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Turbo-V 70 PCB Controller

Model 969-9508

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NOTICE DE MODE D'EMPLOI

MANUAL DE INSTRUCCIONES

MANUAL DE INSTRUÇÕES

BEDRIJFSHANDLEIDING

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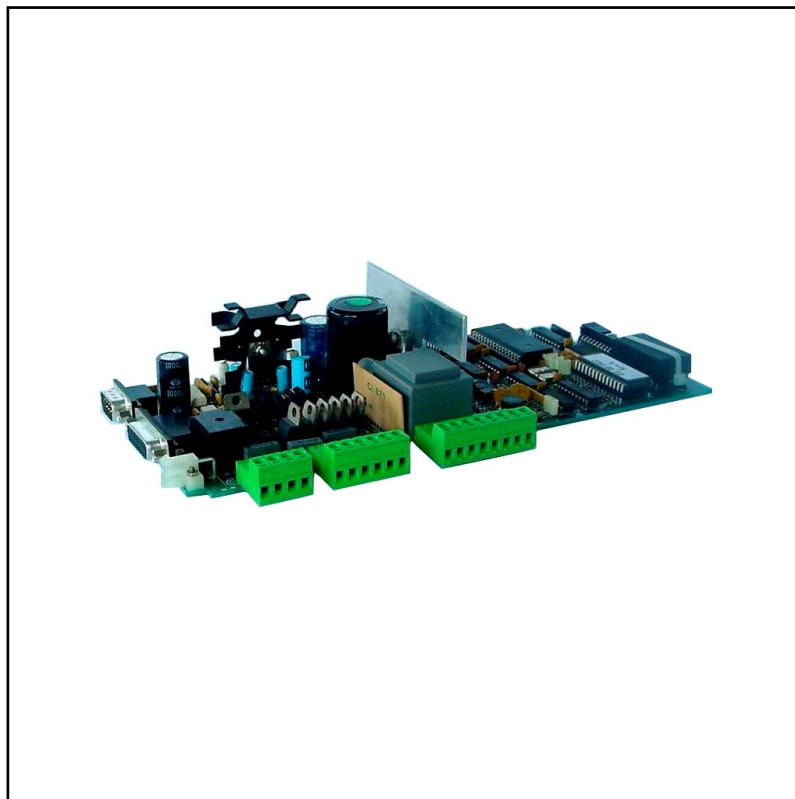
INSTRUKSJON MANUAL

OHJEKÄSIKIRJA

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INSTRUCTION MANUAL

Turbo-V 70 PCB Controller



VARIAN



vacuum technologies

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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.

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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.

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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.) : _____ _____ _____ _____		
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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.)

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INFORMAZIONI GENERALI

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

Il controller Turbo-V 70 PCB è un convertitore di frequenza, controllato da un microprocessore, realizzato con componenti a stato solido e con capacità di autodiagnostica e autoprotezione. Esso incorpora tutta la circuiteria necessaria per il funzionamento automatico delle pompe della serie Turbo-V 70 PCB. Il controller pilota le pompe della serie Turbo-V 70 PCB (con un processo suddiviso in dieci passi) durante la fase di avvio controllando la tensione e la corrente in rapporto alla velocità raggiunta dalla pompa. Tramite connettori ausiliari sono disponibili i comandi per l'avvio e l'arresto della pompa da remoto, i segnali che indicano lo stato operativo della pompa, i comandi per l'avvio e l'arresto della pompa di pre-vuoto, segnali di bloccaggio (per interruttori a pressione, interruttori di controllo del flusso dell'acqua, ecc.). Il controller deve essere alimentato da un trasformatore esterno (non fornito con il controller). Per controllare le funzioni e visualizzare lo stato del controller è disponibile in opzione un apposito apparato (Hand Held Terminal) costituito da una tastiera di comando e da un display di visualizzazione. Nei paragrafi seguenti sono riportate tutte le informazioni necessarie a garantire la sicurezza dell'operatore durante l'utilizzo dell'apparecchiatura. Informazioni dettagliate sono fornite nell'appendice "Technical Information".

Questo manuale utilizza le seguenti convenzioni:



PERICOLO!

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



ATTENZIONE!

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

NOTA

Le note contengono informazioni importanti estrapolate dal testo.

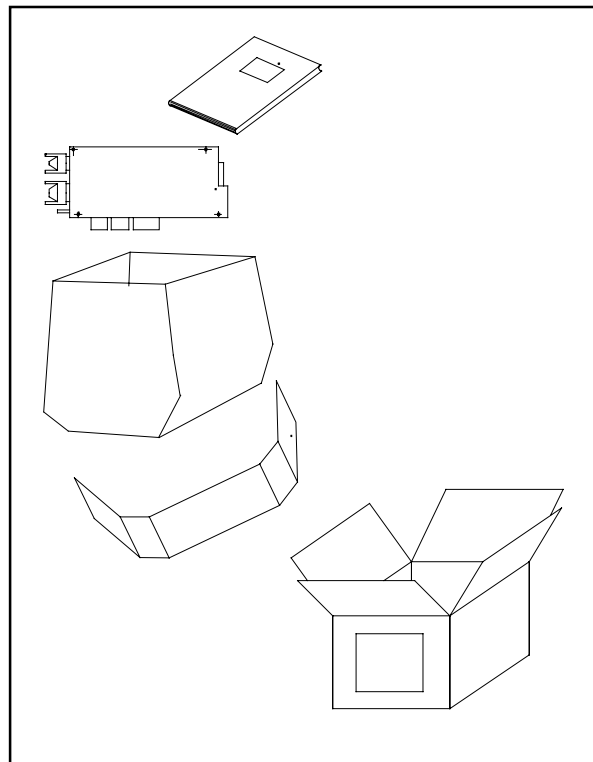
IMMAGAZZINAMENTO

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

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

PREPARAZIONE PER L'INSTALLAZIONE

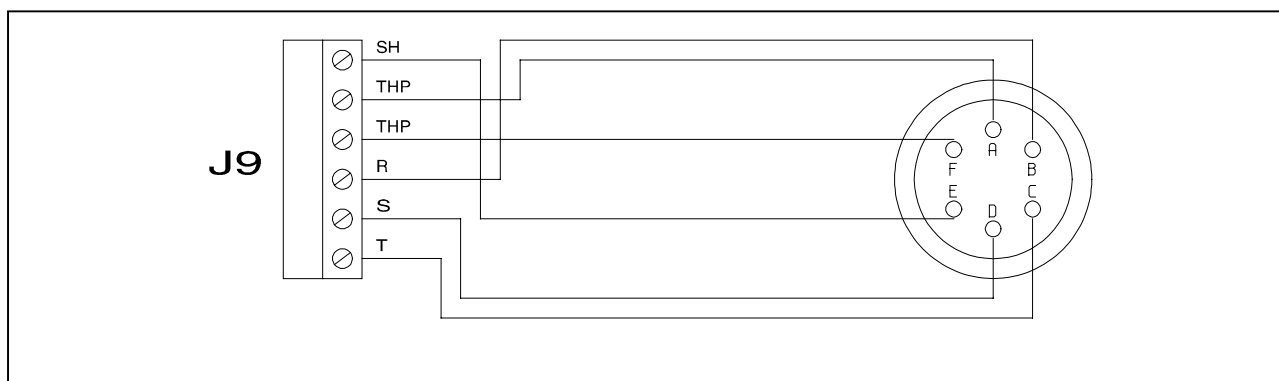
Il controller viene fornito in un imballo protettivo speciale; se si presentano segni di danni, che potrebbero essersi verificati durante il trasporto, contattare l'ufficio vendite locale.



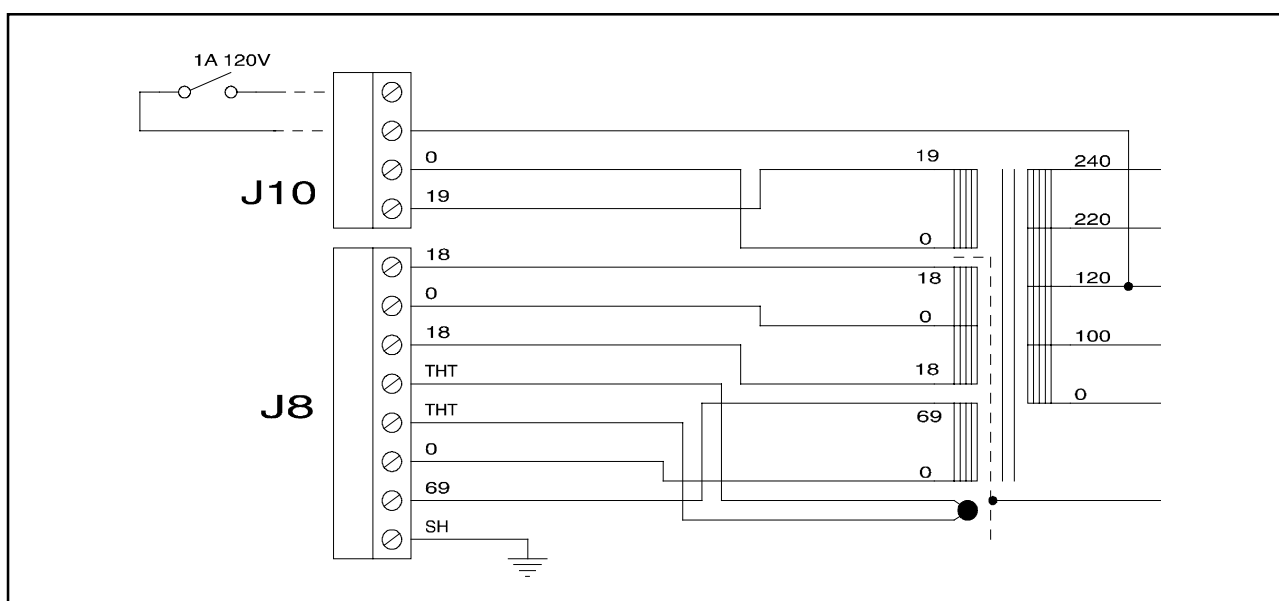
Imballo dei controller

Durante l'operazione di disimballaggio, prestare particolare attenzione a non lasciar cadere il controller e a non sottoporlo ad urti. Non disperdere l'imballo nell'ambiente. Il materiale è completamente riciclabile e risponde alla direttiva CEE 85/399 per la tutela dell'ambiente. Prima di installare il controller occorre preparare alcuni cavi di interconnessione, quali ad esempio i cavi per le interconnessioni con l'alimentazione, quelli per le interconnessioni logiche e quello per il collegamento con la pompa. Nelle figure seguenti sono schematizzati i collegamenti da effettuare tra il controller e la pompa e tra il controller ed il trasformatore di alimentazione.

Per ulteriori dettagli sulle suddette interconnessioni e le caratteristiche tecniche del trasformatore (disponibile come opzione) vedere l'appendice "Technical Information".



Cavo di Interconnessione tra il Controller e la Pompa



Interconnessioni tra il Controller ed il Trasformatore

INSTALLAZIONE

**PERICOLO!**

Le tensioni presenti tra il controller ed il relativo trasformatore, e tra il trasformatore e la rete di alimentazione sono tali da costituire pericolo per chi ne venisse a contatto. Proteggere adeguatamente il controller ed il trasformatore di alimentazione nella loro installazione definitiva da contatti accidentali.

**PERICOLO!**

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 dalla alimentazione. All'interno del controller si sviluppano elevate temperature che possono recare gravi danni. Proteggere adeguatamente il controller nella sua installazione definitiva da contatti accidentali.

NOTA

Il controller installato nel sistema definitivo deve essere posizionato in modo tale che l'aria di raffreddamento possa circolare liberamente intorno all'apparato. Non installare e/o utilizzare il controller in ambienti esposti ad agenti atmosferici (pioggia, gelo, neve), polveri, gas aggressivi, in ambienti esplosivi o con elevato rischio di incendio.

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

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

USO

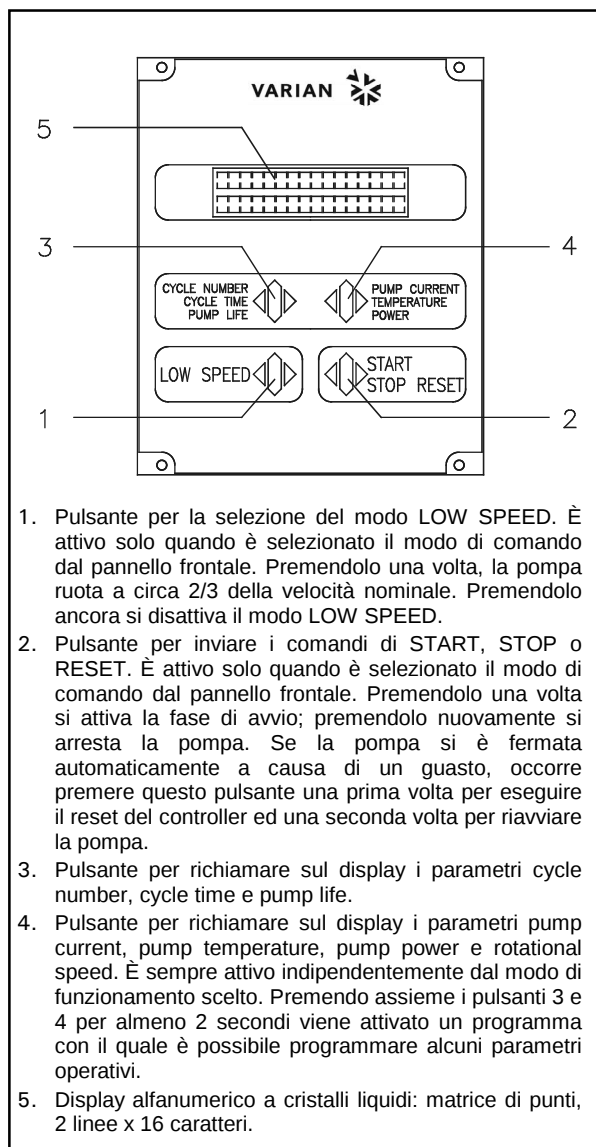
In questo paragrafo sono riportate le principali procedure operative. Per ulteriori dettagli e per procedure che coinvolgono collegamenti o particolari opzionali, fare riferimento al paragrafo "USE" dell'appendice "Technical Information". Alcune delle istruzioni riportate nel seguito sono possibili solo se al controller è collegato l'accessorio "Hand held terminal". Prima di usare il controller effettuare tutti i collegamenti elettrici e pneumatici e fare riferimento al manuale della pompa collegata.



PERICOLO!

Per evitare danni alle persone ed all'apparato, nel caso in cui la pompa sia appoggiata su di 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.

Di seguito è illustrato il pannello di comando dell'hand held terminal.



Pannello frontale dell'Hand Held Terminal

PROCEDURE DI USO

Accensione del Controller

Per accendere il controller è sufficiente fornire la tensione di alimentazione al controller stesso.

Avvio della Pompa

Per avviare la pompa occorre inviare il comando di START ai relativi pin del connettore di ingresso del controller (pin 1 - 6 di P1) o, se è presente l'opzione "hand held terminal", premere il pulsante START.

Arresto della Pompa

Per arrestare la pompa occorre rimuovere il comando di START dai relativi pin del connettore di ingresso del controller (pin 1 - 6 di P1) o, se è presente l'opzione "hand held terminal", premere il pulsante STOP.

MANUTENZIONE

I controller della serie Turbo-V 70 PCB non richiedono 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 ricondizionato in sostituzione di quello guasto.



PERICOLO!

Prima di effettuare qualsiasi intervento sul controller scollegare il cavo di alimentazione.

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

MESSAGGI DI ERRORE

In alcuni casi di guasto la circuiteria di autodiagnosi del controller presenta alcuni messaggi di errore elencati nella tabella seguente.

NOTA

I messaggi di errore sono presentati solo se è installata l'opzione "hand held terminal".

MESSAGGIO	DESCRIZIONE	AZIONE CORRETTIVA
CHECK CONNECTION TO PUMP	Malfunzionamento nel collegamento tra pompa e controller.	Verificare che il cavo di collegamento tra pompa e controller sia ben fissato da entrambe le estremità e non sia interrotto. Premere due volte il pulsante START per riavviare la pompa.
PUMP WAITING INTERLOCK	È attivo il segnale di interlock presente sul connettore P1 a causa dell'interruzione del corto circuito tra il pin 3 ed il pin 8 del connettore J1, o a causa dell'apertura del segnale di interlock esterno.	Ripristinare il corto circuito tra il pin 3 ed il pin8 del connettore J1, o chiudere il segnale di interlock esterno.
FAULT: OVERTIME SX	Durante l'avvio della pompa nel modo "soft start", la pompa non ha raggiunto la velocità prevista ad ogni passo entro 15 minuti. (X può valere da 0 a 9 ed indica il passo non superato).	Verificare che il sistema non presenti delle perdite. Premere due volte il pulsante START per riavviare la pompa.
FAULT: PUMP OVERTEMP.	La temperatura del cuscinetto superiore o della pompa ha superato i 60 °C.	Attendere che la temperatura ritorni al di sotto della soglia. Premere due volte il pulsante START per riavviare la pompa.
FAULT: CONTROLLER OVERTEMPERATURE	La temperatura del trasformatore del controller ha superato i 90 °C.	Attendere che la temperatura ritorni al di sotto della soglia. Premere due volte il pulsante START per riavviare la pompa.
FAULT: TOO HIGH LOAD	Durante il funzionamento normale (dopo la fase di avvio) la corrente assorbita dalla pompa è maggiore di quella programmata (1,5 A).	Verificare che il rotore della pompa abbia la possibilità di ruotare liberamente. Premere due volte il pulsante START per riavviare la pompa.
FAULT: SHORT CIRCUIT	Durante il funzionamento normale (dopo la fase di avvio) la connessione di uscita è in corto circuito (corrente di uscita maggiore di 2,2 A).	Verificare i collegamenti tra pompa e controller. Premere due volte il pulsante START per riavviare la pompa.
SYSTEM OVERRIDE	La pompa è stata fermata da un segnale di emergenza proveniente da un contatto remoto.	Staccare il cavo di alimentazione del controller e correggere la causa dell'emergenza. Ricollegare il cavo di alimentazione e premere due volte il pulsante START per riavviare la pompa.
OVERVOLTAGE	Si è verificato un guasto nella sezione di alimentazione del controller, o il controller ha ricevuto un segnale spurio.	Premere due volte il pulsante START per riavviare la pompa. Se il messaggio si ripresenta rivolgersi in Varian per la manutenzione.
CONTROLLER FAILURE	Interruzione fusibile sul secondario di potenza.	Rivolgersi alla Varian per la Manutenzione.

ALLGEMEINES

Dieser Apparat ist für Fachbetriebe bestimmt. Vor Gebrauch sollte der Benutzer dieses Handbuch sowie alle weiteren mitgelieferten Zusatzdokumentationen genau lesen. Bei Nichtbeachtung - auch teilweise - der enthaltenen Hinweise, unsachgemäßem Gebrauch durch ungeschultes Personal, nicht autorisierten Eingriffen und Mißachtung der einheimischen, hier zur Geltung kommenden Bestimmungen übernimmt die Firma Varian keinerlei Haftung. Der Controller der Serie Turbo-V 70 PCB ist ein mikroprozessorgesteuerte Frequenzwandler. Er ist aus Festkörperbauteilen gefertigt und verfügt über ein Selbstdiagnose- und ein Selbstschutzsystem. Er enthält alle für den automatischen Betrieb der Pumpenserie Turbo-V 70 PCB erforderlichen Schaltungen. Der Controller steuert die Pumpen der Serie Turbo-V 70 PCB (durch einen 10-Schritte-Prozeß) in der Startphase, indem er die Spannung und die Stromstärke im Verhältnis zur Pumpen-geschwindigkeit kontrolliert. Mittels Hilfsverbinder sind die Fernsteuerungen für Pumpenstart- und stopp, die Signale für die Anzeige des Pumpenzustands, die Start- und Stoppsteuerungen der Vorvakuum-pumpen, sowie die Sperrsignale (für Druckschalter, Wasserstrom-Kontrollschalter, etc.) verfügbar. Der Controller muß über einen externen Trafo gespeist werden (nicht mit dem Controller mitgeliefert). Für die Funktionskontrolle und die Visualisierung des Controllerzustandes ist ein entsprechendes Gerät (Hand Held Terminal) erhältlich; es besteht aus einer Steuertastatur und einem Display für die Visualisierung. In den folgenden Abschnitten sind alle erforderlichen Informationen für die Sicherheit des Bedieners bei der Anwendung des Geräts aufgeführt. Detaillierte technische Informationen sind im Anhang "Technical Information" enthalten.

In dieser Gebrauchsanleitung werden Sicherheitshinweise folgendermaßen hervorgehoben:



GEFAHR!

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



ACHTUNG!

Die Warnhinweise werden vor Prozeduren visualisiert, die bei Nichtbeachtung Schäden an der Anlage verursachen könnten.

ANMERKUNG

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

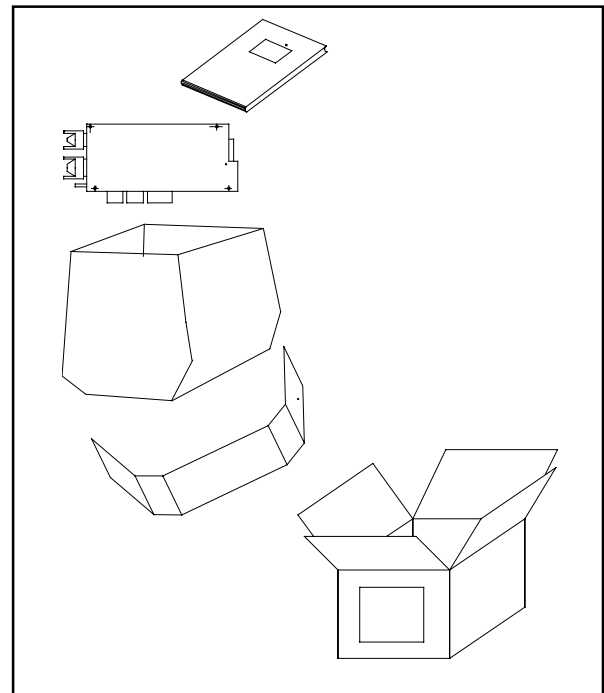
LAGERUNG

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

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

VOR DER INSTALLATION

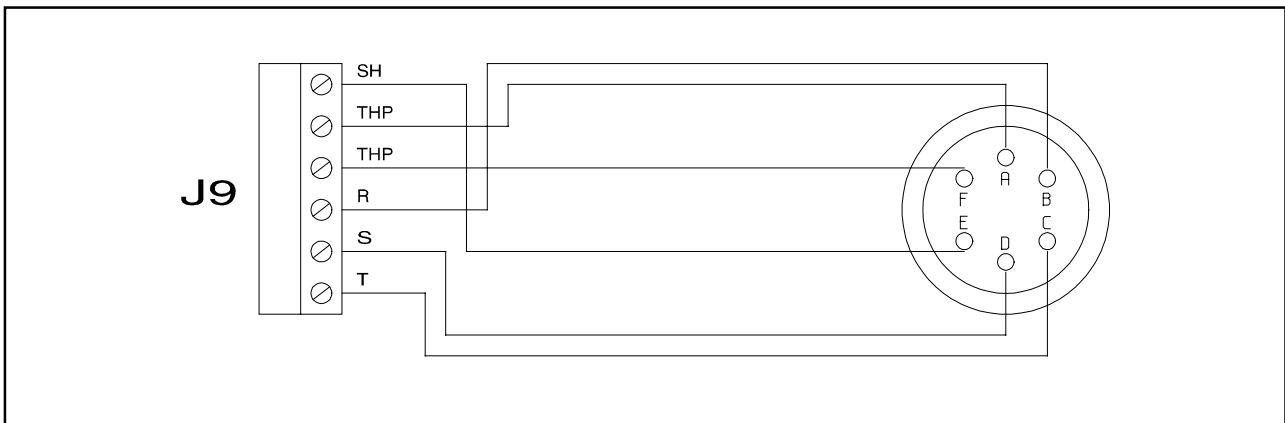
Der Controller wird mit einer speziellen Schutzverpackung geliefert. Eventuelle Transportschäden müssen der zuständigen örtlichen Verkaufsstelle gemeldet werden.



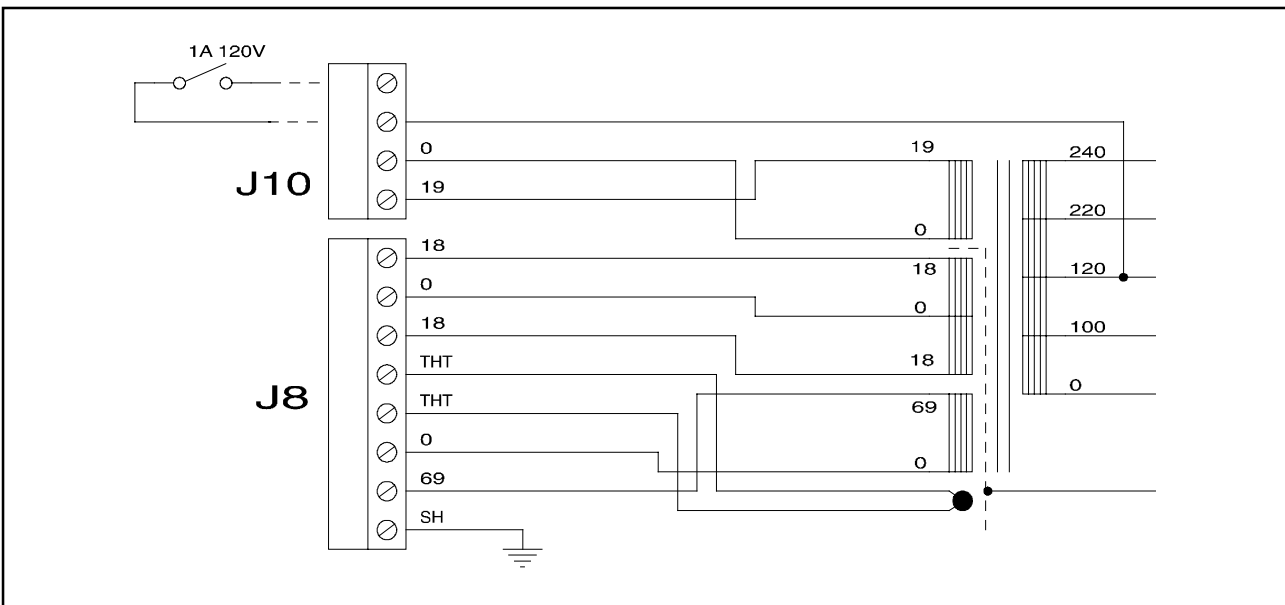
Verpackung des Controllers

Der Controller sollte vorsichtig ausgepackt werden, damit er 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. Vor der Installation des Controllers müssen einige Verbundkabel vorbereitet werden; wie zum Beispiel die Kabel für die Vermaschung mit der Versorgung, die Kabel für die logischen Vermaschungen und das Kabel für den Anschluß mit der Pumpe. Auf den folgenden Abbildungen werden die Anschlüsse aufgezeigt, die zwischen dem Controller und der Pumpe und zwischen dem Controller und dem Versorgungstransformator ausgeführt werden müssen. Weitere Einzelheiten zu den oben genannten Vermaschungen und zu den Merkmalen des Versorgungstransformators (erhältlich als Optional), sind im Anhang Technical Information aufgeführt.



Verbundkabel zwischen Controller und Pumpe



Verbundkabel zwischen Controller und Transformator

INSTALLATION



GEFAHR!

Die Spannungen auf dem Controller und dem zugehörigen Transformator, sowie zwischen dem Transformator und dem Versorgungsnetz sind bei Berührung gefährlich. Schützen Sie den Controller und den Speisungs-transformator bei ihrer definitiven Installation vor zufälligen Berührungen.



GEFAHR!

Im Innern des Controllers bilden sich hohe Spannungen, die schwere Schäden bis hin zum Tod verursachen können. Vor jedem Installations- oder Wartungseingriff den Controller von der Stromversorgung trennen. Im Innern des Controllers bilden sich erhöhte Temperaturen, die schwere Schäden verursachen können. Schützen Sie den Controller bei seiner definitiven Installation vor zufälligen Berührungen.

ANMERKUNG

Der im definitiven System installierte Controller muß so positioniert sein, daß die Kühlungs-luft frei um das Gerät zirkulieren kann. 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.

Beim Betrieb müssen folgende Umgebungsbedingungen eingehalten werden:

- Temperatur: von 0 °C bis +40 °C;
- Relative Luftfeuchtigkeit: 0 - 95 % (nicht kondensierend).

GEBRAUCH

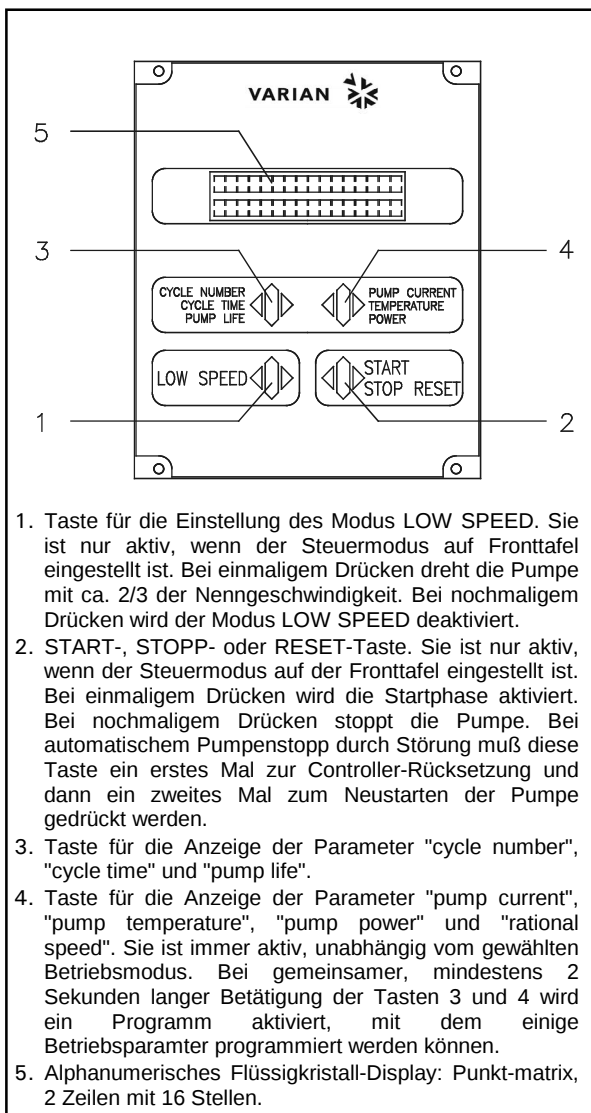
In diesem Kapitel sind die wichtigsten Betriebsvorgänge aufgeführt. Für weitere Hinweise bezüglich Anschlüsse und Montage des bestellbaren Zubehörs siehe Kapitel "USE" im Anhang zu "Technical Information". Einige der nachstehenden Gebrauchshinweise lassen sich beim Controller nur dann ausführen, wenn das Zubehör "Handheld terminal" angeschlossen ist. Vor Benutzung des Controllers sämtliche elektrischen und pneumatischen Anschlüsse ausführen und die Betriebsanleitung der angeschlossenen Pumpe durchlesen.



GEFAHR!

Steht die Pumpe auf einem Tisch, muß auf den stabilen Stand geachtet werden, da sonst Gefahr für Personen- und Geräteschäden bestehen könnte. Die Pumpe nie einschalten, wenn der Eingangsflansch nicht an das System angeschlossen bzw. nicht mit dem Schließflansch verschlossen ist.

Nachstehend wird die Steuertafel des "Hand Held Terminals" beschrieben.



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

Frontpaneel des "Hand Held Terminals"

BEDIENUNG

Einschalten des Controllers

Zum Einschalten des Controllers genügt es, das Netzkabel an die Steckdose anzuschließen.

Pumpenstart

Zum Starten der Pumpe muß der START- Befehl an die entsprechenden Pins des Eingangsverbinders des Controllers (Pin 1 - 6 von P1) gesandt werden; sollte der hand held terminal als Optional vorhanden sein, drücken Sie die START- Taste.

Pumpenstopp

Zum Stoppen der Pumpe muß der STOPP- Befehl an die entsprechenden Pins des Eingangsverbinders des Controllers (Pin 1 - 6 von P1) gesandt werden; sollte der hand held terminal als Optional vorhanden sein, drücken Sie die STOPP - Taste.

WARTUNG

Die Controller der Serie Turbo-V 70 PCB sind wartungsfrei. Eventuell erforderliche Eingriffe müssen von dazu befugtem Fachpersonal ausgeführt werden.

Bei einem Defekt kann der Varian-Reparaturdienst bzw. der "Varian advanced exchange service" in Anspruch genommen werden, der für die Erneuerung des defekten Controllers sorgt.



GEFAHR!

Vor jedem Eingriff am Controller muß der Netzstecker gezogen werden.

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

FEHLERMELDUNGEN

In einigen Störungsfällen zeigt das Selbst-diagnosesystem des Controllers die in der nach-stehenden Tabelle zusammengefaßten Meldungen an.

ANMERKUNG

Die Störungsmeldungen werden nur angezeigt, wenn das Zubehör "handheld terminal" installiert ist.

