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

Agilent Technologies

Sublimation Controller

Model 929-0022
Model 929-0023

(I) *MANUALE ISTRUZIONI*

(D) *BEDIENUNGSHANDBUCH*

(F) *NOTICE DE MODE D'EMPLOI*

(GB) *INSTRUCTION MANUAL*

87-900-077-01(D)
APRIL 2006

Sublimation Controller

VARIAN

vacuum technologies

Dear Customer,

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

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

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

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

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

Sincerely.

Sergio PIRAS

Vice President and General Manager
VARIAN Vacuum Technologies

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

CUSTOMER REQUEST FOR CORRECTIVE / PREVENTIVE / IMPROVEMENT ACTION

TO : VARIAN VACUUM TECHNOLOGIES TORINO - QUALITY ASSURANCE

FAX N° : XXXX - 011 - 9979350

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

E-MAIL : marco.marzio@varianinc.com

NAME	COMPANY	FUNCTION

ADDRESS :

TEL. N° : FAX N° :

E-MAIL :

PROBLEM / SUGGESTION :

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

DATE

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

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

VARIAN

INFORMAZIONI GENERALI

Questa apparecchiatura è destinata ad uso professionale. L'utilizzatore deve leggere attentamente il presente manuale di istruzioni ed ogni altra informazione addizionale fornita dalla Varian prima dell'utilizzo dell'apparecchiatura. La Varian si ritiene sollevata da eventuali responsabilità dovute all'inosservanza totale o parziale delle istruzioni, ad uso improprio da parte di personale non addestrato, ad interventi non autorizzati o ad uso contrario alle normative nazionali specifiche.
Nei paragrafi seguenti sono riportate tutte le informazioni necessarie a garantire la sicurezza dell'operatore durante l'utilizzo dell'apparecchiatura. Informazioni dettagliate sono fornite nell'appendice "Technical informations".
Questo manuale utilizza le seguenti convenzioni:

⚠ PERICOLO!

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

☞ ATTENZIONE!

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

NOTA

Le note contengono informazioni importanti estrapolate dal testo.

DESCRIZIONE DEL CONTROLLER

Il Sublimation Controller della Varian è un controller per le pompe a sublimazione di titanio (TSP). L'unità può essere configurata in fabbrica a seconda delle necessità del cliente, ma la configurazione può essere modificata anche dal cliente per consentire l'adattamento a esigenze diverse.

DESCRIZIONE	NUMERO DI PARTE
Unità Base	
Sublimation Controller predisposto per una tensione di alimentazione di 220 Vac	929-0023
Sublimation Controller predisposto per una tensione di alimentazione di 120 Vac	929-0022
Accessori	
Scheda RS 232 Computer Interface	929-0024
Scheda RS 422 Computer Interface	929-0025
Scheda RS 485 Computer Interface	929-0026
Cavo per pompa TSP	924-0730
Cavo per pompa Mini Ti-Ball	924-0752

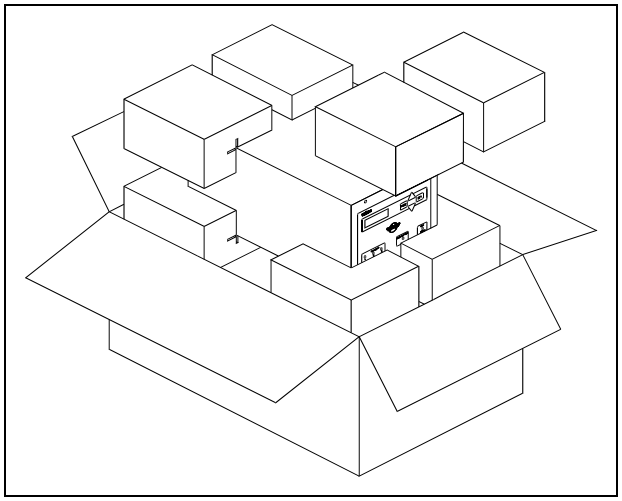
Il Sublimation Controller può controllare una pompa del tipo a sublimazione di titanio (TSP) oppure del tipo Mini Ti-Ball.
Il Sublimation Controller ha diversi modi di funzionamento: MANUAL, AUTOMATIC, AUTOMAT/REMOTE e REMOTE SET.
Nei modi MANUAL e AUTOMATIC tutti i comandi sono dati tramite il pannello frontale. Nei modi REMOTE SET e AUTOMAT/REMOTE alcuni comandi sono dati tramite il pannello frontale ed altri mediante segnali sul connettore di I/O.

IMMAGAZZINAMENTO

Durante il trasporto e l'immagazzinamento del controller non devono essere superate le seguenti condizioni ambientali:
- temperatura: da -20 °C a +70 °C
- umidità relativa: 0 - 95% (non condensante).

PREPARAZIONE PER L'INSTALLAZIONE

Il Sublimation Controller viene fornito in un imballo protettivo speciale; se si presentano segni di danni, che potrebbero essersi verificati durante il trasporto, contattare l'ufficio vendite locale.
Durante l'operazione di disimballaggio, prestare particolare attenzione a non lasciar cadere il controller e a non sottoporlo ad urti o vibrazioni.
Non disperdere l'imballo nell'ambiente. Il materiale è completamente riciclabile e risponde alla direttiva CEE 85/399 per la tutela dell'ambiente.



Imballaggio del Controller

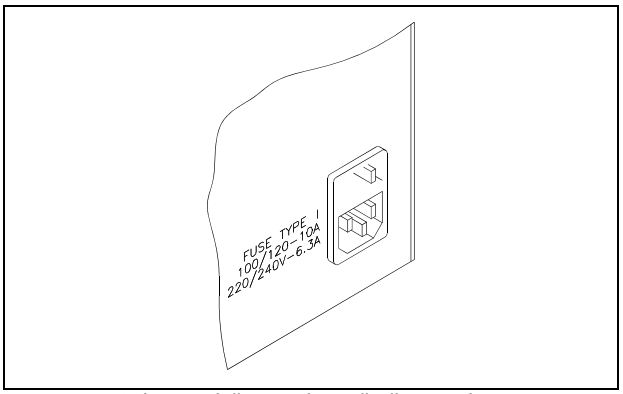
Il Sublimation Controller è predisposto in fabbrica per le seguenti tensioni di alimentazione:
- modello 929-0023 per 220 Vac (tensione di ingresso da 180 a 265 Vac).
- modello 929-0022 per 120 Vac (tensione di ingresso da 90 a 130 Vac).

Nel caso in cui fosse necessario cambiare la tensione di alimentazione, eseguire la seguente procedura:
- Spegnere il Sublimation Controller e staccare il cavo di alimentazione dalla rete.
- Togliere la maschera portafusibili dal pannello posteriore e sfilare il cambiatensione.
- Ruotare il cambiatensione portando il valore di tensione desiderato rivolto verso l'esterno.

☞ ATTENZIONE!

Se la selezione della tensione di ingresso viene portata da 100-120 Vac a 220-240 Vac, o viceversa, DEVONO essere cambiati anche i fusibili ed il cavo di alimentazione.
Per le tensioni 220-240 Vac i fusibili devono essere T6,3A, mentre per le tensioni 100-120 Vac devono essere T10A.

- Se necessario, cambiare i fusibili ed il cavo di alimentazione. Se occorre cambiare il cavo di alimentazione, esso va cablato nel seguente modo:
  blu = neutro
  marrone = fase
  giallo verde = terra
- Reinserire il cambiatensione e riposizionare la maschera portafusibili.
- Collegare il cavo di alimentazione alla rete.



Selettore della Tensione di Alimentazione

INSTALLAZIONE

PERICOLO!

Il Sublimation Controller è munito di un cavo di alimentazione a 3 fili con una spina di sicurezza (approvata a livello internazionale). Utilizzare questo cavo di alimentazione e spina insieme ad una presa munita di collegamento di terra, onde evitare folgorazioni. Verificare che il collegamento di terra sia collegato correttamente.
All'interno del controller si sviluppano alte tensioni che possono recare gravi danni o la morte. Prima di eseguire qualsiasi operazione di installazione o manutenzione del controller scollegarlo dall'alimentazione.

ATTENZIONE!

Il Sublimation Controller può essere usato sia come unità da tavolo sia come modulo a rack, in ogni caso deve essere posizionato in modo tale che l'aria possa circolare liberamente attraverso i fori di areazione presenti sulla copertura superiore e laterale.
Se il Sublimation Controller viene utilizzato come modulo a rack, DEVE essere inserito in un adattatore alto quattro unità rack per evitare che cada all'interno del rack stesso. Il pannello frontale del Sublimation non è previsto per reggere il peso dell'unità.
Non installare o utilizzare il Sublimation Controller in un ambiente esposto ad agenti atmosferici (pioggia, neve, ghiaccio), polvere, gas corrosivi, o in un ambiente esplosivo o ad alto rischio di infiammabilità.

NOTA

Se il Sublimation Controller è utilizzato come unità da tavolo, devono essere presenti i quattro piedini laterali. Se il Sublimation Controller è installato in un rack, rimuovere i quattro piedini e posizionarlo con almeno 30 mm (1,2 pollici) di spazio sopra e sotto.

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

- temperatura: da + 5 °C a +45 °C,
- umidità relativa: 0 - 90 % (senza condensa).

Per collegare il Sublimation Controller alla pompa utilizzare il cavo specifico fornito come opzione. Per informazioni su questi ed altri collegamenti e sull'installazione della scheda opzionale consultare l'appendice "Technical Information".

USO

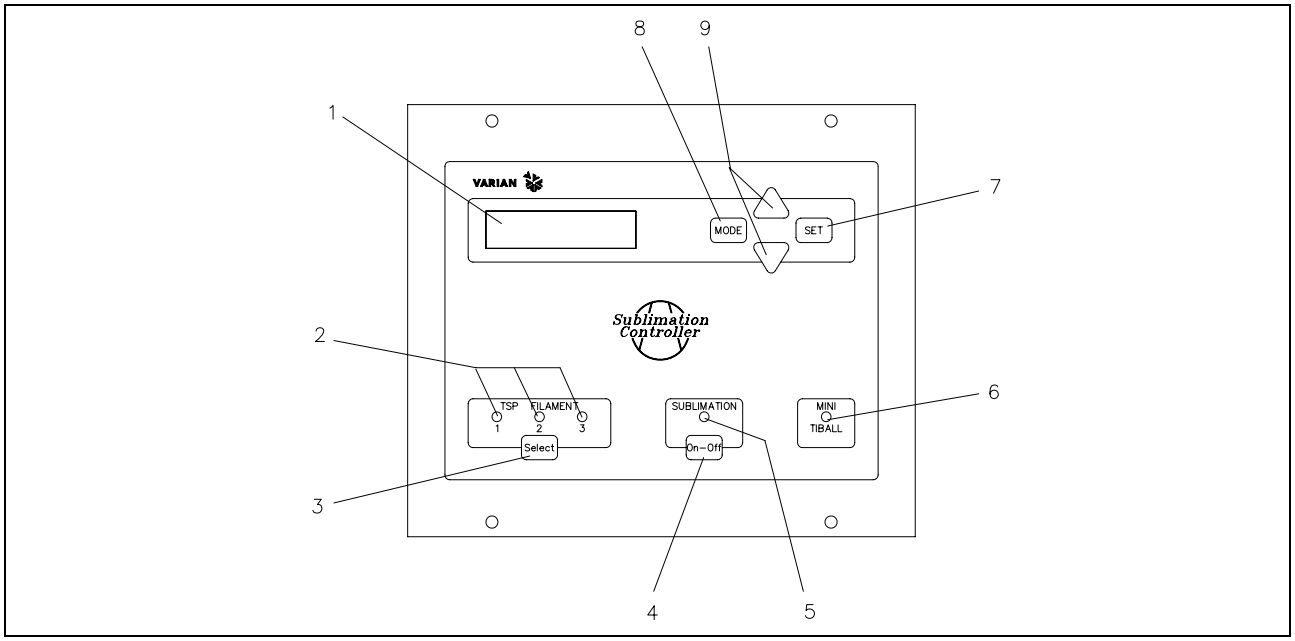
In questo paragrafo sono riportate le principali procedure operative. Per ulteriori dettagli e per procedure che coinvolgono collegamenti o particolari opzionali, fare riferimento al paragrafo "Use" dell'appendice "Technical Information".
Prima dell'utilizzo effettuare tutti i collegamenti elettrici del controller e della pompa e fare riferimento al manuale della pompa collegata. Leggere attentamente anche tale manuale prima dell'utilizzo del sistema.

PERICOLO!

Per evitare danni alle persone ed all'apparato, nel caso in cui la pompa sia appoggiata su un tavolo assicurarsi che sia stabile. Non far funzionare mai la pompa se la flangia di ingresso non è collegata al sistema o non è chiusa con la flangia di chiusura.

Controlli ed Indicatori del Pannello Frontale del Sublimation Controller

La figura seguente illustra il pannello frontale del Sublimation Controller.
Il significato e la funzione dei controlli e degli indicatori è dettagliato nella seguente tabella.

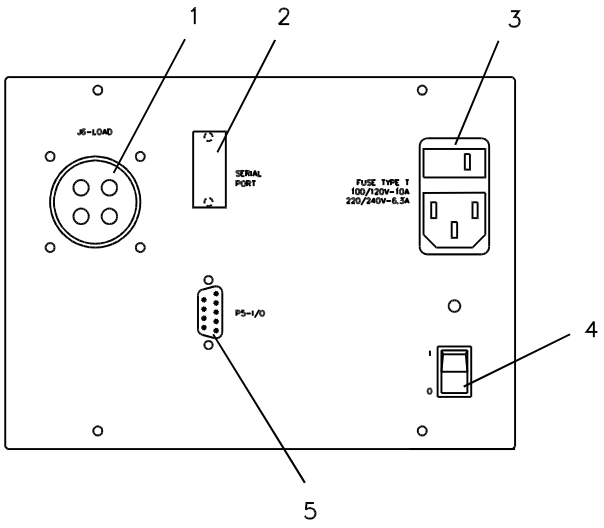


Controlli ed Indicatori del Pannello Frontale del Sublimation Controller

Rif.	Nome del Controllo/Indicatore	Descrizione del Controllo/Indicatore
1		Display LCD a matrice di punti retroilluminato, 16 caratteri 2 righe.
2	TSP FILAMENT 1 , 2, 3	Led verdi che indicano: • se accesi, la selezione del corrispondente filamento della pompa TSP, • se lampeggianti, che il corrispondente filamento della pompa TSP è interrotto.
3	SEL	Pulsante per la selezione manuale di uno dei 3 filamenti della pompa TSP.
4	ON/OFF	Pulsante per la commutazione del modo di funzionamento del controller: • su OFF il è attivo il modo "Impostazione Parametri" • su ON è attivo il modo "Sublimazione".
5	SUBLIMATION	Led verde che indica: • se acceso, che si è nel tempo di attesa fra 2 sublimazioni o nella fase di rampa di corrente; • se lampeggiante, che è in corso la sublimazione.
6	MINI TIBALL	Led verde acceso quando è selezionato il modo di funzionamento per Mini Ti-Ball.
7	SET	Pulsante che, a seconda dei casi, permette di: • confermare l'inizio della sublimazione; • memorizzare le selezioni fatte; • resettare una situazione di Errore.
8	MODE	Pulsante che, a seconda dei casi, permette di: • selezionare il modo di funzionamento (MANUAL, AUTOMATIC, AUTOMAT/REMOTE e REMOTE SET); • uscire dalle pagine di impostazione parametri senza cambiare i parametri.
9	[▲ / ▼]	Pulsanti che servono a modificare i valori nelle pagine di impostazione parametri.

Pannello Posteriore del Sublimation Controller

La figura seguente mostra i controlli e le connessioni del pannello posteriore del Sublimation Controller.



