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PolVac Corp.
Service of Vacuum Pump Systems
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www.polvac.com

Turbo-V70 Switching PCB controller

Model 969-9509

MANUALE ISTRUZIONI

BEDIENUNGSHANDBUCH

NOTICE DE MODE D'EMPLOI

MANUAL DE INSTRUCCIONES

MANUAL DE ISTRUÇÕES

BEDRIJFSHANDLEIDING

ISTRUKSTIONSBOG

BRUKSANVISNING

INSTRUKSJON MANUAL

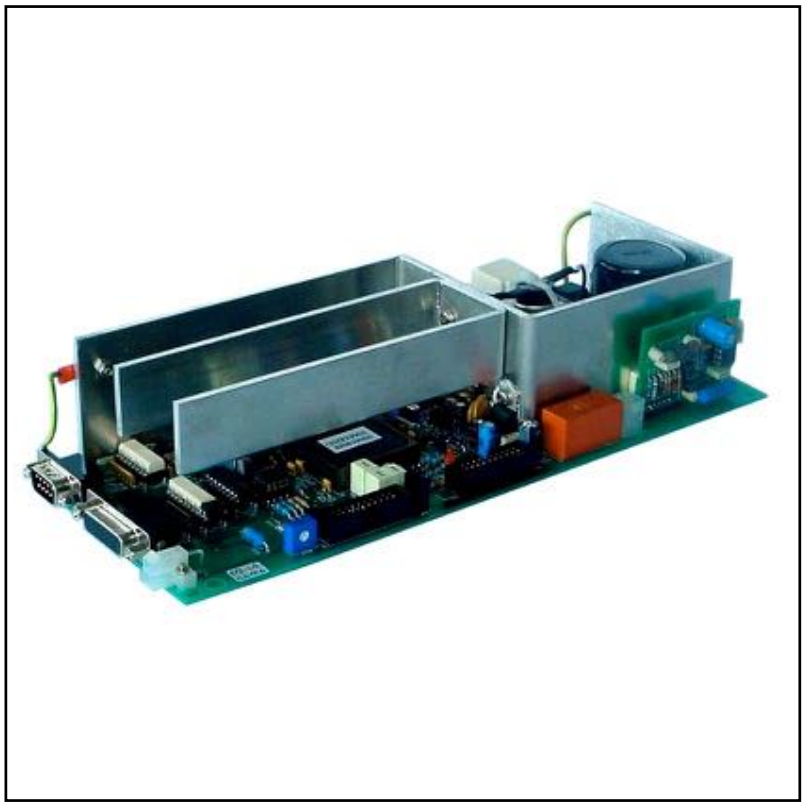
OHJEKÄSIKIRJA

ΟΔΗΓΙΕΣ ΧΡΗΣΕΩΣ

INSTRUCTION MANUAL

87-900-883-01 (C)
APRIL 2002

Turbo-V 70 Switching PCB Controller



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

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

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

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

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

Sincerely.

Sergio PIRAS

Vice President and General Manager
VARIAN Vacuum Technologies

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

CUSTOMER REQUEST FOR CORRECTIVE / PREVENTIVE / IMPROVEMENT ACTION

TO : VARIAN VACUUM TECHNOLOGIES TORINO - QUALITY ASSURANCE

FAX N° : XXXX - 011 - 9979350

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

E-MAIL : marco.marzio@varianinc.com

NAME	COMPANY	FUNCTION

ADDRESS :

TEL. N° : FAX N° :

E-MAIL :

PROBLEM / SUGGESTION :

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

DATE

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

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

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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-V70 Switching 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-V70.
Il controller pilota le pompe della serie Turbo-V70 (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 con una tensione compresa tra 90 e 265 Vac con una frequenza di 50/60 Hz. Un apposito circuito interno del controller provvede a verificare la tensione di ingresso e a trasformarla nella corretta tensione interna necessaria per alimentare il controller stesso. 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 Informations".

Questo manuale utilizza le seguenti convenzioni:

PERICOLO!

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

ATTENZIONE!

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

NOTA

Le note contengono informazioni importanti estrapolate dal testo.

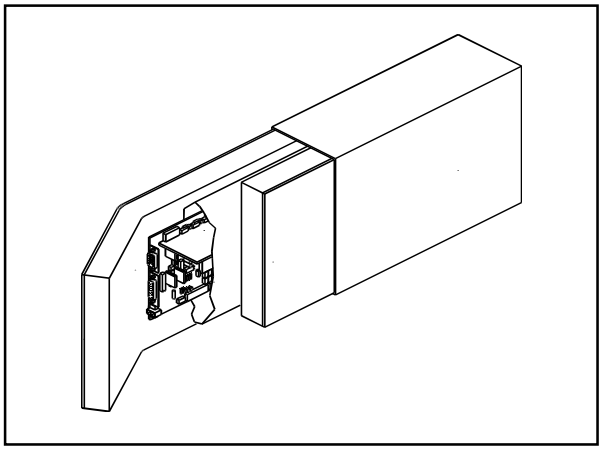
IMMAGAZZINAMENTO

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)