MELDUNG	BESCHREIBUNG	BEHEBUNG
CHECK CONNECTION TO PUMP	Fehlfunktion der Pumpen-Controller Verbindung.	Sicherstellen, daß das Verbindungs-kabel zwischen Pumpe und Controller an beiden Seiten korrekt befestigt ist und keine Unterbrechung vorliegt. Die Pumpe durch zweimalige Betätigung der START-Taste neustarten.
PUMP WAITING INTERLOCK	Das Interlock-Signal auf dem Verbinder P1 ist wegen der Kurzschlußunterbrechung zwischen Pin 3 und Pin 8 des Verbinders K1 oder wegen der Öffnung des externen Interlock-Signals aktiv.	Den Kurzschluß zwischen Pin 3 und Pin 8 des Verbinders J1 rücksetzen oder das externe Interlock-Signal schließen.
FAULT: OVERTIME SX	Beim Pumpenstart im Modus "soft start" hat die Pumpe die bei jedem Schritt vorgesehene Geschwindigkeit inner-halb von 15 Minuten nicht erreicht (X kann 0-9 sein und zeigt den nicht überwundenen Schritt an).	Sicherstellen, daß das System keine Leckagen aufweist. Die Pumpe durch zweimalige Betätigung der START-Taste neustarten.
FAULT: PUMP OVERTEMP.	Die Temperatur des oberen Lagers bzw. der Pumpe hat 60 °C überschritten.	Warten bis die Temperatur unter den Schwellenwert gesunken ist. Die Pumpe durch zweimalige Betätigung der START-Taste neustarten.
FAULT: CONTROLLER OVERTEMPERATURE	Die Temperatur des Controller-Trafos hat 90 °C überschritten.	Warten bis die Temperatur unter den Schwellenwert gesunken ist. Die Pumpe durch zweimalige Betätigung der START-Taste neustarten.
FAULT: TOO HIGH LOAD	Während des Normalbetriebs (nach der Startphase) ist die Pumpen stromaufnahme größer als die vorgesehene (1,5 A).	Sicherstellen,, daß der Pumpenrotor ungehindert drehen kann. Die Pumpe durch zweimalige Betätigung der START-Taste neustarten.
FAULT: SHORT CIRCUIT	Während des Normalbetriebs (nach der Startphase) erfolgt ein Kurzschluß der Ausgangsverbindung (Ausgangs-strom größer als 2,2 A).	Die Verbindung zwischen Pumpe und Controller prüfen. Die Pumpe durch zweimalige Betätigung der START-Taste neustarten.
SYSTEM OVERRIDE	Die Pumpe wurde durch ein von einem entfernten Kontakt kommendes Notsignal gestoppt.	Das Netzkabel des Controllers ausstecken und die Störungsursache beheben. Das Netzkabel wieder anschließen und die Pumpe durch zweimalige Betätigung der START-Taste neustarten.
OVERVOLTAGE	Defekt im Versorgungsbereich des Controllers bzw. der Controller hat ein falsches Signal erhalten.	Die Pumpe durch zweimalige Betätigung der START-Taste neustarten. Erscheint die Meldung wieder sollte der Varian-Wartungs-dienst gerufen werden.
CONTROLLER FAILURE	Unterbrechung der Schmelzsicherung am sekundären Leistungsstromkreis.	Zur Instandhaltung an Varian wenden.

INDICATIONS GENERALES

Cet appareillage a été conçu en vue d'une utilisation professionnelle. Il est conseillé à l'utilisateur de lire attentivement cette notice d'instructions ainsi que toute autre indication supplémentaire fournie par Varian, avant l'utilisation de l'appareil. Varian décline par conséquent toute responsabilité en cas d'inobservation totale ou partielle des instructions données, d'utilisation incorrecte de la part d'un personnel non formé, d'opérations non autorisées ou d'un emploi contraire aux réglementations nationales spécifiques. Le contrôleur Turbo-V 70 PCB est un convertisseur de fréquence, contrôlé par un microprocesseur, réalisé avec des éléments à l'état solide et ayant des capacités d'autodiagnostic et d'autoprotection. Il incorpore l'ensemble de circuits nécessaire au fonctionnement automatique des pompes de la série Turbo-V 70 PCB. Le contrôleur pilote les pompes de la série Turbo-V 70 PCB (selon un processus subdivisé en dix pas) pendant la phase de mise en marche, en contrôlant la tension et le courant par rapport à la vitesse atteinte par la pompe. Des connecteurs auxiliaires permettent de disposer des commandes de mise en marche et d'arrêt de la pompe à distance, des signaux indiquant l'état opérationnel de la pompe, des commandes de mise en marche et d'arrêt de la pompe à pré-vidé ainsi que de signaux de blocage (pour interrupteurs à pression, interrupteurs de contrôle du flux de l'eau, etc.). Le contrôleur doit être alimenté par un transformateur extérieur (non fourni avec le contrôleur). Pour contrôler les fonctions et afficher l'état du contrôleur, il est possible de disposer - en option - d'un appareil prévu à cet effet (Hand Held Terminal), constitué d'un clavier de commande et d'un écran d'affichage. Les paragraphes suivants donnent toutes les indications nécessaires à garantir la sécurité de l'opérateur pendant l'utilisation de l'appareillage. Des renseignements plus détaillés se trouvent dans l'appendice "Technical Information".

Cette notice utilise les signes conventionnels suivants:



DANGER!

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



ATTENTION!

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

NOTE

Les notes contiennent des renseignements importants, isolés du texte.

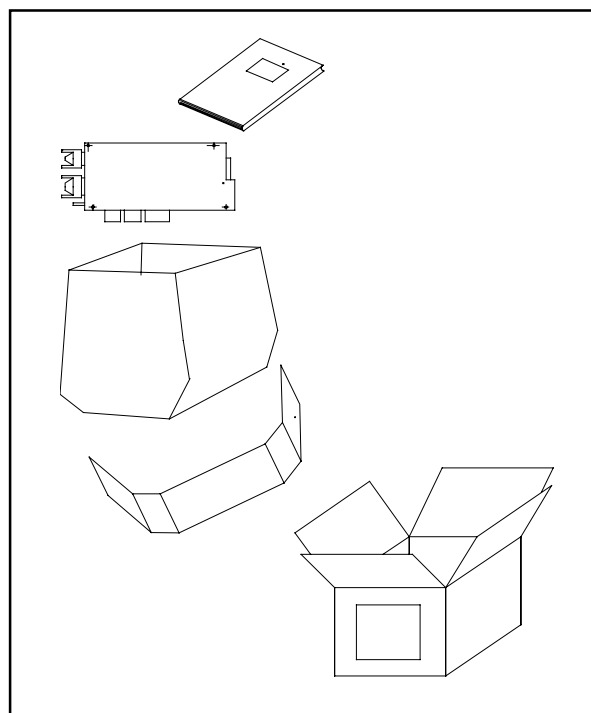
EMMAGASINAGE

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

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

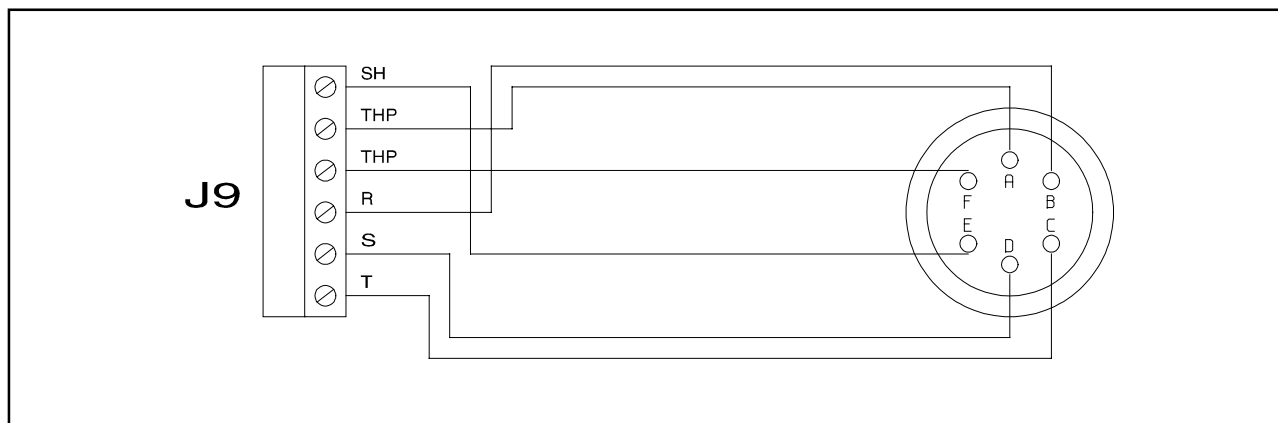
PREPARATION POUR L'INSTALLATION

Le contrôleur 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.

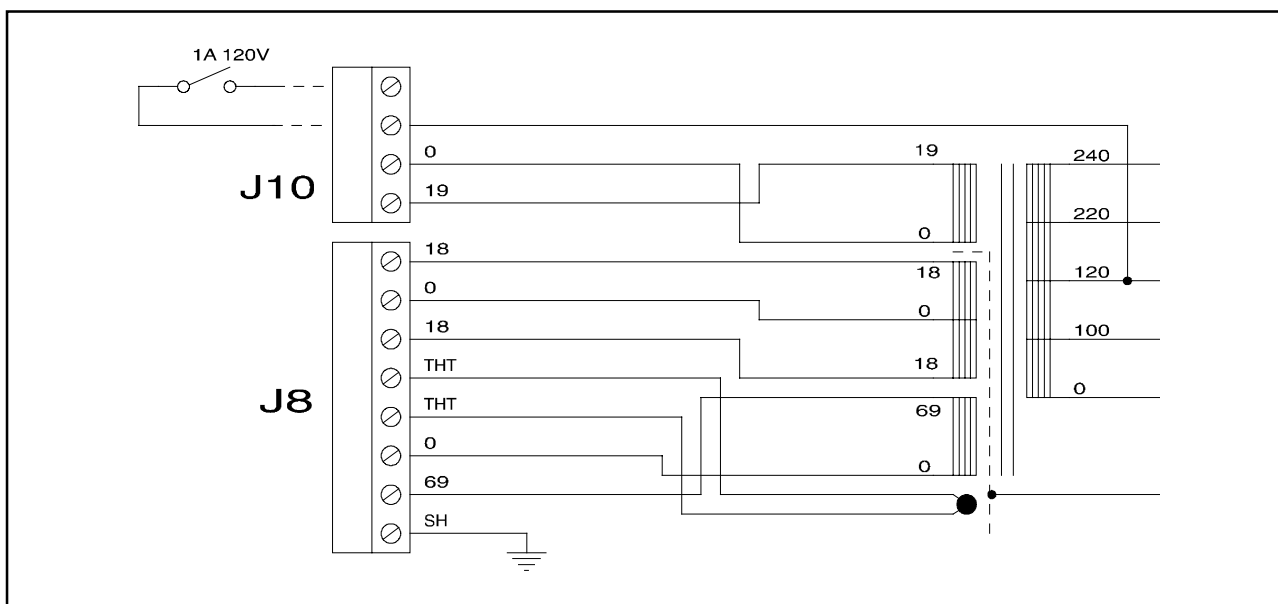


Emballage des contrôleurs

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 85/399 en matière de protection de l'environnement. Avant d'installer le contrôleur, il est nécessaire de préparer quelques câbles d'interconnexion, par exemple les câbles pour les interconnexions avec l'alimentation, ceux pour les interconnexions logiques et celui pour le branchement avec la pompe. Les schémas qui suivent indiquent les connexions à effectuer entre le contrôleur et la pompe et entre le contrôleur et le transformateur d'alimentation. Pour tous autres détails concernant les interconnexions susdites et les caractéristiques du transformateur d'alimentation (disponible en option), se reporter à l'appendice "Technical Information".



Câble d'Interconnexion entre le contrôleur et la pompe



Interconnexions entre le contrôleur et le transformateur

INSTALLATION



DANGER!

Les tensions présentes entre le contrôleur et le transformateur correspondant et entre le réseau d'alimentation constituent un danger: éviter tout contact. Protéger de façon appropriée le contrôleur et le transformateur d'alimentation, dans leur installation définitive, contre tous contacts accidentels.



DANGER!

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. A l'intérieur du contrôleur se développent des températures élevées qui peuvent causer de graves dommages. Protéger de façon appropriée le contrôleur, dans son installation définitive, contre tous contacts accidentels.

NOTE

Le contrôleur installé dans le système définitif doit être positionné de façon à ce que l'air de refroidissement puisse circuler librement autour de l'appareil. Ne pas installer et/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.

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

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

UTILISATION

Dans ce paragraphe, on indique 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 Information". Quelques-unes des instructions données ci-après ne sont possibles que si l'accessoire "Hand held terminal" est connecté au contrôleur. Avant d'utiliser le contrôleur, effectuer toutes les connexions électriques et pneumatiques et se référer à la notice de la pompe connectée.



DANGER!

Pour éviter tous dommages aux personnes et à l'appareil, si la pompe est placée sur un plateau d'appui s'assurer que ce dernier 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.

On présente ci-dessous le tableau de commande du "Hand Held Terminal".

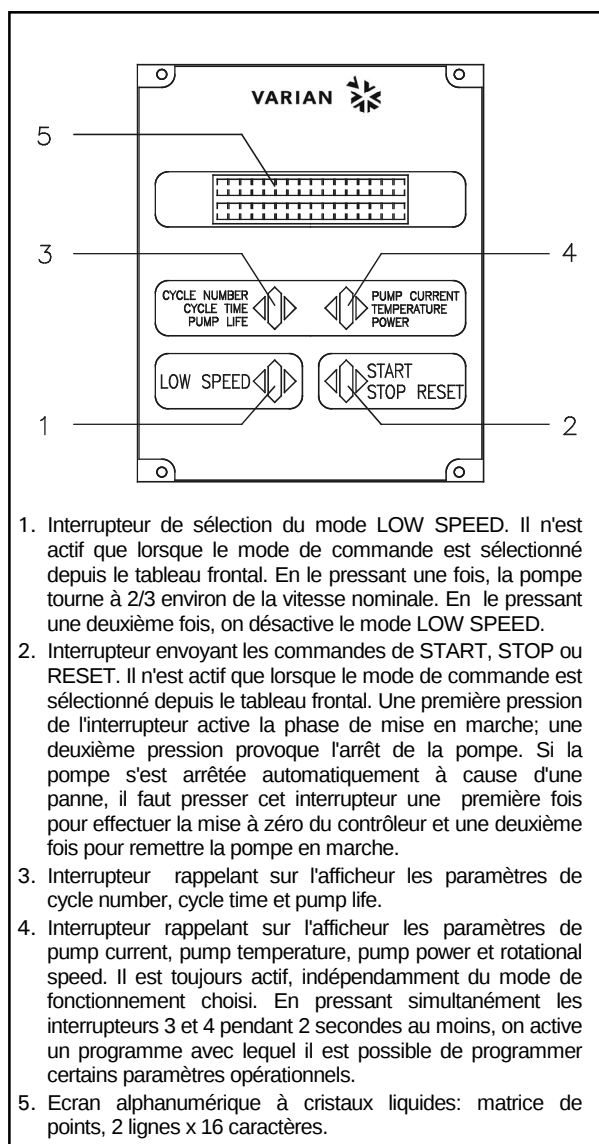


Tableau avant du "Hand Held Terminal"

PROCEDURES D'UTILISATION

Allumage du Contrôleur

Pour allumer le contrôleur, il suffit d'introduire le câble d'alimentation dans la prise du réseau.

Mise en marche de la Pompe

Pour mettre la pompe en marche, il est nécessaire d'envoyer la commande de START aux pins correspondants du connecteur d'entrée du contrôleur (pin 1 - 6 de P1) ou bien, si l'option "hand held terminal" est présente, presser l'interrupteur START.

Arrêt de la Pompe

Pour arrêter la pompe, il est nécessaire d'enlever la commande de START des pins correspondants du connecteur d'entrée du contrôleur (pin 1 - 6 de P1) ou bien, si l'option "hand held terminal" est présente, presser l'interrupteur STOP.

ENTRETIEN

Les contrôleurs de la série Turbo-V 70 PCB n'exigent 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 régénéré 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 régénéré à la place du contrôleur détraqué.

MESSAGES D'ERREUR

Dans certains cas de panne, l'ensemble de circuits d'autodiagnostic du contrôleur présente certains messages d'erreur indiqués dans le tableau ci-dessous.

NOTE

Les messages d'erreur ne sont affichés que si l'option "hand held terminal" est installée.

MESSAGE	DESCRIPTION	INTERVENTION
CHECK CONNECTION TO PUMP	Dysfonctionnement de la connexion entre la pompe et le contrôleur.	S'assurer que le câble de connexion entre la pompe et le contrôleur et le contrôleur est bien fixé aux deux extrémités et qu'il n'est pas coupé. Presser deux fois l'interrupteur START pour réactiver la pompe.
PUMP WAITING INTERLOCK	Le signal d'interlock situé sur le connecteur P1 est actif à cause de la coupure du court-circuit entre le pin 3 et le pin 8 du connecteur J1 ou à cause de l'ouverture du signal d'interlock extérieur.	Rétablir le court-circuit entre le pin 3 et le pin 8 du connecteur J1 ou fermer le signal d'interlock extérieur.
FAULT: OVERTIME SX	Pendant la mise en marche de la pompe dans le mode soft start", la pompe n'a pas atteint la vitesse prévue à chaque pas dans les 15 minutes (X peut valoir de 0 à 9 et indique le pas non franchi).	S'assurer que le système ne présente pas de fuites. Presser deux fois l'interrupteur START pour remettre la pompe en marche.
FAULT: PUMP OVERTEMP.	La température du palier supérieur ou de la a dépassé 60 °C.	Attendre que la température retourne au-dessous du seuil. Presser deux fois l'interrupteur START pour remettre la pompe en marche.
FAULT: CONTROLLER OVERTEMPERATURE	La température du transformateur du contrôleur a dépassé 90 °C.	Attendre que la température retourne au-dessous du seuil. Presser deux fois l'interrupteur START pour remettre la pompe en marche.
FAULT: TOO HIGH LOAD	Pendant le fonctionnement normal (après la phase de mise en marche), le courant absorbé par la pompe est plus grand que celui qui a été programmé (1,5 A).	S'assurer que le rotor de la pompe a la possibilité de tourner librement. Presser deux fois l'interrupteur START pour remettre la pompe en marche.
FAULT: SHORT CIRCUIT	Pendant le fonctionnement normal (après la phase de mise en marche), la connexion de sortie est en court-circuit (courant de sortie plus grand que 2,2 A).	Vérifier les connexions entre la pompe et le contrôleur. Presser deux fois l'interrupteur START pour remettre la pompe en marche.
SYSTEM OVERRIDE	La pompe a été arrêtée par un signal d'alerte provenant d'un contact éloigné.	Débrancher le câble d'alimentation du contrôleur et corriger la cause de l'alerte. Reconnecter le câble d'alimentation et presser deux fois l'interrupteur START pour remettre la pompe en marche.
OVERVOLTAGE	Il s'est produit une panne de la section d'alimentation du contrôleur, ou bien le contrôleur a reçu un faux signal.	Presser deux fois l'interrupteur START pour remettre la pompe en marche. Si le message se présente à nouveau, s'adresser à Varian pour l'entretien.
CONTROLLER FAILURE	Interruption du fusible sur le secondaire de puissance.	Contacteur Varian pour l'entretien.

INFORMACIÓN GENERAL

Este equipo se ha concebido para un uso profesional. El usuario deberá leer atentamente el presente manual de instrucciones y cualquier otra información suplementaria facilitada por Varian antes de utilizar el equipo. Varian se considera libre de cualquier responsabilidad debida al incumplimiento total o parcial de las instrucciones, al uso poco apropiado por parte de personal sin formación, a las operaciones no autorizadas o al uso que no cumpla con las normas nacionales específicas.

El controler Turbo-V 70 PCB es un convertidor de frecuencia, controlado por un microprocesador, realizado con componentes en estado sólido y con capacidad de autodiagnos y autoprotección.

Este incorpora todos los circuitos necesarios para el funcionamiento automático de la serie Turbo-V 70 PCB.

El controler pilota las bombas de la serie Turbo-V 70 PCB (con un proceso dividido en diez pasos) durante la fase de puesta en marcha, controlando la tensión y la corriente en relación a la velocidad alcanzada por la bomba. Mediante conectores auxiliares están disponibles los mandos para la puesta en marcha y la parada de la bomba de remoto, las señales que indican el estado operativo de la bomba, los mandos para la puesta en marcha y la parada de la bomba de pre-vacío, las señales de control del caudal del agua, etc.). El controler ha de ser alimentado por un transformador exterior (no suministrado con el controler).

Para controlar las funciones y visualizar el estado del controler se ofrece opcionalmente un aparato (Hand Held Terminal) específico compuesto por un teclado de mando y por un visor de visualización. En los apartados siguientes se facilita toda la información necesaria para garantizar la seguridad del operador durante el uso del equipo. Una información más detallada se facilita en el Suplemento "Technical Information".

Este manual utiliza los símbolos convencionales siguientes:



¡PELIGRO!

Los mensajes de peligro atraen la atención del operador sobre un procedimiento o una operación específica que, al no realizarse correctamente, podría provocar graves lesiones personales.



¡ATENCIÓN!

Los mensajes de atención se visualizan antes de procedimientos que, al no respetarse, podrían provocar daños al equipo.

NOTA

Las notas contienen información importante extraída del texto.

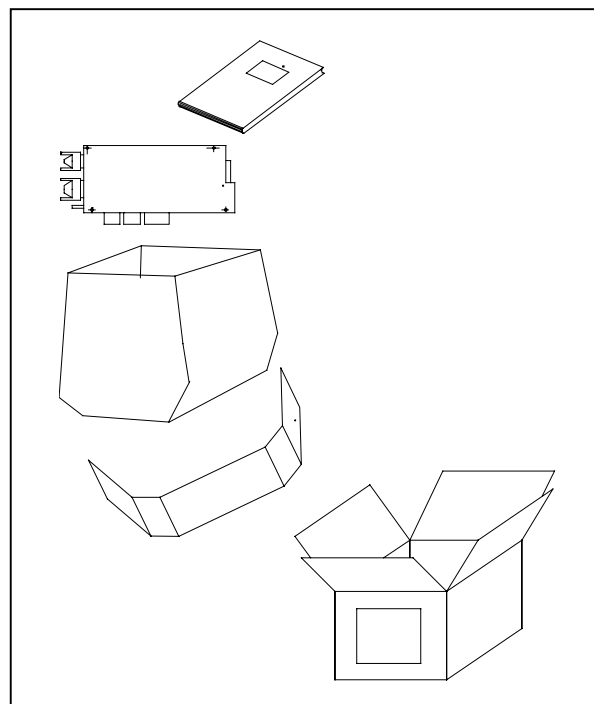
ALMACENAMIENTO

Durante el transporte y el almacenamiento de los controlers se deberá cumplir con las condiciones ambientales siguientes:

- temperatura: de -20 °C a +70 °C
- humedad relativa: 0 - 95% (no condensadora)

PREPARACIÓN PARA LA INSTALACIÓN

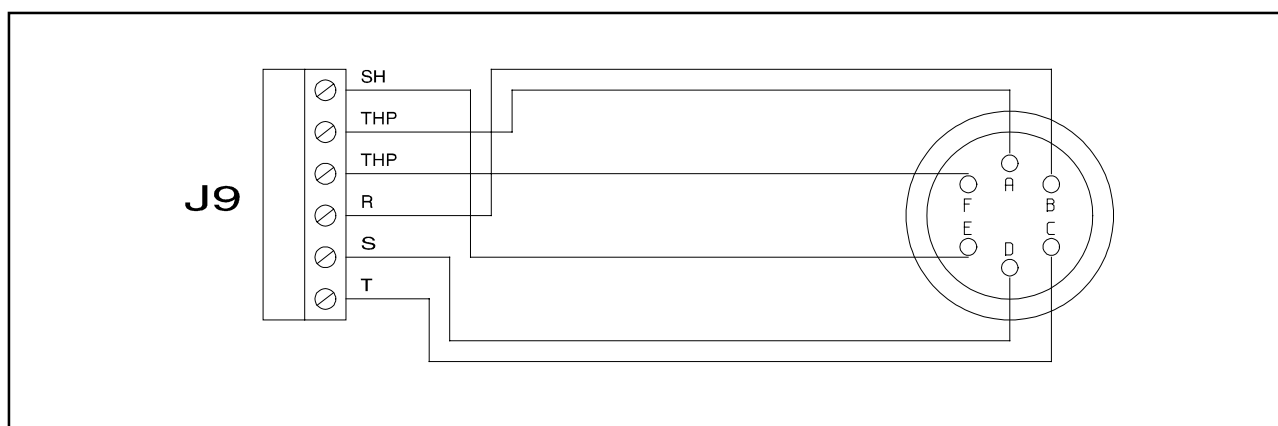
El controler se suministra en un embalaje de protección especial; si se observan señales de daños, que podrían haberse producido durante el transporte, ponerse en contacto con la oficina de venta más cercana.



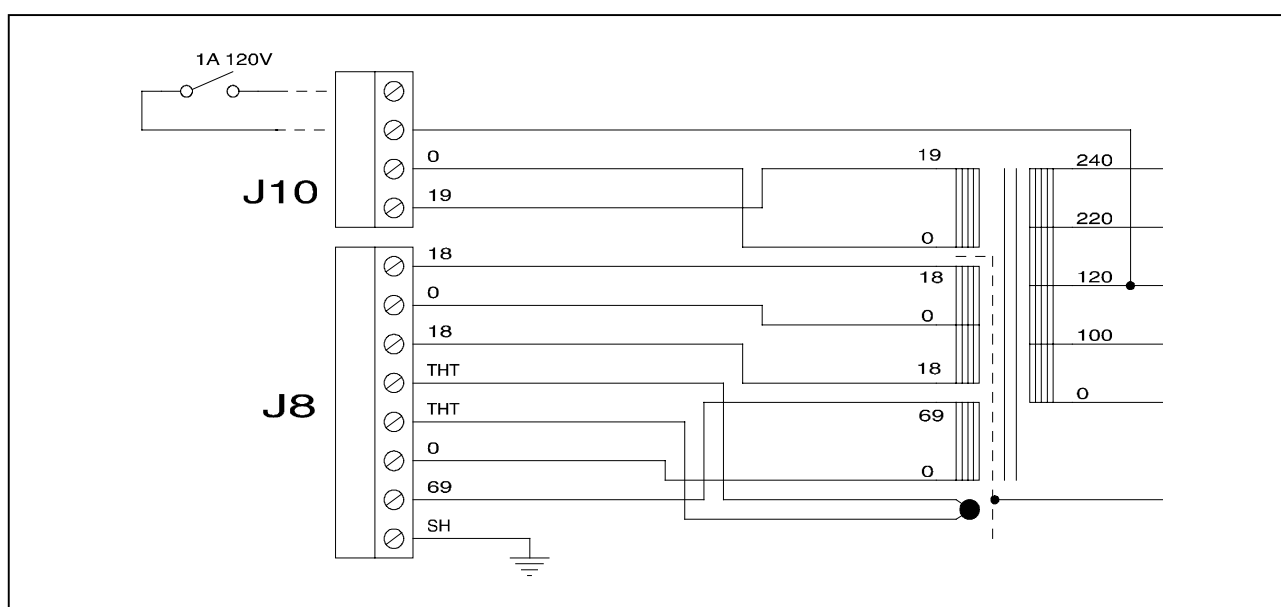
Embalaje del Controler

Durante la operación de desembalaje, prestar una atención especial a no dejar caer el controler y evitarle golpes.

No dispersar el embalaje en el medio ambiente. El material es totalmente reciclable y cumple con la directiva CEE 85/399 para la preservación del medio ambiente. Antes de instalar el controlador habrá que preparar algunos cables de interconexión, como por ejemplo los cables para las interconexiones con la alimentación, los de las interconexiones lógicas y el de acoplamiento con la bomba. En las figuras siguientes están esquematizados los acopliamientos que hay que realizar entre el controlador y la bomba y entre el controlador y el transformador de alimentación. Para más detalles sobre las interconexiones indicadas anteriormente y sobre las características del transformador de alimentación (disponible como opción) véase el suplemento "Technical Information".



Cable de interconexión entre el controler y la bomba



Interconexiones entre el controler y el transformador

INSTALACIÓN



¡PELIGRO!

Las tensiones que existen entre el controler y el transformador correspondiente, y entre el transformador y la red de alimentación representan peligro para quienes entren en contacto con los mismos. Proteger adecuadamente el controler y el transformador de alimentación en su instalación definitiva contra contactos accidentales.



¡PELIGRO!

Dentro del controler se desarrollan altas tensiones que pueden causar graves daños o la muerte. Antes de efectuar cualquier operación de instalación o mantenimiento del controler, desconectarlo de la alimentación. Dentro del controler se desarrollan altas temperaturas que pueden causar graves daños. Proteger el controler adecuadamente en su instalación definitiva contra contactos accidentales.

NOTA

El controler instalado en el sistema definitivo ha de colocarse de manera que el aire de refrigeración pueda circular libremente alrededor del aparato. No instalar y/o utilizar el controler en ambientes expuestos a agentes atmosféricos (lluvia, hielo y nieve), polvos, gases agresivos, en ambientes explosivos o con alto riesgo de incendio.

Durante el funcionamiento es necesario que se respeten las condiciones ambientales siguientes:

- temperatura: de 0 °C a + 40 °C
- humedad relativa: 0 - 95% (no condensadora).

USO

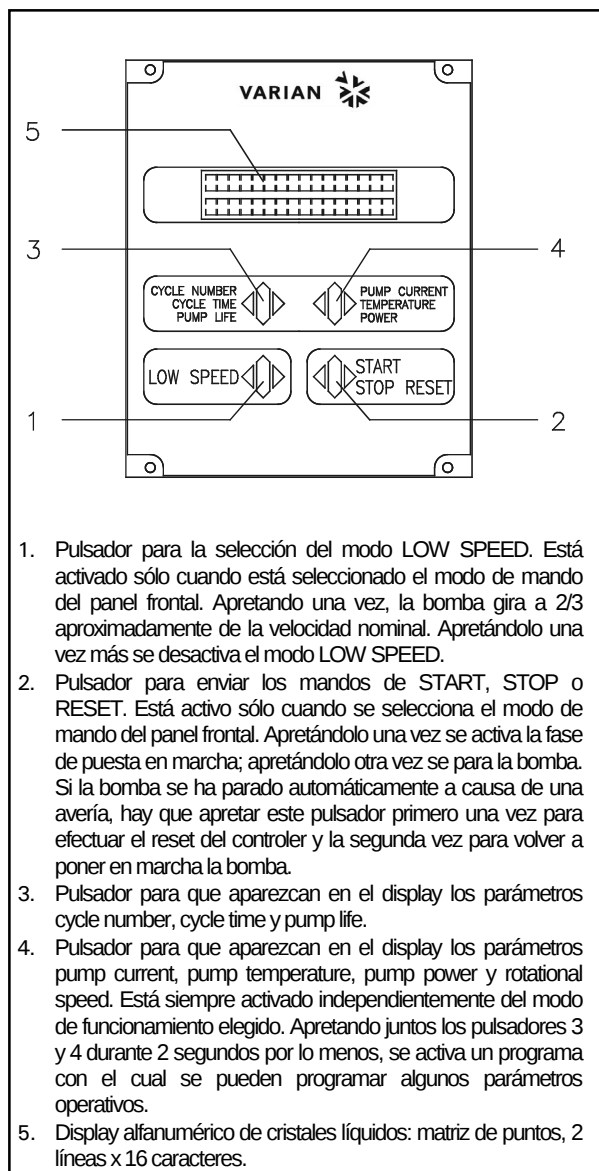
En este apartado se citan los procedimientos operativos principales. Para más detalles y para procedimientos que impliquen conexiones u opcionales especiales, les remitimos al apartado "USE" del anexo "Technical Information". Algunas de las instrucciones citadas a continuación pueden realizarse sólo si al mismo va conectado el accesorio "Hand held terminal". Antes de usar el controler efectuar todas las conexiones eléctricas y neumáticas y consultar el manual de la bomba conectada.



¡PELIGRO!

Para evitar lesiones a las personas y al aparato, si la bomba está apoyada sobre una mesa cerciorarse que es estable. No poner en marcha nunca la bomba si la brida de entrada no está conectada al sistema o no está cerrada con la brida de cierre.

A continuación se ilustra el panel de mando del hand held terminal.



Panel frontal del "Hand Held Terminal"

PROCEDIMIENTOS DE USO

Encendido del controler

Para encender el controler es suficiente introducir el cable de alimentación en la toma de red.

Puesta en marcha de la Bomba

Para poner en marcha la bomba hay que enviar el mando de START a los pins correspondientes del conector de entrada del controler (pin 1 - 6 de P1) o, si existe la opción "hand held terminal", apretar el pulsador START.

Parada de la Bomba

Para detener la bomba hay que quitar el mando de START de los pins correspondientes del conector de entrada del controler (pin 1 - 6 de P1) o, si existe la opción hand held terminal, apretar el pulsador STOP.

MANTENIMIENTO

Los controlers de la serie Turbo-V 70 PCB no necesitan ningún mantenimiento. Cualquier operación ha de ser efectuada por personal autorizado. En caso de avería es posible utilizar el servicio de reparación Varian o del "Varian advance exchange service", que permite obtener un controler regenerado en vez del averiado.



¡PELIGRO!

Antes de efectuar cualquier operación en el controler desenchufar el cable de alimentación.

En caso de que un controler se tenga que desguazar, efectuar su eliminación respetando las normas nacionales específicas.

MENSAJES DE ERROR

En algunos casos de avería los circuitos de autodiagnóstico del controler presenta algunos mensajes de error detallados en la tabla siguiente.

NOTA

Los mensajes de error se presentan sólo si se instala la opción "hand held terminal".