1. Connettore per il collegamento del cavo opzionale verso la pompa TSP o Mini Ti-Ball
2. Connettore RS 232-422-485 opzionale
3. Connettore di alimentazione, selezione tensione di ingresso, fusibili di protezione
4. Interruttore di alimentazione: acceso (I)/spento (O)
5. Connettore per segnali di I/O

PROCEDURE DI USO

Modi di Funzionamento

Il Sublimation Controller può funzionare nei modi MANUAL, AUTOMATIC, REMOTE SET e AUTOMAT/REMOTE.
Nei modi MANUAL e AUTOMATIC tutti i comandi sono dati da pannello frontale.
Nei modi di funzionamento AUTOMAT/REMOTE e REMOTE SET i comandi sono dati sia tramite segnali sul cavo di I/O sia dal pannello frontale.

NOTA

Dopo una interruzione dell'alimentazione il Sublimation ritorna sempre all'ultimo modo di funzionamento impostato. Se il parametro "AUTOSTART" è stato impostato su "YES" ed era in corso una sublimazione, questa riprenderà automaticamente.

L'unità è progettata per funzionare in due diversi modi:
- con la selezione manuale dei parametri (**MANUAL** e **REMOTE SET**)
- con la selezione automatica dei parametri (**AUTOMATIC** e **AUTOMAT/REMOTE**).

Il Sublimation Controller può essere usato per comandare le pompe del tipo TSP oppure del tipo Mini Ti-Ball.
Nei modi MANUAL e REMOTE SET la selezione dei parametri della sublimazione viene effettuata direttamente dall'operatore, attraverso i comandi del pannello frontale (modo MANUAL) o inviati sul connettore di I/O (modo REMOTE).
Se il Sublimation Controller deve essere usato in abbinamento a pompe del tipo TSP deve essere selezionato il tipo di sorgente TSP. Se il controller deve essere usato in abbinamento a pompe del tipo Mini Ti-Ball deve essere selezionato il tipo di sorgente Mini Ti-Ball.

NOTA

L'unità è predisposta in fabbrica nel seguente modo:

- *modo di funzionamento MANUAL*
- *tipo di sorgente TSP*
- *corrente di sublimazione 30 A*
- *tempo di sublimazione 1 minuto*
- *periodo di sublimazione 3 minuti*
- *livello di pressione $1x10^{-7}$ mbar*
- *"AUTOSTART" (riavvio automatico della sublimazione dopo una mancanza di alimentazione) su YES*

Informazioni dettagliate sui modi di funzionamento sono contenute nell'appendice "Technical Information".

Accensione del Sublimation Controller

Per accendere il Sublimation Controller è sufficiente portare l'interruttore di alimentazione presente sul pannello posteriore nella posizione "I".
Per procedere con la sublimazione è sufficiente premere l'interruttore "SUBLIMATION" presente sul pannello frontale, si accenderà il Led verde associato.

NOTA

Se il pulsante del pannello frontale non viene portato nella posizione "ON" la sublimazione non avrà luogo ma l'unità resterà in attesa dell'impostazione dei parametri.

Spegnimento del Sublimation Controller

Per spegnere il Sublimation Controller si deve procedere come segue:

- premere il pulsante "SUBLIMATION" del pannello frontale per portarlo in posizione "OFF" (Led verde spento)
- portare l'interruttore di alimentazione del pannello posteriore nella posizione "O".

MANUTENZIONE

Il Sublimation Controller non richiede alcuna manutenzione. Qualsiasi intervento deve essere eseguito da personale autorizzato.
In caso di guasto è possibile usufruire del servizio di riparazione Varian o del "Varian advance exchange service", che permette di ottenere un controller nuovo in sostituzione di quello guasto.

⚠ PERICOLO!

Prima di effettuare qualsiasi intervento sul controller scollegare il connettore di alimentazione.
In caso di guasto è possibile usufruire del servizio di riparazione Varian o del "Varian advanced exchange service", che permette di ottenere un controller in sostituzione di quello guasto.

Qualora un controller dovesse essere rottamato, procedere alla sua eliminazione nel rispetto delle normative nazionali specifiche.

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.

MESSAGGI DI ERRORE

Per certi tipi di guasti il controller esegue una auto-diagnosi e visualizza uno dei messaggi mostrati nella tabella seguente.

MESSAGGIO	DESCRIZIONE	AZIONE CORRETTIVA
POWER AC FAIL	Anomalia rilevata sul circuito di alimentazione dovuta ad una tensione di alimentazione non corretta.	Spegnere l'unità, quindi verificare la presenza di tensione e la corretta impostazione dei valori di alimentazione (110 - 120 Vac, 60 Hz o 220 - 240 Vac, 50 Hz).
HEATER DEFECTIVE	Si è verificata una interruzione del filamento del riscaldatore durante un ciclo di pompaggio con il Mini Ti-Ball.	Sostituire il Mini Ti-Ball.
FILAMENT X DEFECTIVE	Si è verificata una interruzione del filamento X (dove X può essere 1, 2 o 3) durante una sublimazione con un TSP. Nel caso in cui il parametro "TSP RECOVER" è in modo "AUTOMATIC" il software ripristina direttamente il normale funzionamento, selezionando il filamento successivo del cartridge. Nel caso in cui il parametro "TSP RECOVER" è in modo "MANUAL" la sublimazione viene interrotta.	Se il parametro "TSP RECOVER" è in modo "AUTOMATIC" il software provvede a selezionare automaticamente uno dei restanti filamenti disponibili, segnalando l'avvenuta commutazione sui Led di visualizzazione. Se il parametro "TSP RECOVER" è in modo "MANUAL" l'operatore deve riavviare manualmente la procedura di sublimazione.
CARTRIDGE DEFECTIVE XXX	Si è verificata una interruzione di tutti e tre i filamenti del TSP e la sublimazione viene interrotta.	Sostituire il cartridge.
FAULT: OVERTEMPERATURE	Si è verificato un sovraccarico del trasformatore e il ciclo di pompaggio viene interrotto.	Rimuovere la causa del sovraccarico sul trasformatore.
EXTERNAL INTERLOCK	Non è stato collegato il contatto di interlock (pin 3) sul connettore di I/O.	Collegare l'interlock.

ALLGEMEINES

Dieser Apparat ist für Fachbetriebe bestimmt. Vor Gebrauch sollte der Benutzer dieses Handbuch sowie alle weiteren von Varian mitgelieferten Zusatzdokumentationen genau lesen. Bei Nichtbeachtung - auch teilweise - der enthaltenen Hinweise, unsachgemäßem Gebrauch durch ungeschultes Personal, nicht autorisierten Eingriffen und Mißachtung der einheimischen, hier zur Geltung kommenden Bestimmungen übernimmt die Firma Varian keinerlei Haftung.
In den folgenden Abschnitten sind alle erforderlichen Informationen für die Sicherheit des Bedieners bei der Anwendung des Gerätes aufgeführt. Detaillierte technische Informationen sind im Anhang "Technical Information" enthalten.
In dieser Gebrauchsanleitung werden Sicherheitshinweise folgendermaßen hervorgehoben:

⚠ GEFAHR!

Die Gefahrenhinweise lenken die Aufmerksamkeit des Bedieners auf bestimmte Vorgänge oder Praktiken, die bei unkorrekter Ausführung schwere Verletzungen hervorrufen können.

☞ ACHTUNG!

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

ANMERKUNG

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

BESCHREIBUNG DES CONTROLLERS

Der Sublimation Controller von Varian ist ein Controller für die Pumpen mit Titansublimation (TSP). Das Gerät kann im Werk nach den Angaben des Kunden voreingestellt werden, wobei im Werk voreingestellte Geräte vom Kunden den spezifischen Betriebsbedingungen entsprechend konfiguriert werden können.

BEZEICHNUNG	BEST.-NR.
Grundeinheit	
Sublimation-Controller, voreingestellt für Versorgungsspannung 220 V Ws	929-0023
Sublimation-Controller, voreingestellt für Versorgungsspannung 120 V Ws	929-0022
Zubehör	
Karte RS 232 Computer-Schnittstelle	929-0024
Karte RS 422 Computer-Schnittstelle	929-0025
Karte RS 485 Computer-Schnittstelle	929-0026
Kabel für Pumpe TSP	924-0730
Kabel für Pumpe Mini Ti-Ball	924-0752

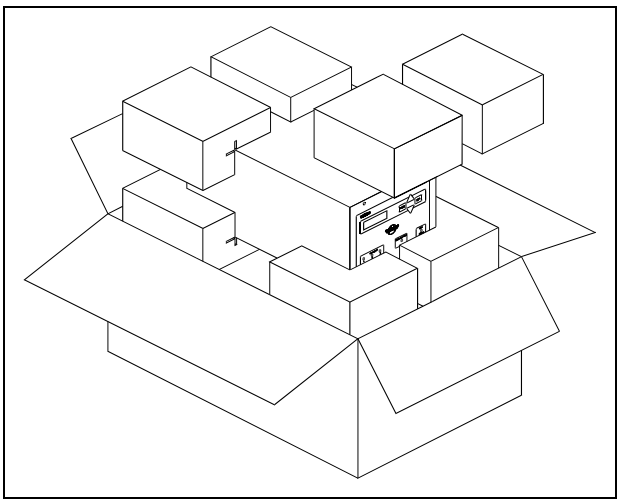
Der Sublimation-Controller kann zur Steuerung von Sublimationspumpen aus Titan (TSP) oder Pumpen der Baureihe Mini Ti-Ball eingesetzt werden.
Der Sublimation-Controller kann in den Betriebsarten MANUAL, AUTOMATISCH, AUTOMATISCH / FERNGESTEUERT und FERNGESTEUERT SET (voreingestellt) betrieben werden. In den Betriebsarten MANUAL und AUTOMATISCH werden die Steuerbefehle über die frontale Schalttafel des Controllers eingegeben; in den Betriebsarten AUTOMATISCH / FERNGESTEUERT und FERNGESTEUERT SET dagegen werden bestimmte Steuerbefehle über die frontale Schalttafel des Controllers eingegeben und andere über einen Verbindungsstecker und E/A-Signale übertragen.

LAGERUNG

Beim Transport und bei der Lagerung des Controllers müssen folgende klimatischen Verhältnisse eingehalten werden:
- Temperatur: von -20 °C bis +70 °C
- Relative Luftfeuchtigkeit: 0-95 % (nicht kondensierend)

VOR DER INSTALLATION

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



Verpackung des Controllers

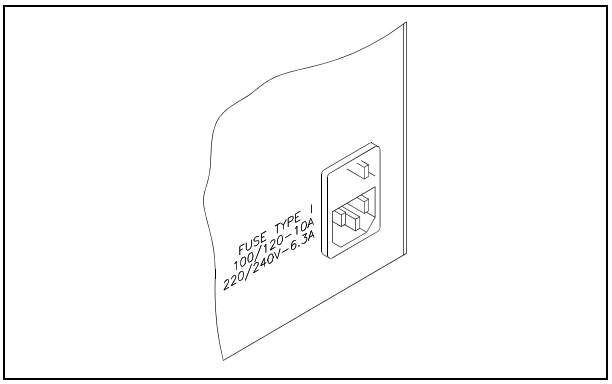
Der Sublimation-Controller sind werkseitig für folgende Versorgungsspannungen ausgelegt:
- Modell 929-0023 für 220 V Ws (Eingangsspannung von 180 bis 265 V Ws);
- Modell 929-0022 für 120 V Ws (Eingangsspannung von 90 bis 130 V Ws).

Soll die Versorgungsspannung geändert werden, so gehen Sie wie folgt vor:
- Schalten Sie den Controller aus, und ziehen Sie das Netzkabel.
- Nehmen Sie den auf der Rückseite des Controllers installierten Sicherungskasten ab, und ziehen Sie den Spannungswechsler heraus.
- Stellen Sie den Spannungswechsler auf die gewünschte Versorgungsspannung ein, indem Sie ihn nach außen hin drehen.

☞ ACHTUNG!

Sollte die Vorsorgungsspannung von 100-120 V Ws auf 220-240 V Ws oder umgekehrt geändert werden, MÜSSEN IN JEDEM FALL auch die Sicherungen und das Netzkabel entsprechend ausgetauscht werden.
Setzen Sie für eine Versorgungsspannung 220-240 V Ws Sicherungen vom Typ T6, 3A und für eine Versorgungsspannung 100-120 V Ws T10A-Sicherungen ein.

- Tauschen Sie immer, soweit erforderlich, die Sicherungen und das Netzkabel aus. Sollte ein Austausch des Netzkabels vorgenommen werden, so müssen die Leiter wie folgt angeschlossen werden:
  blau = neutral
  braun = Phase
  grün-gelb = Erde
- Setzen Sie den Spannungsumschalter wieder ein, und setzen Sie den Sicherungskasten wieder auf.
- Stecken Sie das Netzkabel in eine Netzsteckdose.



Spannungsumschalter

INSTALLATION

GEFAHR!

Der Sublimation-Controller wird mit einem Netzkabel mit 3 Leitern und mit einem den internationalen Normen entsprechenden Netzstecker geliefert. Es sollte immer dieses Netzkabel benutzt werden, das an eine vorschriftsmäßig geerdete Steckdose anzuschließen ist, um Stromentladungen zu vermeiden. Vergewissern Sie sich, daß das Gerät vorschriftsmäßig geerdet ist.
Im Inneren des Controllers entstehen hohe Spannungen, die schwere Schäden verursachen und lebensgefährlich sein können. Vor jedem Montage- bzw. Wartungseingriff muß deshalb der Netzstecker gezogen werden.

ACHTUNG!

Der Controller kann auf einen Tisch oder ein Gestell montiert werden. In beiden Fällen muß eine ungehinderte Zirkulation der Kühlluft durch die im Gehäuse vorne und unten eingelassen Luftöffnungen gewährleistet sein.
Wenn der Controller in einem Gestell montiert wird, MUSS er in einer vier Rackeinheiten hohen Adapter-Einheit installiert werden, um zu vermeiden, daß der Controller nicht in das Gestell fällt. Die vordere Schalttafel des Sublimation-Controllers ist nicht geeignet, das gesamte Gewicht der Einheit zu tragen.
Der Controller darf nicht in Umgebungen installiert u/o benutzt werden, die Witterungseinflüssen (Regen, Frost, Schnee), Staub und aggressiven Gasen ausgesetzt sind und in denen Explosions- und erhöhte Brandgefahr besteht.

ANMERKUNG

Zur Tischaufstellung des Controllers müssen die vier seitlichen Füße ausgezogen werden. Wenn der Controller in einem Gestell installiert werden soll, müssen alle vier Füße abmontiert werden; lassen Sie bei Rack-Installation des Controllers über- und unterhalb einen Raum von wenigstens 30 mm (1,2 Zoll).

Während des Betriebs müssen folgende Umgebungsbedingungen eingehalten werden:

- Temperatur: von +0 °C bis +45 °C;
- Relative Luftfeuchtigkeit: 0 - 95 % (nicht kondensierend).

Für den Anschluß des Sublimation-Controllers an die Pumpe muß das zum Controller gehörende Kabel benutzt werden. Detailliertere Hinweise zu weiteren Anschlußarten sowie zum Einsatz der Zusatzkarte finden Sie im Anhang "Technical Information".