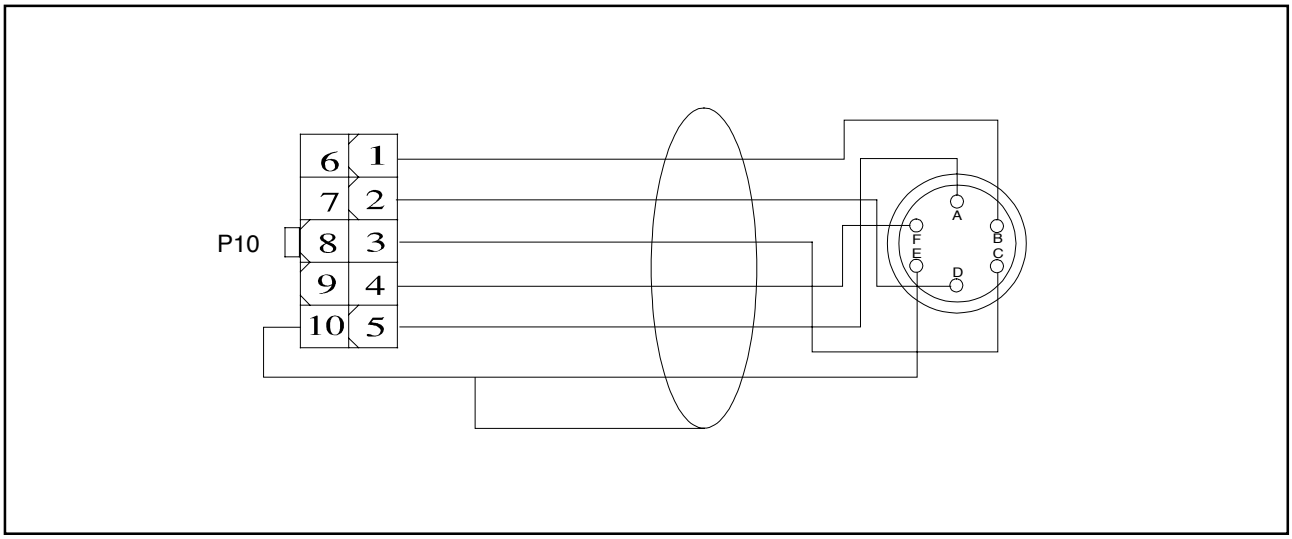
PREPARAZIONE PER L'INSTALLAZIONE

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.

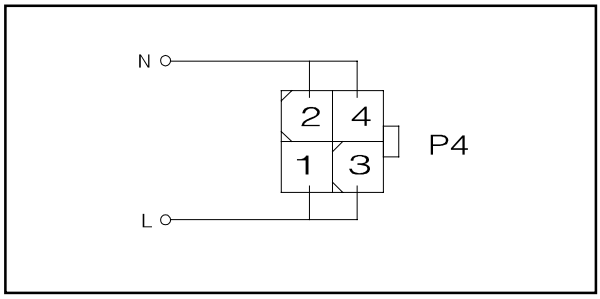


Imballo del controller

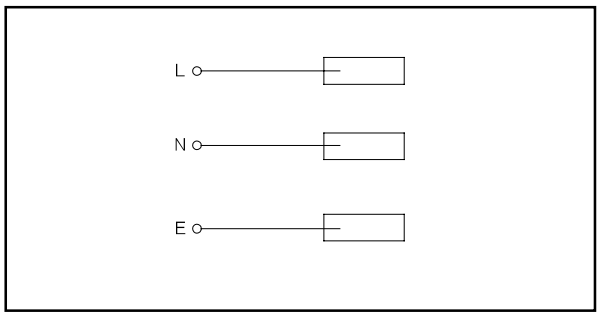
Durante l'operazione di disimballaggio, prestare particolare attenzione a non lasciar cadere il controller e a non sottoporlo ad urti.
Non disperdere l'imballo nell'ambiente. Il materiale è completamente riciclabile e risponde alla direttiva CEE 85/399 per la tutela dell'ambiente.
Prima di installare 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, tra il controller e la pompa primaria, e tra il controller e la rete di alimentazione.
Per ulteriori dettagli sulle suddette interconnessioni vedere l'appendice "Technical Informations".



Cavo di Interconnessione tra il Controller e la Pompa



Interconnessioni tra Controller e Pompa Primaria



Interconnessioni tra Alimentazione e Controller

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.

PERICOLO!

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 Informations". 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.

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.

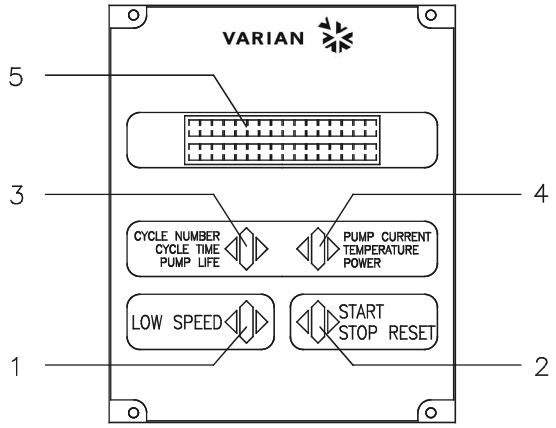
MANUTENZIONE

I controller della serie Turbo-V 70 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.



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

Pannello frontale dell'Hand Held Terminal

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 collegamento tra il pin 3 ed il pin 8 del connettore J1, o chiudere il segnale di interlock esterno.
FAULT: PUMP OVERTEMP.	La temperatura del cuscinetto superiore della pompa ha superato i 60 °C.	Attendere che la temperatura ritorni al di sotto della soglia. Premere due volte il pulsante START per ravviare 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.	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 6 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.	Scollegare 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.