MENSAJE	DESCRIPCIÓN	ACCIÓN CORRECTIVA
CHECK CONNECTION TO PUMP	Mal funcionamiento en la conexión entre la bomba y el Controler.	Comprobar que el cable de conexión entra en la bomba y el controler está bien fijado por ambos extremos y no está interrumpido. Apretar dos veces el pulsador START para volver a poner en marcha la bomba.
PUMP WAITING INTERLOCK	Está activa la señal de interlock presente en el conector P1 a causa de la interrupción del cortocircuito entre el pin 3 y el pin 8 del conector J1, o a causa de la apertura de la señal de interlock externo.	Eliminar el cortocircuito entre el pin 3 y el pin 8 del conector J1, o cerrar la señal de interlock exterior.
FAULT: OVERTIME SX	Durante la puesta en marcha de la bomba en el modo "soft start" la bomba no ha alcanzado la velocidad prevista a cada paso antes de 15 minutos. (X puede valer de 0 a 9 e indica el paso no superado).	Comprobar que el sistema no presenta pérdidas. Apretar dos veces el pulsador START para volver a poner en marcha la bomba.
FAULT: PUMP OVERTEMP.	La temperatura del rodamiento superior o de la bomba ha superado los 60 °C.	Esperar a que la temperatura vuelva por debajo del umbral. Apretar dos veces el pulsador START para volver a poner en marcha la bomba.
FAULT: CONTROLLER OVERTEMPERATURE	La temperatura del transformador del controler ha superado los 90 °C.	Esperar a que la temperatura vuelva por debajo del umbral. Apretar dos veces el pulsador START para volver a poner en marcha la bomba.
FAULT: TOO HIGH LOAD	Durante el funcionamiento normal (tras la fase de puesta en marcha) la corriente absorbida por la bomba es superior a la programada (1,5 A).	Comprobar que el rotor de la bomba tiene la posibilidad de girar libremente. Apretar dos veces el pulsador START para volver a poner en marcha la bomba.
FAULT: SHORT CIRCUIT	Durante el funcionamiento normal (tras la fase de puesta en marcha) la conexión de salida está en cortocircuito (corriente de salida más 2,2 A).	Comprobar las conexiones entre la bomba y el controler. Apretar dos veces el pulsador START para volver a poner en marcha la bomba.
SYSTEM OVERRIDE	La bomba ha sido parada por una señal de emergencia procedente de un contacto remoto.	Desenchufar el cable de alimentación del controler y corregir la causa de la emergencia. Volver a conectar el cable de alimentación y apretar dos veces el pulsador START para volver a poner en marcha la bomba.
OVERVOLTAGE	Se ha producido una avería en la sección de alimentación del controler o el controler ha recibido una señal espurio.	Apretar dos veces el pulsador START para volver a poner en marcha la bomba. Si el mensaje se vuelve a presentar dirigirse a Varian para el mantenimiento.
CONTROLLER FAILURE	Interrupción del fusible sobre el secundario de potencia.	Contactar Varian para el Mantenimiento.

INFORMAÇÕES GERAIS

Esta aparelhagem destina-se ao uso profissional. O utilizador deve ler atentamente o presente manual de instruções e todas as informações adicionais fornecidas pela Varian antes de utilizar a aparelhagem. A Varian não se responsabiliza pela inobservância total ou parcial das instruções, pelo uso indevido por parte de pessoas não treinadas, por operações não autorizadas ou pelo uso contrário às normas nacionais específicas. O controller Turbo-V 70 PCB é um conversor de frequência, controlado por um microprocessador, realizado com componentes em estado sólido e com capacidade de autodiagnóstico e autoprotecção. Incorpora todos os circuitos necessários para o funcionamento automático das bombas da série Turbo-V 70 PCB. O controller comanda as bombas da série Turbo-V 70 PCB (com um processo subdividido em dez passos) durante a fase de activação, controlando a tensão e a corrente em relação à velocidade atingida pela bomba. Através de conectores auxiliares, estão disponíveis os comandos para a activação e a paragem da bomba por controlo remoto, os sinais que indicam o estado operativo da bomba, os comandos para a activação e a paragem da bomba de pré-vácuo, os sinais de bloqueio (para interruptores de pressão, interruptores de controlo do fluxo de água, etc.). O controller deve ser alimentado por um transformador externo (não fornecido com o controller). Para controlar as funções e visualizar o estado do controller, está disponível como opcional uma aparelhagem específica (Hand Held Terminal) constituída por um teclado de comando e por um mostrador para a visualização. Nos parágrafos seguintes estão descritas todas as informações necessárias para garantir a segurança do operador durante o uso da aparelhagem. Informações pormenorizadas são fornecidas no apêndice "Technical Information".

Este manual utiliza as seguintes convenções:



PERIGO!

As mensagens de perigo chamam a atenção do operador para um procedimento ou uma prática específica que, se não efectuada correctamente, pode provocar graves lesões pessoais.



ATENÇÃO!

As mensagens de atenção são visualizadas antes de procedimentos que, se não observados, podem causar danos à aparelhagem.

NOTA

As notas contêm informações importantes destacadas do texto.

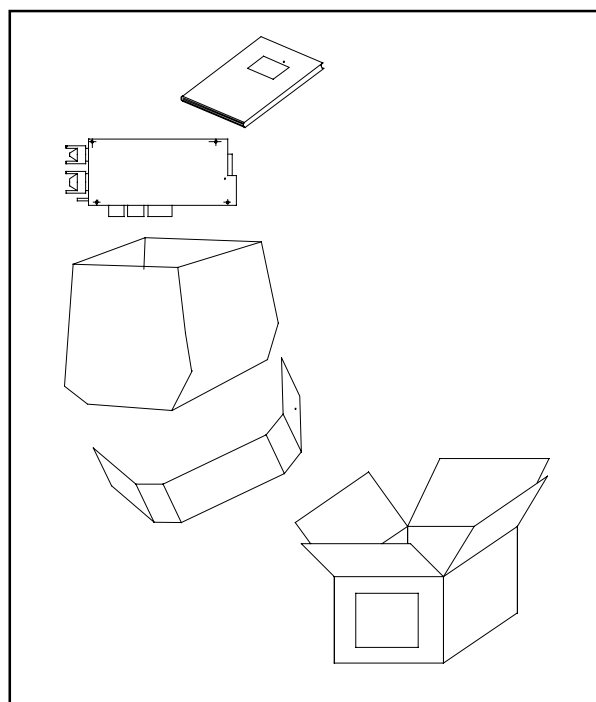
ARMAZENAGEM

Durante o transporte e a armazenagem do controller, devem ser satisfeitas as seguintes condições ambientais:

- temperatura: de -20 °C a + 70 °C
- humidade relativa: 0 - 95% (não condensadora)

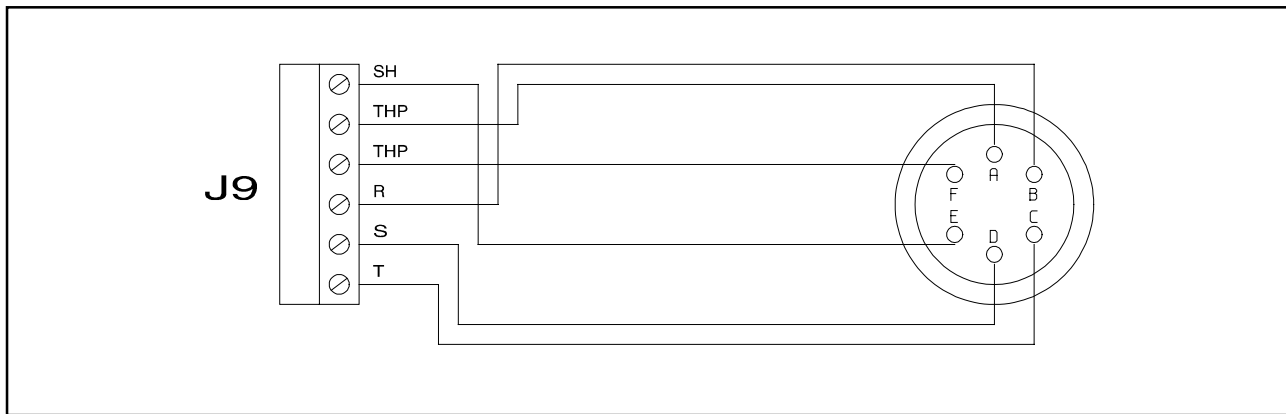
PREPARAÇÃO PARA A INSTALAÇÃO

O controller é fornecido numa embalagem protectora especial; se se apresentarem sinais de danos, que poderiam verificar-se durante o transporte, entrar em contacto com o escritório de vendas local.

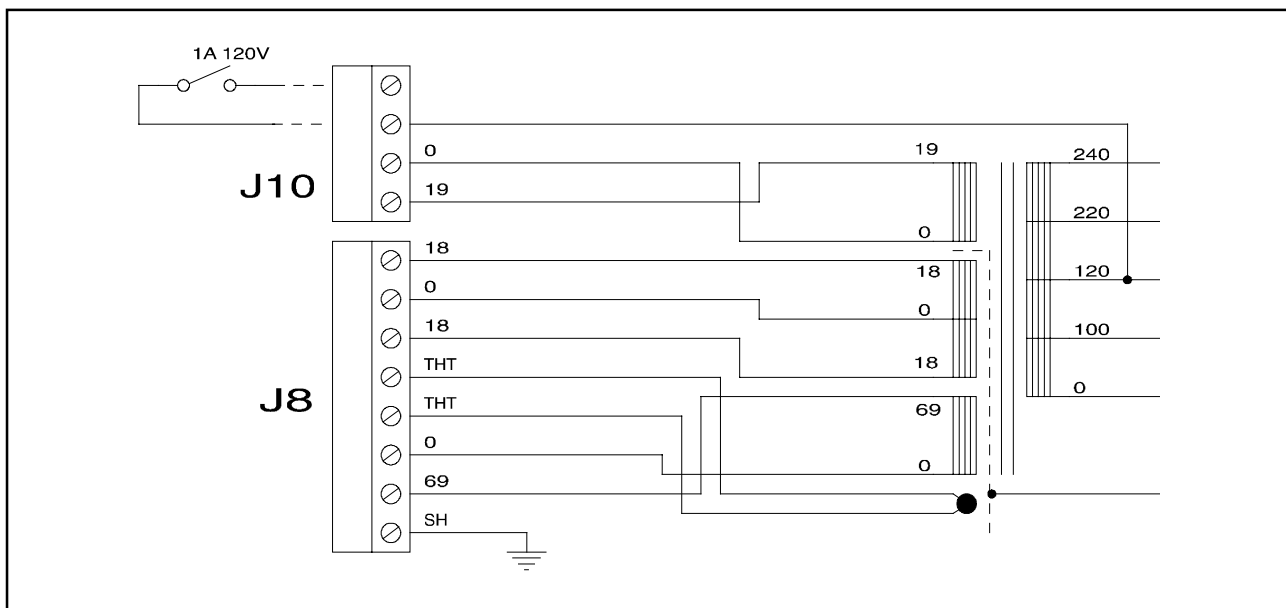


Embalagem do controller

Durante a remoção da embalagem, tomar muito cuidado para não deixar cair o controller e para não submetê-lo a choques. Não depositar a embalagem no meio ambiente. O material é completamente reciclável e responde à norma CEE 85/399 para a protecção do meio ambiente. Antes de instalar o controller, é necessário preparar alguns cabos de interconexão, como por exemplo os cabos para as interconexões com a alimentação, para as interconexões lógicas e para a ligação com a bomba. Nas figuras a seguir estão esquematizadas as ligações a efectuar entre o controller e a bomba, entre o controller e a bomba primária e entre o controller e a rede de alimentação. Para maiores detalhes sobre as interconexões citadas acima ver o apêndice "Technical Information".



Cabo de interconexão entre o controller e a bomba



Interconexões entre o controller e o transformador

INSTALAÇÃO



PERIGO!

As tensões existentes entre o controller e o respectivo transformador e entre o transformador e a rede de alimentação podem ser causa de perigo para quem entrar em contacto com estas partes. Proteger adequadamente o controller e o transformador de alimentação contra contactos acidentais durante a sua instalação definitiva.



PERIGO!

No interior do controller desenvolvem-se altas tensões que podem provocar graves danos ou a morte. Antes de efectuar qualquer operação de instalação ou manutenção do controller, desligar a tomada de alimentação. No interior do controller desenvolvem-se temperaturas elevadas que podem provocar graves danos. Proteger adequadamente o controller contra contactos acidentais durante a sua instalação definitiva.

NOTA

O controller instalado no sistema definitivo deve ser posicionado de modo que o ar de refrigeração possa circular livremente ao redor da aparelhagem. Não instalar e/ou utilizar o controller em ambientes expostos a agentes atmosféricos (chuva, gelo, neve), poeiras, gases agressivos ou em ambientes explosivos ou com elevado risco de incêndio.

Durante o funcionamento é necessário que sejam respeitadas as seguintes condições ambientais:

- temperatura: de 0 °C a + 40 °C
- humidade relativa: 0 - 95% (não condensadora).

UTILIZAÇÃO

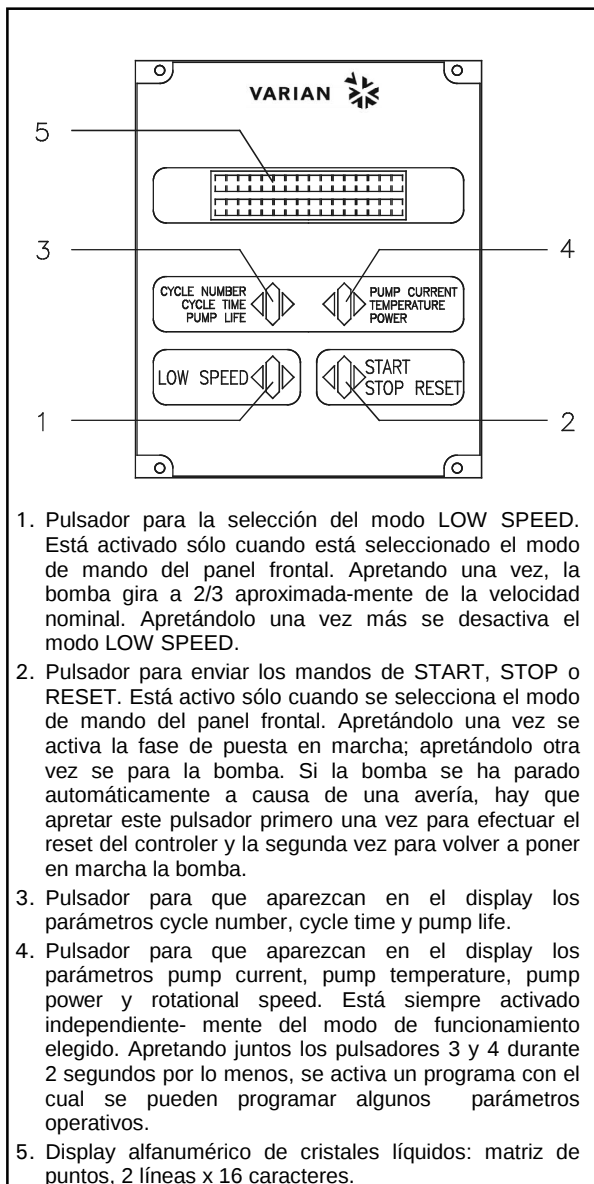
Neste parágrafo são descritos os principais procedimentos operativos. Para maiores detalhes e para procedimentos que envolvam ligações ou peças opcionais, consultar o parágrafo "USE" do apêndice "Technical Information". Algumas das instruções descritas a seguir são possíveis só se o controller estiver ligado ao acessório "hand held terminal". Antes de usar o controller, efectuar todas as ligações eléctricas e pneumáticas e consultar o manual da bomba ligada.



PERIGO!

Para evitar danos às pessoas e à aparelhagem, caso a bomba esteja apoiada numa mesa, certificar-se da sua estabilidade. Nunca activar a bomba se o flange de entrada não estiver ligado ao sistema ou não estiver fechado com o flange de fecho.

A seguir, está ilustrado o painel de comando do "Hand Held Terminal".



1. Pulsador para la selección del modo LOW SPEED. Está activado sólo cuando está seleccionado el modo de mando del panel frontal. Apretando una vez, la bomba gira a 2/3 aproximadamente de la velocidad nominal. Apretándolo una vez más se desactiva el modo LOW SPEED.
2. Pulsador para enviar los mandos de START, STOP o RESET. Está activo sólo cuando se selecciona el modo de mando del panel frontal. Apretándolo una vez se activa la fase de puesta en marcha; apretándolo otra vez se para la bomba. Si la bomba se ha parado automáticamente a causa de una avería, hay que apretar este pulsador primero una vez para efectuar el reset del controler y la segunda vez para volver a poner en marcha la bomba.
3. Pulsador para que aparezcan en el display los parámetros cycle number, cycle time y pump life.
4. Pulsador para que aparezcan en el display los parámetros pump current, pump temperature, pump power y rotational speed. Está siempre activado independiente- mente del modo de funcionamiento elegido. Apretando juntos los pulsadores 3 y 4 durante 2 segundos por lo menos, se activa un programa con el cual se pueden programar algunos parámetros operativos.
5. Display alfanumérico de cristales líquidos: matriz de puntos, 2 líneas x 16 caracteres.

Painel frontal do "Hand Held Terminal"

PROCEDIMENTOS DE USO

Acendimento do Controller

Para ligar o controller é suficiente fornecer a tensão de alimentação ao controller.

Activação da bomba

Para activar a bomba é necessário enviar o comando de START aos respectivos pins do conector de entrada do controller (pin 1 - 6 de P1) ou, se existir a opção "hand held terminal", premer o botão START.

Paragem da bomba

Para parar a bomba é necessário remover o comando de START dos respectivos pins do conector de entrada do controller (pin 1 - 6 de P1) ou, se existir a opção "hand held terminal", premer o botão STOP.

MANUTENÇÃO

O controller da série Turbo-V 70 PCB não requer qualquer manutenção. Todas as operações devem ser efectuadas por pessoal autorizado. Em caso de defeito é possível utilizar o serviço de reparação Varian ou o "Varian advance exchange service", que permite obter um controller regenerado que substitua o controller com defeito.



PERIGO!

Antes de efectuar qualquer operação no controller, desligar o cabo de alimentação.

Caso um controller deva ser destruído, proceder à sua eliminação respeitando as normas nacionais específicas.

MENSAGENS DE ERRO

Em alguns casos de defeito, os circuitos de autodiagnóstico do controller apresentam mensagens de erro relacionadas na tabela abaixo.

NOTA

As mensagens de erro apresentam-se só se estiver instalada a opção "hand held terminal".

MENSAGEM	DESCRIÇÃO	ACÇÃO CORRECTIVA
CHECK CONNECTION TO PUMP	Mau funcionamento na ligação entre a bomba e o controller.	Verificar se o cabo de ligação entre a bomba e o controller está bem fixado em ambas as extremidades e não está interrompido. Premer duas vezes o botão START para reactivar a bomba.
PUMP WAITING INTERLOCK	É activado o sinal de interlock existente no conector P1 devido à interrupção do curto circuito entre o pin 3 e o pin 8 do conector J1 ou devido à abertura do sinal de interlock externo.	Restabelecer o curto circuito entre o pin 3 e o pin 8 do conector J1 ou fechar o sinal de interlock externo.
FAULT: OVERTIME SX	Durante o accionamento da bomba no modo "soft start", a bomba não atingiu a velocidade prevista a cada passo em 15 minutos. (X pode valer de 0 a 9 e indica o passo não superado).	Verificar se o sistema não apresenta perdas. Premer duas vezes o botão START para reactivar a bomba.
FAULT: PUMP OVERTEMP.	A temperatura do rolamento superior ou da bomba superou os 60 °C.	Aguardar até que a temperatura volte ao limite estabelecido. Premer duas vezes o botão START para reactivar a bomba.
FAULT: CONTROLLER OVERTEMPERATURE	A temperatura do transformador do controller superou os 90 °C.	Aguardar até que a temperatura volte ao limite estabelecido. Premer duas vezes o botão START para reactivar a bomba.
FAULT: TOO HIGH LOAD	Durante o funcionamento normal (após a fase de accionamento) a corrente absorvida pela bomba é maior do que a programada (1,5 A).	Verificar se o rotor da bomba pode rodar livremente. Premer duas vezes o botão START para reactivar a bomba.
FAULT: SHORT CIRCUIT	Durante o funcionamento normal (após a fase de accionamento) a conexão de saída está em curto circuito (corrente de saída maior que 2,2 A).	Verificar as ligações entre a bomba e o controller. Premer duas vezes o botão START para reactivar a bomba.
SYSTEM OVERRIDE	A bomba parou por um sinal de emergência proveniente de um contacto remoto.	Remover o cabo de alimentação do controller e corrigir a causa da emergência. Ligar novamente o cabo de alimentação e premer duas vezes o botão START para reactivar a bomba.
OVERVOLTAGE	Verificou-se um defeito na secção de alimentação do controller, ou o controller recebeu um sinal falso.	Premar duas vezes o botão START para reactivar a bomba. Se a mensagem se reapresentar, dirigir-se à Varian para a manutenção.
CONTROLLER FAILURE	Interrupção fusível no secundário de potência.	Contactar a Varian para a manutenção.

ALGEMENE INFORMATIE

Deze apparatuur is bestemd voor beroepsmatig gebruik. De gebruiker wordt verzocht aandachtig deze handleiding en alle overige door Varian verstrekte informatie door te lezen alvorens het apparaat in gebruik te nemen. Varian aanvaardt niet aansprakelijkheid voor de gevolgen van het niet of gedeeltelijk in acht nemen van de aanwijzingen, onoordeelkundig gebruik door niet hiervoor opgeleid personeel, reparaties waarvoor geen toestemming is verkregen of gebruik in strijd met de specifieke nationale wetgeving.

De controller Turbo-V 70 PCB is een frequentieomzetter die gestuurd wordt door een microprocessor, is gemaakt van halfgeleider-elementen en is in staat om zelfdiagnose en zelfbescherming uit te voeren. De controller is van circuits voorzien die noodzakelijk zijn voor de automatische werking van de pompen van de serie Turbo-V 70 PCB. De controller stuurt de pompen van de serie Turbo-V 70 PCB (met een proces bestaande uit tien stappen) tijdens de startfase, en controleert hierbij de spanning en de stroom in verhouding tot de door de pomp bereikte snelheid. Via hulpconnectors zijn de sturingen voor het op afstand starten en stoppen van de pomp beschikbaar, de signalen die de bedrijfstoestand van de pomp aangeven, de sturingen voor het starten en stoppen van de prevacuümpomp, blokkeersignalen (voor drukschakelaars, regelschakelaars van de waterstroom, enz.). De controller moet door een externe transformator worden gevoed (niet geleverd bij de controller). De controller moet van buitenaf gevoed worden door een transformator die niet bij de controller geleverd wordt. Om de functies te controleren en de toestand van de controller aan te geven is als extra een speciaal apparaat (Hand Held Terminal) leverbaar dat uit een toetsenbord en een display bestaat. In de volgende paragrafen is alle informatie vermeld om de veiligheid van de operator tijdens het gebruik van de apparatuur te verzekeren. Gedetailleerde informatie is te vinden in de bijlage "Technical information".

Deze handleiding hanteert de volgende symbolen:



GEVAAR!

Bij dit symbool staat tekst die de aandacht van de operator vestigt op een speciale procedure of methode die, indien niet correct uitgevoerd, ernstig lichamelijk letsel kan veroorzaken.



ATTENTIE

Bij dit symbool staat tekst met procedures die, indien niet opgevolgd, schade aan apparatuur kunnen veroorzaken.

OPMERKING

De opmerkingen bevatten belangrijke informatie die uit de tekst is gelicht.

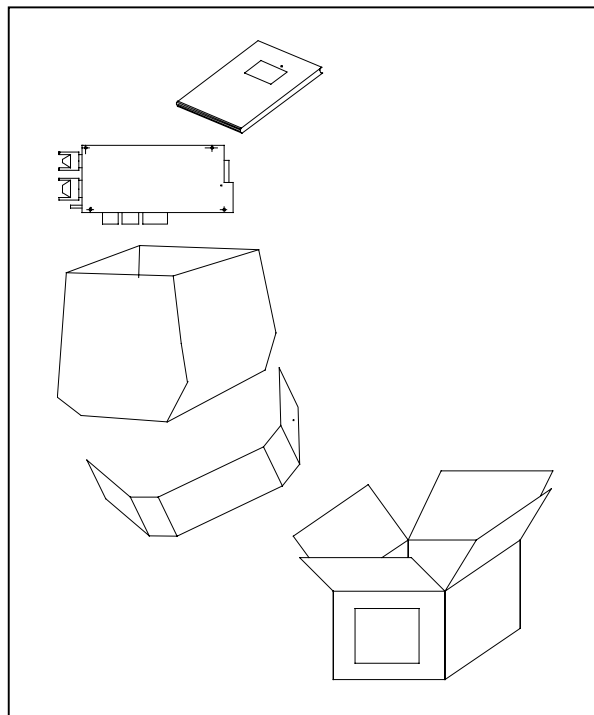
OPSLAG

Tijdens het transport en de opslag van de controllers moeten de volgende omgevingscondities aanwezig zijn:

- temperatuur: van -20 °C tot +70 °C
- relatieve vochtigheid: 0 - 95% (niet condenserend)

VOORBEREIDING VOOR INSTALLATIE

De controller wordt in een speciale beschermende verpakking geleverd; als er schade wordt geconstateerd die tijdens het transport veroorzaakt zou kunnen zijn, meteen contact opnemen met het plaatselijke verkoopkantoor.

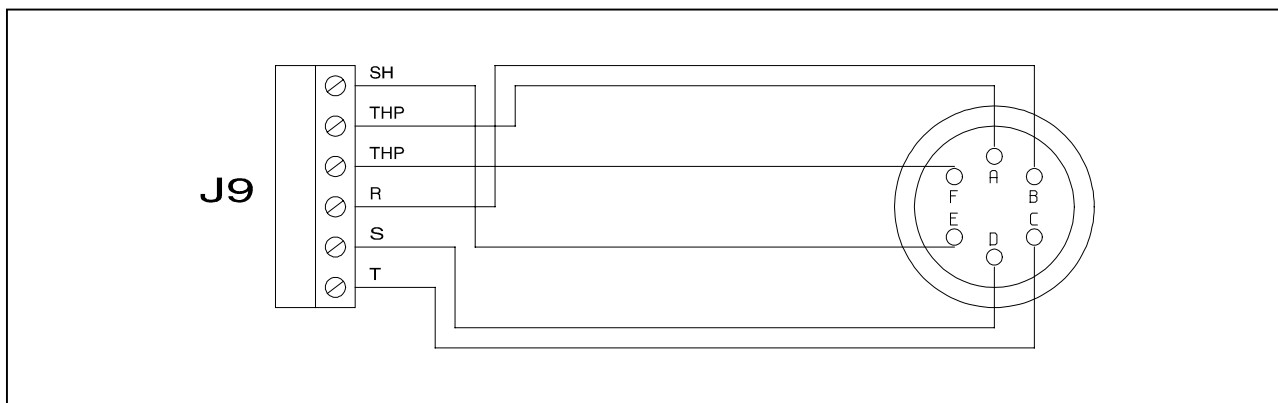


Verpakking van de controller

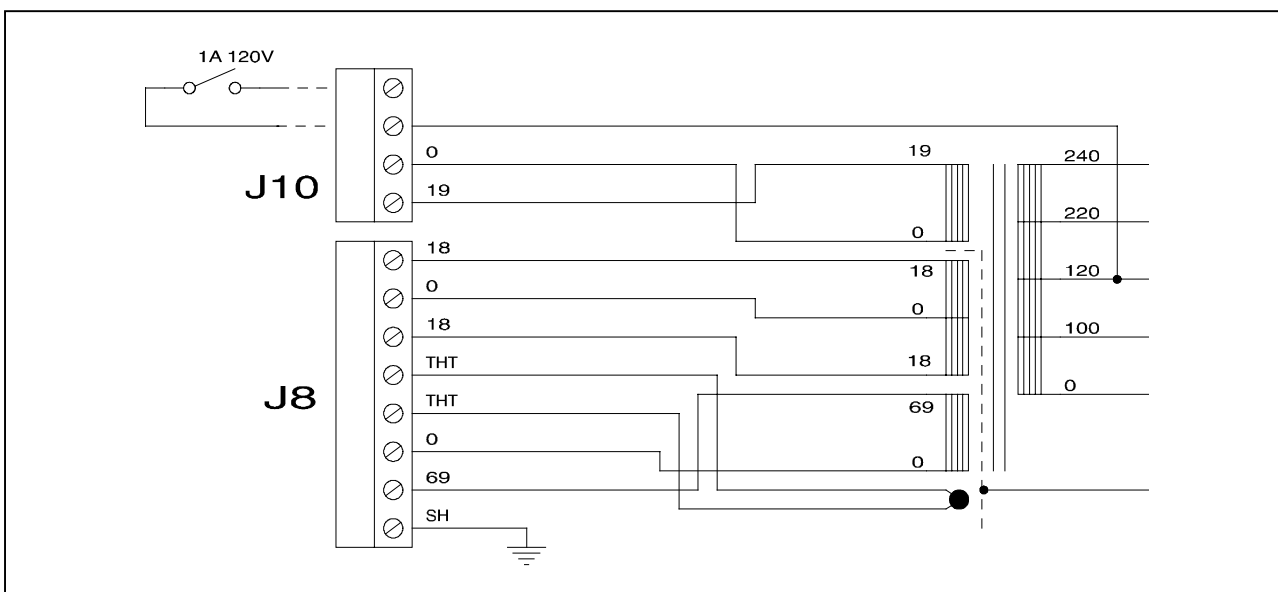
Zorg er bij het uitpakken voor dat de controller niet kan vallen of stoten te verduren krijgt. Laat de verpakking niet ergens buiten achter. Het verpakkingsmateriaal is volledig recyclebaar en voldoet aan de EEG milieurechtlijn 85/399.

Alvorens de controller te installeren, moeten enkele verbindingstekabels worden voorbereid, zoals bijvoorbeeld kabels voor verbinding met de voeding, kabels voor de logicaverbindingen en de kabel voor aansluiting op de pomp. Op de volgende afbeeldingen zijn de verbindingen tussen controller en pomp en tussen controller en voedingstransformator schematisch weergegeven.

Voor meer informatie over deze verbindingen en over de kenmerken van de voedingstransformator (leverbaar als extra) wordt verwezen naar de bijlage "Technical Information".



Verbindingskabel tussen controller en pomp



Verbindingskabel tussen controller en transformator

INSTALLATIE



GEVAAR!

De spanningen aanwezig tussen de controller en de bijbehorende transformator, en tussen de transformator en het aanvoernet zijn dusdanig dat ze gevaar opleveren voor degene die hiermee in contact komt. Bij de definitieve installatie van controller en voedings- transformator, deze op passende wijze tegen eventueel contact beschermen.



GEVAAR!

In de controller ontwikkelen zich hoge spanningen die zware beschadigingen of de dood kunnen veroorzaken. Alvorens installatie- of onderhoudswerkzaamheden uit te voeren, de controller van de voeding afkoppelen. In de controller ontwikkelen zich hoge temperaturen die zware schade kunnen veroorzaken. Bij de definitieve installatie van de controller, deze op passende wijze tegen eventueel contact beschermen.

OPMERKING

De controller die definitief in het systeem geïnstalleerd wordt moet zodanig geplaatst worden dat de koellucht vrij rondom het apparaat kan circuleren. De controller mag niet geïnstalleerd en/of gebruikt worden in ruimten die blootgesteld zijn aan de weersomstandigheden (regen, vorst, sneeuw), stof, agressieve gassen, of in ruimten met explosiegevaar of zeer hoog brandgevaar.

Tijdens de werking moeten de volgende omgevings- condities aanwezig zijn:

- temperatuur: van 0 °C tot +40 °C
- relatieve vochtigheid: 0 - 95% (niet condenserend).

GEBRUIK

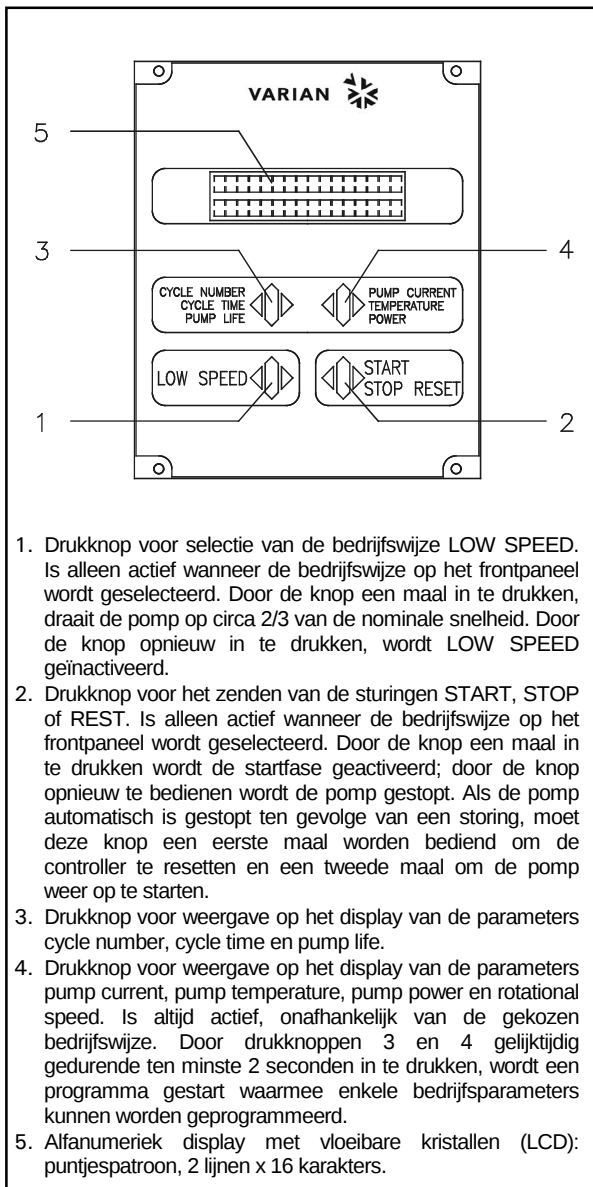
In deze paragraaf worden de voornaamste bedieningswijzen uitgelegd. Voor meer informatie of procedures die aansluitingen of speciale opties betreffen wordt verwezen naar de paragraaf "USE" van de bijlage "Technical Information". Enkele hier vermelde instructies zijn alleen van toepassing indien de op de controller het accessoire "Hand held terminal" is aangesloten. Breng, alvorens de controller in gebruik te nemen, alle elektrische en pneumatische aansluitingen tot stand en raadpleeg hiervoor de handleiding van de aan te sluiten pomp.