GEBRAUCH

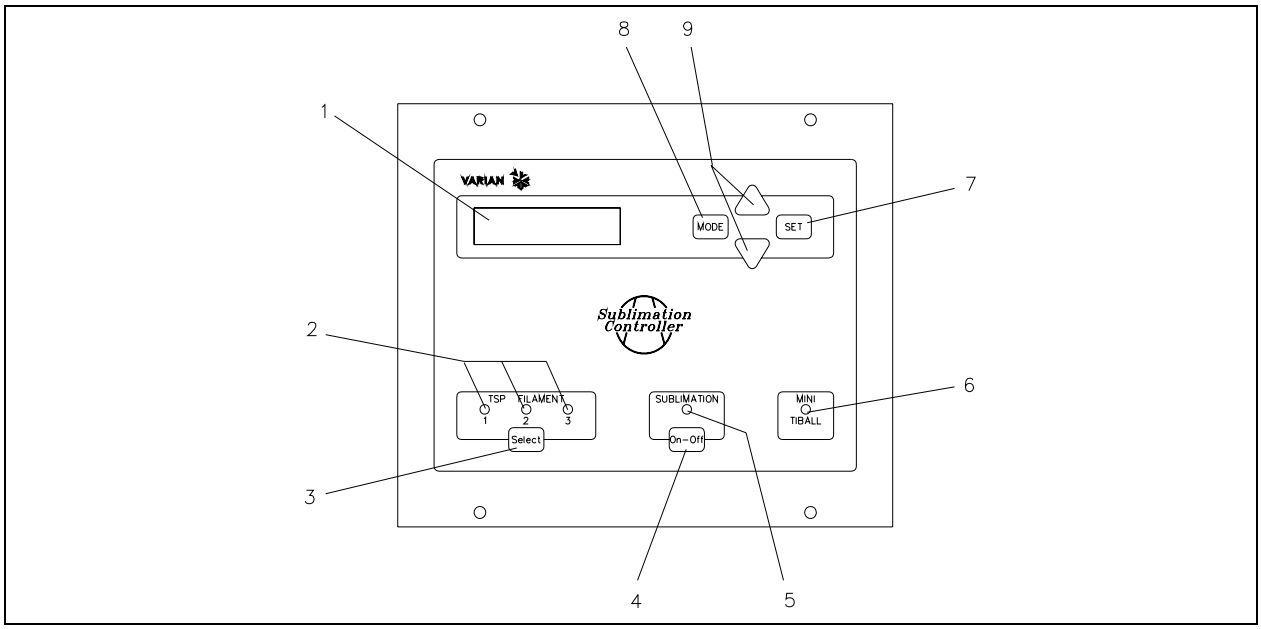
In diesem Kapitel sind die wichtigsten Betriebsvorgänge aufgeführt. Für weitere Hinweise bezüglich Anschluß und Montage des bestellbaren Zubehörs verweisen wir auf das Kapitel "Use" im Anhang zu "Technical Information".
Vor Benutzung des Controllers müssen sämtliche elektrischen Anschlüsse des Controllers und der Pumpe ausgeführt und die Betriebsanleitung der angeschlossenen Pumpe genauestens durchlesen werden.

GEFAHR!

Steht die Pumpe auf einem Tisch, muß auf den stabilen Stand geachtet werden, da sonst die Gefahr von Personen- und Geräteschäden besteht. Die Pumpe nie einschalten, wenn der Eingangsflansch nicht am System angeschlossen bzw. nicht mit dem Schließflansch abgedeckt ist.

Schalter und Anzeigen auf der vorderen Schalttafel des Sublimation-Controllers

Nachstehend wird die vordere Schalttafel des Sublimation-Controllers gezeigt.
Die jeweilige Bedeutung und Funktion der Schalter und Anzeigen wird in der nachstehenden Tabelle beschrieben.

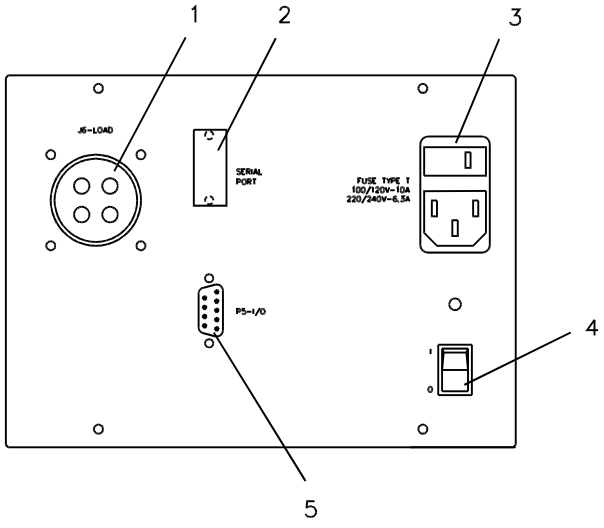


Schalter und Anzeigen auf der vorderen Schalttafel des Sublimation-Controllers

Pos.	Bezeichnung des Schalters / der Anzeige	Funktion des Schalters / der Anzeige
1		Rückbeleuchtetes LCD-Display, 16 Buchstaben, 2 Zeilen
2	TSP FILAMENT 1,2,3	Bedeutung der grünen LEDs: • Aufleuchten: Wahl des entspr. Glühdrahtes der TSP-Pumpe • Blinken: Unterbrechung des Glühdrahtes der TSP-Pumpe
3	SEL	Druckschalter zur manuellen Selektion einer der 3 Glühdrähte der TSP-Pumpe
4	ON/OFF	Druckschalter zur Umschaltung der Betriebsart des Controllers: • OFF: Betriebsart “Parametereingabe” aktiv • ON: Betriebsart “Sublimationszyklus” aktiv
5	SUBLIMATION	Bedeutung des grünen LEDs: • Aufleuchten: Anzeige der Wartezeit zwischen 2 Sublimationen oder der Phase des Stromanstiegs • Blinken: Sublimation aktiv
6	MINI TIBALL	Das Aufleuchten des grünen LEDs steht für die Selektion der Betriebsart Mini Ti-Ball
7	SET	Druckschalter mit folgender Funktionsbelegung: • Bestätigung Sublimationsbeginn • Speicherung der Selektionen • Störungsrückstellung
8	MODE	Druckschalter mit folgender Funktionsbelegung: • Selektion der Betriebsart MANUAL, AUTOMATISCH, AUTOMATISCH / FERNGESTEUERT und FERNGESTEUERT SET • Absprung von der Seite “Parametereingabe” ohne Änderung der eingegebenen Parameter
9	[▲ / ▼]	Druckschalter zur Modifizierung der Werte auf den Seiten zur Parametereingabe

Hintere Schalttafel des Sublimation-Controllers

Die nebenstehende Abbildung zeigt die Schalter und Anschlußstellen der hinteren Schalttafel des Sublimation-Controllers.



1. Steckverbindung zum Anschluß des Zusatzkabels zur TSP- oder Mini Ti-Ball-Pumpe
2. Steckverbindung RS232-422-485 (Sonderzubehör)
3. Netzkabelanschluß, Wahlschalter Eingangsspannung, Sicherungen
4. Netzschalter: aufblinkend: EIN, nicht aufblinkend: AUS
5. Steckverbindung zum Anschluß der E/A-Signale

BEDIENUNG

Betriebsarten

Der Sublimation-Controller kann in den Betriebsarten MANUAL, AUTOMATISCH, AUTOMATISCH / FERNGESTEUERT und FERNGESTEUERT SET (voreingestellt) betrieben werden.
In den Betriebsarten MANUAL und AUTOMATISCH werden die Steuerbefehle über die frontale Schalttafel des Controllers eingegeben; in den Betriebsarten AUTOMATISCH / FERNGESTEUERT und FERNGESTEUERT SET dagegen werden bestimmte Steuerbefehle über die frontale Schalttafel des Controllers eingegeben und andere über einen Verbindungsstecker und E/A-Signale übertragen.

ANMERKUNG

Nach einem Stromausfall wird der Sublimationsbetrieb immer in der jeweils zuletzt selektionierten Betriebsart aufgenommen. Wenn der Parameter “AUTOSTART” mit “YES” bestätigt wurde und der Sublimationsvorgang lief, wird dieser automatisch wieder aufgenommen.

Das Gerät kann auf zwei verschiedene Arten betrieben werden:
- über manuelle Selektion der Parameter (**MANUAL** und FERNGESTEUERT SET)
- über automatische Selektion der Parameter (**AUTOMATISCH** und **AUTOMATISCH /FERNGESTEUERT**).

Der Sublimation-Controller kann zur Steuerung von TSP-Pumpen oder Pumpen der Baureihe Mini Ti-Ball eingesetzt werden.
In den Betriebsarten MANUAL und FERNGESTEUERT SET wird die Selektion der Sublimationsparameter vom Bediener über die frontale Schalttafel des Controllers (Betriebsart MANUAL) vorgenommen oder über den Verbindungsstecker und entsprechende E/A-Signale (Betriebsart FERNGESTEUERT) übertragen.
Wenn der Sublimation Controller mit TSP-Pumpen verwendet wird, muß die Betriebsart TSP selektioniert werden.
Wird der Sublimation Controller dagegen mit einer Mini Ti-Ball-Pumpe verwendet, so muß die Betriebsart Mini Ti-Ball eingestellt werden.

HINWEIS

Der Controller ist werkseitig wie folgt eingestellt:
- *Bedienungsart MANUAL;*
- *Betriebsart für TSP-Pumpe;*
- *Sublimationsstrom 30A*
- *Sublimationszeit 1 Minute*
- *Sublimationsdauer 3 Minuten*
- *Druckpegel $1x10^{-7}$ mbar*
- *“AUTOSTART” (automatischer Neubeginn der Sublimation nach Stromausfall), Schalter auf “YES”*

Nähere Informationen können Sie dem Anhang 'Technical Information' entnehmen.

Zuschaltung des Sublimation Controllers

Zur Zuschaltung des Sublimation Controllers muß der auf der hinteren Schalttafel installierte Netzschalter des Gerätes auf “1” gestellt werden.
Zur Aktivierung des Sublimationszyklus muß der Schalter “SUBLIMATION” auf der vorderen Schalttafel gedrückt werden, so daß das entsprechende grüne LED aufleuchtet.

HINWEIS

Wenn der auf der vorderen Schalttafel installierte Schalter des Gerätes nicht auf “ON” gestellt wird, ist der Sublimationszyklus nicht aktiviert und das Gerät befindet sich im Status Parametereingabe..

Abschaltung des Sublimation Controllers

Gehen Sie zur Abschaltung des Sublimation Controllers wie folgt vor:

- Stellen Sie den auf der vorderen Schalttafel präsenten Schalter “SUBLIMATION” auf “OFF” (das grüne LED erlischt);
- Stellen Sie den auf der hinteren Schalttafel präsenten Netzschalter” auf “0”.

WARTUNG

Der Sublimation Controller ist wartungsfrei. Eventuell erforderliche Eingriffe müssen von dazu befugtem Fachpersonal ausgeführt werden.
Bei Störungen kann der Varian-Reparaturdienst bzw. der "Varian advanced exchange service" in Anspruch genommen werden, der für den Austausch defekter Controller sorgt.

⚠ GEFAHR!

Vor jedem Eingriff am Controller muß der Netzstecker gezogen werden.
Bei Störungen kann der Varian-Reparaturdienst bzw. der "Varian advanced exchange service" in Anspruch genommen werden, der für den Austausch defekter Controller sorgt.

Eine eventuelle Verschrottung muß unter Einhaltung der einschlägigen landesüblichen Vorschriften erfolgen.

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.

STÖRUNGSMELDUNGEN

In einigen Störungsfällen zeigt das Selbstdiagnosesystem des Controllers die in der nachstehenden Tabelle zusammengefaßten Meldungen an.

MELDUNG	BESCHREIBUNG	STÖRUNGSBEHEBUNG
POWER AC FAIL	Störung am Versorgungsstromkreis aufgrund einer falschen Versorgungsspannung.	Schalten Sie das Gerät aus, vergewissern Sie sich von der Spannungspräsenz und der vorgeschriebenen Werte (110-120 V Ws, 60 Hz oder 220-240 V Ws, 50 Hz)
HEATER DEFECTIVE	Unterbrechung im Glühdraht der Heizeinheit während des Pumpzyklus mit Mini Ti-Ball-Pumpe.	Tauschen Sie die Mini Ti-Ball-Pumpe aus.
FILAMET X DEFECTIVE	Unterbrechung im Glühdraht X (entweder 1, 2 oder 3) während des Sublimationszyklus mit TSP-Pumpe. Sollte der Parameter “TSP RECOVER” mit “AUTOMATISCH” eingegeben worden sein, so aktiviert das Programm automatisch die normale Betriebsart, indem der nächste Glühdraht der Heizpatrone selektioniert wird. Sollte der Parameter “TSP RECOVER” mit “MANUELL” eingegeben worden sein, wird der Sublimationszyklus unterbrochen.	Sollte der Parameter “TSP RECOVER” mit “AUTOMATISCH” eingegeben worden sein, so selektioniert das Programm selbsttätig einen der weiteren Glühdrähte und zeigt dies über das entsprechende LED an. Sollte der Parameter “TSP RECOVER” mit “MANUELL” eingegeben worden sein, muß der Sublimationszyklus vom Bediener neu aktiviert werden.
CARTRIDGE DEFECTIVE XXX	Unterbrechung eines oder aller Glühdrähte des TSP-Pumpe; Unterbrechung des Sublimationszyklus.	Tauschen Sie die Heizpatrone aus-.
FAULT: OVER-TEMPERATURE	Überlastung des Transformators und Unterbrechung des Pumpzyklus.	Beheben Sie die Ursache der Überlastung des Transformators.
EXTERNAL INTERLOCK	Kein Anschluß des Interlock-Kontaktes (Stift 3) der Steckverbindung E/A.	Schließen Sie den Stift des Interlock-Kontaktes an.

INDICATIONS GENERALES

Cet appareillage a été conçu en vue d'une utilisation professionnelle. Il est conseillé à l'utilisateur de lire attentivement cette notice d'instructions ainsi que toute autre indication supplémentaire fournie par Varian, avant l'utilisation de l'appareil. Varian décline par conséquent toute responsabilité en cas d'inobservation totale ou partielle des instructions données, d'utilisation incorrecte de la part d'un personnel non formé, d'opérations non autorisées ou d'emploi contraire aux réglementations nationales spécifiques.
Les paragraphes suivants donnent toutes les indications nécessaires à garantir la sécurité de l'opérateur pendant l'utilisation de l'appareillage. Des renseignements plus détaillés se trouvent dans l'appendice "Technical Informations".
Cette notice utilise les signes conventionnels suivants:

DANGER!

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

ATTENTION!

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

NOTE

Les notes contiennent des renseignements importants, isolés du texte.

DESCRIPTION DU CONTROLEUR

Le Sublimation Controller produit par Varian est un contrôleur pour pompes à sublimation de titane (TSP). L'unité peut être configurée en usine selon les nécessités du client, mais la configuration peut également être modifiée par le client lui-même qui pourra l'adapter à des exigences diverses.

DESCRIPTION	NUM. DE L'ELEMENT
Unité de Base	
Sublimation Controller prééquipé pour une tension d'alimentation de 220 Vac	929-0023
Sublimation Controller prééquipé pour une tension d'alimentation de 120 Vac	929-0022
Accessoires	
Carte RS 232 Computer Interface	929-0024
Carte RS 422 Computer Interface	929-0025
Carte RS 485 Computer Interface	929-0026
Câble pour pompe TSP	924-0730
Câble pour pompe Mini Ti-Ball	924-0752

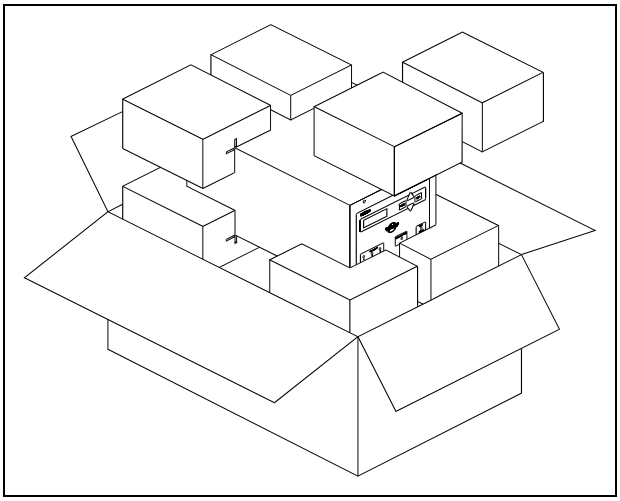
Le Sublimation Controller peut commander une pompe du type à sublimation au titane (TSP) ou bien du type Mini Ti-Ball.
Le Sublimation Controller est caractérisé par différents modes de fonctionnement: MANUAL, AUTOMATIC, AUTOMAT /REMOTE et REMOTE SET.
Dans les modes MANUAL et AUTOMATIC, toutes les commandes sont données par tableau frontal. Dans les modes REMOTE SET et AUTOMAT/REMOTE, certaines commandes sont données par tableau frontal et d'autres par des signaux sur le connecteur d'E/S.