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 Switching 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 erforderlichen Schaltungen.
Der Controller steuert die Pumpen der Serie Turbo-V70 (durch einen 10-Schritte-Prozeß) in der Startphase, indem er die Spannung und die Stromstärke im Verhältnis zur Pumpengeschwindigkeit kontrolliert.
Mittels Hilfsverbinder sind die Fernsteuerungen für Pumpenstart- und stopp, die Signale für die Anzeige des Pumpenzustands, die Start- und Stoppsteuerungen der Vorvakuumpumpen, sowie die Sperrsignale (für Druckschalter, Wasserstrom-Kontrollschalter, etc.) verfügbar.
Der Controller muß mit einer Versorgungsspannung zwischen 90 und 265 V ac bei einer Frequenz von 50/60 Hz gespeist werden. Die Ermittlung der Versorgungsspannung und die Umwandlung auf den für den Controller erforderlichen Wert findet über einen im Controller installierten spezifischen Schaltkreis statt.
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.

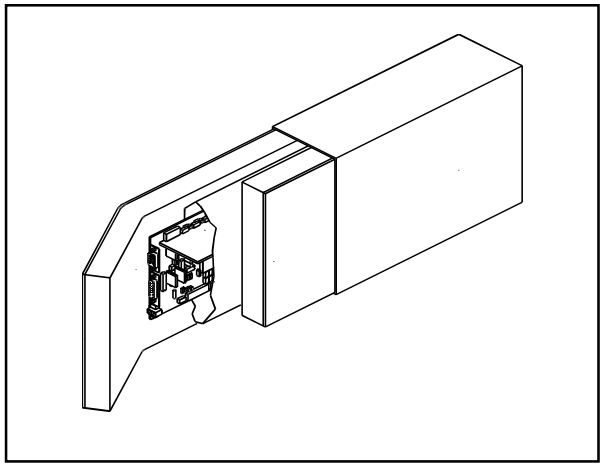
LAGERUNG

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)

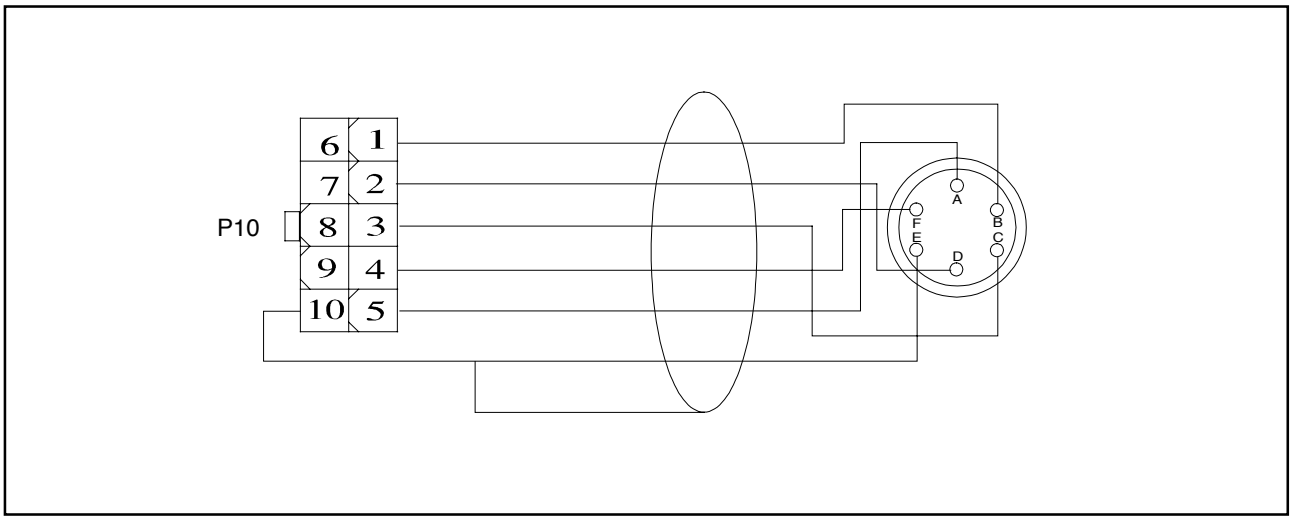
VOR DER INSTALLATION

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

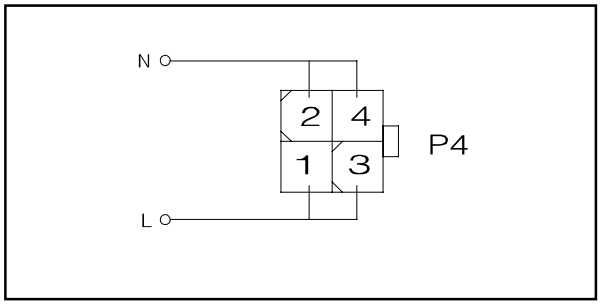


Verpackung des Controllers

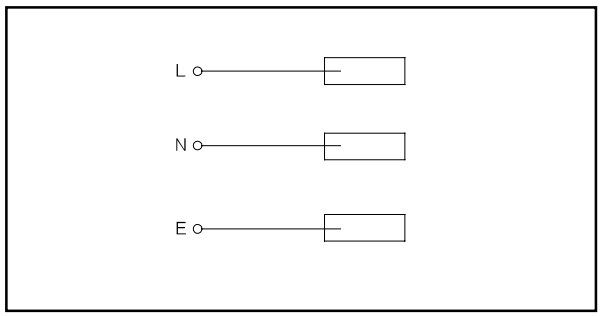
Der Controller sollte vorsichtig ausgepackt werden, damit er nicht fällt oder Stößen ausgesetzt wird.
Das Verpackungsmaterial muß korrekt entsorgt werden. Es ist vollständig recyclebar und entspricht der EG-Richtlinie 85/399 für Umweltschutz.
Vor der Installation des Controllers müssen einigeVerbundkabel 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 Informations aufgeführt.