GEVAAR!

Indien de pomp op een tafel is geplaatst, controleren of deze stabiel staat om letsel aan personen en schade aan het apparaat te voorkomen. Laat de pomp nooit werken zonder dat de ingangsfens aan het systeem is gekoppeld of de afsluitfens is gesloten.

Hier volgt de beschrijving van het bedieningspaneel van de hand-terminal.



Frontpaneel van de "hand terminal"

GEBRUIKSPROCEDURES

Inschakelen van de controller

Om de controller in te schakelen, de voedingskabel in de netcontactdoos inbrengen.

Starten van de pomp

Voor het starten van de pomp moet het START commando naar de betreffende pins van de ingangs-connector van de controller gezonden worden (pins 1-6 van P1) of, indien de hand-terminal aanwezig is, de START knop worden bediend.

Stoppen van de pomp

Voor het stoppen van de pomp moet het START commando aan de betreffende pins van de ingangs-connector van de controller onttrokken worden (pins 1-6 van P1) of, indien de hand-terminal aanwezig is, de STOP knop worden bediend.

ONDERHOUD

De controllers van de serie Turbo-V 70 PCB zijn onderhoudsvrij. Eventuele werkzaamheden moeten door bevoegd personeel worden uitgevoerd. In geval van storing is het mogelijk om de reparatiedienst van Varian of de "Varian advanced exchange service" in te schakelen: zo krijgt men een ruilcontroller ter vervanging van de defecte controller.



GEVAAR!

Alvorens werkzaamheden aan de controller uit te voeren, de voedingskabel afkoppelen.

Mocht de controller gesloopt worden, ga dan overeenkomstig de specifieke nationale wetgeving te werk.

FOUTMELDINGEN

In geval van storingen wekt het zelfdiagnose-circuit van de controller enkele foutmeldingen op die in de volgende tabel zijn omschreven.

OPMERKING

De foutmeldingen worden alleen getoond als de optie "hand-held terminal" is geïnstalleerd.

BOODSCHAP	OMSCHRIJVING	REMEDIE
CHECK CONNECTION TO PUMP	Foutieve verbinding tussen pomp en controller.	Controleren of de verbindingenkabel tussen pomp en controller aan beide uiteinden goed bevestigd is en geen onderbrekingen vertoont. Bedien twee maal de START-knop om de pomp weer op te starten.
PUMP WAITING INTERLOCK	Het interlock-sigitaal op connector P1 is actief wegens onderbreking van de kortsluiting tussen pin 3 en pin 8 van connector J1 of wegens het openen van het externe interlock-sigitaal.	Herstel de kortsluiting tussen pin 3 en pin 8 van connector J1 of sluit het externe interlock-sigitaal.
FAULT: OVERTIME SX	Tijdens de "soft start" van de pomp, heeft de pomp niet binnen 15 minuten de snelheid die voor elke stap is voorzien bereikt (X kan waarde tussen 0 en 9 aannemen en geeft de niet overschreden stap aan).	Controleer of het systeem geen lekkage vertoont. Bedien twee maal de START-knop om de pomp weer op te starten.
FAULT: PUMP OVERTEMP.	De temperatuur van het bovenste pomplager bedraagt meer dan 60 °C.	Wacht tot de temperatuur weer onder de drempelwaarde is gezakt. Bedien twee maal de START-knop om de pomp weer op te starten.
FAULT: CONTROLLER OVERTEMPERATURE	De temperatuur van de transformator van de controller bedraagt meer dan 90 °C.	Wacht tot de temperatuur weer onder de drempelwaarde is gezakt. Bedien twee maal de START-knop om de pomp weer op te starten.
FAULT: TOO HIGH LOAD	Tijdens normale werking (na startfase) ligt de door de pomp geabsorbeerde stroom hoger dan de geprogrammeerde waarde (1,5 A).	Controleer of de pomprotor vrij kan draaien. Bedien twee maal de START-knop om de pomp weer op te starten.
FAULT: SHORT CIRCUIT	Tijdens normale werking (na startfase) is de uitgangsverbinding in kortsluiting (uitgangsstroom groter dan 2,2 A).	Controleer de verbindingen tussen pomp en controller. Bedien twee maal de START-knop om de pomp weer op te starten.
SYSTEM OVERRIDE	De pomp is stilgelegd door een noodsignaal afkomstig van een afstandscontact.	Koppel de voedingskabel van de controller af en elimineer de oorzaak van de noodstop. Sluit de voedingskabel weer aan en bedien twee maal de START-knop om de pomp weer op te starten.
OVERVOLTAGE	Er is een storing opgetreden in de voedingssectie van de controller of de controller heeft een stoorsigitaal ontvangen.	Bedien twee maal de START-knop om de pomp weer op te starten. Als de melding weer verschijnt zich voor onderhoud tot Varian wenden.
CONTROLLER FAILURE	Doorgebrande zekering in secundaire hoofdstroomkring.	Zich tot Varian voor het onderhoud wenden.

GENEREL INFORMATION

Dette materiel er beregnet til professionel anvendelse. Brugeren bør læse denne brugsanvisning og anden yderligere information fra Varian, før udstyret anvendes. Varian tager ikke ansvar for skader helt eller delvis som følge af tilsidesættelse af disse instruktioner, fejlagtig brug af personer uden tilstrækkelig kendskab, ukorrekt anvendelse af udstyret eller håndtering, der strider imod gældende lokale regler.

Styreenheden i Turbo-V 70 PCB serien er en mikroprocessorstyret frekvens-omformer, der består af komponenter med fast tilstand. Styreenheden er udstyret med selvdiagnose og selvbeskyttelsesfunktioner. Styreenheden kontrollerer pumperne i Turbo-V 70 PCB serien (med en ti-trins-proces) i forbindelse med start. Spænding og strøm reguleres i forhold til pumpens opnåede hastighed. Styreenheden omfatter alle midler, der kræves for automatisk drift af pumperne i Turbo-V 70 PCB serien. Hjælpekontakter forsyner kontrol til fjernstart og -stop af pumpen, signaler om pumpens tilstand, kontrol til start og stop af førvakuumpumpen, blokerings signaler (til tryk- og vandføringsafbrydere, osv.). Styreenheden skal forsynes via en ekstern transformator (medleveres ikke). Et specielt apparat (Hand Held Terminal) er tilgængeligt som ekstra tilbehør for at kontrollere styreenhedens funktioner og vise dens tilstand. Dette apparat omfatter et styretastatur og en billedskærm. De følgende afsnit indeholder al information der behøves, for at garantere operatørens sikkerhed under anvendelsen. Detaljeret information findes i bilaget "Technical Information".

I brugsanvisningen anvendes følgende standardrubrikker:



ADVARSEL!

Advarselsmeddelelserne informerer operatøren om, at en speciel procedure eller en vis type arbejde skal udføres præcist efter anvisningerne. I modsat fald er der risiko for svære personskader.



VIGTIGT!

Denne advarselsmeddelelse vises før procedurer, der skal følges nøje for ikke at risikere maskinskader.

BEMÆRK

Dette gør opmærksom på vigtig information i teksten.

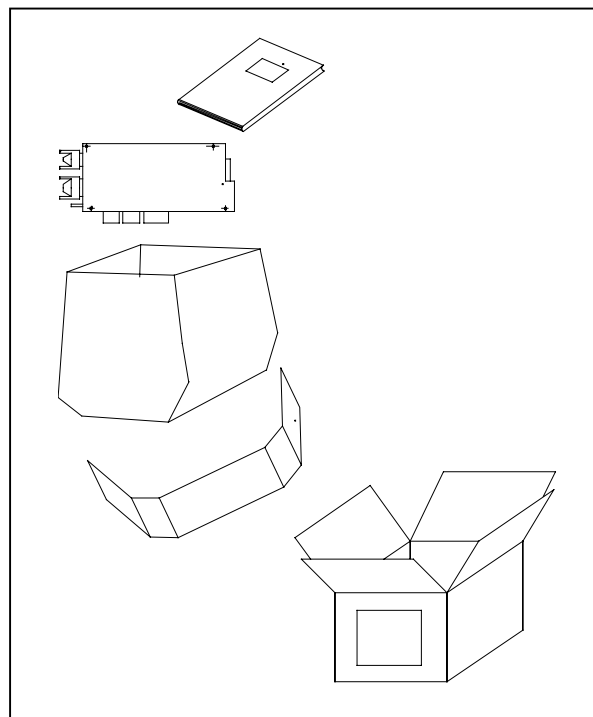
OPBEVARING

Følgende krav til omgivelsesforholdene gælder ved transport og opbevaring af styreenheden:

- temperatur: fra -20 °C til +70 °C
- relativ luftfugtighed: 0 - 95% (ikke kondenserende)

FORBEREDELSE FØR INSTALLATION

Styreenheden leveres i en speciel beskyttende emballage. Kontakt den lokale forhandler, hvis emballagen viser tegn på skader, der kan være opstået under transporten.



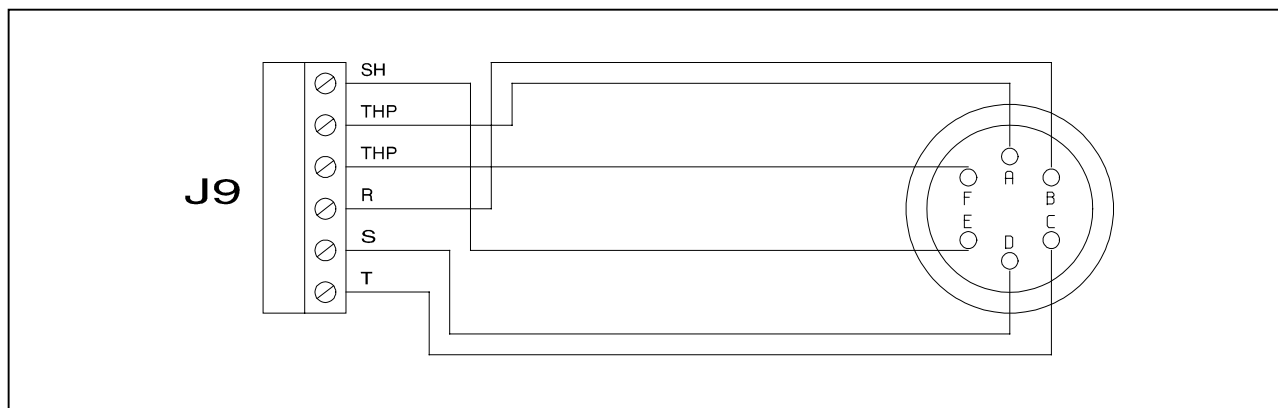
Styreenhedens emballage

Sørg for at styreenheden ikke tabes eller udsættes for stød ved udpakningen.

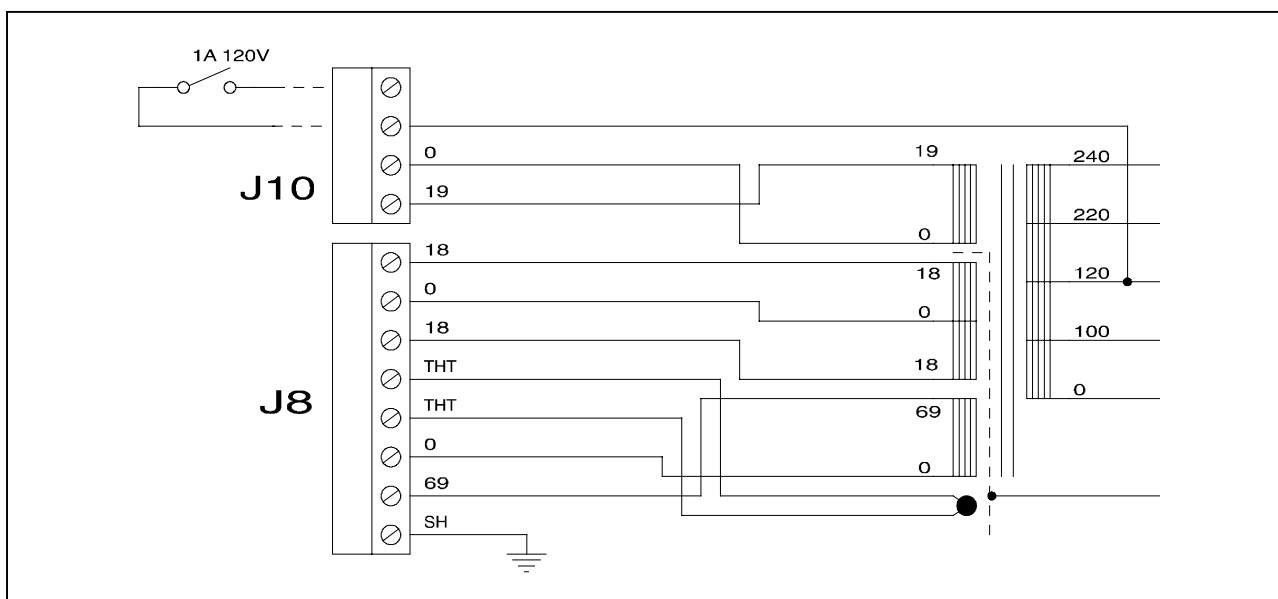
Smid ikke emballagen ud. Materialet kan genbruges 100% og opfylder EU-direktiv 85/399 om miljøbeskyttelse.

Inden styreenheden installeres, skal man klargøre de nødvendige forbindelseskabler, dvs. forbindelseskabler til strømforsyning og pumpe samt kabler til logiske signaler. Følgende billeder viser de nødvendige forbindelser mellem styreenhed og pumpe samt mellem styreenhed og strømkilde.

For yderligere information om forbindelser og strømkilde (ekstra tilbehør) henvises til bilag "Technical Information".



Forbindelseskabel mellem styreenhed og pump



Forbindelseskabel mellem styreenhed og transformator

INSTALLATION



ADVARSEL!

Spænding mellem styreenheden og transformatoren samt mellem transformatoren og elnettet kan nå høje værdier og forårsage stor skade og dødsfald. I forbindelse med permanent installation skal styreenheden og transformatoren på egnet måde beskyttes mod utilsigtet tilslutning.



ADVARSEL!

Spænding frembragt i styreenheden kan nå høje værdier og forårsage stor skade og dødsfald. Frakobl altid strømkablet, inden der udføres installations- eller vedligeholdelsesarbejde på styreenheden. Temperaturen frembragt i styreenheden kan nå høje værdier og forårsage stor skade. I forbindelse med permanent installation skal styreenheden og transformatoren på egnet måde beskyttes mod utilsigtet tilslutning.

BEMÆRK

Styreenheden skal anbringes på en sådan måde, at luft kan cirkulerer frit omkring apparatet. Installér og anvend ikke styreenheden i miljøer, der udsættes for påvirkninger fra atmosfæren (regn, sne, is), damp, aggressive gasser, og ligeledes ikke i eksplosivt eller brandfarligt miljø.

Følgende krav til omgivelserforholdene gælder veddrift:

- temperatur: fra 0 °C til +40 °C
- relativ luftfugtighed: 0 - 95% (ikke kondenserende).

ANVENDELSE

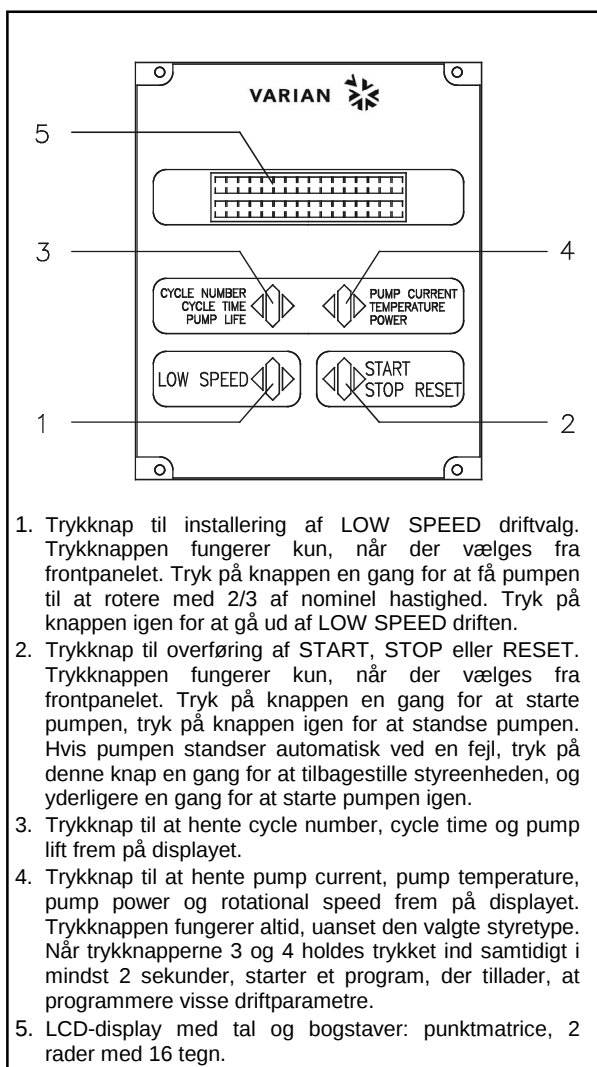
Dette afsnit beskriver de vigtigste driftsprocedurer. For en detaljeret beskrivelse samt procedurer, der involverer tilslutninger eller tilbehør, henvises til afsnittet "USE" i bilag "Technical Information". Visse procedurer, der beskrives nedenstående, kan kun udføres på styreenheden, når den er udstyret med tilbehøret "Hand held terminal". Inden styreenheden anvendes, bør samtlige elektriske og pneumatiske tilslutninger udføres. Læs brugsanvisningen før pumpen tilsluttes.



ADVARSEL!

Sørg for, at pumpen står fast, hvis den er installeret på et bord. Dette er for at forebygge skader på apparatet og personer. Start aldrig pumpen, hvis pumpetilløbet ikke er tilsluttet systemet eller er blokeret.

Følgende beskriver manøvrepanelet til hand-held terminalen.



Frontpanelet på "Hand-held terminalen"

INSTRUKTION

Start af styreenheden

Styreenheden startes ved at sætte strømkablet i vægudtaget.

Start af pumpen

Pumpen startes ved at give START-signal til stifterne på styreenhedens indgangskonnektor (stift 1-6 på P1) eller trykke på START-trykknappen, hvis hand-held terminalen er installeret.

Stop af pumpen

Pumpen stopper ved at frakoble START-signalet fra stifterne på styreenhedens indgangskonnektor (stift 1-6 på P1) eller trykke på STOP-trykknappen, hvis hand-held terminalen er installeret.

VEDLIGEHODELSE

Styreenhederne i Turbo-V 70 PCB serien behøver ikke nogen vedligeholdelse. Ethvert indgreb på pumpen skal foretages af autoriseret personale. Hvis pumpen går i stykker, kan man benytte sig af Varians reparations-service eller Varian udvekslingsservice, hvor man kan få en repareret pumpe i bytte for den, der er gået i stykker.



ADVARSEL!

Inden der foretages noget som helst indgreb på styreenheden, skal strømmen først afbrydes.

Skrotning af pumpen skal foregå i overensstemmelse med det pågældende lands særlige love.

FEJLMEDDELELSER

Styreenheden viser ved selvdiagnose aktuelle fejl på displayet. De mulige meddelelser listes i følgende tabel.

BEMÆRK

Fejlmeddelelserne vises kun, hvis tilbehøret "Hand Held Terminal" er installeret.

MEDDELELSE	BESKRIVELSE	KONTROL
CHECK CONNECTION TO PUMP	Tilslutning mellem pumpe og styreenhed er defekt.	Controllér at tilslutningskabel mellem pumpe og styreenhed er korrekt monteret samt at ingen afbrydninger forekommer. Tryk to gange på START for at starte pumpen igen.
PUMP WAITING INTERLOCK	Interlocksignalet findes på kontakt P1 p.g.a. kortslutning mellem stift 3 og stift 8 i kontakten J1 eller p.g.a. at det eksterne interlocksignal er åbent.	Tilbagestil kortslutningen mellem stift 3 og stift 8 på kontakt J1 eller sluk for det eksterne interlocksignal.
FAULT: OVERTIME SX	Ved opstart af pumpen med "blød start" har pumpen ikke nået den korrekte hastighed for hvert trin indenfor 15 minutter (X kan gælde 0 til 9 og angiver hvilket trin, der ikke blev gennemført).	Kontrollér om systemet er utæt. Tryk to gange på START, for at starte pumpen igen.
FAULT: PUMP OVERTEMP.	Temperaturen på det øverste leje eller pumpen overskrider 60 °C.	Vent på at temperaturen falder til under tærskelværdi. Tryk to gange på START for at starte pumpen igen.
FAULT: CONTROLLER OVERTEMPERATURE	Temperaturen på styreenhedens transformator overskrider 90 °C.	Vent på at temperaturen falder til under tærskelværdi. Tryk to gange på START for at starte pumpen igen.
FAULT: TOO HIGH LOAD	Under normal drift (efter startfasen) forbruger pumpen en større effekt end den programmerede værdi (1,5 A).	Kontrollér om pumpens rotor kan rotere frit. Tryk to gange på START for at starte pumpen igen.
FAULT: SHORT CIRCUIT	Under normal drift (efter startfasen) er udgangseffekten kortsluttet (udgangsstrømmen højere end 2,2 A).	Kontrollér forbindelserne mellem pumpe og styreenhed. Tryk to gange på START for at starte pumpen igen.
SYSTEM OVERRIDE	Pumpen er blevet standset af et nødstopsignal fra en fjernkontakt.	Frakobel styreenhedens strømkabel og kontrollér årsagen til nødstoppet. Sæt derefter strømkablet i. Tryk to gange på START, for at starte pumpen igen.
OVERVOLTAGE	Der er opstået fejl i styreenhedens fødespænding eller styreenheden har fået et falsk signal.	Tryk to gange på START-knappen for at starte pumpen igen. Hvis meddelelsen kommer igen tag kontakt med Varian for nødvendig vedligeholdelse.
CONTROLLER FAILURE	Afbrydelse af sikring i sekundært effektkredsløb.	Ret henvendelse til Varian vedrørende vedligeholdelse.

ALLMÄN INFORMATION

Utrustningen är avsedd för yrkesmässig användning. Användaren bör läsa denna bruksanvisning, samt övrig dokumentation från Varian före användning av utrustningen. Varian tar inget ansvar för skador som helt eller delvis orsakats av åsidosättande av instruktionerna, olämplig användning av person utan tillräcklig kunskap, obehörigt bruk av utrustningen eller hantering som strider mot gällande lokala föreskrifter.

Styrenheten i Turbo-V 70 PCB serien är en mikroprocessorstyrd frekvensomvandlare som består av komponenter med fast tillstånd. Styrenheten är försedd med självdiagnos- och självskyddsfunktion. Styrenheten kontrollerar pumparna i Turbo-V 70 PCB serien (med en tiostegs-process) i samband med start. Spänning och ström regleras i förhållande till pumpens uppnådda hastighet. Styrenheten omfattar alla kretsar som behövs för automatisk drift av pumparna i Turbo-V 70 PCB serien. Hjälpkontakter erbjuder kontroller för fjärrstart och fjärrstopp av pumpen, signaler för pumpens tillstånd, kontroller för start och stopp av förvakuum-pumpen, blockeringsignaler (för tryckvakter, kontrollbrytare för vattenflöde osv). Styrenheten ska förses med ström av en extern transformator (levereras ej med styrenheten). En speciell apparat (Hand Held Terminal) finns som tillval för att kontrollera styrenhetens funktioner och visualisera dess tillstånd. Detta apparat består av ett styrtangentbord och en bildskärm. De följande avsnitten innehåller all information som behövs för att garantera operatörens säkerhet under driften. Detaljerade uppgifter finns i bilagan "Technical information".

I bruksanvisningen används följande standardrubriker:



VARNING!

Varningsmeddelandena informerar operatören om att en speciell procedur eller en viss typ av arbete måste utföras exakt enligt anvisningarna. I annat fall finns risk för svåra personskador.



VIKTIGT

Detta varningsmeddelande visas framför procedurer som måste följas exakt för att undvika skador på maskinen.

OBSERVERA

Detta visar på viktig information i texten.

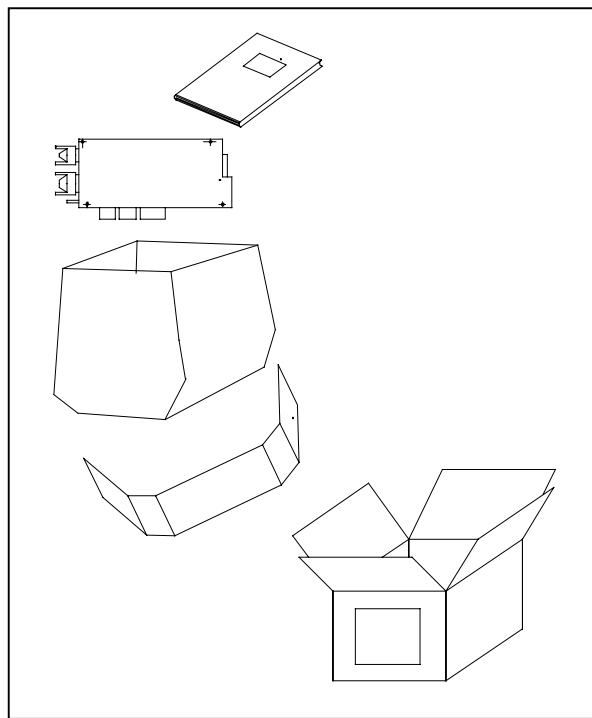
FÖRVARING

Följande krav på omgivningsförhållanden gäller vid transport och förvaring av styrenheten:

- temperatur: från -20 °C till +70 °C
- relativ luftfuktighet: 0 - 95% (utan kondens)

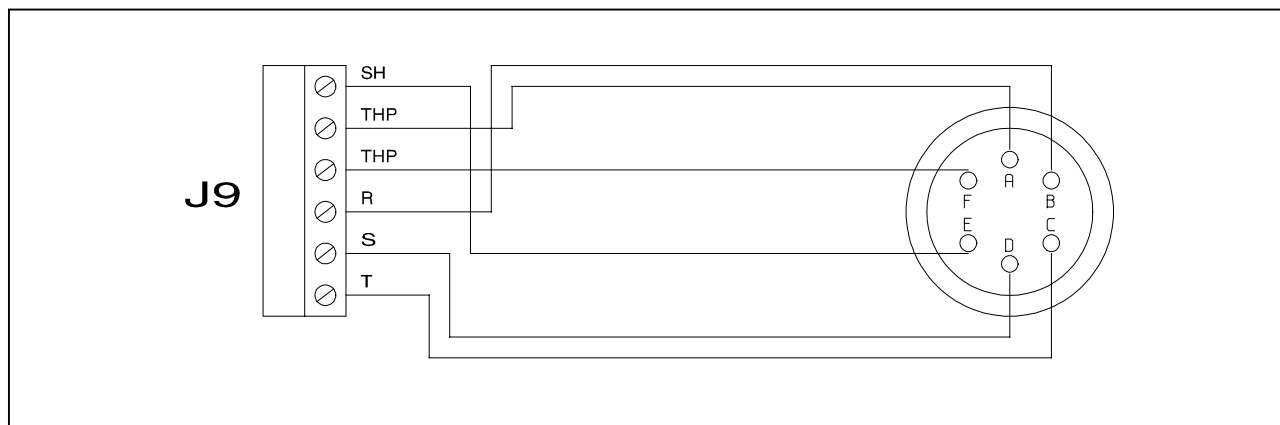
FÖRBEREDELSE FÖR INSTALLATION

Styrenheten levereras i ett särskilt skyddande emballage. Kontakta det lokala försäljningskontoret om emballaget visar tecken på skador som kan ha uppstått under transporten. Se till att styrenheten inte tappas eller utsätts för stötar vid uppackningen.

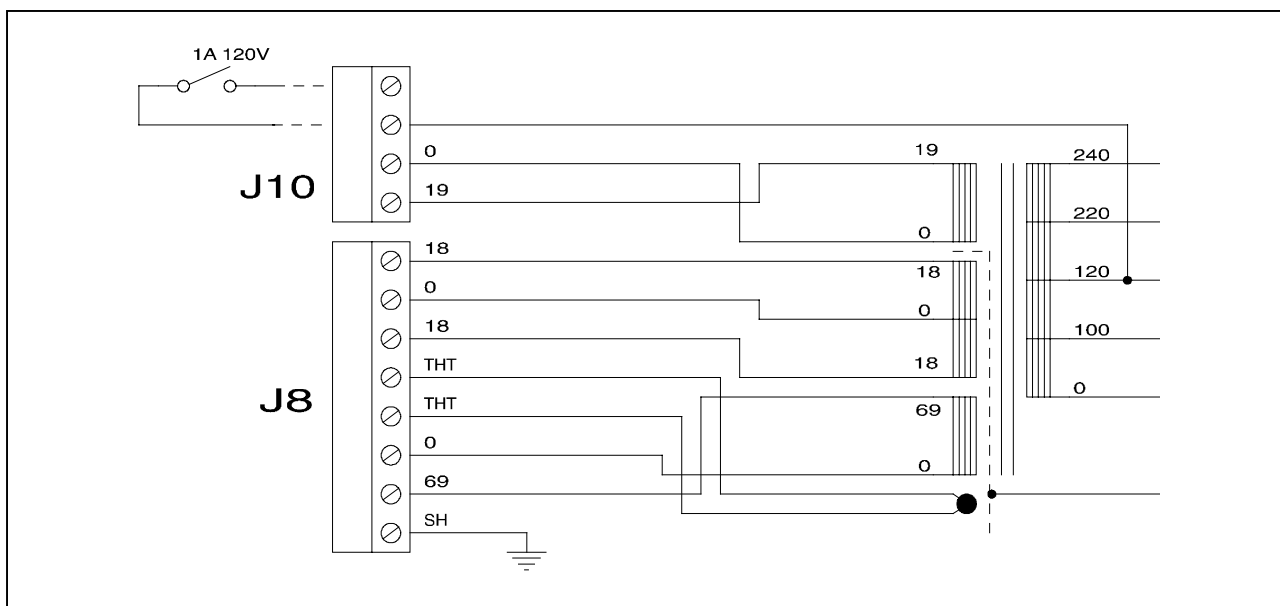


Styrenhetens förpackning

Kasta inte packmaterialet i soporna. Materialet är återvinningsbart till 100% och uppfyller EU-direktiv 85/399 om miljöskydd. Innan styrenheten installeras ska du förbereda de nödvändiga anslutningskablarna, det vill säga anslutningskablar till matarspänning och pump samt kablar för logiska signaler. Följande bilder visar de nödvändiga anslutningarna mellan styrenhet och pump samt mellan styrenhet och strömkälla. För ytterligare information om anslutningar och strömkälla (tillval) hänvisas till bilaga "Technical Information".



Anslutningskabel mellan styrenhet och pump



Anslutningskabel mellan styrenhet och transformator

INSTALLATION



VARNING!

Spänningen mellan styrenhet och transformator samt mellan transformator och elnätet kan nå höga värden och förorsaka allvarliga skador och dödsfall. I samband med permanent installation ska styrenhet och transformator lämpligen skyddas mot oavsiktlig kontakt.



VARNING!

Spänningen inuti styrenheten kan nå höga värden och förorsaka allvarliga skador och dödsfall. Frånkoppla alltid strömkabeln innan något installations- eller underhållsmoment utförs på styrenheten. Temperaturen inuti styrenheten kan nå höga värden och förorsaka allvarliga skador. I samband med permanent installation ska styrenhet och transformator lämpligen skyddas mot oavsiktlig kontakt.

OBSERVERA

Styrenheten ska installeras permanent på ett sådant ställe, att kylluften kan cirkulera fritt kring apparaten. Installera och använd inte styrenheten i miljöer som utsätts för påverkan från atmosfären (regn, snö, is), damm, aggressiva gaser, och inte heller i explosiv eller brandfarlig miljö.