EMMAGASINAGE

Pendant le transport et l'emmagasinage du contrôleur, il faudra veiller à respecter les conditions environnementales suivantes:
- température: de - 20°C à + 70°C
- humidité relative: de 0% à 95% (non condensante).

PREPARATION POUR L'INSTALLATION

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



Emballage du contrôleur

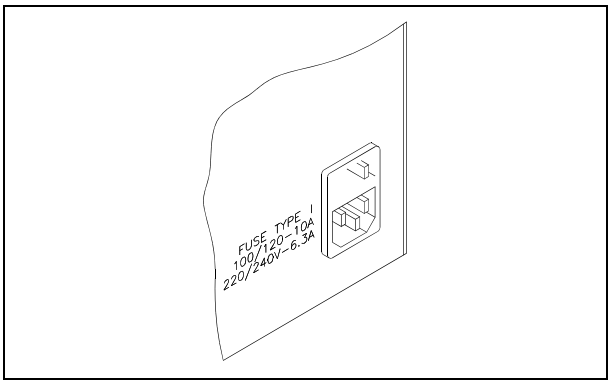
Le Sublimation Controller est prééquipé en usine pour les tension d'alimentation suivantes:
- modèle 929-0023 pour 220 Vac (tension d'entrée de 180 à 265 Vac)
- modèle 929-0022 pour 120 Vac (tension d'entrée de 90 à 130 Vac).

S'il s'avère nécessaire de changer la tension d'alimentation, procéder comme suit:
- Couper l'alimentation du Sublimation Controller et débrancher le câble d'alimentation du réseau.
- Enlever le cache porte-fusible du tableau dorsal et dégager le survolteur-dévolteur.
- Tourner le survolteur-dévolteur de manière à ce que la valeur de tension souhaitée se trouve vers l'extérieur.

ATTENTION!

Si la sélection de la tension d'entrée est portée de 100-120 Vac à 220-240 Vac, ou vice-versa, IL EST NECESSAIRE de changer également les fusibles et le câble d'alimentation.
Pour les tensions de 220-240 Vac, les fusibles doivent être T6,3A, tandis que pour les tensions 100-120 Vac, ils doivent être T10A.

- Si besoin est, changer les fusibles et le câble d'alimentation. S'il apparaît nécessaire de changer le câble d'alimentation, celui-ci doit être câblé comme suit:
  bleu = neutre
  marron = phase
  jaune vert = terre.
- Remettre en place le survolteur-dévolteur ainsi que le cache porte-fusibles.
- Connecter le câble d'alimentation au réseau.



Sélecteur de la Tension d'Alimentation

INSTALLATION

DANGER!

Le Sublimation Controller est muni d'un câble d'alimentation à 3 fils, avec une fiche de sécurité (approuvée au niveau international). Utiliser ce câble d'alimentation et cette fiche avec une prise munie de connexion à la terre, afin d'éviter tout risque d'électrocution. S'assurer que la connexion à la terre soit correctement connectée.
A l'intérieur du contrôleur se développent de hautes tensions qui peuvent causer de graves dommages et même la mort. Avant d'effectuer toute opération d'installation ou d'entretien du contrôleur, le débrancher de la prise d'alimentation.

ATTENTION!

Le Sublimation Controller peut être utilisé soit comme unité de table soit comme module à rack. Il doit, de toute façon, être positionné de façon à ce que l'air de refroidissement puisse circuler librement à travers les trous d'aération se trouvant sur la couverture supérieure et latérale.
Si le Sublimation Controller est utilisé comme module à rack, Il DOIT être introduit dans un adaptateur haut de quatre unités de rack pour éviter qu'il ne tombe à l'intérieur du rack. Le tableau frontal du Sublimation Controller n'est pas prévu pour supporter le poids de l'unité.
Ne pas installer ou utiliser le contrôleur dans des milieux exposés à des agents atmosphériques (pluie, gel, neige), à des poussières, à des gaz de combat ainsi que dans des milieux explosifs ou à risque élevé d'incendie.

NOTE

Si le Sublimation Controller est utilisé comme unité de table, il faut que les quatre pieds latéraux soient présents. Si le Sublimation Controller est installé dans un rack, enlever les quatre pieds ou bien le positionner avec 30 mm (1.2 pouces) d'espace au moins au-dessus et au-dessous).

Pendant le fonctionnement, il est nécessaire de respecter les conditions environnementales suivantes:

- température: de +5°C à + 45°C
- humidité relative: de 0% à 95% (non condensante).

Pour relier le Sublimation Controller à la pompe, utiliser le câble spécifique fourni en option. Pour tous renseignements concernant ces connexions et d'autres connexions ainsi que l'installation de la carte optionnelle, consulter l'appendice "Technical Information".

UTILISATION

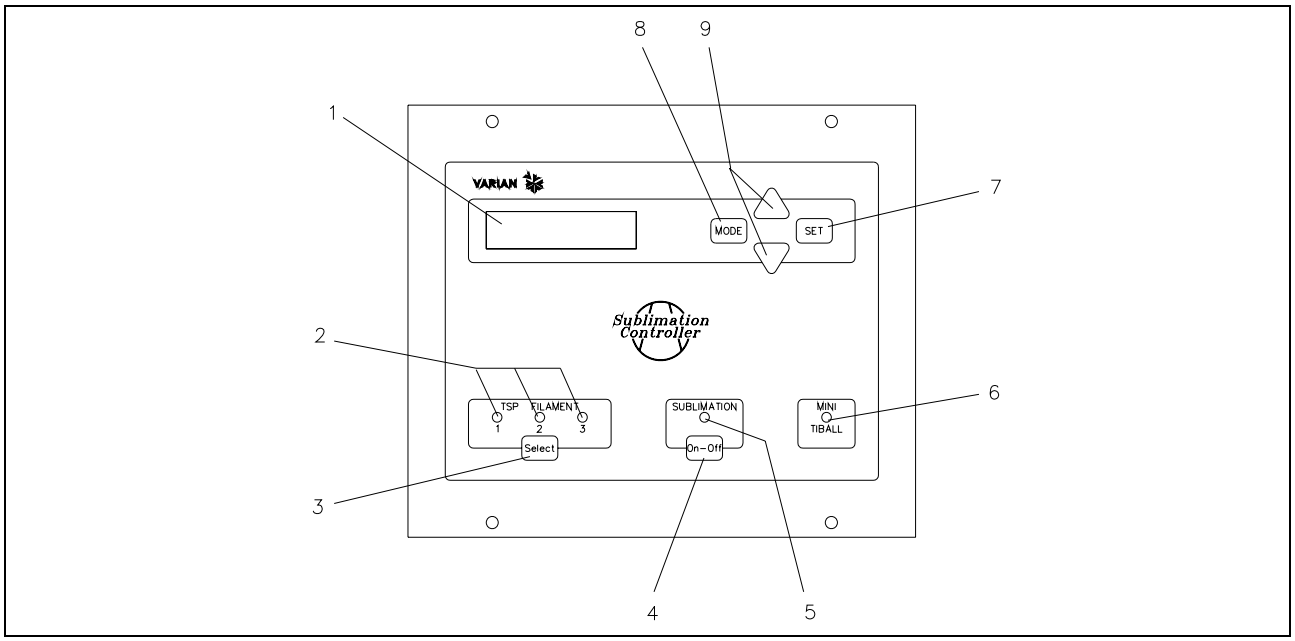
On indique, dans ce paragraphe, les principales procédures opérationnelles. Pour tous autres détails et pour les procédures concernant des connexions ou des éléments en option, se reporter au paragraphe "Use" de l'appendice "Technical Informations".
Avant d'utiliser le contrôleur, effectuer toutes les connexions électriques du contrôleur et de la pompe et se référer à la notice de la pompe connectée. Lire également cette notice avec attention avant d'utilise le système.

DANGER!

Pour éviter tous dommages aux personnes et à l'appareil, si la pompe est placée sur un table d'appui, s'assurer que cette dernière est stable. Ne jamais faire fonctionner la pompe si la bride d'entrée n'est pas connectée au système ou n'est pas fermée à l'aide de la bride de fermeture.

Commandes et Voyants du Tableau Frontal du Sublimation Controller

La figure ci-dessous représente le tableau frontal du Sublimation Controller.
La signification et la fonction des commandes et des voyants sont indiquées dans le tableau de la page suivante.

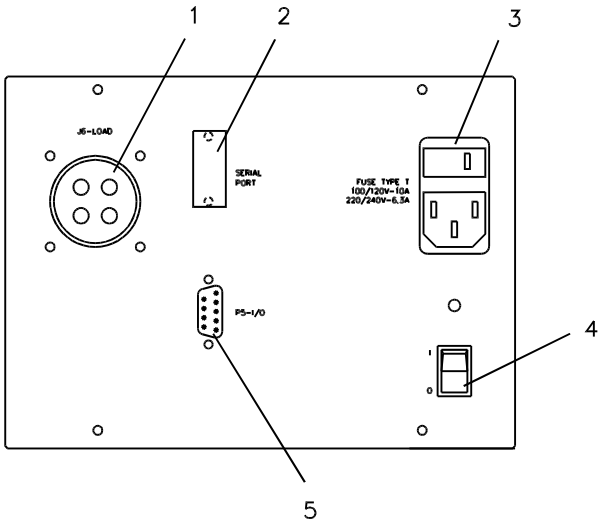


Commandes et Voyants du Tableau Frontal du Sublimation Controller

Réf.	Nom de la Commande/du Voyant	Description de la Commande/du Voyant
1		Affichage à cristaux liquides à imprimante par points éclairé par l'arrière. 16 caractères 2 lignes.
2	TSP FILAMENT 1,2,3	Voyants verts indiquant: • s'ils sont allumés: la sélection du filament correspondant de la pompe TSP, • s'ils clignotent: le filament correspondant de la pompe est coupé.
3	SEL	Touche de sélection manuelle de l'un des trois filaments de la pompe TSP
4	ON/OFF	Bouton de commutation de mode de fonctionnement du contrôleur: • sur OFF: le mode "Fixation des Paramètres" est actif • sur ON: le mode "Sublimation" est actif.
5	SUBLIMATION	La diode verte indique: • si elle est allumée: on est dans le temps d'attente entre 2 sublimations ou bien dans la phase de rampe de courant; • si elle clignote: la sublimation est en cours.
6	MINI TIBALL	Le voyant vert s'allume lorsque le mode de fonctionnement pour Mini Ti-Ball est sélectionné.
7	SET	Bouton qui permet, selon les cas: • de confirmer le début de la sublimation; • de mémoriser les sélections faites; • de mettre à zéro une situation d'Erreur.
8	MODE	Bouton qui permet, selon les cas: • de sélectionner le mode de fonctionnement (MANUAL, AUTOMATIC, AUTOMAT/REMOTE et REMOTE SET); • de sortir des pages de fixation des paramètres sans modifier les paramètres.
9	[▲ / ▼]	Boutons servant à modifier les valeurs dans les pages de fixation des paramètres.

Tableau Dorsal du Sublimation Controller

La figure suivante indique les commandes et les connexions du tableau dorsal du Sublimation Controller.



1. Connecteur de liaison du câble optionnel vers la pompe TSP ou Mini Ti-Ball
2. Connecteur RS 232-422-485 optionnel
3. Connecteur d'alimentation, sélection de la tension d'entrée, fusibles de protection
4. Interrupteur d'alimentation: allumé (I), coupé (O)
5. Connecteur de signaux d'E/S.

PROCEDURES D'UTILISATION

Modes de Fonctionnement

Le Sublimation Controller peut fonctionner dans les modes MANUAL, AUTOMATIC, REMOTE SET et AUTOMAT /REMOTE.
Dans les modes MANUAL et AUTOMATIC, toutes les commandes sont données par tableau frontal.
Dans les modes de fonctionnement AUTOMAT/REMOTE et REMOTE SET, les commandes sont données soit par des signaux sur le câble d'E/S soit par par le tableau frontal.

NOTE

Après une coupure d'alimentation, le Sublimation retourne toujours au dernier mode de fonctionnement établi. Si le paramètre "AUTOSTART" a été établi sur "YES" et si une sublimation était à ce moment-là en cours, cette dernière reprendra automatiquement.

L'unité est conçue pour fonctionner dans deux modes différents:
- avec la sélection manuelle des paramètres (**MANUAL** et **REMOTE SET**)
- avec la sélection automatique des paramètres (**AUTOMATIC** et **AUTOMAT/REMOTE**).

Le Sublimation Controller peut être utilisé pour commander les pompes du type TSP ou bien du type Mini Ti-Ball.
Dans les modes MANUAL et REMOTE SET, la sélection des paramètres de la sublimation est effectuée directement par l'opérateur, au travers des commandes du tableau frontal (mode MANUAL) ou bien ils sont envoyés sur le connecteur d'E/S (mode REMOTE).
Si le Sublimation Controller doit être utilisé en association avec des pompes du type TSP, il faut sélectionner le type de source TSP. Si le contrôleur doit être utilisé en association avec des pompes du type Mini Ti-Ball, il fait sélectionner le type de source Mini Ti-Ball.

NOTE

L'unité est prééquipée en usine de la façon suivante:
- *mode de fonctionnement MANUAL*
- *type de source TSP*
- *courant de sublimation: 30 A*
- *temps de sublimation: 1 minute*
- *période de sublimation: 3 minutes*
- *niveau de pression: 1x10^{-7} mbar*
- *"AUTOSTART" (redémarrage automatique de la sublimation après une coupure d'alimentation) sur YES*

Des renseignements plus détaillés sur le mode de fonctionnement sont contenus dans l'appendice "Technical Information".

Mise sous tension du Sublimation Controller

Pour mettre le Sublimation Controller sous tension, il suffit de mettre l'interrupteur d'alimentation situé sur le tableau dorsal dans la position "I".
Pour procéder ensuite à la sublimation, il suffit de presser l'interrupteur "SUBLIMATION" se trouvant sur le tableau frontal: le voyant vert correspondant s'allumera.

NOTE

Si l'interrupteur du tableau frontal n'est pas mis dans la position "ON", la sublimation n'aura pas lieu, mais l'unité restera dans l'attente de la fixation des paramètres.

Mise hors tension du Sublimation Controller

Pour mettre le Sublimation Controller hors tension, procéder comme suit:

- presser l'interrupteur "SUBLIMATION" du tableau frontal pour le mettre dans la position "OFF" (voyant vert éteint)
- mettre l'interrupteur d'alimentation du tableau frontal dans la position "O".

ENTRETIEN

Le Sublimation Controller n'exige aucun entretien. Toute opération doit être effectuée par un personnel agréé.
En cas de panne, il est possible de s'adresser au Service de réparation Varian ou bien au "Varian advance exchange service" qui permet d'obtenir un contrôleur neuf à la place du contrôleur détraqué.

⚠ DANGER!

Avant d'effectuer toute opération sur le contrôleur, débrancher le câble d'alimentation.
En cas de panne, il est possible de s'adresser au Service de réparation Varian ou bien au "Varian advance exchange service" qui permet d'obtenir un contrôleur neuf à la place du contrôleur détraqué.

En cas de mise au rebut du contrôleur, procéder à son élimination conformément aux réglementations nationales en la matière.