Anschluß Controller - Pumpe



Anschluß Controller - Primärpumpe



Anschluß Versorgungsspannung - Controller

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.

GEFAHR!

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 Kühlungsluft 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 Umgebungs-bedingungen 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 Betriebs-anleitung 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.

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.

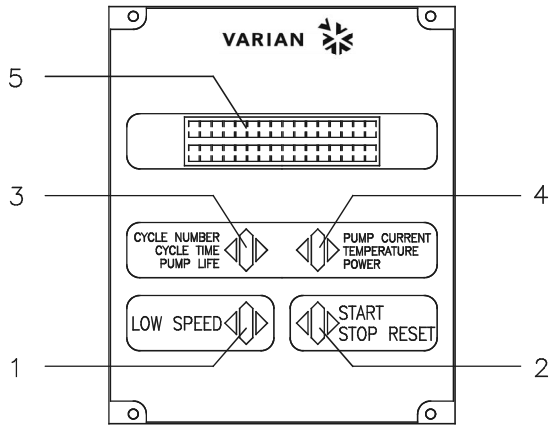
WARTUNG

Die Controller der Serie Turbo-V 70 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.



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 Betriebsparamter programmiert werden können.
5. Alphanumerisches Flüssigkristall-Display: Punkt-matrix, 2 Zeilen mit 16 Stellen.

Frontpaneel des “Hand Held Terminals”

FEHLERMELDUNGEN

In einigen Störungsfällen zeigt das Selbstdiagnosessystem des Controllers die in der nachstehenden 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 Kurzschlußunter-brechung 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: PUMP OVERTEMP.	Die Temperatur des oberen Lagers bzw. der Pumpe hat 60 °C über-schritten.	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 vorge-sehene.	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 (Ausgangsstrom größer als 6 A).	Die Verbindung zwischen Pumpe und Controller prüfen. Die Pumpe durch zweimalige Betätigung der START-Taste neu-starten.
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.

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 Switching 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. Le contrôleur pilote les pompes de la série Turbo-V 70 (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-vide ainsi que de signaux de blocage (pour interrupteurs à pression, interrupteurs de contrôle du flux de l'eau, etc.). Le contrôleur doit être alimenté avec une tension comprise entre 90 et 265 Vac à une fréquence de 50 à 60 Hz. Un circuit interne spécial du contrôleur procède à la vérification de la tension d'entée et à sa transformayion dans la tension interne correcte nécessaire à l'alimentation du contrôleur lui-même. 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 Informations".

Cette notice utilise les signes conventionnels suivants:

DANGER!

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

ATTENTION

Les message d'attention 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.

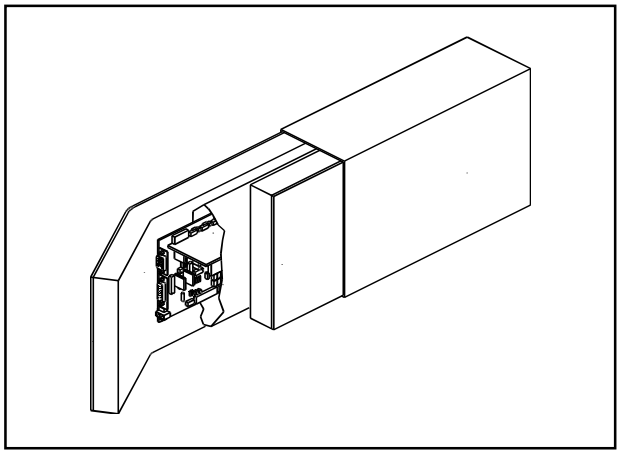
EMMAGASINAGE

Pendant le transport et l'emmagasinage 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).

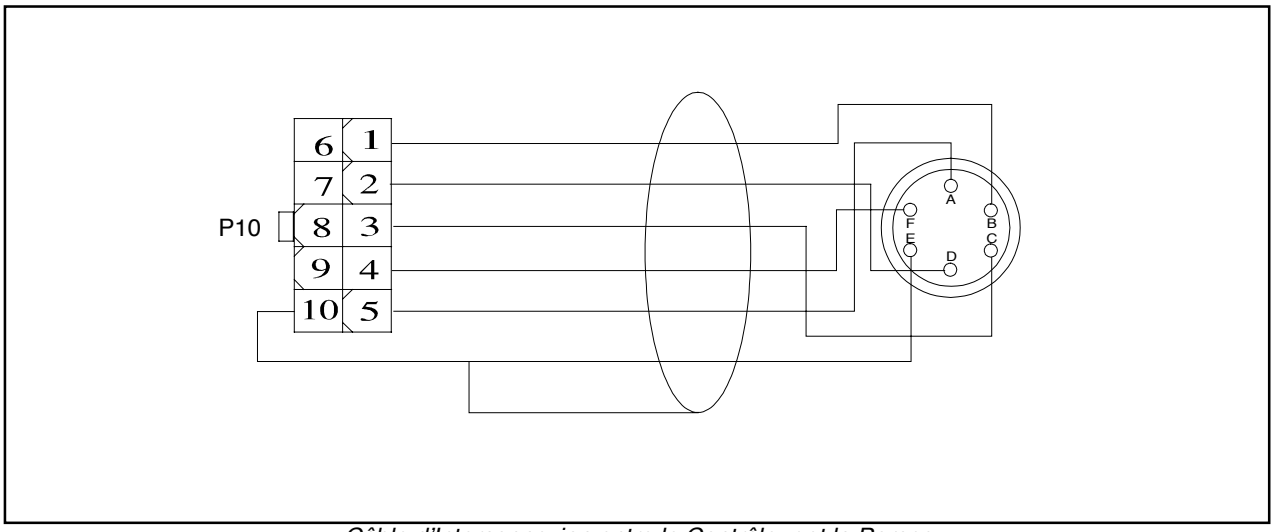
PREPARATION POUR L'INSTALLATION

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.