Följande krav på omgivningsförhållanden gäller vid drift:

- temperatur: från 0 °C till +40 °C
- relativ luftfuktighet: 0 - 95% (utan kondens)

ANVÄNDNING

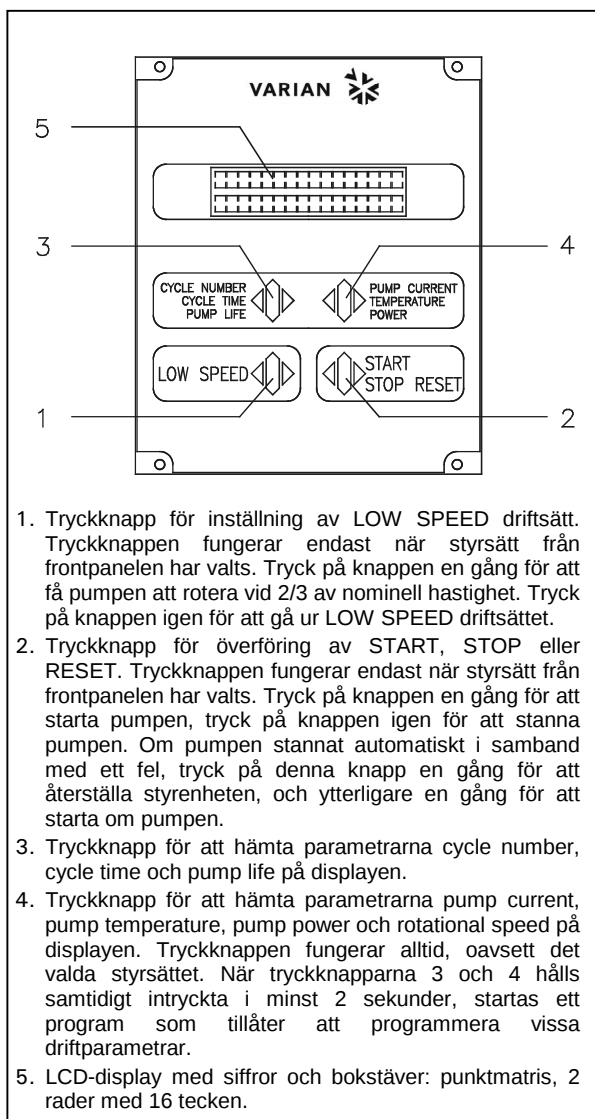
Detta avsnitt beskriver de viktigaste driftmomenten. För en detaljerad beskrivning samt beträffande moment som involverar anslutningar eller tillbehör hänvisas till avsnittet "USE" i bilaga "Technical Information". Vissa anvisningar som listas nedan kan endast utföras på styrenheten när den är utrustad med tillbehöret "Hand held terminal". Innan styrenheten används bör samtliga elektriska och pneumatiska anslutningar utföras. Läs bruksanvisningen för den anslutna pumpen.



VARNING!

Försäkra dig att pumpen står stadigt, om den är installerad på ett bord, detta för att förebygga skador på apparaten och personer. Sätt aldrig igång pumpen, om intagsflänsen varken är kopplad till systemet eller är blockerad på plats med låsflänsen.

Nedan beskrivs manöverpanelen för Hand Held Terminalen.



Frontpanelen på "Hand Held Terminalen"

INSTRUKTIONER FÖR BRUK

Start av styrenheten

Styrenheten startas enkelt genom att sätta strömkabeln i vägguttaget.

Start av pumpen

Pumpen startas genom att skicka START-kommando till stiften på inmatningsmodulen till styrenheten (stift 1-6 på P1) alternativt trycka på tryckknappen START, om Hand Held Terminalen är installerad.

Stopp av pumpen

Pumpen stoppas genom att ta bort START-kommando från stiften på inmatningsmodulen till styrenheten (stift 1-6 på P1) alternativt trycka på tryckknappen STOPP, om Hand Held Terminalen är installerad.

UNDERHÅLL

Styrenheterna i Turbo-V 70 PCB serien är underhållsfria. Allt servicearbete måste utföras av auktoriserad personal.

Om styrenheten havererar, kontakta Varian reparationsverkstad eller Varian utbytesservice, som kan ersätta styrenheten med en renoverad styrenhet.



VARNING!

Innan något arbete utförs på styrenheten måste dess strömförsörjning brytas.

Skrotning av pumpen skall ske enligt gällande lagstiftning.

FELMEDDELANDEN

När vissa fel uppstår visar styrenhetens självdiagnoskrets aktuellt felmeddelande på displayen. De möjliga meddelandena listas i följande tabell.

OBSERVERA

Felmeddelandena visas endast om tillbehöret "Hand Held Terminal" är installerat.

MEDDELANDE	BESKRIVNING	ÅTGÄRD
CHECK CONNECTION TO PUMP	Anslutningen mellan pump och styrenhet är defekt.	Kontrollera att anslutningskabeln mellan pump och styrenhet är ordentligt monterad samt att inget avbrott förekommer. Tryck två gånger på knappen START för att starta om pumpen.
PUMP WAITING INTERLOCK	Interlock-signalen finns på kontakt P1 på grund av kortslutning mellan stift 3 och stift 8 i kontakten J1, eller på grund av att den externa interlock-signalen är öppen.	Åtgärda kortslutningen mellan stift 3 och stift 8 på kontakt J1 eller stäng den externa interlock-signalen.
FAULT: OVERTIME SX	Vid uppstart av pumpen med "mjukstart" har pumpen inte nått korrekt hastighet för varje steg inom 15 minuter (X kan gälla 0 till 9 och anger vilket steg, som inte genomförts).	Kontrollera om systemet läcker. Tryck två gånger på knappen START för att starta om pumpen.
FAULT: PUMP OVERTEMP.	Temperaturen på det övre lagret eller pumpen överskrider 60 °C.	Vänta tills temperaturen sjunker under tröskelvärdet. Tryck två gånger på knappen START för att starta om pumpen.
FAULT: CONTROLLER OVERTEMPERATURE	Temperaturen på styrenhetens transformator överskrider 90 °C.	Vänta tills temperaturen sjunker under tröskelvärdet. Tryck två gånger på knappen START för att starta om pumpen.
FAULT: TOO HIGH LOAD	Under normal drift (efter startmomentet) förbrukar pumpen en större effekt än det programmerade värdet (1,5 A).	Kontrollera att pumpens rotor kan rotera fritt. Tryck två gånger på knappen START för att starta om pumpen.
FAULT: SHORT CIRCUIT	Under normal drift (efter startmomentet) har utgången kortslutits (utgångsström högre än 2,2 A).	Kontrollera anslutningarna mellan pump och styrenhet. Tryck två gånger på knappen START för att starta om pumpen.
SYSTEM OVERRIDE	Pumpen har stannats av en nödstoppsignal från en fjärrkontakt.	Frånkoppla styrenhetens strömkabel och kontrollera nödstoppets orsak. Sätt därefter i strömkabeln. Tryck två gånger på knappen START för att starta om pumpen.
OVERVOLTAGE	Ett fel i styrenhetens matningsdel har uppstått eller styrenheten har fått en falsk signal.	Tryck två gånger på knappen START för att starta om pumpen. Om meddelandet visas igen, ta kontakt med Varian för nödvändigt underhåll.
CONTROLLER FAILURE	Avbrott i säkring i den sekundära effektkretsen.	Kontakta Varian för underhåll.

GENERELL INFORMASJON

Dette utstyret er beregnet til bruk av profesjonelle brukere. Brukeren bør lese denne brukerveiledningen og all annen informasjon fra Varian før utstyret tas i bruk.

Varian kan ikke holdes ansvarlig for hendelser som skjer på grunn av manglende oppfølging, selv delvis, av disse instruksjonene, feilaktig bruk av utrenet personell, ikke godkjente endringer av utstyret eller handlinger som på noen måte er i strid med nasjonale bestemmelser.

Styreenheten i Turbo-V 70 PCB serien er en mikroprosessorstyrt frekvensomvender, som består av komponenter med fast tilstand. Styreenheten har funksjoner for selvdiagnose og selvbeskyttelse.

Styreenheten kontrollerer pumpene i Turbo-V 70 PCB serien (med en titringsprosess) ved oppstart. Spenning og strømstyrke justeres i forhold til pumpens oppnådde hastighet. Styreenheten omfatter alle kretser som er nødvendige for automatisk drift av pumpene i Turbo-V 70 PCB serien. Hjelpetaster gir muligheter for fjernstyrt start og stopp av pumpen, signaler for pumpens tilstand, kontroller for start og stopp av forvakuum-pumpen, blokkeringssignaler (for trykksensorer, kontrollbrytere for vannstrøm osv). Styreenheten skal forsynes gjennom en ekstern transformator (som leveres ikke med styreenheten).

Et spesielt apparat (Hand Held Terminal) kan bestilles som ekstrautstyr for å kontrollere styreenhetens funksjoner og vise dets tilstand. Dette apparatet omfatter et styretastatur og en bildeskjerm. De følgende avsnittene inneholder all informasjon som er nødvendig for å sikre brukeren når utstyret er i bruk. For mer detaljert bruk vises det til tillegget "Technical Information".

Denne veiledningen bruker følgende standard-protokoll:



ADVARSEL!

Disse meldingene skal tiltrekke seg brukerens oppmerksomhet til en spesiell fremgangsmåte eller praksis som, hvis den ikke følges, kan medføre alvorlige skader.



FORSIKTIG!

Denne advarselen vises foran fremgangsmåter som, dersom de ikke følges, kan føre til at utstyret skades.

MERK

Merknadene inneholder viktig informasjon som er hentet fra teksten.

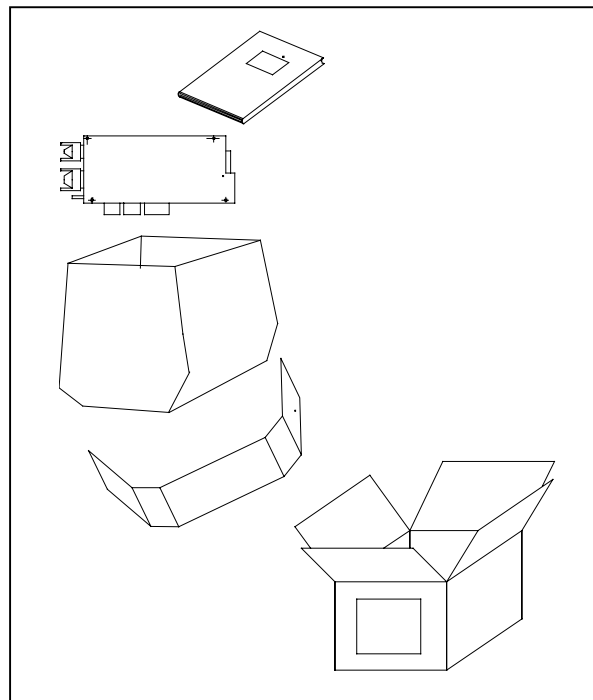
LAGRING

Når styreenhetene transporteres eller lagres, må følgende forhold være oppfylt:

- temperatur: fra 20 °C til +70 °C
- relativ fuktighet: 0 - 95% (uten kondens)

FORBEREDE INSTALLASJONEN

Styreenheten leveres i en spesiell beskyttelsesemballasje. Viser denne tegn på skader som kan ha oppstått under transporten, må du ta kontakt med det lokale salgskontoret.

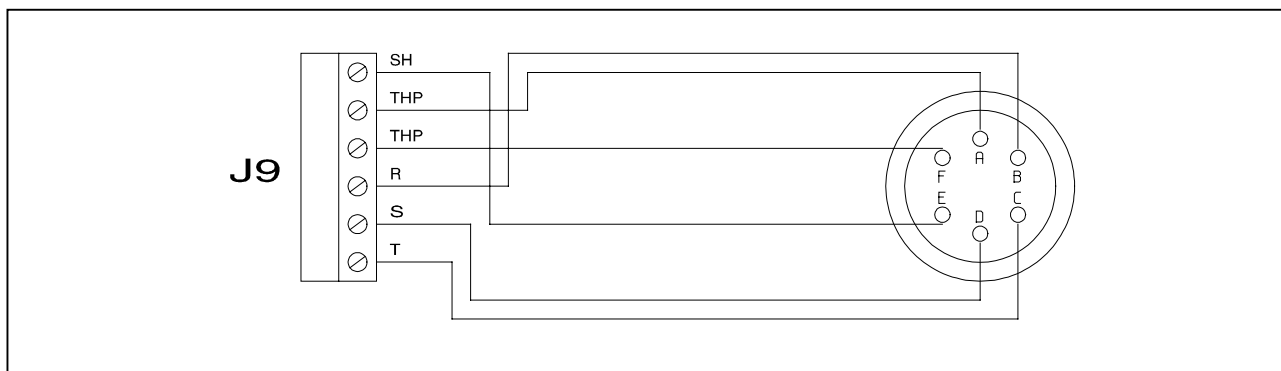


Styreenhetens emballasje

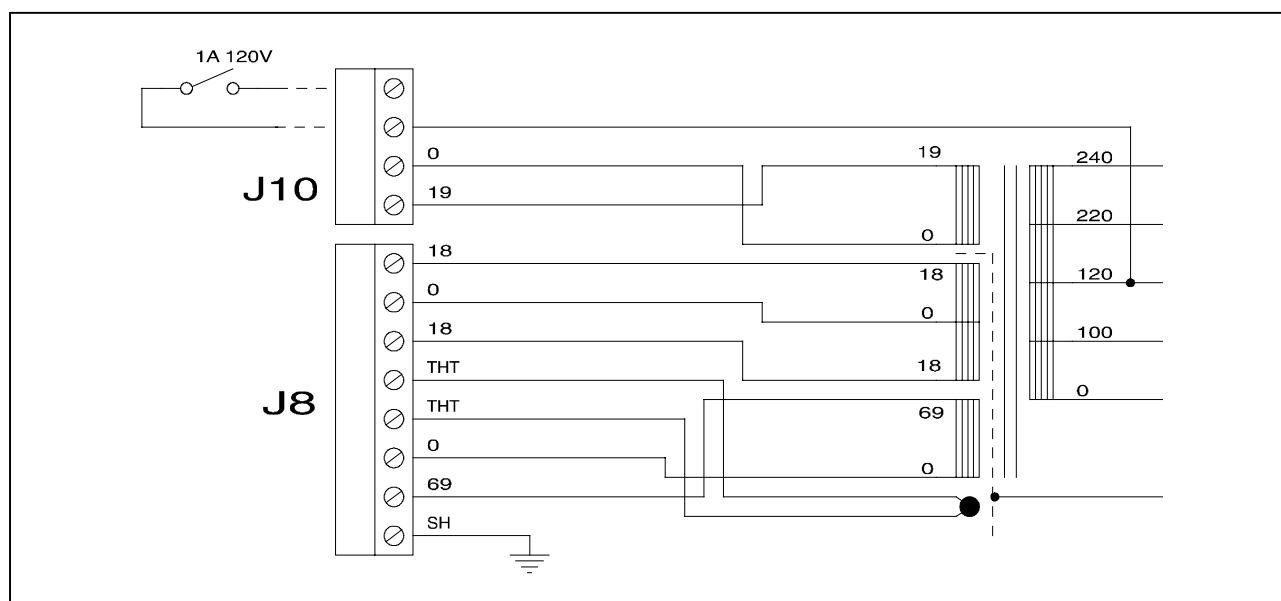
Når styreenheten pakkes ut, må du passe på at den ikke slippes ned eller utsettes for noen form for støt.

Emballasjen må ikke kastes på en ulovlig måte. Alle materialer er 100% resirkulerbare og er i samsvar med EU-direktiv 85/399 om miljøbeskyttelse.

Før styreenheten installeres skal du klargjøre de nødvendige forbindelseskablene, det vil si forbindelseskabler til matespenning og pumpe samt kabler for logiske signaler. Følgende bilder viser de nødvendige forbindelsene mellom styreenhet og pumpe samt mellom styreenhet og strømkilde. For ytterligere informasjon om forbindelser og strømkilde (ekstrautstyr) vises det til vedlegget "Technical Information".



Forbindelseskabel mellom styreenhet og pump



Forbindelseskabel mellom styreenhet og transformator

INSTALLASJON



ADVARSEL!

Spenningen mellom styreenheten og transformatoren samt mellom transformatoren og elnettet kan nå høye verdier og kan føre til alvorlige skader og dødsfall. Kople alltid strømkabelen fra strømmettet før alle installasjons- eller vedlikeholdsarbeider som utføres på styreenheten. I forbindelse med permanent installasjon skal styreenhet og transformator beskyttes mot utilsiktet kontakt på en passende måte.



ADVARSEL!

Spenningen inne i styreenheten kan nå høye verdier og kan føre til alvorlige skader og dødsfall. Kople alltid strømkabelen fra strømmettet før alle installasjons- eller vedlikeholdsarbeider som utføres på styreenheten. Temperaturen inne i styreenheten kan nå høye verdier og kan føre til alvorlige skader. I forbindelse med permanent installasjon skal styreenhet og transformator beskyttes mot utilsiktet kontakt på en passende måte.

MERK

Styreenheten skal installeres på slik måte, at kjøleluften kan sirkulere fritt rundt apparatet. Ikke installer eller bruk styreenheten i miljøer som utsettes for regn, snø eller is, støv, aggressive gasser, eksplosjonsfarlige miljøer eller i miljøer med stor brannfare.

Under bruk må følgende forhold respekteres:

- temperatur: fra 0 °C til + 40 °C
- relativ fuktighet: 0 - 95% (uten kondens)

BRUK

Dette avsnittet beskriver de viktigste driftsmomentene. For en detaljert beskrivelse samt moment som omfatter tilkoblinger eller ekstraustyr vises det til avsnittet "Use" i vedlegget "Technical Information". Visse anvisninger som listes nedenfor kan kun gjennomføres på styreenheten når den er utstyrt med ekstraustyret "Hand Held Terminal".

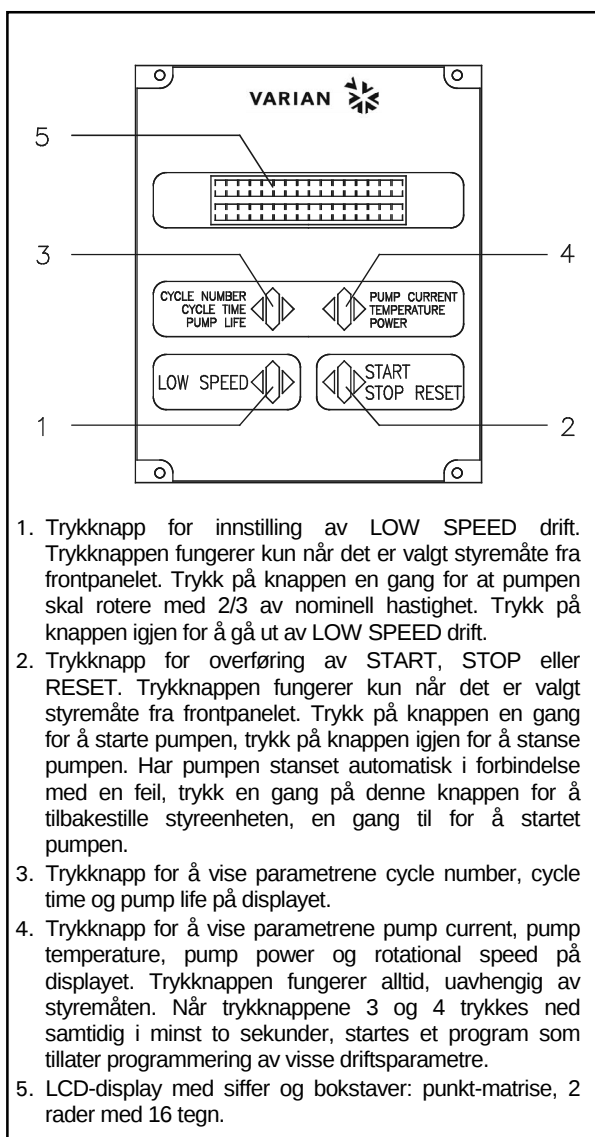
Før styreenheten tas i bruk bør samtlige elektriske og pneumatiske tilkoblinger gjøres. Les brukerveiledningen for pumpen som er tilkoplest.



ADVARSEL!

Dersom pumpen er installert på et bord må du kontrollere at pumpen står støtt. Dette er viktig for å forhindre skader på apparatet og på personer. Dersom inngangsflynsen hverken er tilkoplest systemet eller dersom den er blokkert av låseflynsen må pumpen aldri startes opp.

Nedenfor beskrives styrepanelet til styreenheten.



Frontpanelet til "Hand held terminalen"

INSTRUKSJONER FOR BRUK

Starte styreenheten

Styreenheten startes ved å sette strømkabelen i veggkontakten.

Starte pumpen

Pumpen startes ved å gi START-kommando til stiftene på styreenhetens inngangskonnektor (stift 1-6 på P1) eller ved å trykke på knappen START, dersom Hand Held Terminalen er installert.

Stoppe pumpen

Pumpen stopper ved å fjerne START-kommando fra stiftene på styreenhetens inngangskonnektor (stift 1-6 på P1) eller ved å trykke på knappen STOPP, dersom Hand Held Terminalen er installert.

VEDLIKEHOLD

Turbo-V 70 PCB seriens styreenheter er vedlikeholdsfrie. Alt arbeid på styreenheten må kun utføres av autorisert personell. Dersom styreenheten stanser, må du ta kontakt med Varians reparasjonsservice eller med Varians avanserte bytteservice, som kan tilby overholte styreenheter til erstatning for den ødelagte styreenheten.



ADVARSEL!

Før noe arbeid utføres på styreenheten, må den frakoples strømmettet.

Dersom en styreenhet skal kasseres, må dette skje i henhold til nasjonale bestemmelser.

FEILMELDINGER

Selvdiagnosekretsen i styreenheten viser den aktuelle feilmeldingen i displayet. De aktuelle feilmeldingen fremgår av tabellen nedenfor.

MERK

Feilmeldingene vises kun dersom ekstrastyret "Hand Held Terminal" er installert.

MELDING	BESKRIVELSE	FORHOLDSREGEL
CHECK CONNECTION TO PUMP	Defekt kopling mellom pumpe og styreenhet.	Kontroller at tilkoplingskabelen mellom pumpe og styreenhet er skikkelig montert samt at kabelen ikke er skadet. Trykk to ganger på knappen START for å starte pumpen.
PUMP WAITING INTERLOCK	Låsesignalet for kontakt P1 skyldes en kortslutning mellom stift 3 og stift 8 i kontakten J1 eller fordi det eksterne låsesignalet er åpent.	Tilbakestill kortslutningen mellom stift 3 og stift 8 på kontakt J1 eller steng det eksterne låsesignalet.
FAULT: OVERTIME SX	Ved oppstart av pumpen med "mykstart" har pumpen ikke nådd den korrekte hastigheten for hvert trinn i løpet av 15 minutter (X kan gjelde 0 til 9 og angir hvilket trinn som ikke har blitt gjennomført).	Kontroller om systemet lekker. Trykk to ganger på knappen START for å starte pumpen.
FAULT: PUMP OVERTEMP.	Temperaturen på det øvre lageret eller pumpen er over 60 °C.	Vent til temperaturen synker under terskelverdien. Trykk to ganger på knappen START for å starte pumpen.
FAULT: CONTROLLER OVERTEMPERATURE	Temperaturen på styreenhetens transformator er over 90 °C.	Vent til temperaturen synker under terskelverdien. Trykk to ganger på knappen START for å starte pumpen.
FAULT: TOO HIGH LOAD	Ved normal drift (etter startmomentet) bruker pumpen mer effekt enn den programmerte verdien (1,5 A).	Kontroller om pumpens rotor kan rotere fritt. Trykk to ganger på knappen START for å starte pumpen.
FAULT: SHORT CIRCUIT	Ved normal drift (etter startmomentet) er utgangen kortsluttet (utgangsstrøm over 2,2 A).	Kontroller tilkoplingene mellom pumpe og styreenhet. Trykk to ganger på knappen START for å starte pumpen.
SYSTEM OVERRIDE	Pumpen har stanset av et nødstoppsignal en fra fjernkontakt.	Kople fra styreenhetens strømkabel og finn frem til årsaken til nødstoppen. Kople deretter maskinen til strømmettet igjen. Trykk to ganger på knappen START for å starte pumpen.
OVERVOLTAGE	Det har oppstått en feil i styreenhetens matedel, eller så har styreenheten fått et falskt signal.	Trykk to ganger på knappen START for å starte pumpen igjen. Viser feilmeldingen om igjen, må du ta kontakt med Varian for nødvendig vedlikehold.
CONTROLLER FAILURE	Avbrudd i sikringen til det sekundære effektkretsløpet.	Kontakt Varian for vedlikehold.

YLEISIÄ TIETOJA

Tämä laite on tarkoitettu ammattimaiseen käyttöön. Ennen laitteen käyttöönottoa käyttäjän tulee lukea huolellisesti mukana seuraava käyttöohje sekä kaikki muut Varianin toimittamat lisätiedot. Varian ei vastaa seurauksista, jotka johtuvat laitteen käyttöohjeiden täydellisestä tai osittaisesta laiminlyömisestä, ammattitaidottomien henkilöiden suorittamasta laitteen virheellisestä käytöstä, valtuuttamattomista toimenpiteistä tai maakohtaisten säädösten ja normien vastaisesta käytöstä.

Sarjan Turbo-V 70 PCB valvoja on mikroprosessorin valvoma kiinteistä materiaaleista tehtyjä taajuudenmuuntimia, jotka kykenevät itsemäärättyyn ja itsesuojaukseen. Valvoja ajaa Turbo-V 70 PCB sarjan pumppuja (kymmenportaisessa järjestelmässä) käynnistysvaiheessa valvoen jännitettä ja sähkövirtaa suhteessa pumpun saavuttamaan nopeuteen.

Ne yhdistävät kaikki sähköpiirit, jotka ovat välttämättömiä Turbo-V 70 PCB sarjan pumpun automaattiselle toiminnalle. Apuliittimiä käyttäen on mahdollista käyttää kauko-ohjattua pumpun käynnistystä ja pysähdystä, signaaleja, jotka ilmaisevat pumpun toimintatilan, esityhjennyspumppun käynnistys- ja pysähdysaika, veden virtauksen säätelykatkaisijaa jne. Valvojan tulee saada sähkö ulkopuoliselta muuntajalta (tämä ei tule valvojan kanssa). Yhdistäkää valvoja ulko-virtalähteseen muuntajan avulla (muuntaja ostettava erikseen). "Käsin Pidetävä Pääte"-lisälaite käytetään toimintojen tarkistamiseksi ja valvojan tilan näkemiseksi. Lisälaite sisältää ohjausnäppäimistön ja näyttölaitteen. Seuraavilla sivuilla on luettavissa tarpeelliset tiedot laitteen käyttäjän turvallisuuden takaamiseksi laitteen käytön aikana. Yksityiskohtaiset tiedot löytyvät liitteestä "Tekniset tiedot".

Tämä käsikirja käyttää seuraavia merkintöjä:



VAARA!

Vaara-merkinnät saavat käyttäjän huomion kiinnittymään erityisiin toimintotapoihin, joiden seuraamatta jättäminen voi aiheuttaa vakavia henkilövaurioita.



HUOMIO !

Huomio-merkinnät varoittavat toiminnoista, joiden laiminlyönti voi johtaa laitteen vaurioitumiseen.

HUOM

Huomiot sisältävät tärkeitä tekstistä otettua tietoa.

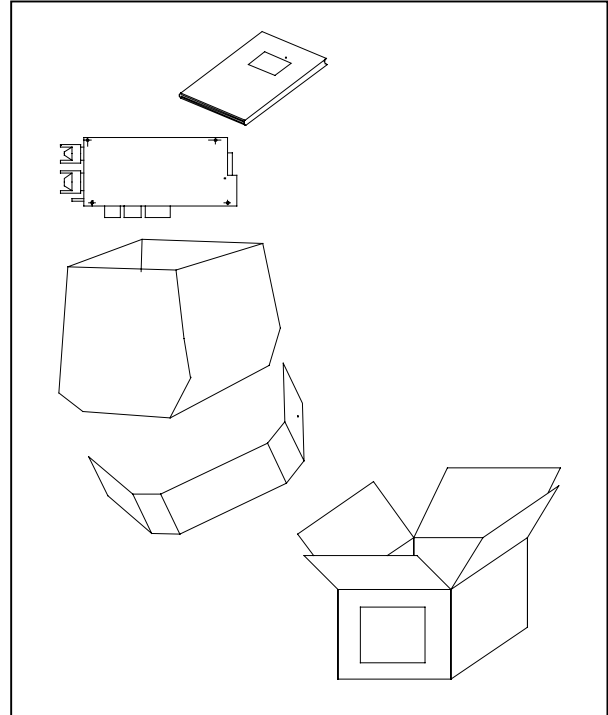
VARASTOINTI

Valvojan kuljetuksen ja varastoinnin aikana tulevat seuraavat ympäristövaatimukset olla täytettyinä:

- lämpötila: -20 °C ja +70 °C asteen välillä
- suhteellinen kosteus: 0 - 95% (ilman lauhdetta).

VALMISTELUT ASENNUSTA VARTEN

Valvoja toimitetaan erityisessä suojaavassa pakkauksessa. Mikäli havaitsette mahdollisesti kuljetuksen aikana sattuneita vaurioita, ottakaa yhteys paikalliseen myyntitoimistoon.

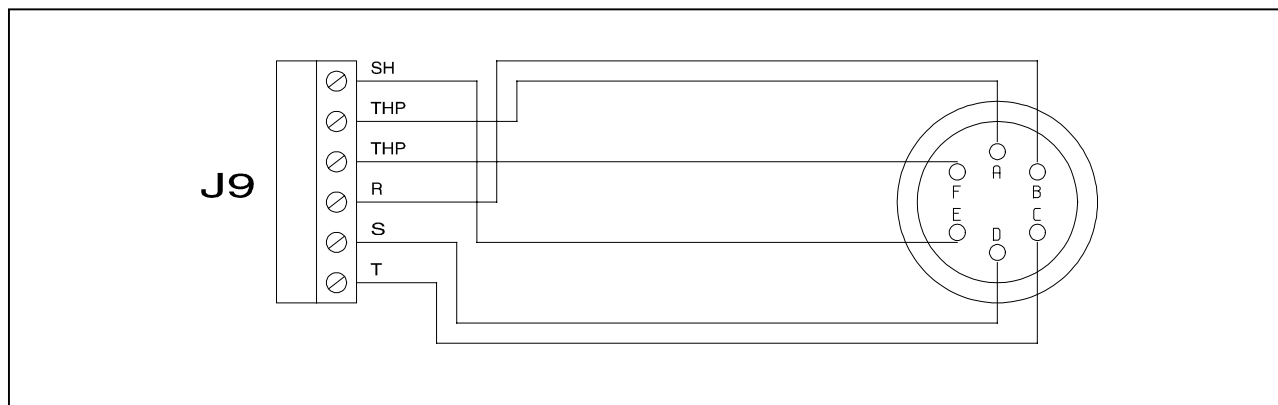


Valvojan pakkaus

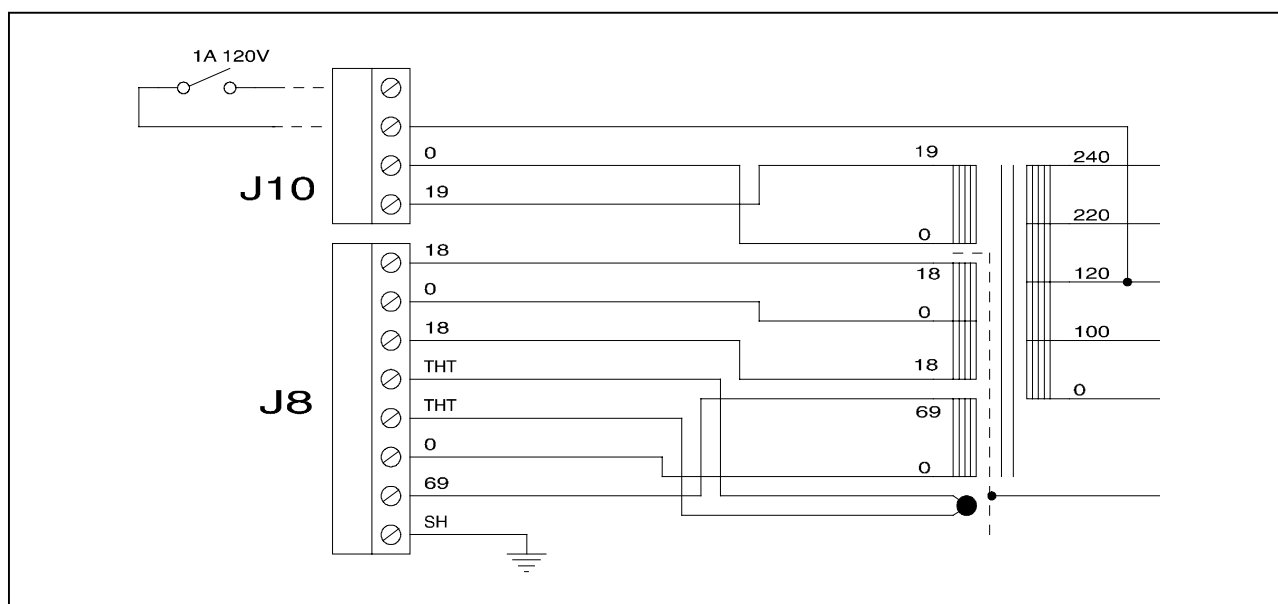
Pakkauksen purkamisen yhteydessä huolehdi, että valvoja ei pääse putoamaan ja välttää sen joutumista iskujen kohteeksi. Älkää jättäkö pakkausta ympäristöön. Materiaali voidaan kokonaisuudessaan kierrättää ja se vastaa EY:n 85/399 direktiiviä ympäristön suojelusta.

Ennen kuin asennatte valvojan, pitää valmistaa liitoskaapeleita, esimerkiksi sähkövirtakaapeleita, loogisten signaalien kaapeleita ja pumpun liitoskaapeli. Seuraavissa piirroksissa näkyy liitännät valvojan ja pumpun välillä ja valvojan ja muuntajan välillä.

Liitännän ja (lisä-) muuntajan lähimmät tiedot löytyvät liitteestä "Tekniset tiedot".



Valvojan ja muuntajan litoskaapeli



Valvojan ja muuntajan litäntä

ASENNUS

**VAARA!**

Valvojan ja muuntajan välille ja myös muuntajan ja sähköverkon välille syntyy korkeajännitettä, joka voi aiheuttaa vakavia vammoja tai jopa kuoleman. Suojatkaa valvoja ja muuntaja tahattomalta kosketukselta, kun ne ovat jo asennetut.

**VAARA!**

Valvojan sisällä syntyy korkeajännitettä, joka voi aiheuttaa vakavia vammoja tai jopa kuoleman. Ennen minkätahansa valvojan huolto- tai asennustoimenpiteen suorittamista, irroittakaa valvoja sähköverkosta. Valvojan sisällä syntyy ylikuumenemista, joka voi aiheuttaa vakavia vammoja. Suojatkaa valvoja ja muuntaja tahattomalta kosketukselta, kun ne ovat jo asennetut.