MISE AU REBUT

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

MESSAGES D'ERREUR

Dans certains cas de panne, le contrôleur procède à un autodiagnostic et affiche l'un des messages indiqués dans le tableau ci-dessous:

MESSAGE	DESCRIPTION	INTERVENTION
POWER AC FAIL	Détection d'une anomalie sur le circuit d'alimentation due à une tension d'alimentation erronée.	Couper l'unité, puis s'assurer que la tension est présente et que les valeurs d'alimentation ont été correctement établies (110 - 120 Vac, 60 Hz ou 220 - 240 Vac, 50 Hz).
HEATER DEFECTIVE	Il s'est produit une coupure du filament du réchauffeur pendant un cycle de pompage avec le Mini Ti-Ball.	Remplacer le Mini Ti- Ball.
FILAMET X DEFECTIVE	Il s'est produit une coupure du filament X (X pouvant être 1. 2 ou 3) au cours d'une sublimation avec un TSP. Si le paramètre "TSP RECOVER" est en mode "AUTOMATIC", le logiciel rétablit directement le fonctionnement normal, sélectionnant le filament suivant du cartridge. Si le paramètre "TSP RECOVER" est en mode "MANUAL", la sublimation est coupée.	Si le paramètre "TSP RECOVER" est en mode "AUTOMATIC", le logiciel procédera à la sélection automatique de l'un des filaments disponibles restants et il signalera que la commutation a eu lieu sur les voyants d'affichage. Si le "TSP RECOVER" est en mode "MANUAL", l'opérateur doit réamorcer manuellement la procédure de sublimation.
CARTRIDGE DEFECTIVE XXX	Il s'est produit une coupure des trois filaments du TSP et la sublimation est coupée	Remplacer le cartridge.
FAULT: OVER-TEMPERATURE	Il s'est produit une surcharge du transformateur et le cycle de pompage est coupé.	Eliminer la cause de la surcharge sur le transformateur.
EXTERNAL INTERLOCK	Le contact d'interlock (pin 3) n'a pas été connecté sur le connecteur d'E/S.	Connecter l'interlock.

GENERAL INFORMATION

This equipment is destined for use by professionals. The user should read this instruction manual and any other additional information supplied by Varian before operating the equipment. Varian will not be held responsible for any events occurring due to non-compliance, even partial, with these instructions, improper use by untrained persons, non-authorised interference with the equipment or any action contrary to that provided for by specific national standards.
The following paragraphs contain all the information necessary to guarantee the safety of the operator when using the equipment. Detailed information is supplied in the appendix "Technical Information".
This manual uses the following standard protocol:

WARNING!

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

CAUTION

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

NOTE

The notes contain important information taken from the text.

CONTROLLER DESCRIPTION

Varian's Sublimation Controller is a titanium sublimation pumps (TSP) controller. The unit can be factory configured to the customer's needs, but the configuration can be modified by the user to adapt the controller to the different user needs.

DESCRIPTION	PART NUMBER
Base Unit	
Sublimation Controller set for 220 Vac input voltage	929-0023
Sublimation Controller set for 110 Vac input voltage	929-0022
Accessories	
RS 232 Computer Interface Card	929-0024
RS 422 Computer Interface Card	929-0025
RS 485 Computer Interface Card	929-0026
Cable for TSP pump	924-0730
Cable for Mini Ti-Ball pump	924-0752

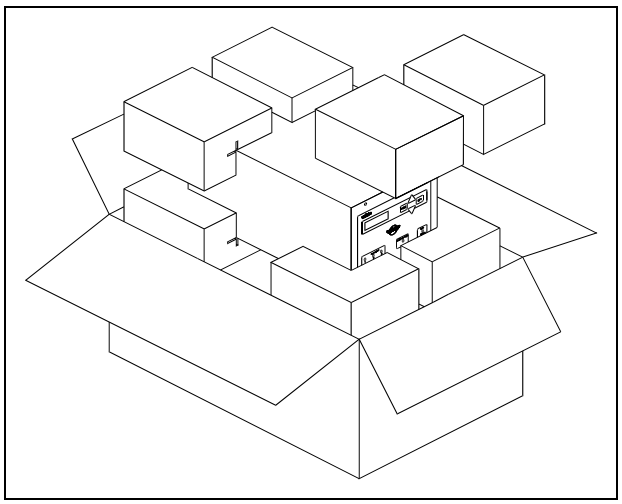
The Sublimation Controller can control a TSP or a Mini Ti-Ball pump type.
The Sublimation Controller can be operated in different ways: MANUAL, AUTOMATIC, AUTOMAT/REMOTE and REMOTE SET. In MANUAL and AUTOMATIC modes all controls are given on front panel. In REMOTE SET and AUTOMAT/REMOTE some controls are given on front panel and others are given by signal through the I/O connector.

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 Sublimation 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.



Controller packing

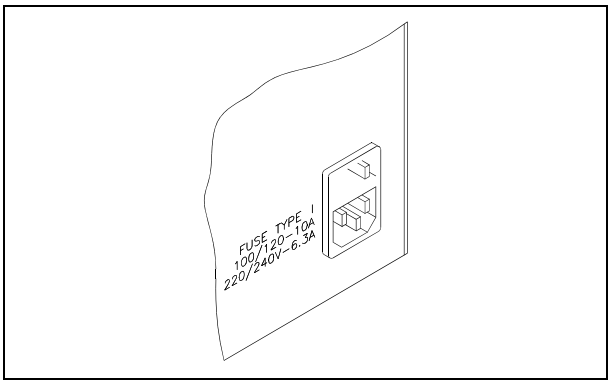
The Sublimation Controller is factory set for follows input voltages:
- model 929-0023 set to 220 Vac (input voltage 180 to 265 Vac).
- model 929-0022 set to 120 Vac (input voltage 90 to 130 Vac).

If a change in line voltage operation is desired, proceed as follows;
- Switch off the Sublimation Controller and unplug the power cord from the wall socket.
- On the rear panel pull off the fuse cover, the unplug the voltage selector.
- Rotate the voltage selector until the desired voltage appears towards the external part of the controller.

CAUTION

If the line voltage pass from 220-240 Vac to 100-120 Vac, or viceversa, the power cord and the fuses MUST be changed also. For 220-240 Vac the fuses must be T6.3A and for 100-120 Vac must be T10A.

- If necessary, change the fuses and the power cord. If power cord must be changed, rewire as follows:
  blue = neutral
  brown = phase
  yellow-green = ground
- Insert the voltage selector, then repositioning the fuse cover.
- Plug the power cord into wall socket.



Operating voltage selector

INSTALLATION

WARNING!

The Sublimation Controller is equipped with a 3-wire power cord and plug (internationally approved) for user's safety. Use this power cord and plug in conjunction with a properly grounded power socket to avoid electrical shock. Verify that the ground connections are properly connected.
High voltages developed inside the controller can cause severe injury or death. Before servicing the unit, disconnect the input power cable.

CAUTION

The controller can be used as a bench unit or a rack module, but it must be positioned so that free air can flow through the holes of the top and side cover.
If the Sublimation Controller is used as a rack module, it MUST be inserted in a 4 unit height rack adapter chassis to avoid collapse of the controller fall inside the rack. The front panel of the Sublimation Controller is not designed to support the controller weight.
Do not install or use the Sublimation Controller in an environment exposed to atmospheric agents (rain ,snow, ice), dust, corrosive gases or in explosive environments or those with a high fire risk.

NOTE

If the Sublimation Controller is used as a bench unit, it must have the four side legs. If the Sublimation Controller is installed on a rack, remove the four side legs and position it with at least 30 mm (1,2 inches) of clearance on top and bottom.

During operation, the following environmental conditions must be respected:
- temperature: from +5 °C to +45 °C
- relative humidity: 0 - 90% (non-condensing)

To connect the Sublimation Controller to the pump use the specific cable supplied as an option. See the appendix "Technical Information" for detailed information about the above mentioned and other connection and about the optional card installation.

USE

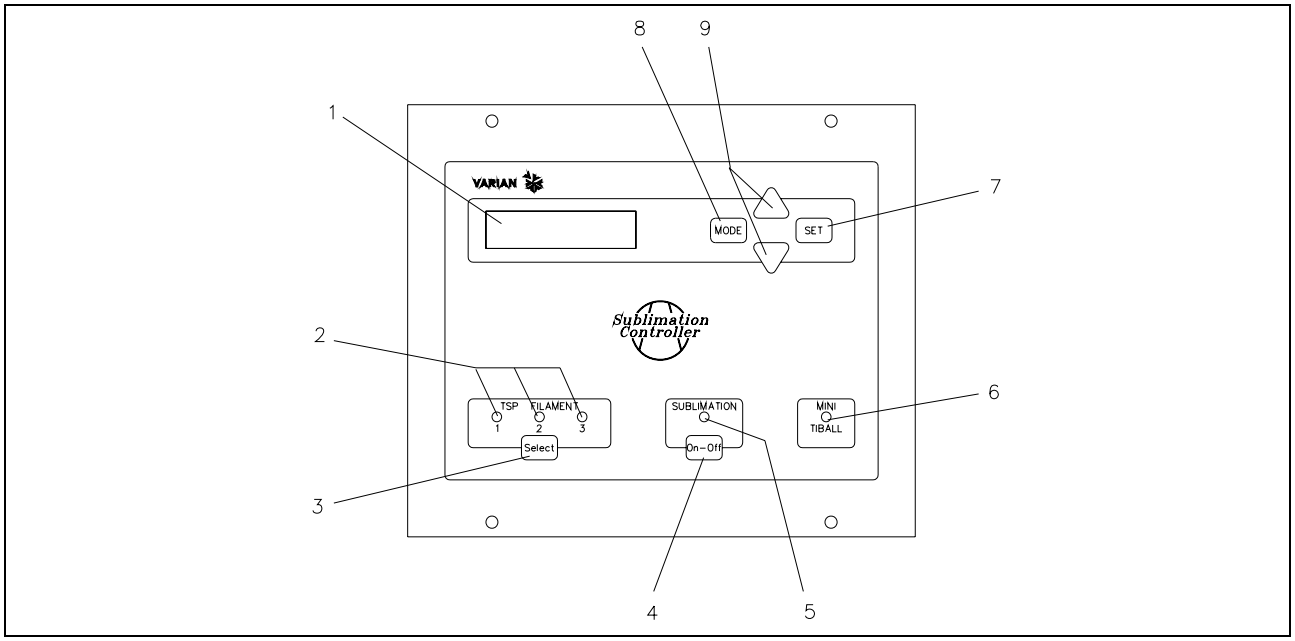
This paragraph describes the fundamental operating procedures. Detailed information and operating procedures that involve optional connections or options are supplied in the paragraph "USE" of the appendix "Technical Information".
Make all electrical connections of the controller and the pump prior to operating the controller. Read carefully the pump instruction manual prior to operating the system.

WARNING!

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

Sublimation Controller Front Panel Controls and Indicators

The Sublimation Controller front panel is shown in the following figure.
The control and indicator meanings and functions are detailed in the following table.

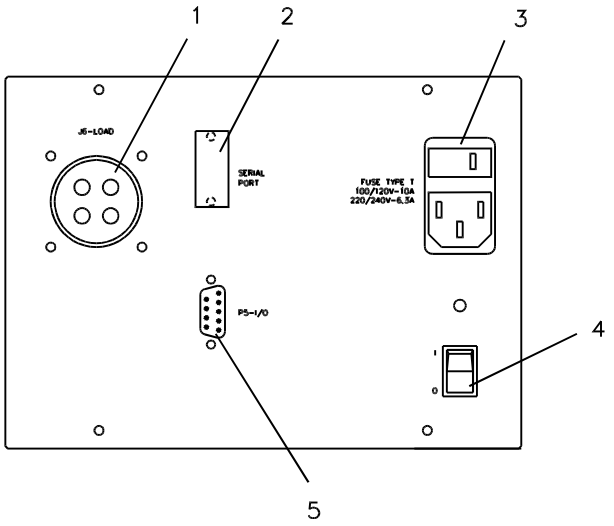


Sublimation Controller front panel controls

Ref.	Control/Indicator Name	Control/Indicator Description
1		LCD back lighted alphanumeric display dot matrix, 16 characters, 2 rows.
2	TSP FILAMENT 1 , 2, 3	Green LEDs that show: • if ON, the relevant TSP pump filament selected; • if blinking, the relevant TSP pump filament interrupted.
3	SEL	Key for manual selection of one TSP pump filaments.
4	ON/OFF	Key for controller operating mode selection: • OFF when “Parameters Setting” mode is activated; • ON when “Sublimation” is activated.
5	SUBLIMATION	Green LED that show: • if ON, that controller status is in waiting time between two sublimation or during current leading edge; • if blinking, the sublimation is in phase.
6	MINI TIBALL	Green LED ON when Mini Ti-Ball operating mode is selected.
7	SET	Key that, depending on condition: • confirm the start of sublimation; • memorize the selection made; • reset a fail status.
8	MODE	Key that, depending on condition: • select the operating mode (MANUAL, AUTOMATIC, AUTOMAT/REMOTE and REMOTE SET); • escape from the parameters setting pages without changing the parameters.
9	[▲ / ▼]	Keys used to modify the values in the parameters setting pages.

Sublimation Controller Rear Panel

The following figure shows the controls and the connections of the Sublimation Controller rear panel.



1. Connector to plug the optional cable for TSP or Mini Ti-Ball connection
2. RS 232-422-485 connector (optional)
3. Power cord socket, input voltage selector, protection fuses
4. Power switch: ON (I)/OFF(O)
5. I/O signals connector

Sublimation Controller rear panel

OPERATING PROCEDURES

Operating Modes

The Sublimation Controller can be operated in the MANUAL, AUTOMATIC, REMOTE SET and AUTOMAT/REMOTE mode.
In MANUAL and AUTOMATIC modes all the controls are given on front panel.
In AUTOMAT/REMOTE and REMOTE SET, the controls are given via signals coming through the I/O cable.

NOTE

After a power failure the Sublimation Controller will return to the previously selected operating mode. If “AUTOSTART” parameter was set on “YES” and before the power failure the unit was in sublimation mode, the sublimation starts on again automatically.

The unit is designed to operate in two different modes:

- with manual selection of the parameters (**MANUAL** and **REMOTE SET** modes)
- with automatic selection of the parameters (**AUTOMATIC** and **AUTOMAT/REMOTE** modes)

The Sublimation Controller can be used to control the TSP or Mini Ti-Ball pumps type.
In MANUAL and REMOTE SET operating modes the sublimation parameters are setting by the user by means of the front panel controls (MANUAL mode) and/or by signal send on the I/O connector (REMOTE mode).
If the Sublimation Controller is used in conjunction with the TSP pump the TSP source type must be set. If the Sublimation Controller is used in conjunction with the Mini Ti-Ball pump the Mini Ti-Ball source type must be set.

NOTE

The unit is factory set as follows:

- *MANUAL operating mode*
- *TSP source type*
- *sublimation current 30 A*
- *sublimation time 1 minute*
- *sublimation period 3 minutes*
- *pressure threshold $1x10^{-7}$ mbar*
- *“AUTOSTART” (automatic restart before power failure) on “YES”*

Detailed information about the operating modes are contained in the appendix “Technical Information”.

Sublimation Controller Switching ON

To switch ON the Sublimation Controller switch the power switch located on the rear panel to the “I” position.
To start the sublimation, push the “SUBLIMATION” key located on the front panel and the relevant green LED will light.

NOTE

If the “SUBLIMATION” key is not set in ON position the sublimation will not starts and the unit will wait for a parameters setting.

Sublimation Controller Switching OFF

To switch OFF the Sublimation Controller , proceed as follows:
- set the “SUBLIMATION” key in OFF position (green LED extinguished)
- switch the power switch located on the rear panel to the “O” position.

MAINTENANCE

The Sublimation Controller does not require any maintenance. Any work performed on the pump must be carried out by authorized personnel.

⚠ **WARNING!**

Before carrying out any work on the controller, disconnect it from the supply.
In the case of breakdown, contact your local Varian service center who can supply a replacement controller.

NOTE

Before returning the pump for repairs, or replacement with a reconditioned unit, the "Health and Safety" sheet attached to this instruction manual must be filled-in and sent to the local sales office. A copy of the sheet must also be inserted in the pump package before shipping.

If a controller is to be scrapped, it must be disposed of in accordance with the specific national standards.

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.

ERROR MESSAGES

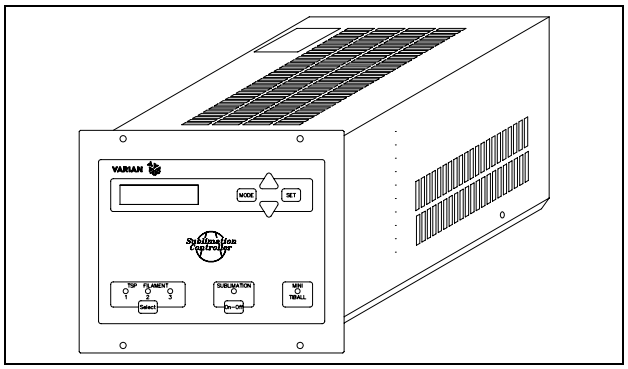
For a certain type of failure, the controller will self-diagnose the error and the messages described in the following table will be displayed.