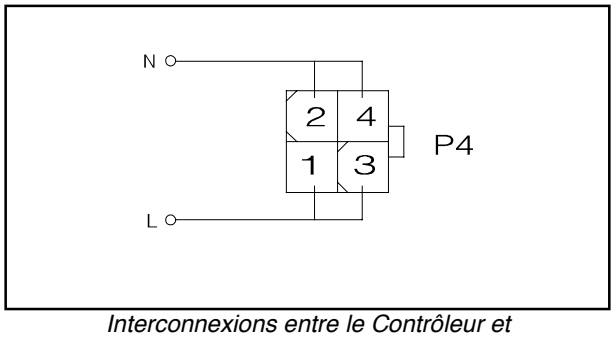


Enballage du contrôleur

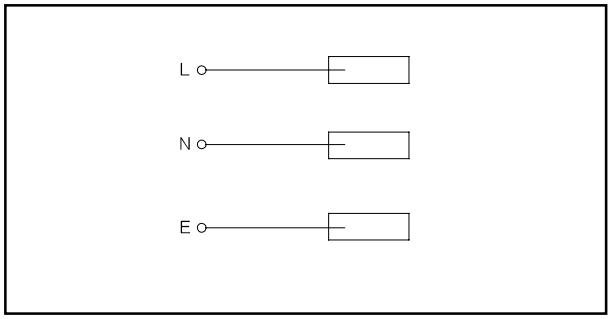
Pendant l'opération d'ouverture de l'emballage, veiller tout particulièrement à ne pas laisser tomber le contrôleur et à ne lui faire subir aucun choc.
Ne pas jeter l'emballage dans la nature. Le matériel est entièrement recyclable et il est conforme aux directives CEE 85/399 en matière de protection 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 schémasqui 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 Informations".



Câble d'Interconnexion entre le Contrôleur et la Pompe



Interconnexions entre le Contrôleur et la Pompe Primaire



Interconnexions entre l'Alimentation et le Contrôleur

INSTALLATION

DANGER!

Les tensions présentes entre le contrôleur et le transformateur correspondant et entre le transformateur et 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.

DANGER!

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 Informations".
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.

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'otpion "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.

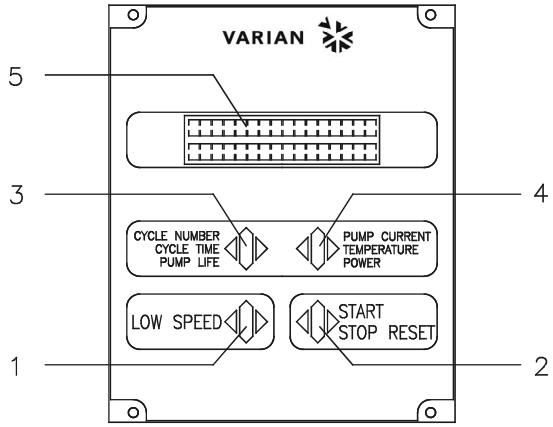
ENTRETIEN

Les contrôleurs de la série Turbo-V 70 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 contrôler régénéré à la place du contrôleur détraqué.

DANGER!

Avant d'effectuer toute opération sur le contrôleur, débrancher le câble d'alimentation.

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



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

Tableau avant du "Hand Held Terminal

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: PUMP OVERTEMP.	La température du palier supérieur ou de la pompe 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.	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 6 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.

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 Switching PCB es un convertidor de frecuencia, controlado por un microprocesador, realizado con componentes en estado sólido y con capacidad de autodiagnosis y autoprotección.
Éste incorpora todos los circuitos necesarios para el funcionamiento automático de la serie Turbo-V 70.
El controler pilota las bombas de la serie Turbo-V 70 (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 alimentarse con una tensión comprendida entre 90 y 265 Vac con una frecuencia de 50/60 Hz. Un circuito específico interior del controler se encarga de comprobar la tensión interior necesaria para alimentar 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.