HUOM

Valvojan sisällä syntyy korkeajännitettä, joka voi aiheuttaa vakavia vammoja tai jopa kuoleman. Ennen minkätahansa valvojan huolto- tai asennustoimenpiteen suorittamista, irroittakaa valvoja sähköverkosta. Valvojan sisällä syntyy ylikuumenemista, joka voi aiheuttaa vakavia vammoja. Suojatkaa valvoja ja muuntaja tahattomalta kosketukselta, kun ne ovat jo asennetut.

Toiminnan aikana tulee noudattaa seuraavia ympäristönoloja koskevia sääntöjä:

- lämpötila: 0 °C ja +40 °C välillä
- suhteellinen kosteus: 0 - 95% välillä (ilman lauhdetta).

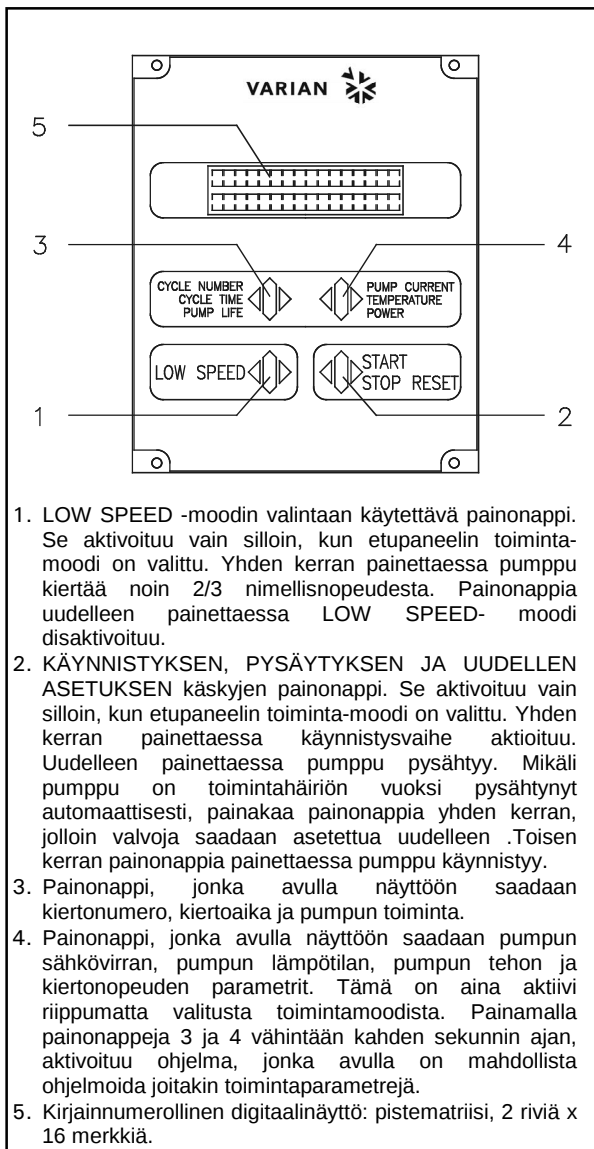
KÄYTTÖ

Tähän kappaleeseen on kirjattu tärkeimmät käyttötoimenpiteet. Tarkempia lisätietoja sekä kytkentöjä, että valinnaisia lisälaitteita koskevien toimenpiteiden suorittamista käsittäviä tietoja löydätte kappaleesta "Käyttö", joka on "Tekniset tiedot"- kappaleen liitteenä. Jotkin seuraavista ohjeista ovat mahdollisia valvojalle vain mikäli se on kytkettynä "Käsin Pidettävä Pääte"-lisälaitteeseen. Ennen valvojan käyttöä suorittaakaa kaikki sähkökytkennät seuraten kytkettävän pumpun käyttöohjeita.

**VAARA!**

Mikäli pumpppu on asetettu pöydälle, varmistakaa että se on vakaassa asennossa. Näin vältetään vammoilta ihmisille sekä itse koneelle. Älkää myöskään käyttäkö pumpppua, mikäli sisään tulon laippaa ei ole kytketty järjestelmään tai mikäli sitä ei ole suljettu laippasulkijalla.

Seuraavassa on esitelty käsin pidettävän päätteen valvontapaneeli.



Käsin Pidettävän Pääteen etupaneeli

KÄYTTÖTOIMENPITEET

Valvojan päälle pano

Valvoja käynnistyy asettamalla virtakaapeli pistorasiaan.

Pumpun käynnistys

Pumpppu käynnistyy lähettämällä START-signaali valvojan sisään tulokonektorin nuppeihin (P1:n nuppeihin 1-6) tai painamalla START painonappia, jos on Käsin Pidettävä Pääte.

Pumpun pysäyttäminen

Pumpppu pysähtyy ottamalla START-signaali pois päältä valvojan sisään tulokonektorin nuppeilta (P1:n nuppeilta 1-6) tai painamalla STOP painonappia, jos on Käsin Pidettävä Pääte.

HUOLTO

Turbo-V 70 PCB sarjan valvojat eivät kaipa minkäänlaista huoltoa. Mahdolliset valvojan tehtävät toimenpiteet tulee jättää aina valtuutetun henkilön tehtäviksi. Toimintahäiriön sattuessa on mahdollista käyttää Varianin korjauspalvelua tai "Varian advance exchange service" -palvelua, jolloin on mahdollista vaihtaa rikki koonnut valvoja ladattuun valvojaan.

**VAARA!**

Ennen minkätähansa valvojan tehtävän toimenpiteen suorittamista irroittakaa sähkökaapeli pistorasiasta.

Mikäli valvoja täytyy romuttaa, toimikaa sen hävittämisessä kansallisten säädösten ja normien määräävällä tavalla.

VIANETSINTÄ

Joidenkin toimintahäiriöiden yhteydessä valvojan itsemäärittelypiiri analysoi virheen, joka näkyy viesteinä, jotka on kuvailtu seuraavassa taulukossa.

HUOM

Virheviestit näkyvät vain siinä tapauksessa, että siihen on asennettu valinnainen "Käsin pidettävä pääte".

VIESTI	VIKA	KORJAUSTOIMENPITEET
CHECK CONNECTION TO PUMP	Toimintahäiriö pumpun ja valvojan liitännässä.	Tarkistakaa että pumpun ja valvojan välinen yhteyskaapeli on hyvin kiinnitetty päistään eikä sen varrella ole esteitä. Painakaa kaksi kertaa painonappia START jolloin pumppu käynnistyy.
PUMP WAITING INTERLOCK	Lukitussignaali (interlock) liittimessä P1 on aktiivinen johtuen liittimen J1 neuojen 3 ja 8 välillä tapahtuneen oikosulun keskeytyksestä tai ulkoisen lukitussignaalin (interlock) avautumisesta.	Palauttakaa liittimen J1 neuojen 3 ja 8 välinen oikosulku tai sulkekaa ulkopuolinen lukitussignaali (interlock).
FAULT: OVERTIME SX	"Soft Start" moodissa tapahtuvan pumpun käynnistyksen aikana pumppu ei ole saavuttanut sille joka askeleella tarkoitettua nopeutta 15 minuutin sisällä. (X on askelnumero 09 ja ilmaisee sen askeleen, jota ei ole ylitetty).	Tarkistakaa, että järjestelmässä ei ole vuotoja. Painakaa painonappia START kaksi kertaa, jolloin pumppu käynnistyy.
FAULT: PUMP OVERTEMP.	Ylemmän laakerin tai pumpun lämpötila on ylittänyt 60 °C.	Odottakaa että lämpötila putoaa kynnysarvon alapuolelle. Painakaa painonappia START kaksi kertaa jolloin pumppu käynnistyy.
FAULT: CONTROLLER OVERTEMPERATURE	Valvojan muuntajan lämpötila on ylittänyt 90 °C.	Odottakaa, että lämpötila putoaa kynnysarvon alapuolelle. Painakaa painonappia START kaksi kertaa jolloin pumppu käynnistyy.
FAULT: TOO HIGH LOAD	Normaalityöskentelyn aikana (käynnistyksen jälkeen) pumpun absorboima sähkövirta on korkeampi kuin sille on ohjelmoitu (1,5 A).	Tarkistakaa, että pumpun roottori pyörii vapaasti. Painakaa painonappia START kaksi kertaa jolloin pumppu käynnistyy.
FAULT: SHORT CIRCUIT	Normaalityöskentelyn aikana (käynnistyksen jälkeen) poistoliitin on oikosulussa (poistuva virta suurempi kuin 2,2 A).	Tarkistakaa pumpun ja valvojan välinen liitos. Painakaa painonappia START kaksi kertaa jolloin pumppu käynnistyy.
SYSTEM OVERRIDE	Kaukokytimestä tuleva hälytyssignaali on pysäyttänyt pumpun.	Irroittakaa valvojan sähkökaapeli verkkovirrasta ja korjatkaa hälytyksen aiheuttaja. Kytkekää sähkökaapeli uudelleen ja painakaa painonappia START kaksi kertaa jolloin pumppu käynnistyy.
OVERVOLTAGE	Valvojan sähkövirran syötössä on ilmennyt ongelma tai valvojan saama signaali on väärä.	Painakaa painonappia START kaksi kertaa, jolloin pumppu käynnistyy. Mikäli viesti näkyy uudelleen kääntykää Varian huoltopalvelun puoleen.
CONTROLLER FAILURE	Sulake palanut toisiovirtapiirissä.	Ota yhteys Varianiin huoltoa varten.

ΓΕΝΙΚΕΣ ΠΛΗΡΟΦΟΡΙΕΣ

Αυτή η συσκευή προορίζεται για επαγγελματική χρήση. Ο χρήστης θα πρέπει να διαβάσει προσεκτικά τις οδηγίες του παρόντος εγχειριδίου και οποιαδήποτε άλλη πρόσθετη πληροφορία που παρέχεται από τη Varian, πριν από τη χρησιμοποίηση της συσκευής. Η Varian δεν φέρει καμία ευθύνη όσον αφορά την ολική ή μερική αθέτηση των οδηγιών, την ακατάλληλη χρήση εκ μέρους ανεκπαίδευτου προσωπικού, αυθαίρετες επεμβάσεις ή χρήση που δεν συμφωνεί με τις ειδικές εθνικές διατάξεις.

Οι ρυθμιστές της σειράς Turbo-V 70 PCB είναι ένας μετατροπέας συχνότητας, ελεγχόμενος από έναν μικροεπεξεργαστή. Είναι κατασκευασμένοι με εξαρτήματα σε στερεά κατάσταση και έχουν αυτοδιαγνωστική και αυτοπροστατευτική ικανότητα.

Ο ρυθμιστής ενσωματώνει όλα τα αναγκαία κυκλώματα για την αυτόματη λειτουργία των αντλιών της σειράς Turbo-V 70 PCB.

Ο ρυθμιστής οδηγεί τις αντλίες της σειράς Turbo-V 70 PCB με μια διαδικασία που διαιρείται σε δέκα στάδια κατά τη διάρκεια εκκίνησης ελέγχοντας την τάση και το ηλεκτρικό ρεύμα σε σχέση με την ταχύτητα στην οποία θα φτάσει η αντλία.

Με τη βοήθεια βοηθητικών βυσμάτων είναι διαθέσιμοι όλοι οι χειρισμοί για την εκκίνηση και το σταμάτημα της αντλίας εξ αποστάσεως, τα σήματα που δείχνουν την κατάσταση λειτουργίας της αντλίας, οι χειρισμοί εκκίνησης και σταματήματος της αντλίας προκειμένου, τα σήματα μπλοκαρίσματος (για διακόπτες πίεσης, διακόπτες ελέγχου της ροής του νερού, κλπ.).

Ο ρυθμιστής θα πρέπει να τροφοδοτείται εξωτερικά διαμέσω ενός μετασχηματιστή ο οποίος (δεν προμηθεύεται με τον ρυθμιστή).

Για να ελεγχθούν οι λειτουργίες και να παρουσιαστεί στην οθόνη η κατάσταση λειτουργίας του ρυθμιστή διατίθεται μία ειδική συσκευή (Hand Held Terminal) η οποία αποτελείται από ένα πληκτρολόγιο διοίκησης και μία οθόνη. Στις επόμενες παραγράφους αναφέρονται όλες οι απαραίτητες πληροφορίες που εγγυούνται την ασφάλεια του χειριστή κατά τη διάρκεια της χρησιμοποίησης της συσκευής. Λεπτομερείς πληροφορίες παρέχονται στο παράρτημα "Technical Information".

Αυτό τό εγχειρίδιο χρησιμοποιεί τις ακόλουθες συμβάσεις:

**ΚΙΝΔΥΝΟΣ**

Οι ενδείξεις κινδύνου προσελκύουν την προσοχή του χειριστή σε μια διαδικασία ή σε μια ειδική εργασία η οποία εάν δεν εκτελεστεί σωστά, θα μπορούσε να προκαλέσει σοβαρές προσωπικές βλάβες.

**ΠΡΟΣΟΧΗ**

Οι ενδείξεις προσοχής εμφανίζονται πριν από τις διαδικασίες οι οποίες εάν δεν εκτελεστούν με προσοχή, θα μπορούσαν να προκαλέσουν ζημιές στη συσκευή.

ΣΗΜΕΙΩΣΗ

Οι σημειώσεις περιέχουν σημαντικές πληροφορίες που έχουν αποσπαστεί από το κείμενο.

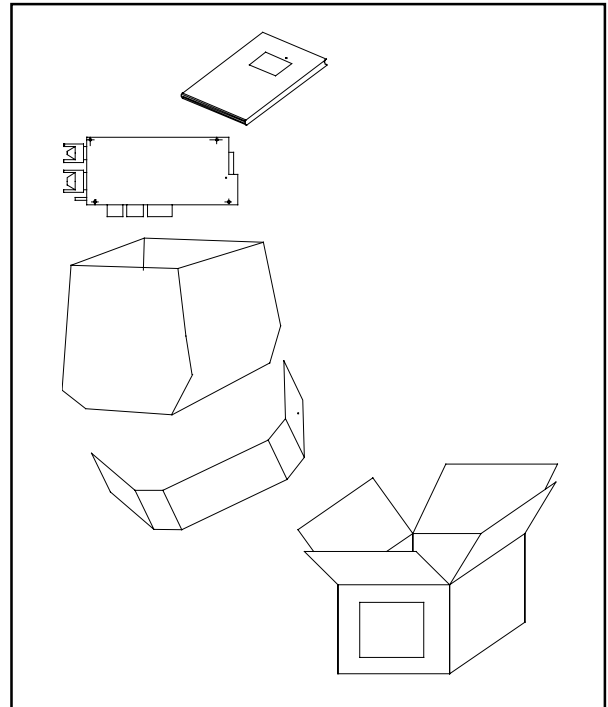
ΑΠΟΘΗΚΕΥΣΗ

Κατά τη διάρκεια της μεταφοράς και της αποθήκευσης των ρυθμιστών πρέπει να τηρούνται οι ακόλουθες περιβαλλοντικές συνθήκες:

- θερμοκρασία: -20 °C έως +70 °C
- σχετική υγρασία 0 - 95% (ασυμπύκνωτη).

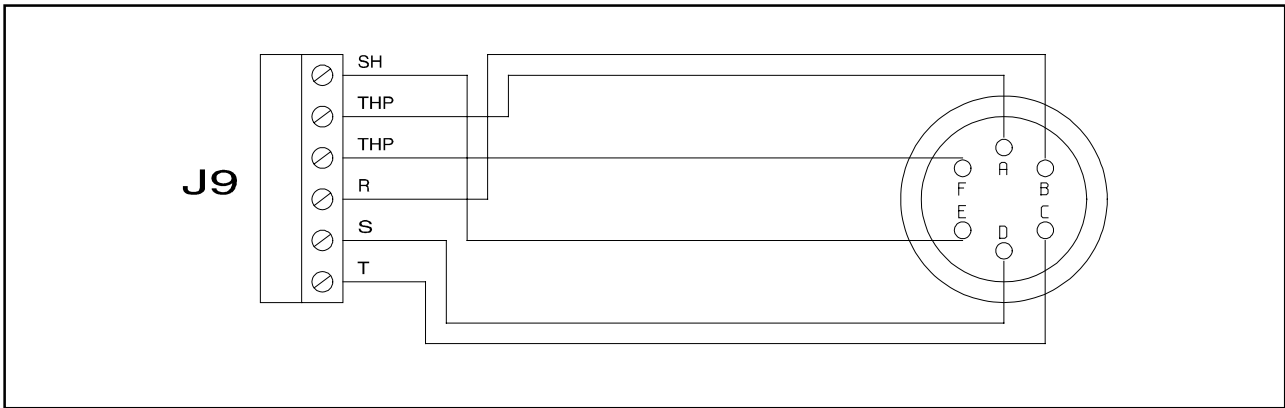
ΠΡΟΕΤΟΙΜΑΣΙΑ ΓΙΑ ΤΗΝ ΕΓΚΑΤΑΣΤΑΣΗ

Ο ρυθμιστής είναι εξοπλισμένος με μία ευρύχωρη προστατευτική συσκευασία. Αν υπάρχουν ενδείξεις βλάβης που θα μπορούσαν να έχουν προκληθεί κατά τη διάρκεια της μεταφοράς, συμβουλευτείτε το τοπικό τμήμα πωλήσεων.

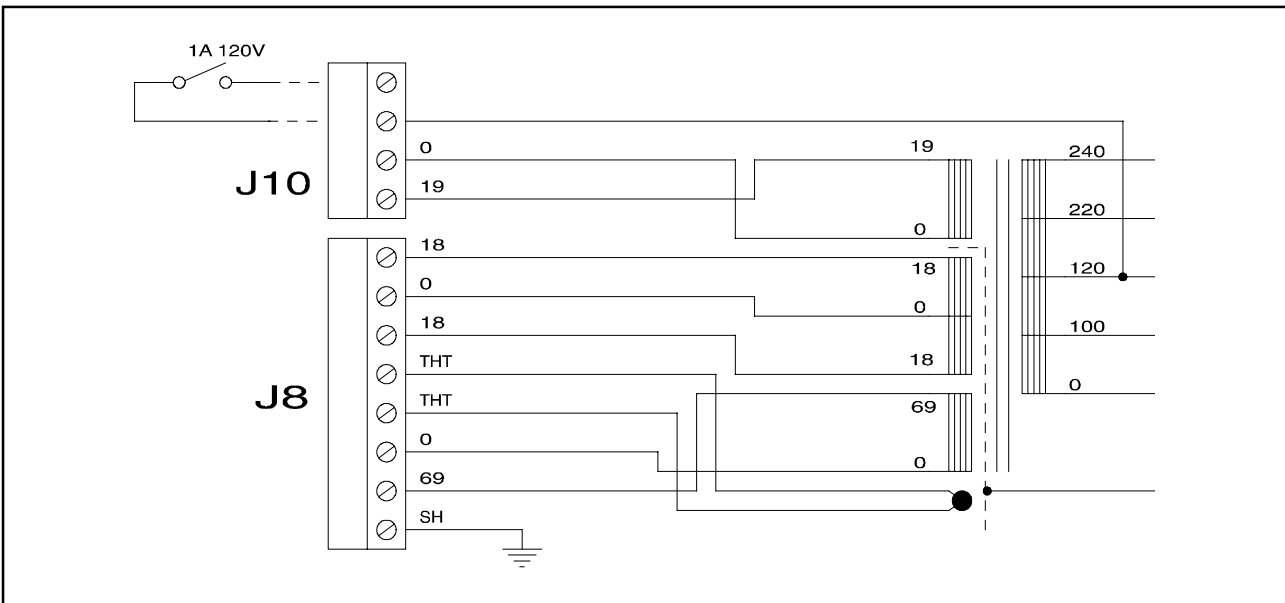


Συσκευασία του ρυθμιστή

Κατά τη διάρκεια του ανοίγματος της συσκευασίας, δώστε ιδιαίτερη προσοχή έτσι ώστε να μην πέσει και να μην χτυπηθεί ο ρυθμιστής. Μην εγκαταλείπετε τη συσκευασία στο περιβάλλον. Το υλικό ανακυκλώνεται πλήρως και ανταποκρίνεται στην Οδηγία της Ε.Ε. 85/399 για την διαφύλαξη του περιβάλλοντος. Πριν από την εγκατάσταση του ρυθμιστή είναι αναγκαίο να προετοιμάσετε μερικά καλώδια διασύνδεσης, όπως για παράδειγμα τα καλώδια για τη σύνδεση με την τροφοδοσία, τα καλώδια για τις συνδέσεις λογικής και της αντλίας. Στα ακόλουθα σχήματα παρουσιάζονται οι συνδέσεις που πρέπει να πραγματοποιηθούν μεταξύ του ρυθμιστή και των αντλιών και μεταξύ του ρυθμιστή και του μετασχηματιστή τροφοδοσίας. Περισσότερες πληροφορίες όσον αφορά τις παραπάνω συνδέσεις και τα χαρακτηριστικά του μετασχηματιστή τροφοδοσίας (διαθέσιμος ως έξτρα) παρέχονται στο παράρτημα "Technical Information".



Συνδέσεις μεταξύ του ρυθμιστή και της αντλίας



Συνδέσεις μεταξύ του ρυθμιστή και του Μετασχηματιστή

ΕΓΚΑΤΑΣΤΑΣΗ

**ΚΙΝΔΥΝΟΣ**

Οι τάσεις που αναπτύσσονται στον ρυθμιστή και τον σχετικό μετασχηματιστή, καθώς και μεταξύ του μετασχηματιστή και του δικτύου τροφοδοσίας είναι τέτοιου ύψους που να αποτελούν κίνδυνο για όποιον έρθει σε επαφή μαζί τους. Προστατεύετε κατάλληλα τον ρυθμιστή και τον μετασχηματιστή τροφοδοσίας στην τελική τους θέση από τις τυχάιες επαφές.

**ΚΙΝΔΥΝΟΣ**

Στο εσωτερικό του ρυθμιστή αναπτύσσονται υψηλές τάσεις που μπορούν να προκαλέσουν σοβαρούς τραυματισμούς ή και το θάνατο. Πριν εκτελέσετε οποιαδήποτε εργασία εγκατάστασης ή συντήρησης του ρυθμιστή αποσυνδέστε τον από την πρίζα τροφοδοσίας. Στο εσωτερικό του ρυθμιστή αναπτύσσονται υψηλές θερμοκρασίες που μπορεί να προκαλέσουν σοβαρές βλάβες ή τραυματισμούς. Προστατεύετε κατάλληλα τον ρυθμιστή τροφοδοσίας στην τελική του θέση από τις τυχάιες επαφές.

ΣΗΜΕΙΩΣΗ

Ο ρυθμιστής που έχει εγκατασταθεί στο τελικό σύστημα θα πρέπει να τοποθετηθεί με τέτοιο τρόπο ώστε ο αέρας ψύξης να μπορεί να κυκλοφορεί ελεύθερα γύρω από τη συσκευή.

Μην τοποθετείτε και - ή χρησιμοποιείτε τον ρυθμιστή σε χώρους εκτεθειμένους στις καιρικές συνθήκες (βροχή, πάγο, χιόνι, σκόνες, αέρια, σε χώρους όπου υπάρχει κίνδυνος έκρηξης ή πυρκαγιάς).

Κατά τη διάρκεια της λειτουργίας πρέπει να τηρούνται οι ακόλουθες περιβαλλοντικές συνθήκες:

- θερμοκρασία: 0 °C έως +40 °C
- σχετική υγρασία: 0 - 95% (ασυμπύκνωτη).

ΧΡΗΣΗ

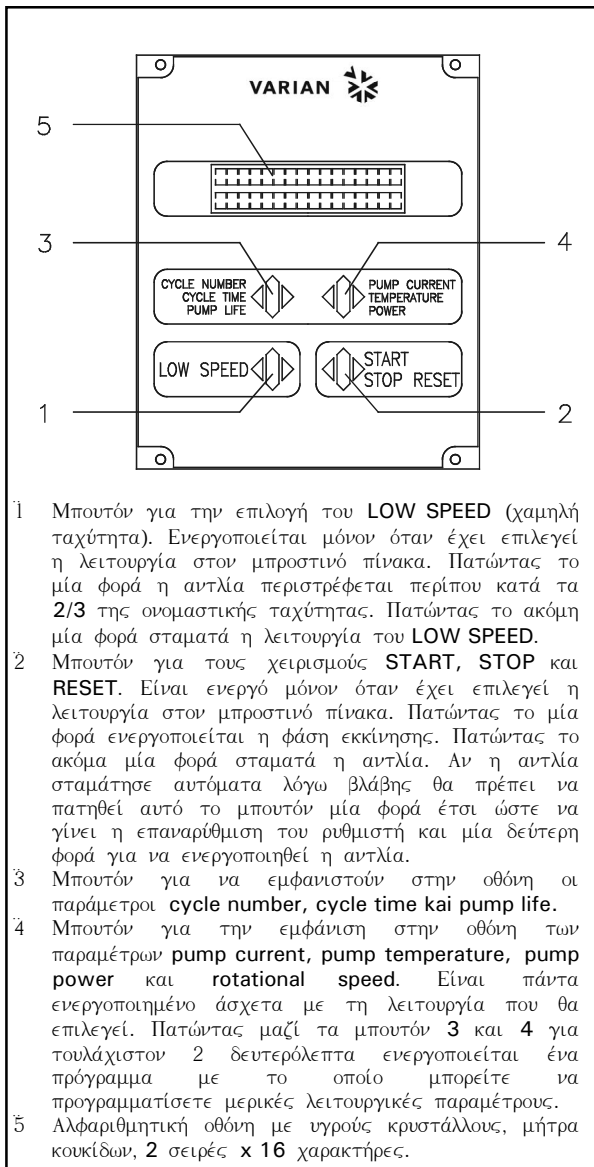
Σ αυτήν την παράγραφο αναφέρονται οι κυριότερες διαδικασίες λειτουργίας. Για περισσότερες λεπτομέρειες και για διαδικασίες που απαιτούν ιδιαίτερες συνδέσεις ή αξεσουάρ, αναφερθείτε στην παράγραφο "Χρήση" του Παραρτήματος "Τεχνικές Πληροφορίες". Μερικές από τις αναφερόμενες στη συνέχεια πληροφορίες μπορούν να εφαρμοστούν και στον ρυθμιστή μόνον αν αυτός είναι συνδεδεμένος με το εξάρτημα "Hand Held Terminal". Πριν χρησιμοποιήσετε τον ρυθμιστή κάντε όλες τις ηλεκτρικές και πιευματικές συνδέσεις βάσει του εγχειριδίου της αντλίας σύνδεσης.



ΚΙΝΔΥΝΟΣ

Για να αποφύγετε βλάβες σε άτομα ή στη συσκευή, όταν η αντλία είναι τοποθετημένη σε ένα τραπέζι σιγουρευτείτε ότι είναι καλά σταθεροποιημένη. Μην θέτετε σε λειτουργία την αντλία αν η φλάντζα εισόδου δεν είναι συνδεδεμένη στο σύστημα ή αν δεν είναι κλειστή με την φλάντζα κλεισίματος.

Στη συνέχεια παρουσιάζεται ο πίνακας ελέγχου του Hand Held Terminal.



Εμπρόσθιος πίνακας του Hand Held Terminal

ΔΙΑΔΙΚΑΣΙΕΣ ΣΧΕΤΙΚΑ ΜΕ ΤΗ ΧΡΗΣΗ

Αναμμα του Ρυθμιστή

Για να ανάψει ο ρυθμιστής είναι αρκετό να βάλετε το καλώδιο τροφοδοσίας στην πρίζα του δικτύου.

Εκκίνηση της Αντλίας

Για να τεθεί σε κίνηση η αντλία θα πρέπει να πατήσετε το μπουτόν **START** στα σχετικά **pin** του βύσματος εισόδου του ρυθμιστή (**pin 1 - 6** του **P1**) ή, αν υπάρχει το **Hand Held Terminal**, πατώντας το κουμπί **START**.

Σταμάτημα της αντλίας

Για να τεθεί σε κίνηση η αντλία θα πρέπει να πατήσετε το μπουτόν **START** στα σχετικά **pin** του βύσματος εισόδου του ρυθμιστή (**pin 1 - 6** του **P1**) ή, αν υπάρχει το **Hand Held Terminal**, πατώντας το κουμπί **STOP**.

ΣΥΝΤΗΡΗΣΗ

Οι ρυθμιστές της σειράς **Turbo-V 70 PCB** δεν απαιτούν καμία συντήρηση. Οποιαδήποτε επέμβαση θα πρέπει να πραγματοποιηθεί από εξουσιοδοτημένο προσωπικό. Σε περίπτωση βλάβης μπορείτε να χρησιμοποιήσετε την υπηρεσία επισκευών της **Varian** ή της "**Varian advance exchange service**", που σας δίνει τη δυνατότητα να έχετε έναν αναζωογονημένο ρυθμιστή σε αντικατάσταση του χαλασμένου.



ΚΙΝΔΥΝΟΣ

Πριν από οποιαδήποτε επέμβαση στον ρυθμιστή αποσυνδέστε το καλώδιο τροφοδοσίας.

Αν πρέπει να καταστραφεί ο ρυθμιστής ακολουθήστε τη διαδικασία που προβλέπεται από τους ειδικούς εθνικούς κανονισμούς.

ΜΗΝΥΜΑΤΑ ΛΑΘΟΥΣ

Σε ορισμένες περιπτώσεις βλάβης τα κυκλώματα αυτοδιάγνωσης του ρυθμιστή παρουσιάζουν ορισμένα μηνύματα λάθους τα οποία παρουσιάζονται στον πίνακα που ακολουθεί.

ΣΗΜΕΙΩΣΗ

Τα μηνύματα λάθους παρουσιάζονται *μόνον* αν έχει εγκατασταθεί η επιπλέον λειτουργία **"Hand Held terminal"**.

ΜΗΝΥΜΑ	ΠΕΡΙΓΡΑΦΗ	ΔΙΟΡΘΩΣΗ
CHECK CONNECTION TO PUMP	Κακή λειτουργία στη σύνδεση αντλίας και ρυθμιστή.	Ελέγχετε αν το καλώδιο σύνδεσης μεταξύ αντλίας και ρυθμιστή είναι καλά σταθεροποιημένο και στα δύο άκρα και ότι δεν υπάρχει διακοπή. Πατήστε δύο φορές το μπουτόν START για να θέσετε ξανά σε κίνηση την Αντλία.
PUMP WAITING INTERLOCK	Εχει ενεργοποιηθεί το σήμα interlock που βρίσκεται στον συνδετήρα P1 λόγω διακοπής του βραχυκυκλώματος μεταξύ του pin 3 και του pin 8 του βύσματος J1 , ή λόγω ανοίγματος του σήματος του εξωτερικού interlock .	Επαναφέρατε το βραχυκύκλωμα μεταξύ του pin 3 και του pin 8 του βύσματος J1 , ή κλείστε το σήμα του εξωτερικού interlock .
FAULT: oVETIME SX	Κατά τη διάρκεια εκκίνησης της αντλίας με το "soft start" , η αντλία δεν έφτασε στην προβλεπόμενη ταχύτητα για κάθε στάδιο μέσα σε 15 λεπτά. (Το X μπορεί να είναι από 0 ως 9 και δείχνει το στάδιο που δεν έχει ξεπεραστεί).	Ελέγχετε έτσι ώστε το σύστημα να μην παρουσιάζει διαρροές. Πατήστε δύο φορές το μπουτόν START για να θέσετε ξανά σε κίνηση την Αντλία.
FAULT: PUMP OVERTEMP.	Η θερμοκρασία του άνω κουζινέτου της αντλίας χεπέρασε τους 60 °C .	Περιμένετε ώσπου η θερμοκρασία να κατεβεί κάτω από το ανώτατο επιτρεπτό σημείο. Πατήστε δύο φορές το μπουτόν START για να θέσετε ξανά σε κίνηση την Αντλία.
FAULT: CONTROLLER oVTEMPERATURE	Η θερμοκρασία του μετασχηματιστή χεπέρασε τους 90 °C .	Περιμένετε ώσπου η θερμοκρασία να κατεβεί κάτω από το ανώτατο επιτρεπτό σημείο. Πατήστε δύο φορές το μπουτόν START για να θέσετε ξανά σε κίνηση την Αντλία.
FAULT: TOO HIGH LOAD	Κατά την κανονική λειτουργία (μετά τη φάση εκκίνησης) το απορροφούμενο ρεύμα από την αντλία είναι μεγαλύτερο από το προγραμματισμένο. (1,5 A).	Ελέγχετε αν ο ρότορας της αντλίας μπορεί να περιστραφεί ελεύθερα. Πατήστε δύο φορές το μπουτόν START για να θέσετε ξανά σε κίνηση την Αντλία.
FAULT: SHORT CIRCUIT	Κατά την κανονική λειτουργία (μετά τη φάση εκκίνησης) η σύνδεση εξόδου έχει βραχυκυκλώσει (ρεύμα εξόδου μεγαλύτερο από 2,2 A).	Ελέγχετε τις συνδέσεις μεταξύ αντλίας και ρυθμιστή. Πατήστε δύο φορές το μπουτόν START για να θέσετε ξανά σε κίνηση την Αντλία.
SYSTEM OVERRIDE	Η αντλία σταμάτησε από ένα σήμα κινδύνου που προέρχεται από την μακρινή επαφή.	Βγάλτε το καλώδιο τροφοδοσίας του ρυθμιστή και διορθώστε την αιτία πρόκλησης του σήματος κινδύνου. Επανασυνδέστε το καλώδιο τροφοδοσίας και πατήστε δύο φορές το μπουτόν START για να θέσετε ξανά σε κίνηση την αντλία.
OVERVOLTAGE	Παρουσιάστηκε βλάβη στον τομέα τροφοδοσίας του ρυθμιστή ή ο ρυθμιστής δέχθηκε ένα λανθασμένο σήμα.	Πατήστε δύο φορές το μπουτόν START για να θέσετε ξανά σε κίνηση την αντλία. Αν ξαναπαρουσιαστεί το μήνυμα απευθυνθείτε στην Varian για συντήρηση.
CONTROLLER FAILURE	Διακοπή ασφάλειας στο δευτερεύον ισχύος.	Απευθυνθείτε στη Varian για τη συντήρηση.