MESSAGE	DESCRIPTION	REPAIR ACTION
POWER AC FAIL	Anomalous operation relevant to the power supply due to an incorrect power supply voltage.	Switch OFF the unit then check the power supply and the correct setting of voltage input values (110 - 120 Vac, 60 Hz o 220 - 240 Vac, 50 Hz).
HEATER DEFECTIVE	Heater filament interruption during a pumping cycle with the Mini Ti-Ball.	Replace the Mini Ti-Ball.
FILAMENT X DEFECTIVE	Filament X (where X can be 1, 2 or 3) interruption during a sublimation with the TSP. If the “TSP RECOVER” parameter is set in “AUTOMATIC” the software restart the normal operation, selecting a successive cartridge filament. If the “TSP RECOVER” parameter is set in “MANUAL” the sublimation will turn off.	If the “TSP RECOVER” parameter is set in “AUTOMATIC”, the software selects automatically one of the remaining filament, and the relevant LED will be ON. If the “TSP RECOVER” parameter is set in “MANUAL” the user must manually restart the sublimation procedure.
CARTRIDGE DEFECTIVE XXX	All TSP filament are interrupted and the sublimation is turned off.	Replace the cartridge.
FAULT: OVERTEMPERATURE	Transformer overload occurs and the pumping cycle is stopped.	Eliminates the cause of the overload on the transformer.
EXTERNAL INTERLOCK	The interlock on pin 3 of the I/O connector is not connected.	Connect the interlock.

SUBLIMATION CONTROLLER DESCRIPTION

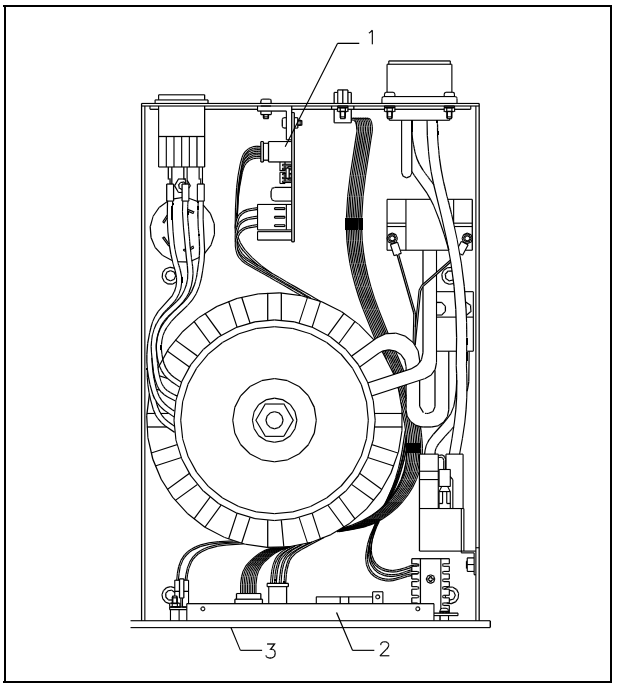
The Sublimation Controller base is available in two versions which differ only in the factory set input voltage.

- Model 929-0022 set for 120 Vac 60 Hz
- Model 929-0023 set for 220 Vac 50 Hz



Sublimation Controller

It consist of various boards. The following figure shows the minimum configuration.



Sublimation Controller boards (Top view)

1) Dc power supply board: it contains the line voltage change over and the EMI filter.
   The ac input voltage is rectified and the needed DC output voltages are generated.
2) Microprocessor boards (located on front panel: it is based on a single chip microprocessor with a large input/output capability. It manages commands coming from the front panel keyboard and from the various cards and drives the front panel display and all output card function.
3) Display and front panel keyboard: it contains the functional push buttons, the LEDs indicating the operating filament and the active mode of operation and the LCD display.

NOTE

Leave at least 30 mm (1.2 inches) of free air circulation on top and bottom of the unit for an efficient cooling of the unit. Blind the unused slots on rear panel with the provided covers.

SUBLIMATION CONTROLLER SPECIFICATION

Input:	
– Voltage: (selectable at the rear of the case)	– 90 to 110 Vac - 1 phase (use setting 100 Vac) – 110 to 130 Vac - 1 phase (use setting 120 Vac) – 190 to 230 Vac - 1 phase (use setting 220 Vac) – 230 to 265 Vac - 1 phase (use setting 240 Vac)
– Frequency:	47 to 63 Hz
– Power:	660 W active power (maximum) 800 VA apparent power (maximum, see note)
Fuse:	6.3 A (for 220-240 Vac setting) slow blow (qty. 2) 10 A (for 100-120 Vac setting) slow blow (qty. 2)
Operating:	
– Temperature	0 to + 45 °C
– Humidity	90% maximum non condensing humidity
Radio interference suppression	Conforms to: EN55011 class A group 1 IEC 1000-4/2/3/4
Safety requirements	Conforms to: EN 61010 and EN 60204
Installation category	II
Pollution degree	2
Cables	Mains (3 meters long, 3 wires, Ø 0.75 mm^2)
Weight	12 Kg

NOTE

When the controller is powered by means of a transformer, the transformer power must be at least 1500 VA to avoid a distortion of the power waveform.

SUBLIMATION CONTROLLER OUTLINE

The outline dimensions for the Sublimation Controller base unit are shown in the following figure.

PUMP CONNECTION

The pump is connected to the controller rear panel via “LOAD” connector (cable to be separately ordered).

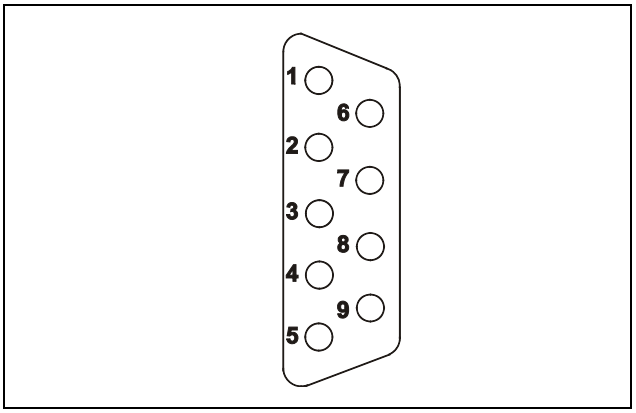
WARNING!

When installing the high power cable:
- Turn the power off.
- Plug the cable on the pump side and secure it with the ring nut.
- Plug the cable on the controller side and secure it with the ring nut.

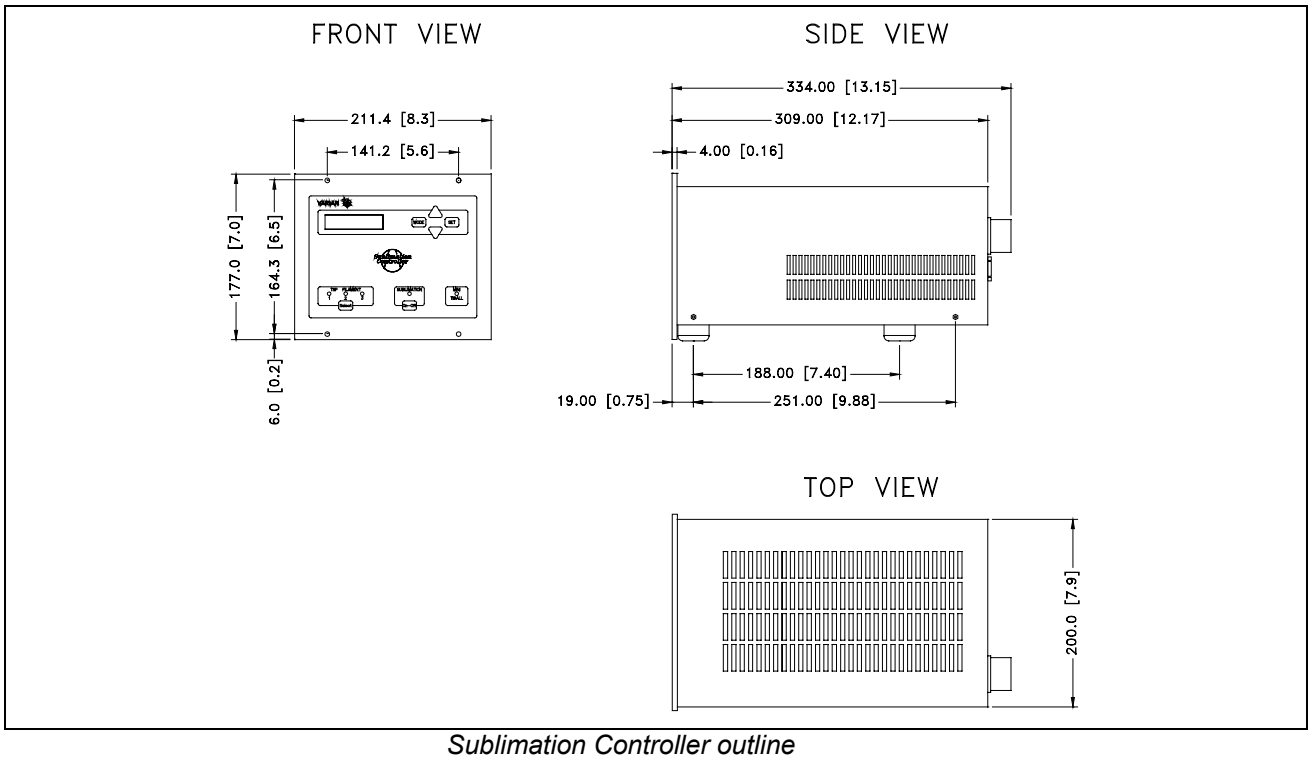
When removing the cable make sure that the power is off.

REMOTE I/O CONNECTION

An external analogue unit can be connected to the I/O connector to set some sublimation parameters and receive feedback from the field.
The pin layout is shown in the following figure.



I/O connector layout



Sublimation Controller outline

The correspondence between pin and signal is:

Pin 1 Input signal. Voltage range 0 to 10 Vdc. Used for setting sublimation current value between 30 A (corresponding to 6 Vdc) and 50 A (corresponding to 10 Vdc).

Pin 2 Input signal. Voltage range 0 to 5 Vdc. Used for setting pressure threshold value: minimum value $1*10^{-10}$ mbar (corresponding to 0 Vdc), maximum value $1*10^{-4}$ mbar (corresponding to 5 Vdc).

Pin 3 Interlock. This pin must be shorted to one of the common pins (number 4 or 6 to 9) (the jumper is furnished with the controller).

Pin 4 Common.

Pin 5 Output signal. Voltage range 0 to 10 Vdc. Used to feedback the sublimation current value applied during sublimation (0 Vdc = 0 A, 10 Vdc = 50 A).

Pin 6 to 9. Common.

NOTE

Without the interlock connection the controller cannot operate.
If the controller is not connected with a remote unit the tap furnished with the controller must be used.
If the controller is connected with a remote unit the interlock must be correctly connected as described.

USE

There are three different type of settings that can be selected;

1) configuration of the Sublimation Controller
2) operating mode selection
3) parameters setting.

NOTE

The unit is factory set for:

- *MANUAL mode operation*
- *source TSP*
- *sublimation current 30 A*
- *sublimation time 1 minute*
- *sublimation period 3 minutes*
- *pressure threshold 1x10^{-7} mbar*
- *"AUTOSTART" set YES (automatic restart after shut down)*

NOTE

The message sequences illustrated below is referred at the first operation of the Sublimation Controller with the default settings.

Configuration Selection

The Sublimation Controller configuration permits selection of the follows aspects:

- type of source that can be used by Sublimation Controller
- enables/disables of automatic restart of sublimation after a shut down
- the automatic/manual selection of the TSP filament for the sublimation

To enable the configuration mode that permits the selection of the source type press the **MODE** and **SET** keys, on the front panel, and simultaneously, on rear panel, switch on the power. The display shows:

S	O	U	R	C	E		T	Y	P	E	:			
						T	S	P						

Press ▲ or ▼ to change the source type from TSP to Mini Ti-Ball, and the display shows:

S	O	U	R	C	E		T	Y	P	E	:			
		M	i	n	i		T	i	-	b	a	l	l	

Press **SET** to confirm the choice. For a few seconds the display shows, depending from the selection, one of the following message:

S	O	U	R	C	E		S	E	L	E	C	T	E	D
						T	S	P						

Or:

S	O	U	R	C	E		S	E	L	E	C	T	E	D
		M	i	n	i		T	i	-	b	a	l	l	

Then the controller passes to the normal start up operations and the display shows:

				A	U	T	O	T	E	S	T			

Then, if a serial module is mounted on the controller, the display shows:

					S	E	R	I	A	L				
						T	E	S	T					

At the end of this check, if no problems on the serial port are detected, the display shows:

					S	E	R	I	A	L				
							O	K						

Before the serial port check, if the Computer Interface Card is mounted or before the message "AUTOTEST" the software check the presence of the zero-crossing signal and, in case of fault (frequency absent or different from 50 or 60 Hz), the display shows:

	P	O	W	E	R		A	C		F	A	I	L	

and the controller must be shut down.
If the check has a positive result, the display shows, for a few seconds:

				A	U	T	O	T	E	S	T			
							O	K						

Then the display shows one of the following message, depends of the source type previously selected:

														▲▼
M	i	n	i		T	i	-	b	a	l	l			
												M	A	N

Or:

T	**S**	**P**		**F**	**i**	**l**	**a**	**m**	**e**	**n**	**t**		**X**	
													M	**A**	**N**

Where X can be 1, 2 or 3 depending on the TSP filament selected. The message **MAN** that appears at the end of the second row indicates the operation mode currently set (factory set MANUAL).
To enable the configuration mode to modify the autostart and the automatic change of the TSP filament press the **MODE** and **SET** keys.

NOTE

Before activating the configuration mode, make sure that the SUBLIMATION Led is off.

The display shows:

S	**U**	**B**	**L**	**I**	**M**	**A**	**T**	**I**	**O**	**N**				
	A	**U**	**T**	**O**	**S**	**T**	**A**	**R**	**T**		**:**		**Y**	**E**	**S**

The AUTOSTART is factory set on YES. This enable the automatic restart of the sublimation after a shut down. Press ▲ or ▼ key to change from YES to NO and viceversa. The display shows:

S	**U**	**B**	**L**	**I**	**M**	**A**	**T**	**I**	**O**	**N**				
	A	**U**	**T**	**O**	**S**	**T**	**A**	**R**	**T**		**:**		**N**	**O**	

Make the selection then press **SET** key to confirm the choice.
If a cartridge with multiple TSP is present the display will show:

T	**S**	**P**		**R**	**E**	**C**	**O**	**V**	**E**	**R**	**:**			
			A	**U**	**T**	**O**	**M**	**A**	**T**	**I**	**C**			

Factory setting is AUTOMATIC, that enables the automatic change of the TSP filament in case of fault (if possible). This configuration can be changed on MANUAL by pressing the ▲ or ▼ key. In this case the display shows:

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

In MANUAL configuration, in case of interruption of the TSP filament, the controller will be in a fault condition and the sublimation will be interrupted.

To confirm the choice press **SET** key. If no serial module are mounted on the controller the display return to the previous message:

M	**i**	**n**	**i**		**T**	**i**	**-**	**b**	**a**	**l**	**l**			
													M	**A**	**N**

Or:

T	**S**	**P**		**F**	**i**	**l**	**a**	**m**	**e**	**n**	**t**		**X**	
													M	**A**	**N**

Otherwise, if serial module are present on the controller the display shows:

S	**E**	**R**	**I**	**A**	**L**		**A**	**D**	**D**	**R**	**E**	**S**	**S**	
						X	**X**	**X**						

Where **XXX** is the serial address currently set, then the display shows;

S	**E**	**R**	**I**	**A**	**L**		**B**	**A**	**U**	**D**		**R**	**A**	**T**	**E**
		X	**X**	**X**	**X**		**B**	**A**	**U**	**D**					

Where **XXXX** is the speed of communication expressed in Baud.