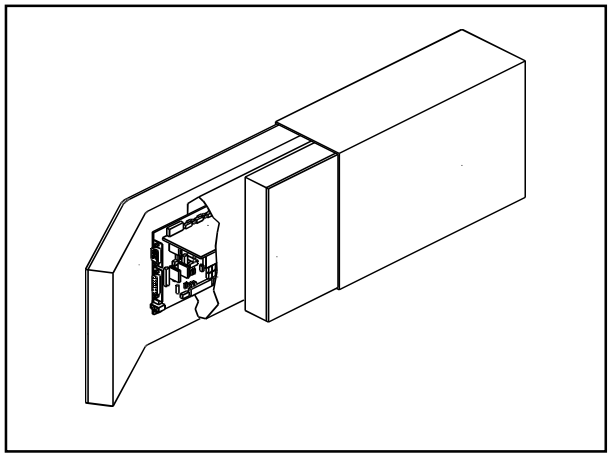
ALMACENAMIENTO

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

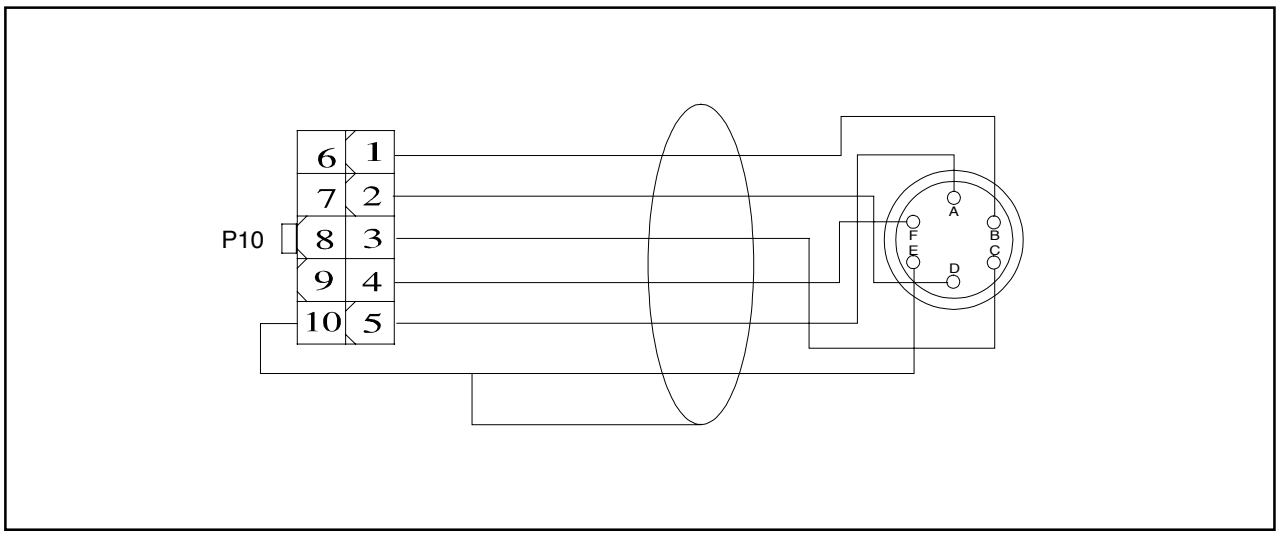
El controler se suministra en un embalaje de protección especial; si se observan señales de daños, que podrían haberse producido durante el transporte, ponerse en contacto con la oficina de venta más cercana.



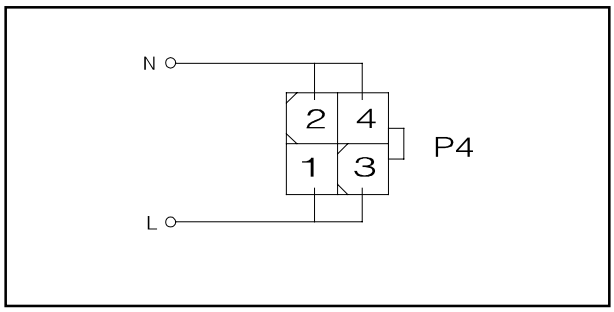
Embalaje del Controler

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 acopliamiento con la bomba. En las figuras siguients están esquematizados los acopliamientos que hay que realizar entre el controlador y la bomba y entre el controlador y el trasformador de alimentación.

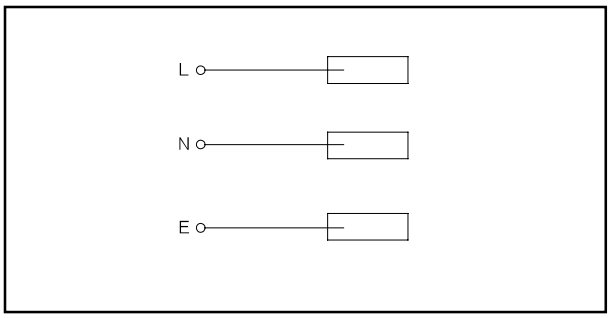
Para más detalles sobre las interconexiones indicadas anteriormente y sobre las características del trasformador de alimentación (disponible como opción) véase el suplemento "Techinical Informations"



Cable de Interconexión entre el Controller y la Bomba



Interconexiones entre el Controler y la Bomba Principal



Interconexiones entre la Alimentación y el Controler

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 adecuada-mente 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.

¡PELIGRO!

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 ºC a + 40 ºC
- 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 Informations".
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.

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) 0, 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.

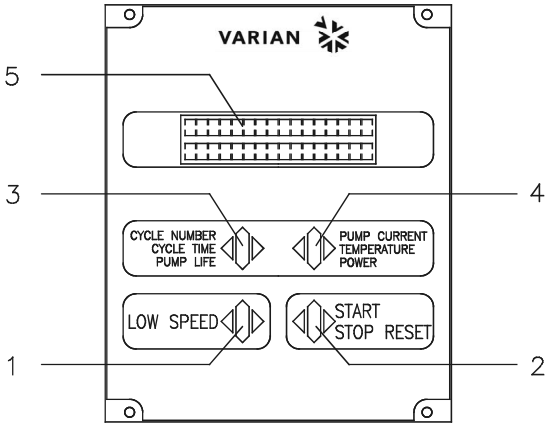
MANTENIMIENTO

Los controlers de la serie Turbo-V 70 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 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.



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 independientemente 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.

Panel frontal del "Hand Held Terminal"

MENSAJES DE ERROR

En algunos casos de avería los circuitos de autodiagnosis 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: PUMP OVERTEMP.	La temperatura del rodamiento superior o de la bomba ha superado los 60 ºC.	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 ºC.	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.	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 6 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.