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 Turbo-V 70 PCB controller is a microprocessor-controlled, solid-state, frequency converter with self-diagnostic and self-protection features.

It incorporates all the facilities required for the automatic operation of the Turbo-V 70 PCB pump series. The controller drives (within ten steps) the Turbo-V 70 PCB pump during the starting phase by controlling the voltage and current respect to the speed reached by the pump.

Remote start/stop, pump status signals, forepump start/stop, interlock control (for pressure switch, water flow switch, etc.) capability, are provided via auxiliary connectors. The controller needs to be powered by an external transformer (not supplied with the PCB).

An hand held terminal is available as an option to control and display the controller operation. 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.

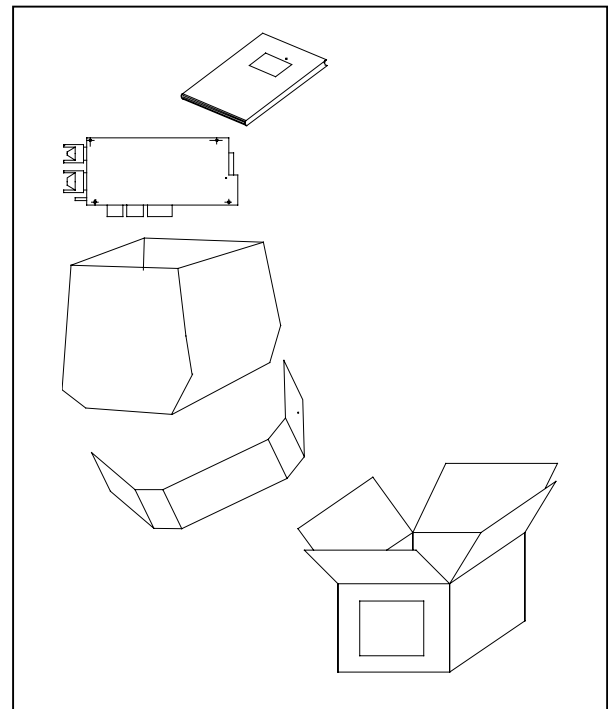
STORAGE

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

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

PREPARATION FOR INSTALLATION

The controller is supplied in a special protective packing. If this shows signs of damage which may have occurred during transport, contact your local sales office.



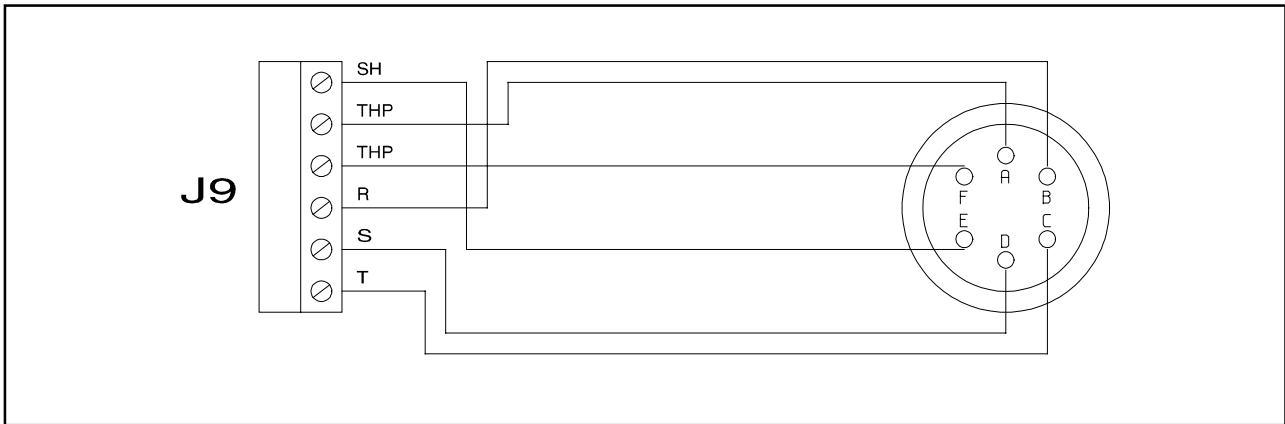
Controller Packing

When unpacking the controller, ensure that it is not dropped or subjected to any form of impact.

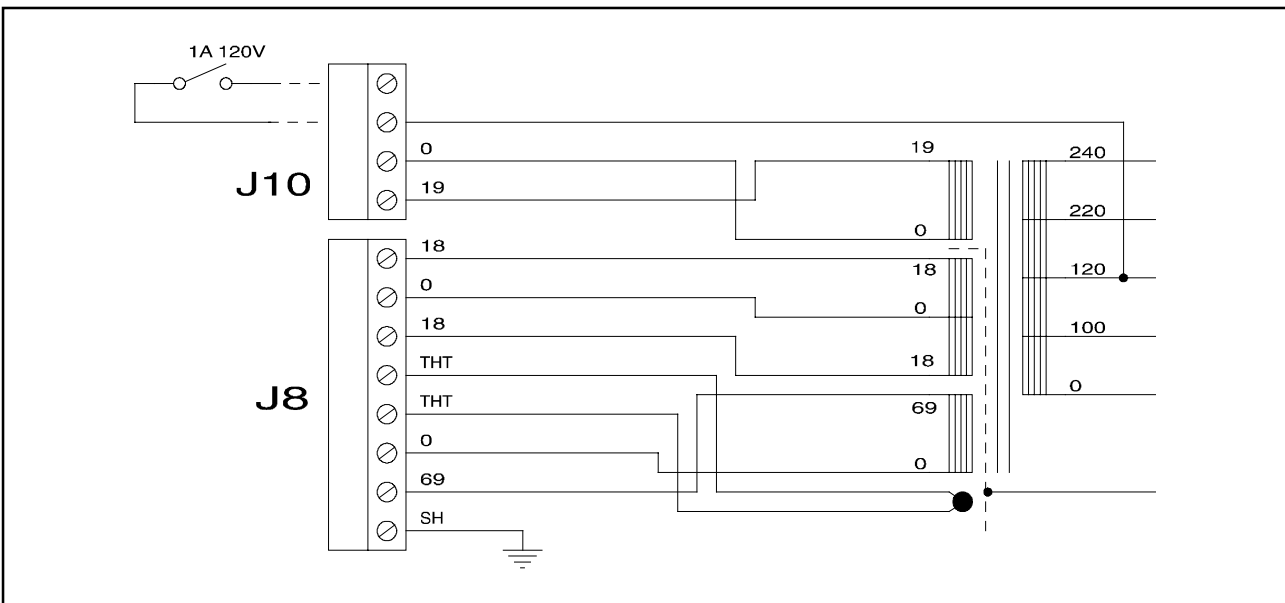
Do not dispose of the packing materials in an unauthorized manner. The material is 100% recyclable and complies with EEC Directive 85/399.

Before installing the controller you must prepare some interconnection cables, i.e. the power interconnections, the logic interconnections and the pump connections. The following pictures show the interconnections between pump and controller and between controller and power transformer.

Detailed information about interconnections and transformer characteristics (available as an option) are supplied in the appendix "Technical Information".



Interconnection Cable Controller - Pump



Interconnection Cable Controller - Power Transformer

INSTALLATION



WARNING!

Voltages between controller and power transformer and transformer and mains are dangerous in case of contact. Protect adequately the controller and the transformer installed into the customer system from accidental contacts.



WARNING!

High voltage developed in the controller can cause severe injury or death. Before servicing the unit, disconnect the input power cable. High temperature developed in the controller can cause severe injury. Protect adequately the controller from accidental contacts.

NOTE

The controller installed into the customer system must be positioned so that cold air can flow through the PCB components.

Do not install or use the controller in an environment exposed to atmospheric agents (rain, snow, ice), dust, aggressive gases, or in explosive environments or those with a high fire risk.

During operation, the following environmental conditions must be respected:

- temperature: from 0 °C to +40 °C
- relative humidity: 0 - 95% (without condensation).

USE

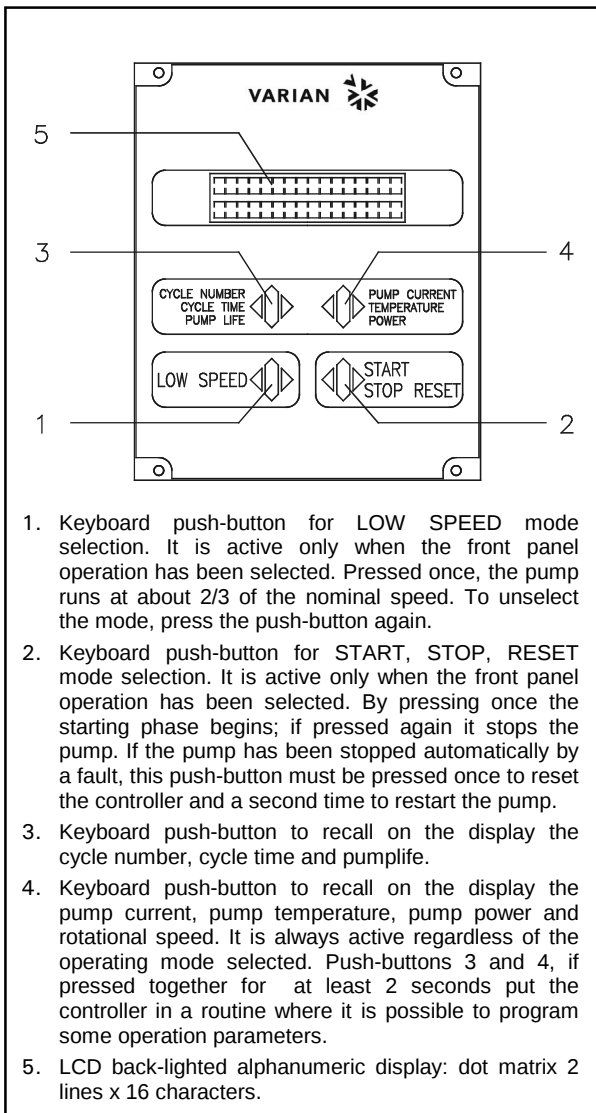
This paragraph describes the fundamental operating procedures. Detailed information and operating procedures that involve optional connections or options are supplied in the paragraph "USE" of the appendix "Technical Information". Some procedures can be executed with controller only when the accessory "Hand held terminal" is available. Make all vacuum manifold and electrical connections and refer to Turbo-V pump instruction manual prior to operating the Turbo-V controller.



WARNING!

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

The following figure shows the hand held terminal control panel.



Hand Held Terminal Control Panel

USE PROCEDURE

Controller Startup

To startup the controller plug the power cable into a suitable power source.

Starting the pump

To start the pump send the START command to related pins of the input connector (pin 1 - 6 of P1 connector), or, when the hand held terminal is available, press the START pushbutton.

Pump Shutdown

To shutdown the pump remove the START command from the related pins of the input connector (pin 1 - 6 of P1 connector), or, when the hand held terminal is available, press the STOP pushbutton.

MAINTENANCE

The Turbo-V 70 PCB series controller does not require any maintenance. Any work performed on the controller must be carried out by authorized personnel. When a fault has occurred it is possible to use the Varian repair service. Replacement controllers are available on an advance exchange basis through Varian.



WARNING!

Before carrying out any work on the controller, disconnect it from the supply.

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

ERROR MESSAGES

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

NOTE

The error messages are displayed only when the option hand held terminal is available.

MESSAGE	DESCRIPTION	REPAIR ACTION
CHECK CONNECTION TO PUMP	Wrong connection between the pump and the controller.	Check connection between controller and pump. Press the START push-button twice to start the pump.
PUMP WAITING INTERLOCK	The interlock signal of P1 connector is activated by an interruption of the link between pin 3 and 8 of J1 connector, or because the external interlock signal is open.	Reset the short circuit between pin 3 and pin 8 of J1 connector, or close the external interlock signal.
FAULT: OVERTIME SX	Within each step of the soft start mode the rotational speed of the pump does not reach the planned value within 15 minutes. (X) is the step number from 0 to 9 indicating the step number not passed).	Verify that system has no leaks. Press the START pushbutton twice to start the pump.
FAULT: PUMP OVERTEMP.	The upper bearing/pump temperature exceeds 60 °C.	Wait until the temperature decrease below threshold value. Press the START push-button twice to start the pump.
FAULT: CONTROLLER OVERTEMPERATURE	The controller transformer temperature exceeds 90 °C.	Wait until the temperature decrease below threshold value. Press the START push-button twice to start the pump.
FAULT: TOO HIGH LOAD	In normal operation (after the starting phase) the current drawn by the pump is higher than programmed (1.5 A)	Check that the pump rotor is free to rotate. Press the START push-button twice to start the pump.
FAULT: SHORT CIRCUIT	After the starting phase the output connection is shorted (output current higher than 2.2 A).	Check connections and shortages between pump and controller. Press the START push-button twice to start the pump.
SYSTEM OVERRIDE	The pump is stopped by an emergency stop signal provided via a remote contact.	Remove the controller power cable and check the emergency condition. Then reconnect the power cable and press the START push-button twice to start the pump.
OVERVOLTAGE	Controller power supply circuitry is faulty, or the Controller received a spike.	Press the START push-button twice to start the pump. Should the message still be present, call the Varian service.
CONTROLLER FAILURE	Fuse blown on the power supply secondary of the transformer.	Contact Varian for Maintenance.

**TURBO-V 70 PCB CONTROLLER
DESCRIPTION**

The controller is a solid-state frequency converter which is driven by a single chip microcomputer and is composed of a PCB which includes power supply, analog and input/output section, microprocessor and digital section.

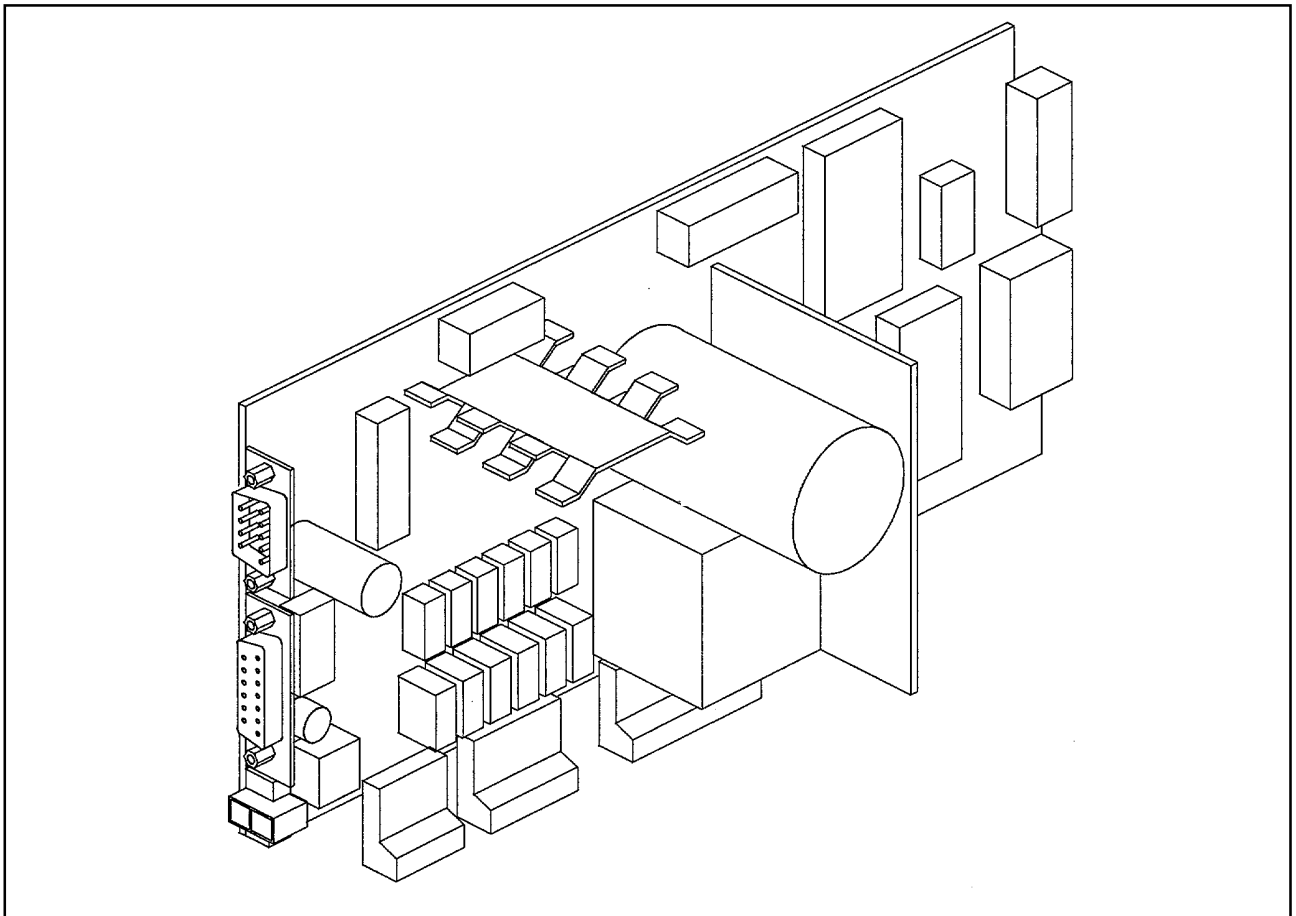
The power supply converts the single phase (50-60 Hz) AC mains supply into a 3-phase, low voltage, medium frequency output which is required to power the Turbo-V pump.

The microcomputer generates the variable output frequency and controls the 3-phase output voltage according to the software and the gas load condition of the pump.

Moreover, it manages signals from sensors, input/output connection information, and gives outputs for a fully automatic operation.

A dedicated non-volatile RAM is used to store pump operating parameters and the input/output programmed information upon failure for a period of 10 years accumulated off time.

The controller can be operated via remote signals through input/output connectors.



Turbo-V 70 PCB Controller

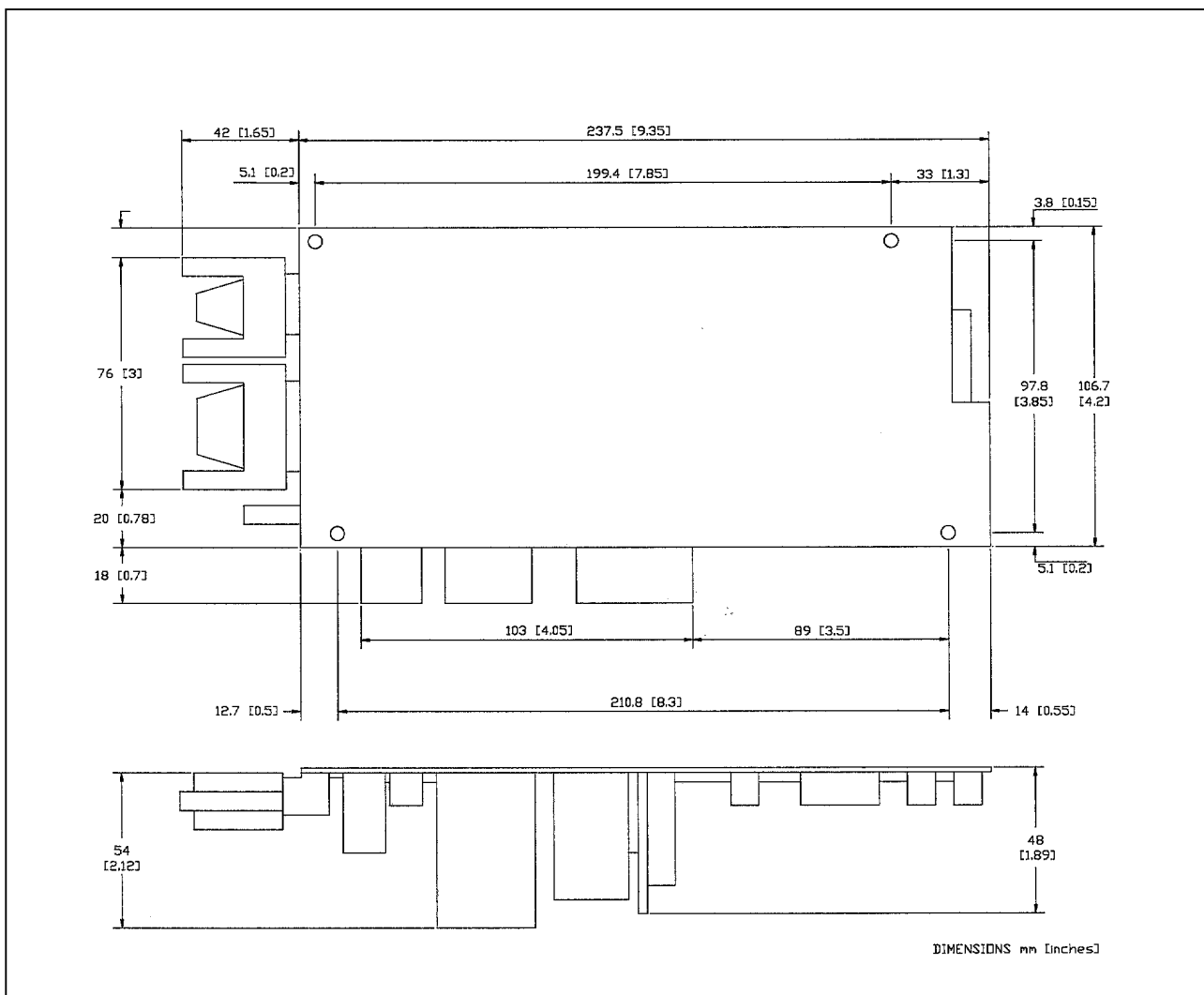
CONTROLLER SPECIFICATIONS

Input:	
Voltage	19, 18, 69 Vac $\pm 10\%$, 1-phase via an external transformer
Frequency	47 to 63 Hz
Power	350 VA maximum
Output:	
Voltage	54 Vac nominal $\pm 10\%$, 3-phase
Frequency	1250 Hz, $\pm 2\%$
Power	150 W maximum
Operating temperature	0 °C to +40 °C
Storage temperature	-20 °C to +70 °C

P1 optoisolator input	Minimum ON 3mA Maximum 5mA
J2 optoisolator output	24 Vdc 60mA
P6 output fan	100 mA
Weight:	0.5 kg (1.1 lbs)

CONTROLLER OUTLINE

The outline dimensions for the Turbo-V 70 PCB controller are shown in the following figure.



Controller outline

GENERAL

Inspect the controller for any shipping damage.

Before installing the controller you must prepare some interconnection cables, i.e. the power interconnections, the logic interconnections and the pump connection.

In the following paragraph are detailed the above mentioned connections.

NOTE

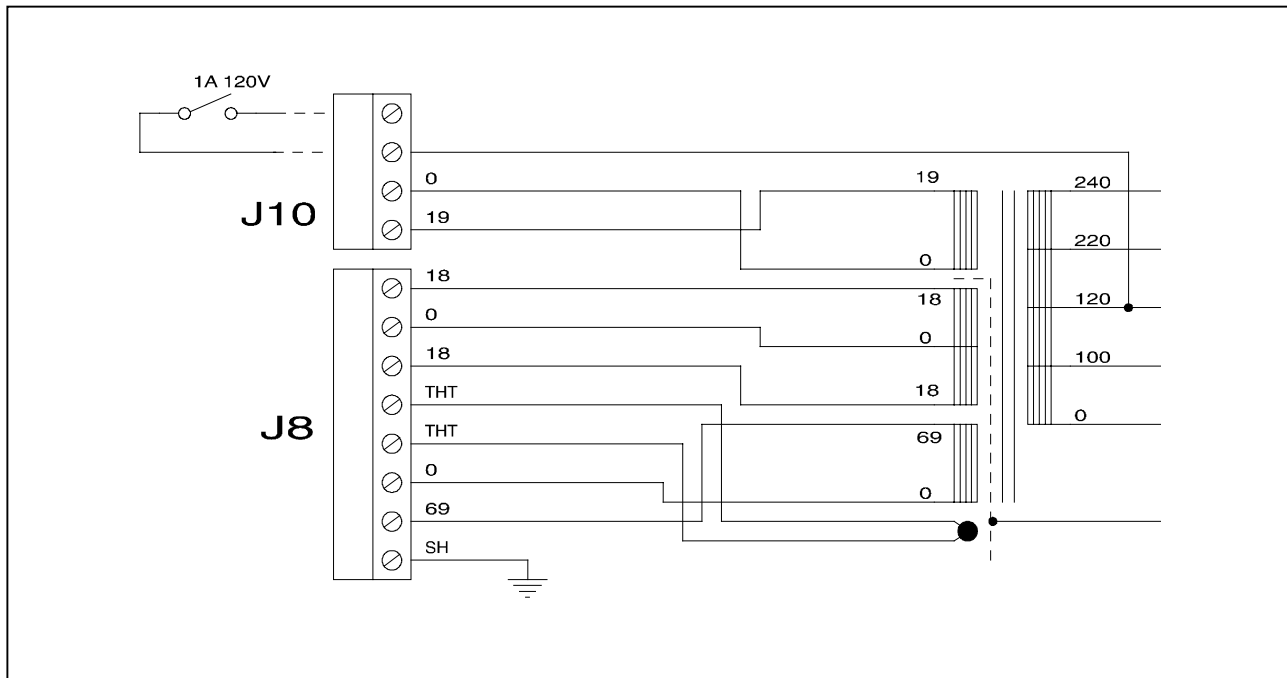
The PCB installed into the customer system must be positioned so that cold air (forced or natural convection) can flow through the PCB components.

POWER INTERCONNECTIONS

Controller to Power Connection

The power supply from the external transformer must be connected to J10 and J8 connectors.

See the following figure for interconnections detail.

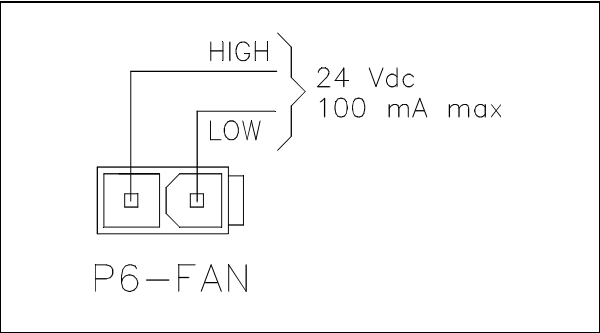


J10 and J8 Connectors Interconnection

Connection P6 - 24 Vdc Connector

This is a dedicated 24 Vdc, 100 mA maximum, output for the optional Turbo-V 70 PCB pump cooling fan.

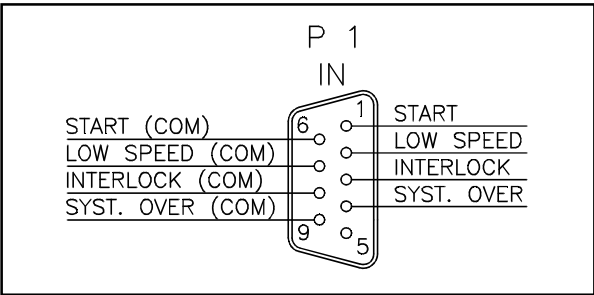
The mating connector and cable are provided assembled with the air cooling kit.



Fan Connector

LOGIC INTERCONNECTIONS

Connection P1 - Logic Input Interconnections



P1 logic input connector

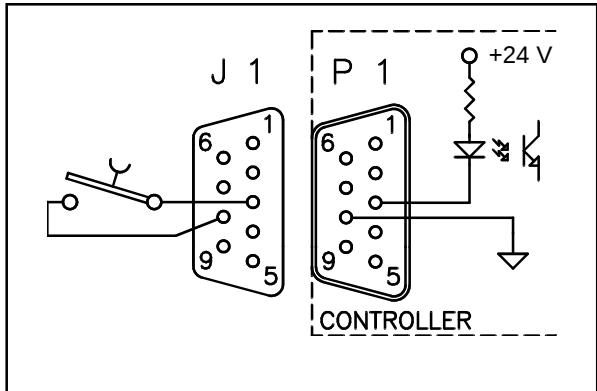
All the logic input to the controller must be connected at J1 mating connector. With the provided J1 mating connector (shipped with pin 3 and pin 8 shorted) make the connections with AWG 24, (0.24 mm²) or smaller wire to the pins indicated in the following figure to obtain the desired capability.

PIN	DESCRIPTION
1-6	Remote START/STOP optically isolated from the internal circuit, requires a permanently closed contact (relay contact, transistor, etc.). When the contact closes, the turbopump starts, and when the contact opens, the turbopump is stopped.
2-7	Remote LOW SPEED optically isolated from the internal circuit, requires a permanently closed contact (relay contact, transistor, etc.). When the contact closes, the turbopump runs at low speed and when the contact opens, the turbopump reverts to high speed mode.
3-8	INTERLOCK optically isolated from the internal circuit, this signal can be used to delay the starting of the turbopump. It requires a permanent closed contact before starting the turbopump.
4-9	SYSTEM OVERRIDE optically isolated from the internal circuit, this signal is used to stop the pump in emergency condition, requires a closed contact. When the contact is closed, the turbopump and the interconnected devices are stopped.

NOTE

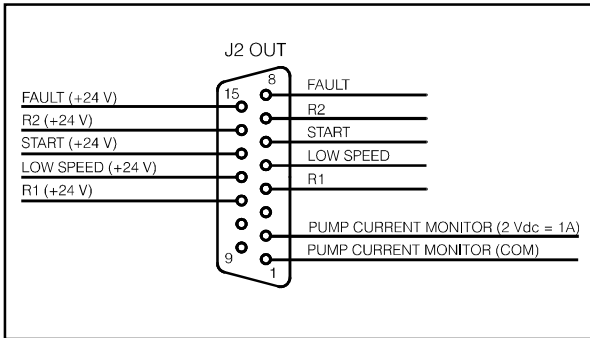
Pin 3-8 must be shorted to allow the Turbo-V 70 PCB pump to start if no interlock contact is connected. If, after starting the pump, the interlock contact opens, it has no effect on the operation and the pump continues to turn.

The following figure shows a typical contact logic input connection and the related simplified circuit of the controller.



Typical logic input connection

Connection J2 - Logic Output Interconnections



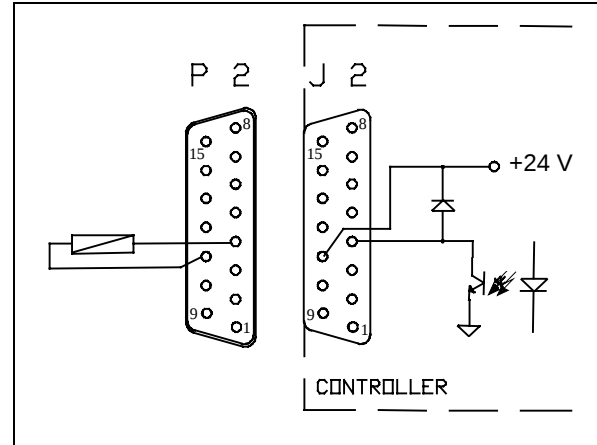
Logic output connector

All the logic output from the controller must be connected at P2 mating connector. With the optional P2 mating connector make the connection with AWG 24 (0.25 mm²) or smaller wire to the pins indicated in the figure to obtain the desired capability. The following table describes the signals available on the connector.

PIN	DESCRIPTION
1-2	Analog output Voltage of DC current drawn by the turbopump (pin 2 positive, pin 1 negative). 2 Vdc = 1 A.
4-11	R1 signal 24 V, 60 mA, optically isolated output (pin 11 positive, pin 4 negative). The output voltage will be present when the rotational speed of the pump is higher than the selected speed threshold. Default value = 67 KRPM
5-12	LOW SPEED signal, 24 V, 60 mA, optically isolated output (pin 12 positive, pin 5 negative). The output voltage will be present when the low speed mode is selected.
6-13	START signal 24 V, 60 mA, optically isolated output (pin 13 positive, pin 6 negative). The output voltage will be present when the remote start is present until NORMAL operation is reached.

PIN	DESCRIPTION
7-14	R2 signal 24 V, 60 mA, optically isolated output (pin 14 positive, pin 7 negative). The output Voltage will be present upon the programmed condition delay YES or delay NO (see the cycle diagram in the following pages). If YES is selected, R2 is off and the output is zero over all run up time, then: a) If running speed > speed threshold R2 = OFF b) If running speed < speed threshold R2 = ON If NO is selected: a) If running speed > speed threshold R2 = OFF b) If running speed < speed threshold R2 = ON
8-15	FAULT signal 24 V, 60 mA, optically isolated output (pin 15 positive pin 8 negative). The output Voltage will be present when a fault condition is detected.

The following figure shows a typical logic output connection (relay coil) but any other device may be connected e.g. a LED, a computer, etc., and the related simplified circuit of the controller.