NOTE

If the RS 232 Computer Interface Card is mounted on the controller, the message "SERIAL ADDRESS XXX" is not displayed.

Operating Mode Selection

The operating mode selection permits the selection of the mode by means of which the Sublimation Controller is controlled.
To select the operating mode press the **MODE** key. The display shows:

M	**O**	**D**	**E**	**:**										
			M	**A**	**N**	**U**	**A**	**L**						

In this operating mode the selection of time, period and current value of sublimation are set by means of the control panel.

If the ▲ key is pressed the display shows:

M	**O**	**D**	**E**	**:**										
◆			**A**	**U**	**T**	**O**	**M**	**A**	**T**	**I**	**C**			

In this operating mode only the sublimation current value and the pressure threshold are set by means of the control panel. The sublimation occurs when the pressure threshold is reached (analog input on pin 2 of the I/O connector, range 0 to 5 Vdc).
If the ▼ key is pressed the display shows the previous message (mode MANUAL).
If the ▲ key is pressed the display shows:

M	**O**	**D**	**E**	**:**										
◆			**R**	**E**	**M**	**O**	**T**	**E**		**S**	**E**	**T**		

In this operating mode only the time and period of sublimation are set by means of the control panel. The current value of sublimation is set by means of a signal incoming on the analog input on pin 2 of the I/O connector, range 0 to 10 Vdc (0 Vdc = 0 A, 10 Vdc = 50 A).
If the ▼ key is pressed the display shows the previous message (mode AUTOMATIC).
If the ▲ key is pressed the display shows:

M	**O**	**D**	**E**	**:**										
◆	**A**	**U**	**T**	**O**	**M**	**A**	**T**	**/**	**R**	**E**	**M**	**O**	**T**	**E**

In this operating mode the sublimation starts when the pressure threshold is reached (as in the AUTOMATIC operating mode).
The current value of sublimation is set by means of a signal incoming on the analog input on pin 2 of the I/O connector, range 0 to 10 Vdc.
If the ▼ key is pressed the display shows the previous message (mode REMOTE SET).
If the ▲ key is pressed the display shows the first message illustrated before (mode MANUAL).
To select the desired operating mode press the **SET** key. The controller comes back to the normal operating mode and the display shows one of the following messages, depending on the source type selected.

M	**i**	**n**	**i**		**T**	**i**	**-**	**b**	**a**	**l**	**l**			◆
												M	**A**	**N**

Or:

T	**S**	**P**		**F**	**i**	**l**	**a**	**m**	**e**	**n**	**t**	**X**		◆
												M	**A**	**N**

The message **MAN** at the end of the second row can be different. It depends of the operating mode selected:
- in mode AUTOMATIC the message become **AUT**
- in mode REMOTE SET the message become **REM**
- in mode AUTOMAT/REMOTE the message become **A/M.**

NOTE

The controller escape automatically from the operating mode selection before 30 second, if no selection are made, and return to the normal operation.
If the **MODE** *key is pressed during the operating mode selection the Sublimation Controller returns to the normal operation and the operating mode remains that previously selected before the activation of the operating mode selection.*

Sublimation Parameters Setting

The mode by means of which is possible to modify the sublimation parameters depends on the selected operating mode (MANUAL, AUTOMATIC, REMOTE SET and AUTOMAT/REMOTE). In the following paragraph are described the different setting for each operating mode.
To display the sublimation parameters menu and to switch from one page to another, press the ▼ or ▲ keys.
When the desired parameter is displayed, the value can be changed as follows:
1) press the **SET** key
2) press ▲ key to increase the value or ▼ key to decrease the value
3) press **SET** key to confirm the choice or **MODE** key to escape without changing the value. In any case the controller come back to the normal operating mode and the display shows one of the following messages, depending on the source type selected.

M	**i**	**n**	**i**		**T**	**i**	**-**	**b**	**a**	**l**	**l**			◆
												M	**A**	**N**

Or:

T	**S**	**P**		**F**	**i**	**l**	**a**	**m**	**e**	**n**	**t**		**X**		▲▼
													M	**A**	**N**

The message **MAN** at the end of the second row can be different. It depends on the operating mode selected and changes as previously described.

NOTE

The controller escapes automatically from the sublimation parameters setting mode before 30 second, if no selection are made, and return to the normal operation.

NOTE

The sublimation current value can even be set when the sublimation is activated.

Selection in MANUAL Operating Mode

In this operating mode the possible selection on the front panel are:
- sublimation period
- sublimation time
- current value.

During the sublimation period setting the display shows:

S	**U**	**B**	**L**	**.**		**P**	**E**	**R**	**I**	**O**	**D**				▲▼
		X	**X**		**Y**	**Y**	**Y**	**Y**	**Y**				**M**	**A**	**N**

Where **XX** is the value currently set and **YYYYY** is the unit used (minutes or hours).
The possible selectable values, by means of the ▼ or ▲ keys, range from 3 minutes to 32 hours (for intermediate values refer to “Parameters Values”).
When the sublimation time setting is activated the display shows:

S	**U**	**B**	**L**	**.**		**T**	**I**	**M**	**E**						▲▼
				X	**.**	**X**		**m**	**i**	**n**			**M**	**A**	**N**

Where **X.X min** is the value currently set.
The possible selectable values, by means of the ▼ or ▲ keys, are comprised from 1 to 7 minutes, with step of 30 seconds.

NOTE

The software does not permit the setting of a sublimation time greater than period of sublimation.

For the current value of sublimation the display shows:

S	**U**	**B**	**L**	**.**		**C**	**U**	**R**	**R**	**E**	**N**	**T**			▲▼
				X	**X**	**.**	**X**		**A**				**M**	**A**	**N**

Where **XX.X A** is the currently set value.
The possible selectable values, by means of the ▼ or ▲ keys, are comprised from 30 to 50 A, with step of 0.5 A.

Selection in AUTOMATIC Operating Mode

In this operating mode the possible selection on the front panel are:
- sublimation time
- sublimation current value
- pressure threshold.

For the time and current value the possible settings and the messages displayed are the same shown for the MANUAL operating mode, excepted for the script **AUT** in place of **MAN** at the end of the second row.

For the pressure threshold setting the display shows:

S	**U**	**B**	**L**	**.**		**P**	**R**	**E**	**S**	**S**	**U**	**R**	**E**		▲▼
	X	***1**	**0^{-}**	**X**	**X**		**m**	**b**	**a**	**r**			**A**	**U**	**T**

Where **X*10^{-}XX** is the pressure threshold set in mbar.
The possible selectable values, by means of the ▼ or ▲ keys, are comprised from $1*10^{-10}$ to $1*10^{-4}$ mbar, with step of $1*10^{-X}$ mbar.

Selection in REMOTE SET Operating Mode

In this operating mode the possible selection on the front panel are:
- sublimation time
- sublimation period.

For these parameters the possible settings and the messages displayed are the same shown for the MANUAL operating mode, excepted for the script **REM** in place of **MAN** at the end of the second row.

Selection in AUTOMAT/REMOTE Operating Mode

In this operating mode the possible selection on the front panel are:
- sublimation time
- pressure threshold.

For these parameters the possible settings and the messages displayed are the same shown for the MANUAL and AUTOMATIC operating mode, excepted for the script **A/R** in place of **MAN** at the end of the second row.

Parameters Values

In the following table are indicated the different possible values for each sublimation parameter.

PARAMETER	DEFAULT VALUE	ADJUSTABLE RANGE
Current	30 A	30 A to 50 A at step of 0.5 A
Time	1 minute	1 minute to 7 minutes at step of 30 seconds
Period	3 minutes	3 minutes to 32 hours with following intermediate values: – 10 minutes – 30 minutes – 1 hour – 2 hours – 4 hours – 8 hours
Pressure threshold	$1x10^{-7}$ mbar	$1x10^{-10}$ mbar to $1x10^{-4}$ mbar at step of $1x10^{-X}$ mbar

Sublimation

To start the sublimation proceed as follows:

– On the rear panel, turn the power switch on (I position).
– Wait for the following messages displayed in sequence:

				A	U	T	O	T	E	S	T				

				A	U	T	O	T	E	S	T				
							O	K							

M	i	n	i		T	i	-	b	a	l	l				▲▼
													M	A	N

Or:

T	S	P		F	i	l	a	m	e	n	t		X		▲▼
													M	A	N

Then press the **SUBLIMATION** key. The relevant Led will be turned on and the display shows:

S	U	B	L	I	M	A	T	I	O	N					
▲▼	S	T	A	R	T		?		N	O			M	A	N

Pressing the ▼ or ▲ keys the display shows:

S	U	B	L	I	M	A	T	I	O	N					
▲▼	S	T	A	R	T		?		Y	E	S		M	A	N

Press **SET** key to confirm the start or any other key to escape. After the start time, during the current ramp the display shows:

V	=	X	X	.	X	V			I	=	X	X	.	X	A
C	U	R	R	.		R	A	M	P				M	A	N

Where **XX.X** are the currently value used.
Then, finish the current ramp, during the sublimation, the display shows the voltage, the current and the time used for the sublimation, as follows:

V	=	X	X	.	X	V			I	=	X	X	.	X	A
T	=	X	X	:	X	X	:	X	X				M	A	N

Where **XX.X** are the currently value used and **XX:XX:XX** is the sublimation time expressed in hours, minutes and seconds format.

Between sublimations, the display shows the remaining time before next sublimation and the period set for the sublimation, as follows:

T	**I**	**M**	**E**		**T**	**O**		**S**	**U**	**B**	**L**	**=**	**X**	**X**	**h**
P	**E**	**R**	**I**	**O**	**D**	**=**	**X**	**X**	**h**				**M**	**A**	**N**

Where **XX** are the current value.
The operation of the Sublimation Controller depends on the operating mode selected as described below.

Operation in MANUAL mode

After the start confirmation (by press **SET** key at the message "SUBLIMATION START ? YES") the sublimation begin with the parameters previously set or default until the **SUBLIMATION** key is pressed and the relevant green Led is turned off.
During a sublimation cycle it is possible to modify the current value. In this case press **SET** key and the display shows:

I	**s**	**e**	**t**		**=**		**X**	**X**	**.**	**X**		**A**			
													M	**A**	**N**

With the ▼ or ▲ keys increase or decrease the current value, then press **SET** key to confirm or any other key to escape without modifying the setting.

NOTE

The Sublimation Controller escape automatically from the current setting before 30 second, if no selection are made, and return to sublimation operation.

Operation in AUTOMATIC mode

After the start confirmation (by press **SET** key at the message "SUBLIMATION START ? YES") the sublimation begin when the pressure measured (incoming to the I/O connector) reach the pressure threshold set.
In this operation mode the display shows:

S	**U**	**B**	**L**	**.**		**P**	**R**	**E**	**S**	**S**	**U**	**R**	**E**		⬍
	X	**X**	**X**	**X**	**X**		**m**	**b**	**a**	**r**					

To finish sublimation press the **SUBLIMATION** key and the relevant Led is turned off.

Operation in REMOTE SET mode

The operation is the same previously described for MANUAL operation, but the current depends on the signal incoming to the I/O connector.
To end sublimation, press the **SUBLIMATION** key and the relevant Led is turned off.
In this operating mode it is possible to display the current measured on the incoming signal on the I/O connector pressing **SET** key. The display shows:

I	**m**	**i**	**s**		**=**		**X**	**X**	**.**	**X**		**A**			
													R	**E**	**M**

To escape from this message press the **SET** key again or wait 30 second without pressing any key.

Operation in AUTOMAT/REMOTE mode

The operation is the same as previously described for AUTOMATIC operation, but the current depends on the signal incoming to the I/O connector. The display shows:

S	**U**	**B**	**L**	**.**		**P**	**R**	**E**	**S**	**S**	**U**	**R**	**E**		⬍
	X	**X**	**X**	**X**	**X**		**m**	**b**	**a**	**r**					

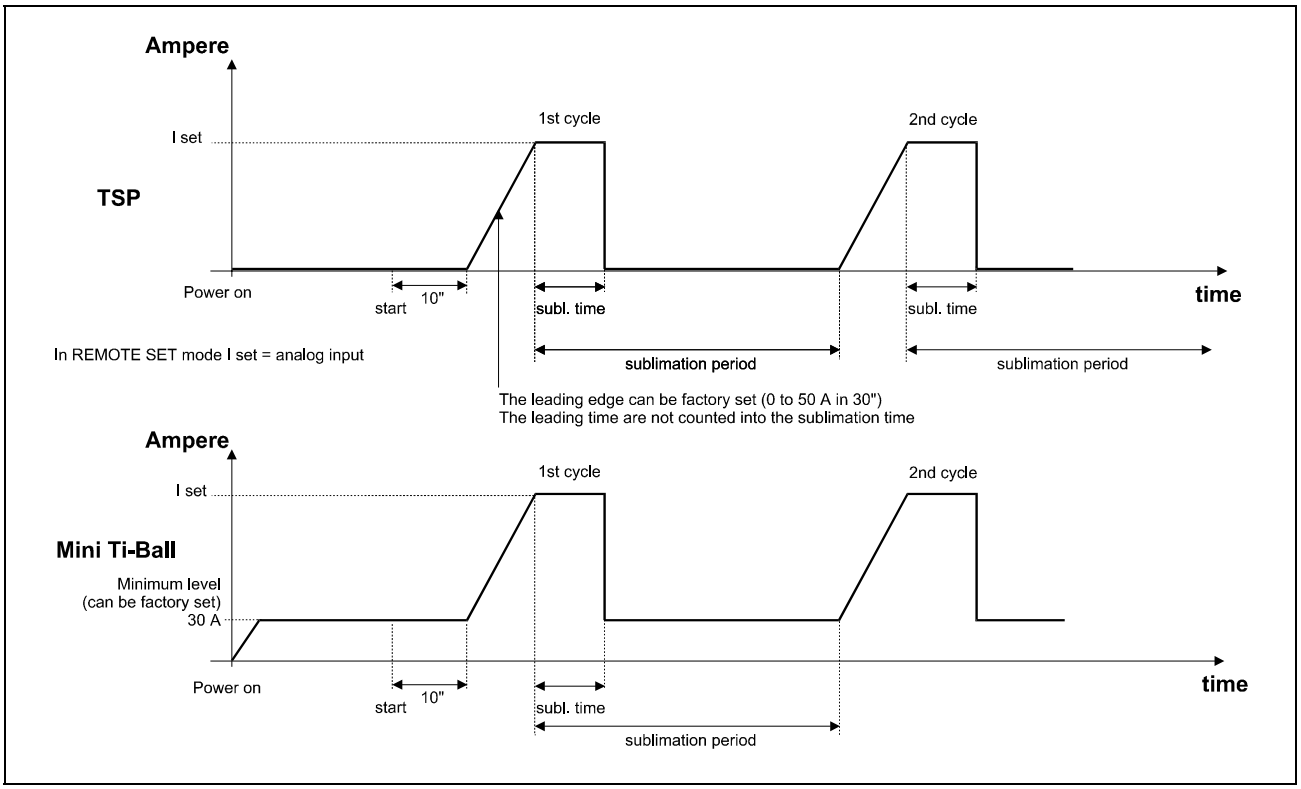
To end sublimation, press the **SUBLIMATION** key and the relevant Led is turned off.
In this operating mode, as in REMOTE SET, it is possible to display the current measured on the incoming signal on the I/O connector pressing **SET** key. The message displayed is the same shown in REMOTE SET operating mode excepted for the script **A/R** in place of **REM** at the end of the second row.