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 Switching 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. O controller comanda as bombas da série Turbo-V 70 (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 com uma tensão entre 90 e 265 Vca com uma frequência de 50/60 Hz. Um circuito interno especial do controller verifica a tensão de entrada e transforma-a na tensão interna correcta necessária para alimentar o próprio 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 Informations".

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.

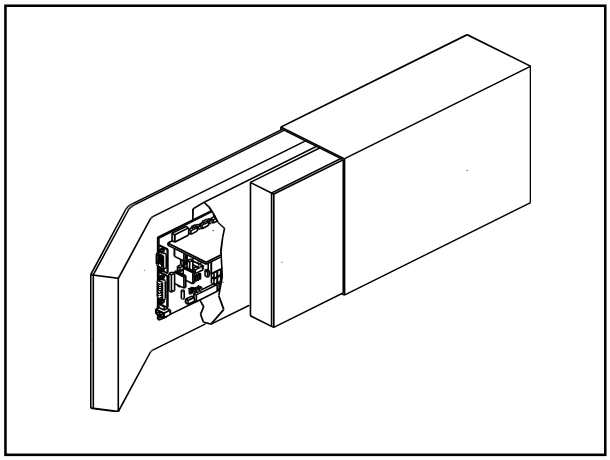
ARMAZENAGEM

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

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

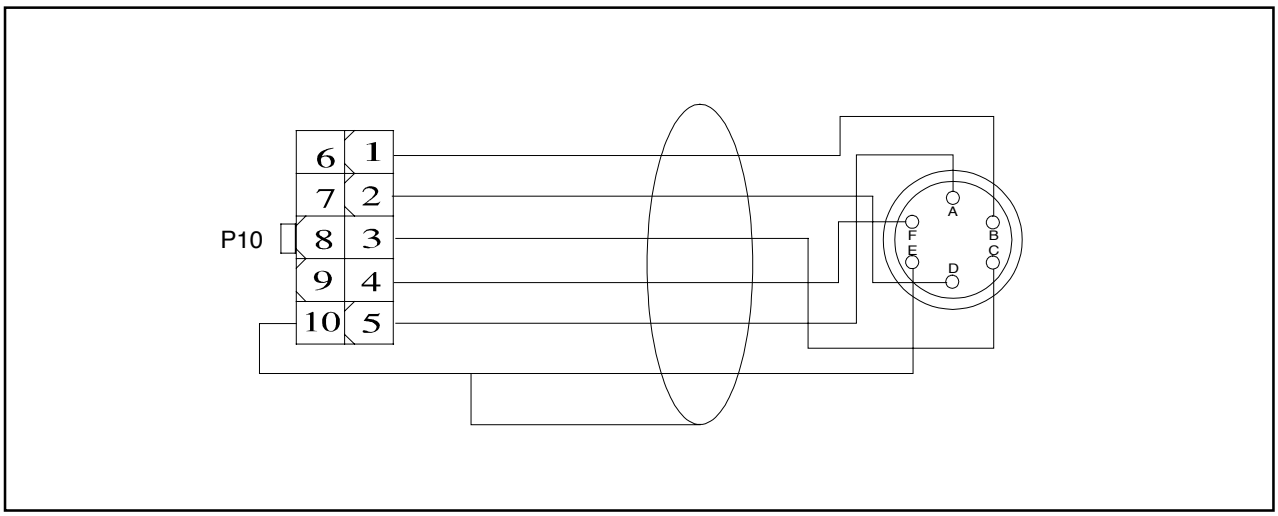
PREPARAÇÃO PARA A INSTALAÇÃO

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.

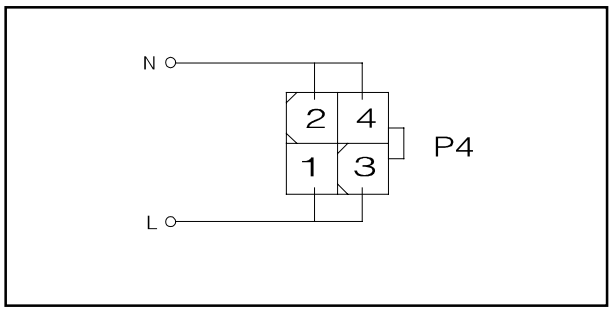


Embalagem do controller

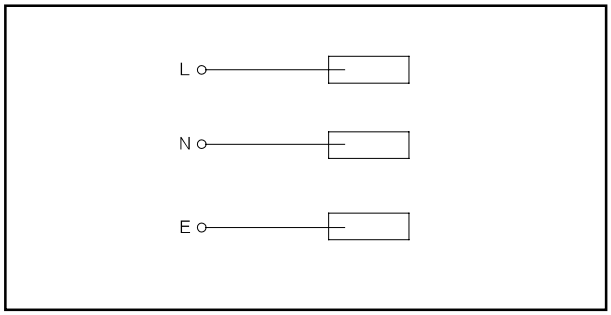
Durante a remoção da embalagem, tomar muito cuidado para não deixar cair o controller e para não submetê-lo a choques.
Não depositar a embalagem no meio ambiente. O material é completamente reciclável e responde à norma CEE 85/399 para a protecção do meio ambiente.
Antes de instalar o controller, é necessário 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 Informations".



Cabo de Interconexão entre o Controller e a Bomba



Interconexões entre o Controller e a Bomba Primária



Interconexões entre o Alimentador e o Controller

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!