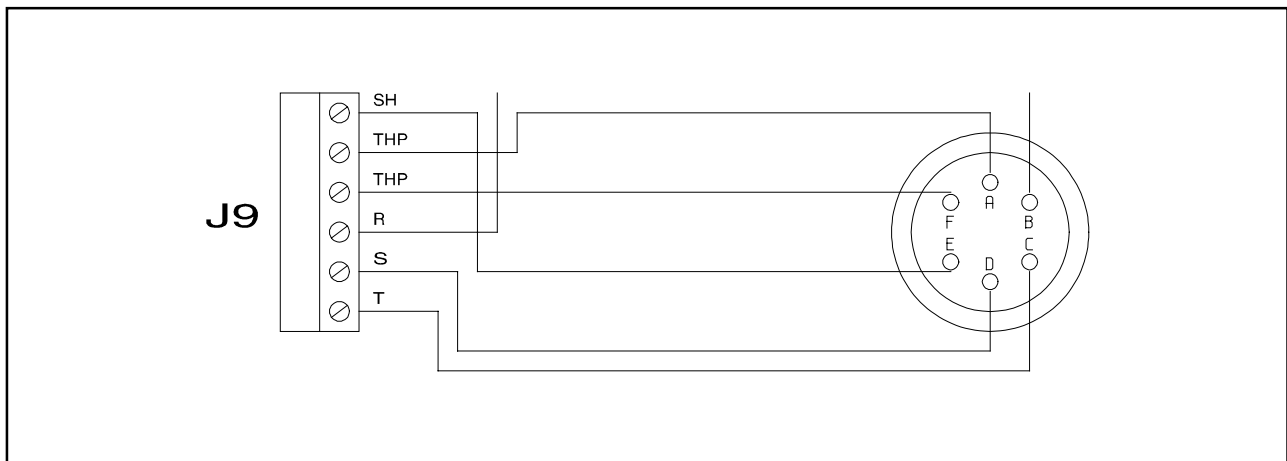
Typical output connection

Controller-to-Pump Connection

To connect the controller to the pump an appropriate interconnection cable must be prepared to connect the J9 terminal board of the controller with the pump connector.

The following figure shows the pump output connector configuration where pins:

- Pins A-F = pump temperature sensor
- Pins B-C-D = 54 Vac 3-phase output to pump motor stator
- Pin E = ground.



Controller-to-pump cable

USE

General

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



WARNING!

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

NOTE

The input signal P1 connector should be left in position including the shipping links if no external connections are made. The forepump and the Turbo-V pump can be switched on at the same time.

NOTE

When the Turbo-V 70 pump is baked by a membrane pump, the Soft Start mode should be deselected.

The controller operates completely automatically after the remote start command is given.

The controller operation can be controlled and monitored by means of an Hand Held terminal connected to the P3 connector.

The commands and the messages shown in the following paragraphs are available only when the Hand Held terminal is connected to the controller.

Startup

- Plug the controller power cable into a suitable power source.
- The display lights, and shows:

R	E	A	D	Y		F	O	R		L	O	C	A	L	
S	O	F	T			S	T	A	R	T					

The controller with the Soft Start mode allows the pump to ramp-up to Normal speed slowly with a minimum ramp-up time of 75 seconds and a maximum of about 45 minutes.

The Soft Start mode is always operative as default mode. If it is necessary to deselect this mode refer to the following paragraph.

If the Soft Start mode is deselected, the ramp-up will be done within 75 seconds and the display changes as follows:

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

NOTE

If the pump is not connected, the display will be as follows:

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

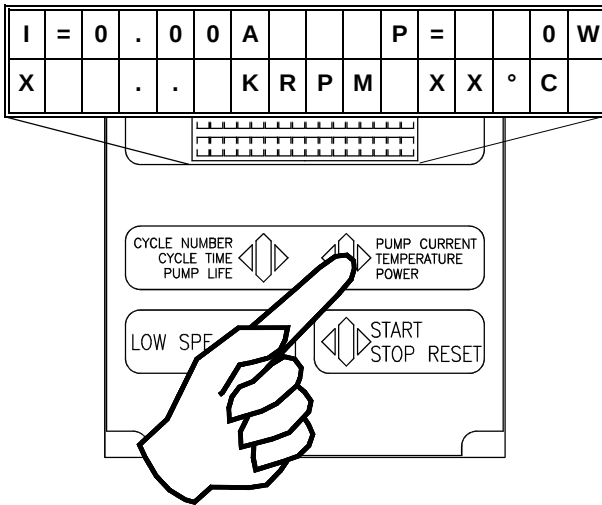
NOTE

After pressing the START pushbutton, if the P1 connector is not in place with the link or the external interlock connections are open, the display will be as shown in the following figure.

Unplug the controller power cable and verify the P1 connection according to the previous Section.

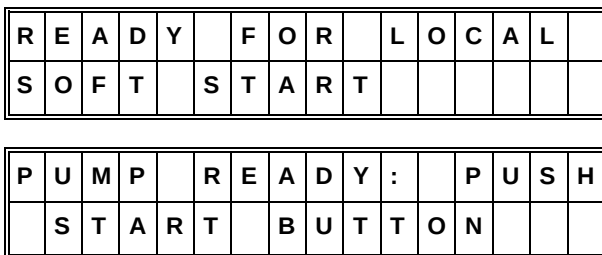
P	U	M	P		W	A	I	T	I	N	G				
I	N	T	E	R	L	O	C	K							

- Press the CURRENT push-button and the display shows:

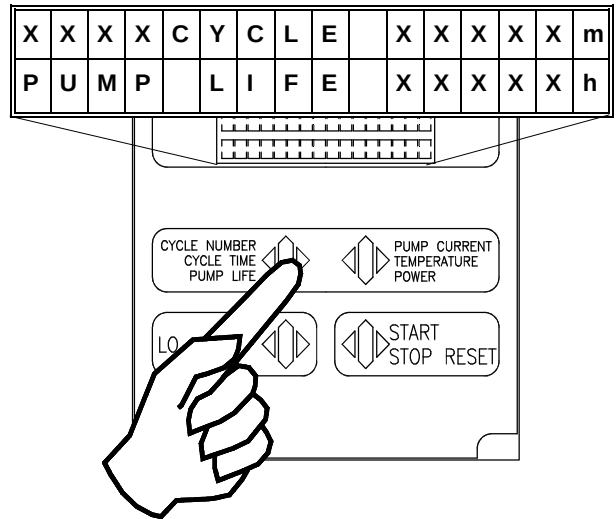


where:

- I** = is the DC current drawn by the pump range (0.00 to 9.99 Ampere)
- P** = is the DC power drawn by the pump (range 0 to 999 Watt)
- KRPM** = is the theoretical rotational speed of the pump as a function of the controller output frequency (range 9 to 75 KRPM)
- °C** = is the temperature of the outer ring of the upper bearing (range 00 to 99 °C)
- X** = during operation a selected set point condition (1 or 2 contrast inverted) appears when the programmed threshold speed value is not reached.
- Press the CYCLE NUMBER once and the display shows:



- Press the the CYCLE NUMBER twice and the display shows:



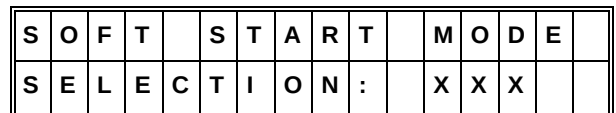
where:

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

FRONT / REMOTE Selection

By pressing CYCLE NUMBER and PUMP CURRENT pushbuttons together for at least 2 seconds, the processor enters in a routine where it is possible to program the controller. In this routine, the CYCLE pushbutton is used for choosing/changing the value or condition; the PUMP CURRENT pushbutton is used to enter and confirm the value.

The display shows:



where: **XXX** = YES or NO.

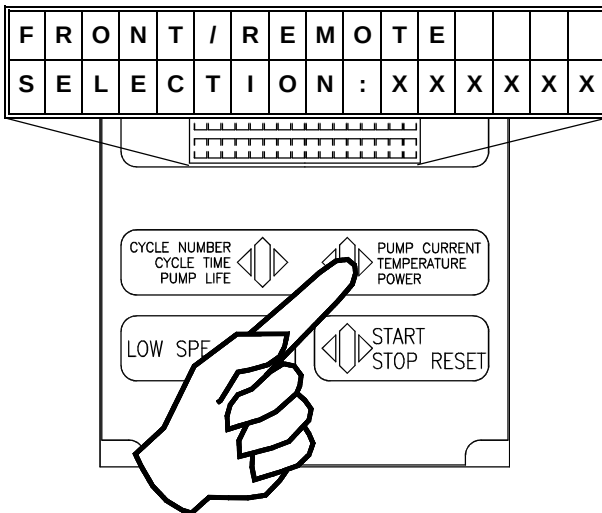
If YES is selected, the Soft Start mode allows the pump to ramp-up the Normal speed within ten steps. When NO is selected, the Soft Start mode is deselected and the ramp-up of the pump will be done within 75 seconds. The controller is factory set to YES.

NOTE

The Soft Start mode may be deselected/selected only when the pump is stopped.

If necessary press CYCLE NUMBER to select YES or NO, then enter the selection by pressing the PUMP CURRENT pushbutton.

The display shows:



where: **XXXXXX** = means the word FRONT or REMOTE depending on the last selection.
The controller is factory-set for FRONT panel operation.

After choosing the desired selection by pressing the CYCLE pushbutton, confirm the selection by pressing the PUMP CURRENT pushbutton.

Monitor Relay Programming

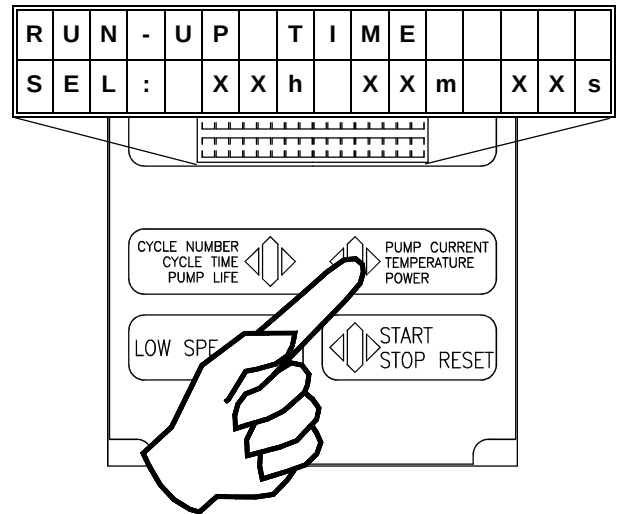
- The display shows:

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

where: **XXKRPM** = is the switch point of relay R1 at the preset turbopump speed, adjustable from 00 to 99 KRPM.
The speed threshold will condition the R1 and R2 operation (see the following cycle diagram) and it is factory-set to 67 KRPM.

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

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



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

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

The run up time is factory-set to:
00h 08m 00s.

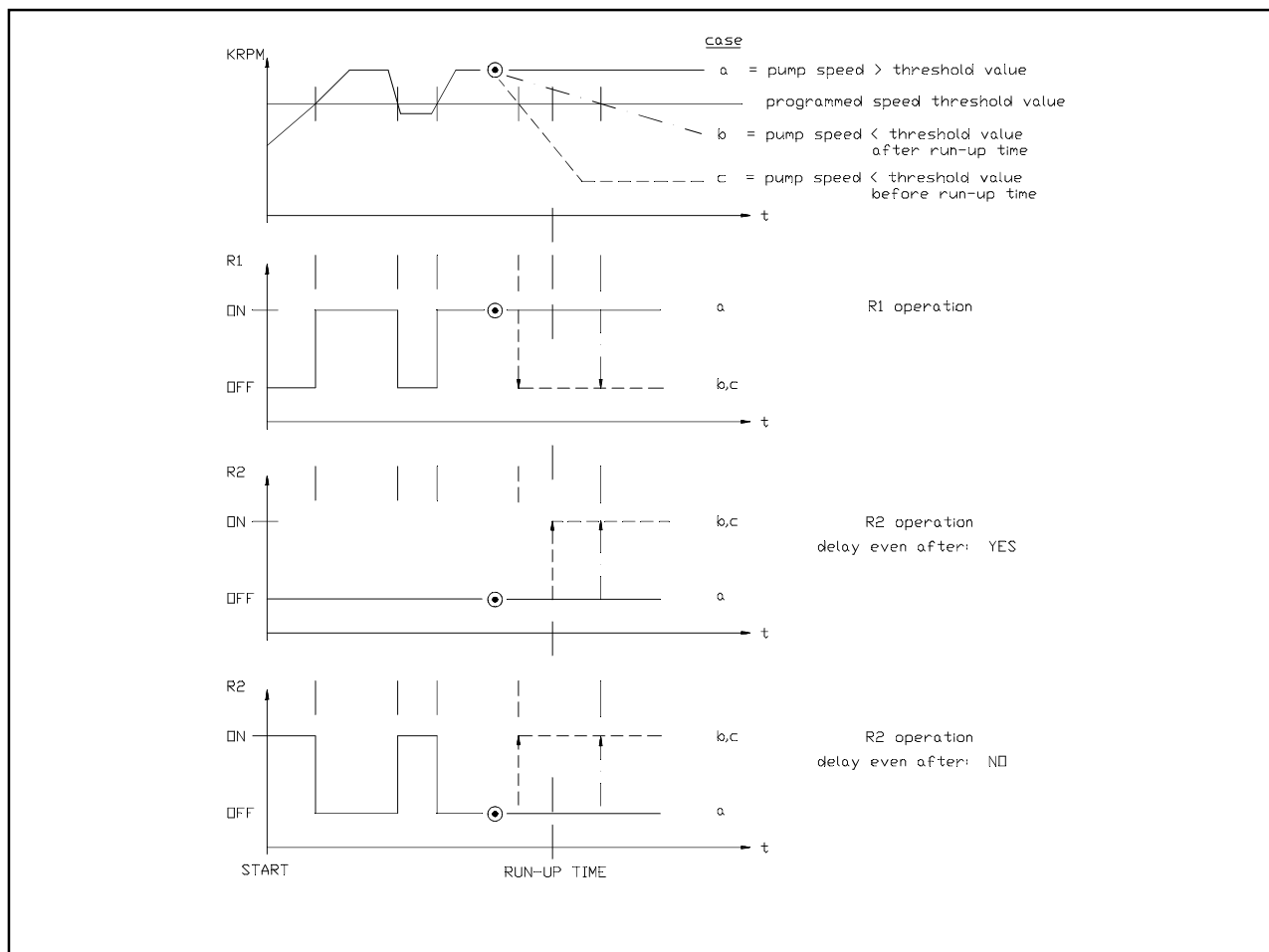
When the last digit is entered, the display will be as shown in the following figure.

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

where:

XXX = YES or NO.

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



Cycle diagram

Reset Command

- The display shows:

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

where:

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

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

R	E	A	D	Y		F	O	R		L	O	C	A	L	
S	O	F	T			S	T	A	R	T					

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

The controller is factory-set to NO.

NOTE

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

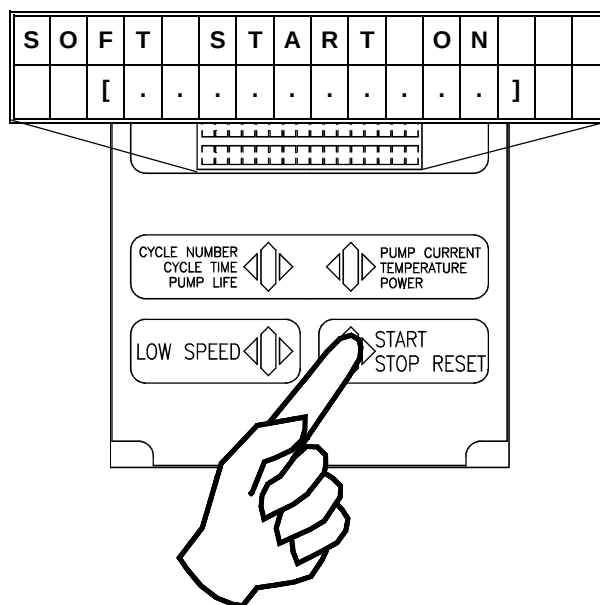
Starting the Pump

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

NOTE

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

- Press the START push-button (or use the remote start signal), the display shows:



Where the sign minus (-) become a square (ž) when the pump finish the ramp-up step. The active step is indicated by a flashing square (€ž).

- As the ten steps are fully covered, the pump will reach the Normal operation. If during the Soft Start mode the current drawn by the pump exceed 1.4 A the speed of the pump is decreased to maintain the maximum power allowable (1.4 A).

If within each step of the Soft Start mode the rotational speed of the pump do not rech the planned value within 15 minutes the display shows:

F	A	U	L	T	:										
O	V	E	R	T	I	M	E	:	S	X					

where X = the step number from 0 to 9 indicating the step number not passed.

When this message is displayed the pump is stopped.

Reset the controller by pressing twice the STOP push-button to start the pump.

- If the Soft Start mode has been deselected the display will change and shows:

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

where:

1 2 = contrast inverted identifies the set point condition:

- **1** is displayed when relay R1 is de-energized and the related output is zero voltage.
- **2** is displayed when relay R2 is energized.

XX KRPM = indicates the actual theoretical rotational speed of the pump as a function of the controller output frequency (range 9 to 75 KRPM).

- After START command, frequency output will be at the maximum level, then the frequency will decrease to a value proportional to the pump rotational speed (about 9 KRPM if the pump is completely stopped).

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

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

where: **XX** =indicates the rotational speed (75 KRPM for high speed, or 50 KRPM for low speed).

During acceleration of the pump or during any operating condition, it is always possible to select the other parameters to be displayed (PUMP CURRENT or CYCLE NUMBER push-buttons). If this is the case when the pump reaches the normal speed, the display reverts to the previous figure.

Operating the Pump

After the starting period, if the system has a vacuum leak or the pressure in the pump/chamber is high (from 1 mbar to atmosphere), the pump continues to operate indefinitely.

If the gas load at the turbopump inlet flange continues to stay high, the power drawn by the turbopump increases up to the maximum value. Then the Turbo-V pump is slowed down in proportion to the gas load at least until it reaches about 9 KRPM.

This will occur either in NORMAL operation or with the LOW SPEED selected.

As soon as the gas load decreases, the pump will automatically accelerate to reach normal operation.

The pump can be stopped at any rotational speed and can be restarted at any rotational speed from either the front panel buttons or the remote connections.

The controller automatically synchronizes the output to the rotational speed of the pump and then accelerates linearly up to the nominal speed or within steps if the Soft Start has been selected.

Low Speed Operation

NOTE

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

This feature is provided for operating the pump at moderate high pressure with high gas throughput. To operate in this low speed mode, engage the LOW SPEED push-button once if the display shows:

R	E	A	D	Y		F	O	R		L	O	C	A	L	
S	O	F	T			S	T	A	R	T					

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

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

or twice if the display shows other parameters, either before starting the pump or after it is operating.

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

R	E	A	D	Y		F	O	R		L	O	C	A	L	
S	O	F	T			S	T	A	R	T				L	S

The pump reaches the Normal high speed, then decrease the speed to the low speed value and the display shows:

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

If the Soft Start has been deselected the display shows:

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

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

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

S	O	F	T		S	T	A	R	T		O	N			
		[	-	-	-	-	-	-	-	-	-	-	-	L	S

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

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

With normal LOW SPEED operation, the pump will run at about 2/3 of its nominal speed and achieves a base pressure somewhat higher than the standard specifications. If the gas load becomes higher, the controller output frequency and voltage start to decrease automatically, and the Turbo-V pump is slowed down in proportion to the gas load until it reaches about 9 KRPM.

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

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

while approaching the low speed value.

When the low speed mode is deselected, the pump starts to accelerate to its rotational speed.

The display shows:

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

Pump Shutdown

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

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

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

Power Failure

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

The display shows:

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

until normal operation achieved.

Remote Control Mode Operation

If remote signals are used to operate the controller, it must be programmed for remote operation (see paragraph "FRONT/REMOTE/232 Selection") and when ready to start, the display shows as in the following figure.

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

If the Soft Start has been deselected the display shows:

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

With or without Soft Start mode selected the START/STOP and LOW SPEED pushbuttons are inoperative, while the CYCLE NUMBER and PUMP CURRENT pushbuttons are always active.

ERROR MESSAGES

For a certain type of failure, the controller will self-diagnose the error and the following messages will be displayed if the hand-held terminal is connected.

NOTE

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

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

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

NOTE

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

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

Disconnect connector P1 and check the link or the external interlock, then install the connector to start the pump.

NOTE

If within each step of the soft start mode the rotational speed of the pump do not reach the planned value within 15 minutes the display will be as shown in the following figure.

F	A	U	L	T	:										
O	V	E	R	T	I	M	E	:	S	X					

Verify that systems has no leaks than press STOP RESET pushbutton twice to start the pump.

NOTE

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

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

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

NOTE

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

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

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

NOTE

If in normal operation (after the starting phase) the current drawn by the pump is higher than programmed (1.5 A), the pump and the inter-connected devices are switched off and the display will be as shown in the following figure.

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

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

NOTE

After the starting phase if the output connection is shorted (output current higher than 2.2 A), the display will be as shown in the following figure.

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

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

NOTE

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

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

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

The following message is displayed if the fuse of the transformer secondary blows:

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

Since no operation can be carried out, contact VARIAN.

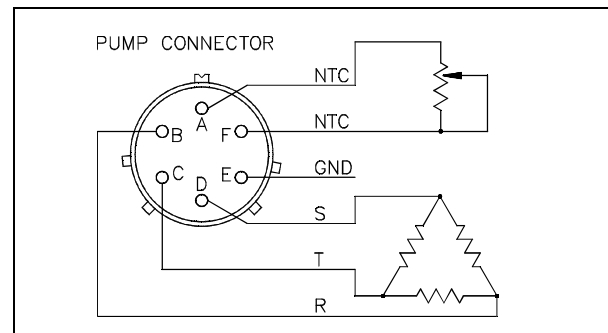
CONTROLLER TEST

a) Equipment required

- Digital voltmeter (DVM) true RMS.
- Dummy load: 3 x 48Ω, 50 W each or 3 x 78Ω, 50 W each.
- Potentiometer 50 KΩ, 1/4 W minimum.

b) Test set up

- Remove the power cable.
- Disconnect the Turbo-V controller.
- Remove the cover from the Turbo-V controller.
- Set potentiometer to 30K Ω and connect it as directed in the following figure.
- Check the line voltage selector and connect the power cable to the appropriate socket.



Dummy load connections

Power Supply Test

a) DC voltage test

Check the DC voltages referring to test points indicated in the following figure. The meter should read:

- + 5Vdc $\pm 5\%$
- ± 12 Vdc $\pm 5\%$
- Ground reference = case of Q3

On the hand held terminal, push the START pushbutton and check:

- 54 Vdc $\pm$ 10% between TP3(-) and TP5(+)
- 24 Vdc $\pm$ 15% on the fan connector.

b) AC three-phase output voltage test

On the pump connector connect the DVM in turn between: pins B and C, B and D, C and D.

The meter should read 44 Vac $\pm 15\%$; a different value of 0.4 Vac is tolerable between phase and phase.

c) Front panel check

On the hand held terminal, press the CURRENT pushbutton and check:

- Current 0.00 A
- Power 0.00 W
- Speed 75 KRPM
- Temperature 25 °C ±2 °C

Press STOP and remove the power cable.

Test with Dummy Load

- Connect the 48Ω or the 78Ω dummy loads to the pump connector pins B, C, D, as shown in the previous figure.
- Disconnect the potentiometer, set it to 10 KΩ, and then reconnect it.
- Connect the power cable.
- Push the START and CURRENT pushbuttons and check the front panel display as shown in the following table.

	During start-up without Soft Start mode		After start-up	
	With 48Ω dummy load	With 78Ω dummy load	With 48Ω dummy load	With 78Ω dummy load
Current ±10%	1.4 A	0.6 A	1.3 A	0.45 A
Power ±10%	80 W	40 W	70 W	24 W
Speed ±4 KRPM	34	75	9	75
Temperature ±2 °C	52 °C	52 °C	52 °C	52 °C

- Check the 3-phase ac output voltage.
After start up it should be:
42 Vac with 78Ω dummy load and
42 Vac with 48Ω dummy load.

Press the STOP pushbutton and remove the power cable.

Pump over-Temperature Test

- Disconnect the potentiometer, set it to 5KΩ, and then reconnect it.
- Disconnect the dummy loads.
- Connect the dummy loads.
- Push the START pushbutton.
By pressing the CURRENT pushbutton, the temperature reading should be 71 °C ±2 °C. All the other values should be zero.
- Check the 3-phase ac output voltage.
It should be zero.
- Press STOP and remove the power cable.

Functional Test

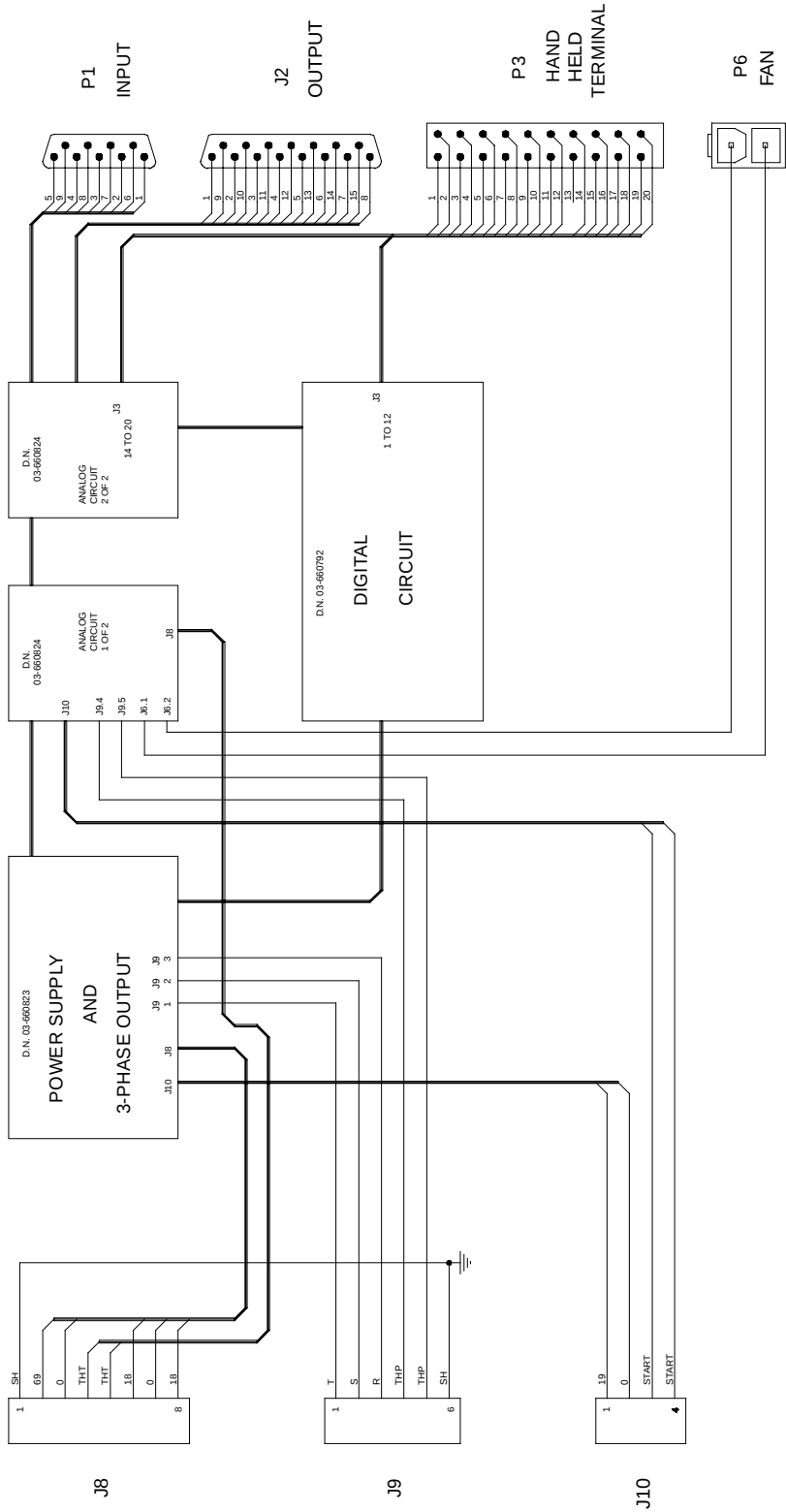
Perform the functional test with the turbopump, taking care to check the ramp sequence and start up time.

ACCESSORIES AND SPARE PARTS

DESCRIPTION	PART NUMBER
P2 output mating connector	969-9852
J1 input mating connector	969-9853

OPTIONS

DESCRIPTION	PART NUMBER
Power transformer	969-9862



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DIMENSION		ANGLE ±		Ra (µm)	
MACHINING		CONCENTRICITY		PERPENDICULARITY	
WELD CONSTR		PARALLELISM		CHAMFER	
OTHER					
C22/94		NUMBER		POSITION	
C.M.		DRAWN		CHECKED	
06/94		DATE		REVISION	
D		SIZE		DRAWING No.	
A3		03.660825		D	
07/06/94		DATE		SCALE	
C.M.		DRAWN		CHECKED	
JOB ORDER		DATE		SCALE	
C.M.		07/06/94		/	
TV70 PCB MAINS WIRING DIAGRAM		H			



Request for Return



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

North and South America

Varian Vacuum Technologies
121 Hartwell Ave
Lexington, MA 02421
Phone : +1 781 8617200
Fax: +1 781 8609252

Europe and Middle East

Varian SpA
Via Flli Varian 54
10040 Leini (TO) – ITALY
Phone: +39 011 9979111
Fax: +39 011 9979330

Asia and ROW

Varian Vacuum Technologies
Local Office

CUSTOMER INFORMATION

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

FAILURE REPORT

TURBO PUMPS and TURBOCONTROLLERS

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

ION PUMPS/CONTROLLERS

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

VALVES/COMPONENTS

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

LEAK DETECTORS

☐ Cannot calibrate ☐ Vacuum system unstable ☐ Failed to start	☐ No zero/high background ☐ Cannot reach test mode ☐ Other
Customer application:	

INSTRUMENTS

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

PRIMARY PUMPS

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

DIFFUSION PUMPS

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

FAILURE DESCRIPTION

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

NOTA: Su richiesta questo documento è disponibile anche in Tedesco, Italiano e Francese.

REMARQUE : Sur demande ce document est également disponible en allemand, italien et français.

HINWEIS: Auf Anfrage ist diese Unterlage auch auf Deutsch, Italienisch und Französisch erhältlich.

Sales and Service Offices

Argentina

Varian Argentina Ltd.

Sucursal Argentina
Av. Ricardo Balbin 2316
1428 Buenos Aires
Argentina
Tel: (54) 1 783 5306
Fax: (54) 1 786 5172

Australia

Varian Australia Pty Ltd.

679-701 Springvale Road
Mulgrave, Victoria ZZ 3170
Australia
Tel: (61) 395607133
Fax: (61) 395607950

Benelux

Varian Vacuum Technologies

Rijksstraatweg 269 H,
3956 CP Leersum
The Netherlands
Tel: (31) 343 469910
Fax: (31) 343 469961

Brazil

Varian Industria e Comercio Ltda.

Avenida Dr. Cardoso de Mello 1644
Vila Olimpia
Sao Paulo 04548 005
Brazil
Tel: (55) 11 3845 0444
Fax: (55) 11 3845 9350

Canada

Central coordination through:

Varian Vacuum Technologies
121 Hartwell Avenue
Lexington, MA 02421
USA
Tel: (781) 861 7200
Fax: (781) 860 5437
Toll Free: (800) 882 7426

China

Varian Technologies - Beijing

Room 1201, Jinyu Mansion
No. 129A, Xuanwumen Xidajie
Xicheng District
Beijing 1000031 P.R. China
Tel: (86) 10 6608 1530
Fax: (86) 10 6608 1534

France and Wallonie

Varian s.a.

7 avenue des Tropiques
Z.A. de Courtaboeuf – B.P. 12
Les Ulis cedex (Orsay) 91941
France
Tel: (33) 1 69 86 38 13
Fax: (33) 1 69 28 23 08

Germany and Austria

Varian Deutschland GmbH

Alsfelder Strasse 6
Postfach 11 14 35
64289 Darmstadt
Germany
Tel: (49) 6151 703 353
Fax: (49) 6151 703 302

India

Varian India PVT LTD

101-108, 1st Floor
1010 Competent House
7, Nangal Raya Business Centre
New Delhi 110 046
India
Tel: (91) 11 5548444
Fax: (91) 11 5548445

Italy

Varian Vacuum Technologies

Via F.lli Varian, 54
10040 Leini, (Torino)
Italy
Tel: (39) 011 997 9111
Fax: (39) 011 997 9350

Japan

Varian Vacuum Technologies

Sumitomo Shibaura Building, 8th Floor
4-16-36 Shibaura
Minato-ku, Tokyo 108
Japan
Tel: (81) 3 5232 1253
Fax: (81) 3 5232 1263

Korea

Varian Technologies Korea, Ltd.

Shinsa 2nd Bldg. 2F
966-5 Daechi-dong
Kangnam-gu, Seoul
Korea 135-280
Tel: (82) 2 3452 2452
Fax: (82) 2 3452 2451

Mexico

Varian S.A.

Concepcion Beistegui No 109
Col Del Valle
C.P. 03100
Mexico, D.F.
Tel: (52) 5 523 9465
Fax: (52) 5 523 9472

Taiwan

Varian Technologies Asia Ltd.

18F-13 No.79, Hsin Tai Wu Road
Sec. 1, Hsi Chih
Taipei Hsien
Taiwan, R.O.C.
Tel: (886) 2 2698 9555
Fax: (886) 2 2698 9678

UK and Ireland

Varian Ltd.

28 Manor Road
Walton-On-Thames
Surrey KT 12 2QF
England
Tel: (44) 1932 89 8000
Fax: (44) 1932 22 8769

United States

Varian Vacuum Technologies

121 Hartwell Avenue
Lexington, MA 02421
USA
Tel: (781) 861 7200
Fax: (781) 860 5437
Toll Free: (800) 882 7426

Other Countries

Varian Vacuum Technologies

Via F.lli Varian, 54
10040 Leini, (Torino)
Italy
Tel: (39) 011 997 9111
Fax: (39) 011 997 9350

Internet Users:

Customer Service & Technical Support:

vtt.customer.service@varianinc.com

Worldwide Web Site:

www.varianinc.com/vacuum

Order On-line:

www.evarian.com

Representatives in most countries



VARIAN