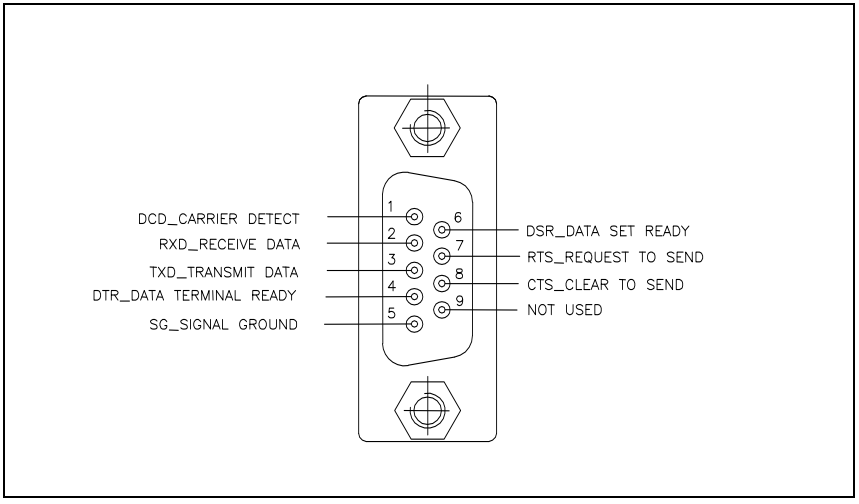


Figure 9 RS232 D-Shell Female 9P

Tab. 4 D Type 9 Pin FEMALE Connector

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

Pin Functions

Tab. 5

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 ... 5000 V] [0x0D]	6 characters 'CR ' 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 resetClear Fault (Reset)

“F0n”

n = HV Channel number 1 or 2

Max Output Voltage setting
“H0nxxxx”[Enter] where:

H0 = HV Channel Serial Command for Voltage Target

n = HV Channel number 1 or 2 or 3
xxxx = Voltage Target (min 3000 V, max 5000 V 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

16 for channel 3

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

16 for channel 3

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
‘3’ reports only channel 3
’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 Agilent operator.

Agilent Technologies

Vacuum Products Division

Dear Customer,

Thank you for purchasing an Agilent vacuum product. At Agilent Vacuum Products Division 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 products. 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.

Giampaolo LEVI

Vice President and General Manager
Agilent Vacuum Products Division

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

CUSTOMER REQUEST FOR CORRECTIVE / PREVENTIVE / IMPROVEMENT ACTION

TO: AGILENT VACUUM PRODUCTS DIVISION TORINO – QUALITY ASSURANCE

FAX N°: XXXX-011-9979350

ADDRESS: AGILENT TECHNOLOGIES ITALIA S.p.A. – Vacuum Products Division –

Via F.lli Varian, 54 – 10040 Leinì (TO) – Italy

E-MAIL: vpd-qualityassurance_pdl-ext@agilent.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 (by AGILENT VPD) LOG N° _____

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

Agilent Technologies

Agilent Technologies

Vacuum Products Division
Instructions for returning products

Dear Customer:

Please follow these instructions whenever one of our products needs to be returned.

1) Complete the attached Request for Return form and send it to Agilent Technologies (see below), taking particular care to identify all products that have pumped or been exposed to any toxic or hazardous materials.

2) After evaluating the information, Agilent Technologies will provide you with a Return Authorization (RA) number via email or fax, as requested.
Note: Depending on the type of return, a Purchase Order may be required at the time the Request for Return is submitted. We will quote any necessary services (evaluation, repair, special cleaning, eg).

3) **Important steps for the shipment of returning product:**
   - Remove all accessories from the core product (e.g. inlet screens, vent valves).
   - Prior to shipment, drain any oils or other liquids, purge or flush all gasses, and wipe off any excess residue.
   - If ordering an Advance Exchange product, **please use the packaging from the Advance Exchange to return the defective product.**
   - Seal the product in a plastic bag, and package product carefully to avoid damage in transit. You are responsible for loss or damage in transit.
   - Agilent Technologies is not responsible for returning customer provided packaging or containers.
   - **Clearly label package with RA number.** Using the shipping label provided will ensure the proper address and RA number are on the package. Packages shipped to Agilent without a RA clearly written on the outside cannot be accepted and will be returned.

4) Return only products for which the RA was issued.

5) **Product being returned under a RA must be received within 15 business days.**

6) **Ship to the location specified on the printable label, which will be sent, along with the RA number, as soon as we have received all of the required information.** Customer is responsible for freight charges on returning product.

7) Return shipments must comply with all applicable **Shipping Regulations** (IATA, DOT, etc.) and carrier requirements.