SUBLIMATION TIMING

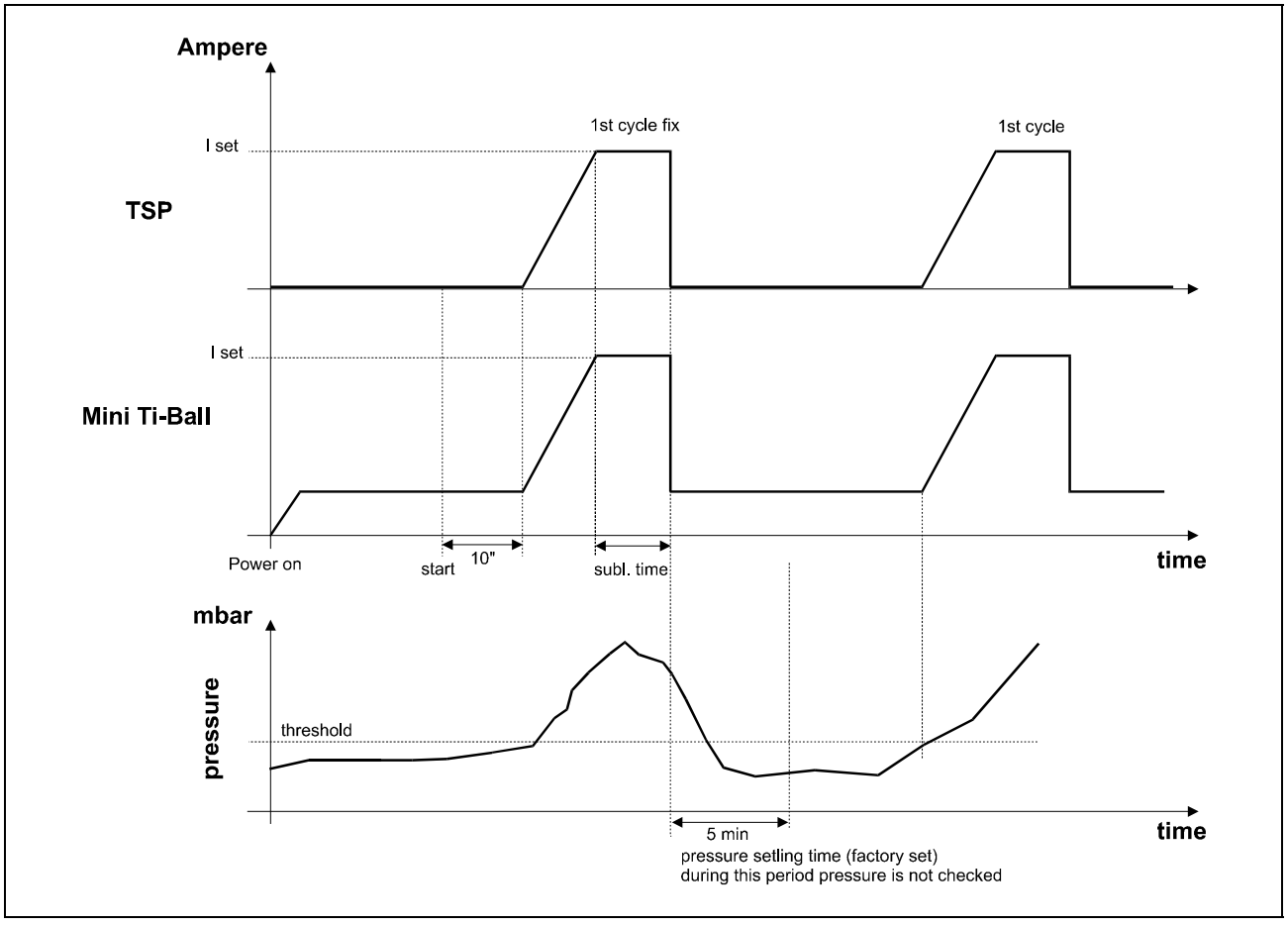
On the next page are shown the figures of the sublimation timing in the different operating modes.

OPERATIONAL FLOW-CHART

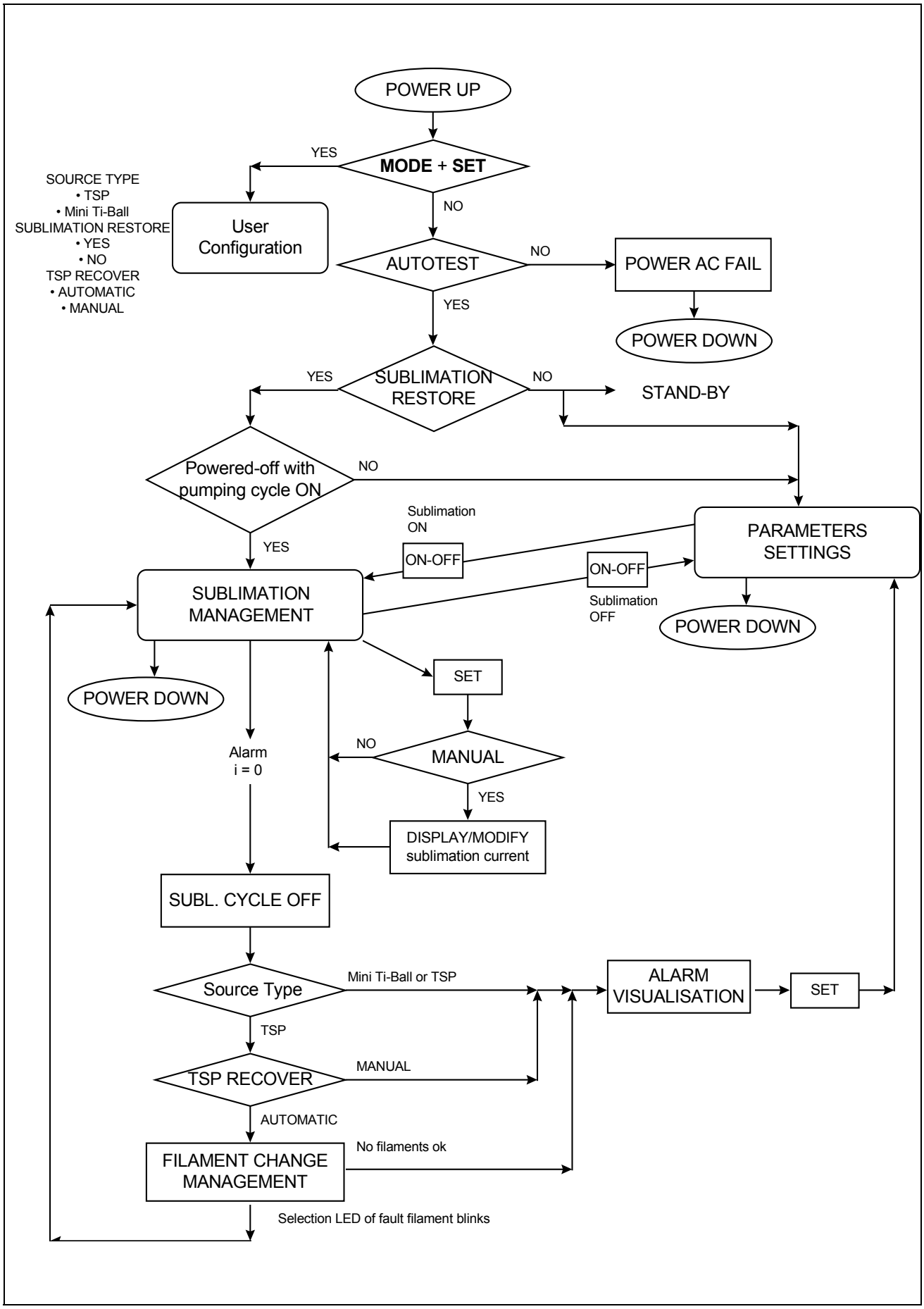
In the following page it is shown the operational flowchart that indicates all the major function of the Sublimation Controller.



Sublimation Timing in MANUAL and REMOTE SET operating mode



Sublimation Timing in AUTOMATIC and AUTOMAT/REMOTE operating mode


POWER UP
YES
MODE + SET
NO
SOURCE TYPE
• TSP
• Mini Ti-Ball
SUBLIMATION RESTORE
• YES
• NO
TSP RECOVER
• AUTOMATIC
• MANUAL
User Configuration
AUTOTEST
NO
POWER AC FAIL
YES
POWER DOWN
YES
SUBLIMATION RESTORE
NO
STAND-BY
Powered-off with pumping cycle ON
NO
YES
Sublimation ON
ON-OFF
PARAMETERS SETTINGS
ON-OFF
Sublimation OFF
SUBLIMATION MANAGEMENT
POWER DOWN
SET
POWER DOWN
Alarm i = 0
NO
MANUAL
YES
DISPLAY/MODIFY sublimation current
SUBL. CYCLE OFF
Source Type
Mini Ti-Ball or TSP
ALARM VISUALISATION
SET
TSP
TSP RECOVER
MANUAL
AUTOMATIC
FILAMENT CHANGE MANAGEMENT
No filaments ok
Selection LED of fault filament blinks

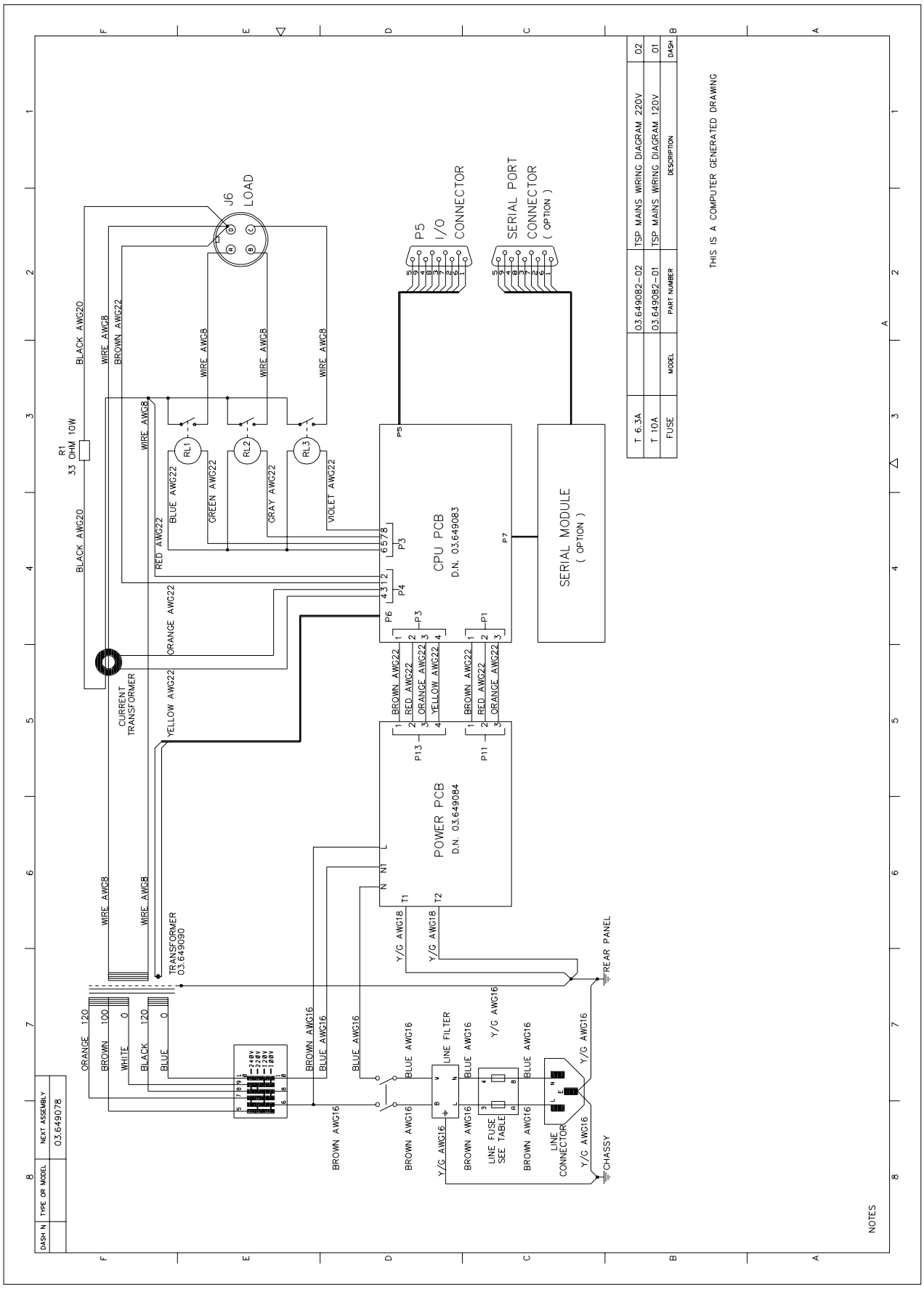
SPARE PARTS

The Sublimation Controller spare parts are listed in the following table.

DESCRIPTION	PART NUMBER
Options	
RS 232 Computer Interface Card	929-0024
RS 422 Computer Interface Card	929-0025
RS 485 Computer Interface Card	929-0026
Rack Adapter	929-0064
Cables	
Cable for TSP pump	924-0730
Cable for Mini Ti-Ball pump	924-0752

ELECTRICAL DIAGRAM

In the following page is shown the electrical diagram of the Sublimation Controller.


J6
LOAD
P5
I/O
CONNECTOR
SERIAL PORT
CONNECTOR
(OPTION)
CPU PCB
D.N. 03.649083
POWER PCB
D.N. 03.649084
SERIAL MODULE
(OPTION)
CURRENT
TRANSFORMER
TRANSFORMER
03.649090
LINE FILTER
LINE FUSE
SEE TABLE
LINE
CONNECTOR
REAR PANEL
CHASSY
R1
33 OHM 10W
RL1
RL2
RL3
BLACK AWG20
WIRE AWG8
BROWN AWG22
BLUE AWG22
GREEN AWG22
GRAY AWG22
VIOLET AWG22
RED AWG22
ORANGE AWG22
YELLOW AWG22
BROWN AWG16
BLUE AWG16
Y/G AWG16
Y/G AWG18
ORANGE 120
BROWN 100
WHITE 0
BLACK 120
BLUE 0
T 6.3A
T 10A
FUSE
MODEL
03.649082-02
03.649082-01
PART NUMBER
TSP MAINS WIRING DIAGRAM 220V
TSP MAINS WIRING DIAGRAM 120V
DESCRIPTION
02
01
DASH
THIS IS A COMPUTER GENERATED DRAWING
NOTES
DASH N
TYPE OR MODEL
NEXT ASSEMBLY
03.649078

VARIAN

Request for Return

ISO 9001 REGISTERED

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

North and South America	**Europe and Middle East**	**Asia and ROW**
Varian Vacuum Technologies 121 Hartwell Ave Lexington, MA 02421 Phone : +1 781 8617200 Fax: +1 781 8609252	Varian SpA Via Flli Varian 54 10040 Leini (TO) – ITALY Phone: +39 011 9979111 Fax: +39 011 9979330	Varian Vacuum Technologies Local Office

CUSTOMER INFORMATION

Company name: ……

Contact person: Name: …… Tel: ……

Fax: …… E-Mail: ……

Ship Method: …… Shipping Collect #: …… P.O.#: ……

Europe only: VAT reg. Number: …… *USA only:* ☐ Taxable ☐ Non-taxable

Customer Ship To: …… Customer Bill To: ……

…… ……

…… ……

PRODUCT IDENTIFICATION

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

TYPE OF RETURN *(check appropriate box)*

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

HEALTH and SAFETY CERTIFICATION

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

The equipment listed above (check one):

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

OR

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

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

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

……

Print Name: …… Customer Authorized Signature: ……

Print Title: …… Date: ……/……/……

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

Do not write below this line

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

VARIAN

Request for Return

ISO 9001 REGISTERED

FAILURE REPORT

TURBO PUMPS and TURBOCONTROLLERS

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

TURBOCONTROLLER ERROR MESSAGE:

ION PUMPS/CONTROLLERS

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

Customer application:

VALVES/COMPONENTS

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

Customer application:

LEAK DETECTORS

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

Customer application:

INSTRUMENTS

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

Customer application:

PRIMARY PUMPS

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

Customer application:

DIFFUSION PUMPS

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

Customer application:

FAILURE DESCRIPTION

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

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

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