RETURN THE COMPLETED **REQUEST FOR RETURN** FORM TO YOUR NEAREST LOCATION:

EUROPE:	**NORTH AMERICA:**	**PACIFIC RIM:**
Fax: 00 39 011 9979 330		
Fax Free: 00 800 345 345 00	Fax: 1 781 860 9252	please visit our website for individual
Toll Free: 00 800 234 234 00	Toll Free: 800 882 7426, Option 3	office information
vpt-customercare@agilent.com	vpl-ra@agilent.com	http://www.agilent.com

Agilent Technologies

Vacuum Products Division
Request for Return Form
(Health and Safety Certification)

Please read important policy information on Page 3 that applies to all returns.

1) CUSTOMER INFORMATION

Company Name:	**Contact Name:**
Tel: **Email:**	**Fax:**
Customer Ship To:	**Customer Bill To:**
Europe only: **VAT reg. Number:**	USA/Canada only: ☐ **Taxable** ☐ **Non-taxable**

2) PRODUCT IDENTIFICATION

Product Description	Agilent P/N	Agilent S/N	Original Purchasing Reference

3) TYPE OF RETURN (**Choose one from each row** and supply Purchase Order if requesting a billable service)

3A. ☐ Non-Billable ☐ Billable ➡ New PO # (hard copy must be submitted with this form):

3B. ☐ Exchange ☐ Repair ☐ Upgrade ☐ Consignment/Demo ☐ Calibration ☐ Evaluation ☐ Return for Credit

4) HEALTH and SAFETY CERTIFICATION

AGILENT TECHNOLOGIES CANNOT ACCEPT ANY PRODUCTS CONTAMINATED WITH BIOLOGICAL OR EXPLOSIVE HAZARDS, RADIOACTIVE MATERIAL, OR MERCURY AT ITS FACILITY.
Call Agilent Technologies to discuss alternatives if this requirement presents a problem.

The equipment listed above (check one):

☐ **HAS NOT** pumped or been exposed to any toxic or hazardous materials. OR

☐ **HAS** pumped or been exposed to the following toxic or hazardous materials. If this box is checked, the following information must also be filled out. Check boxes for all materials to which product(s) pumped or was exposed:

☐ Toxic ☐ Corrosive ☐ Reactive ☐ Flammable ☐ Explosive ☐ Biological ☐ Radioactive

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

_____

NOTE: If a product is received at Agilent 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 Agilent employees as well as to any third party occurring as a result of exposure to toxic or hazardous materials present in the product.

Print Name: **Authorized Signature:** ..... **Date:**

5) FAILURE INFORMATION:

Failure Mode (REQUIRED FIELD. See next page for suggestions of failure terms):
Detailed Description of Malfunction: (Please provide the error message)
Application (system and model):

I understand and agree to the terms of Section 6, Page 3/3.
Print Name: **Authorized Signature:** ..... **Date:**

Agilent Technologies

Vacuum Products Division
Request for Return Form
(Health and Safety Certification)

Please use these Failure Mode to describe the concern about the product on Page 2.

TURBO PUMPS and TURBO CONTROLLERS

APPARENT DEFECT/MALFUNCTION		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	-Clogging	.....	OPERATING TIME:	

ION PUMPS/CONTROLLERS

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

VALVES/COMPONENTS

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

LEAK DETECTORS

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

INSTRUMENTS

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

SCROLL AND ROTARY VANE PUMPS

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

DIFFUSION PUMPS

- Heater failure	- Electrical problem
- Doesn't reach vacuum	- Cooling coil damage
- Vacuum leak	- Other

Section 6) *ADDITIONAL TERMS*

Please read the terms and conditions below as they apply to all returns and are in addition to the Agilent Technologies Vacuum Product Division – Products and Services Terms of Sale.

- Customer is responsible for the freight charges for the returning product. Return shipments must comply with all applicable **Shipping Regulations** (IATA, DOT, etc.) and carrier requirements.
- Customers receiving an Advance Exchange product agree to return the defective, rebuildable part to Agilent Technologies **within 15 business days**. Failure to do so, or returning a non-rebuildable part (crashed), will result in an invoice for the non-returned/non-rebuildable part.
- Returns for credit toward the purchase of new or refurbished Products are subject to prior Agilent approval and may incur a restocking fee. Please reference the original purchase order number.
- Units returned for evaluation will be evaluated, and a quote for repair will be issued. If you choose to have the unit repaired, the cost of the evaluation will be deducted from the final repair pricing. A Purchase Order for the final repair price should be issued within 3 weeks of quotation date. Units without a Purchase Order for repair will be returned to the customer, and the evaluation fee will be invoiced.
- A Special Cleaning fee will apply to all exposed products per Section 4 of this document.
- If requesting a calibration service, units must be functionally capable of being calibrated.

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