As 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.

PERIGO!

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 ºC a + 40 ºC
- 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 Informations". 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.

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.

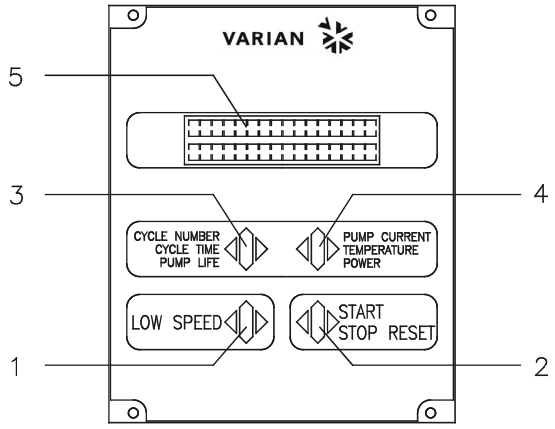
MANUTENÇÃO

O controller da série Turbo-V 70 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.



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 aproximada-mente 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.
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5. Display alfanumérico de cristales líquidos: matriz de puntos, 2 líneas x 16 caracteres.

Painel frontal do "Hand Held Terminal"

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: PUMP OVERTEMP.	A temperatura do rolamento superior ou da bomba superou os 60 ºC.	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 ºC.	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.	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 6 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.	Premer duas vezes o botão START para reactivar a bomba. Se a mensagem se reapresenta, dirigir-se à Varian para a manutenção. Embalagem do controller.

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 acht zich niet aansprakelijk 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 Switching PCB is een frequentieom-zetter die gestuurd wordt door een microprocessor, is gemaakt van halfgeleiderelementen en is in staat om zelfdiagnose en zelfbescherming uit tevoeren. De controller is van circuits voorzien die noodzakelijk zijn voor de automatische werking van de pompen van de serie Turbo-V 70. De controller stuurt de pompen van de serie Turbo-V 70 (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 gevoed worden met een spanning van 90 tot 265 Vac met een frequentie van 50/60 Hz. Een speciaal intern circuit van de controller controleert de ingangsspanning en zet deze om in de correcte interne spanning die voor de voeding van de controller is vereist. 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.

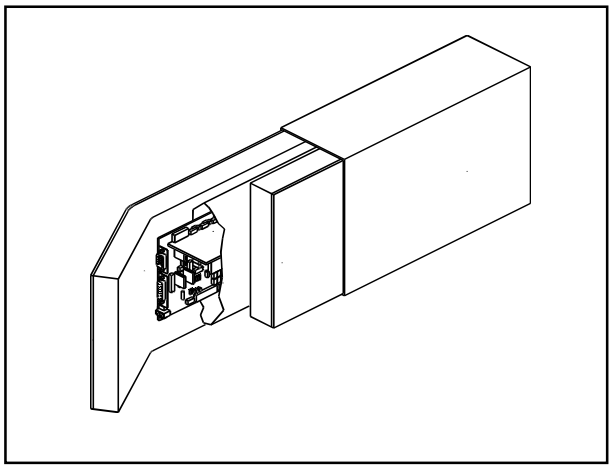
OPSLAG

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)

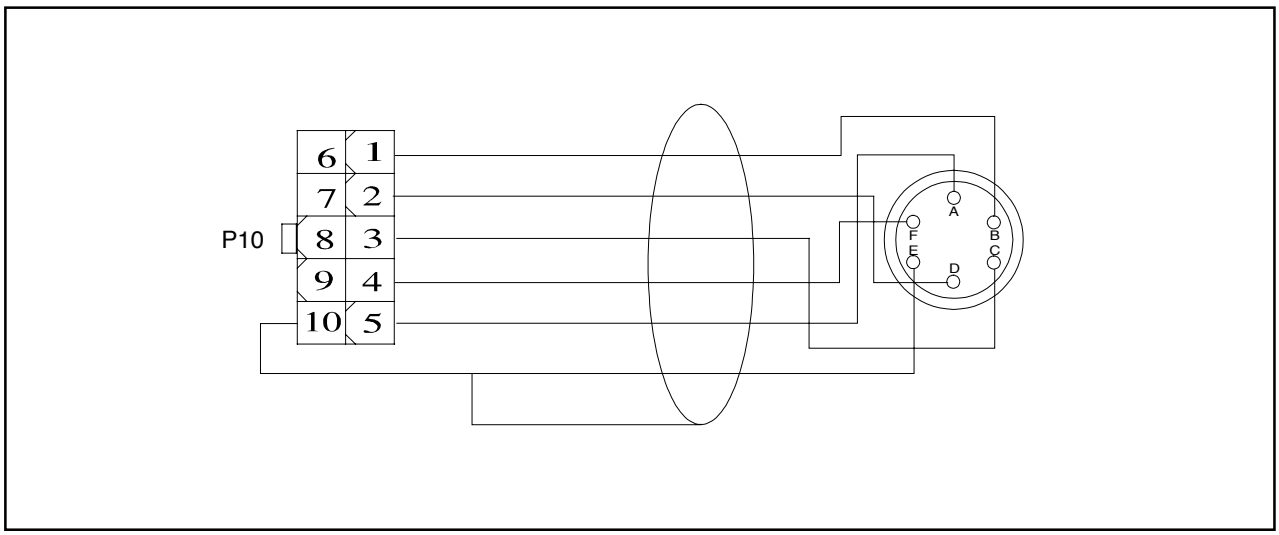
VOORBEREIDING VOOR INSTALLATIE

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.

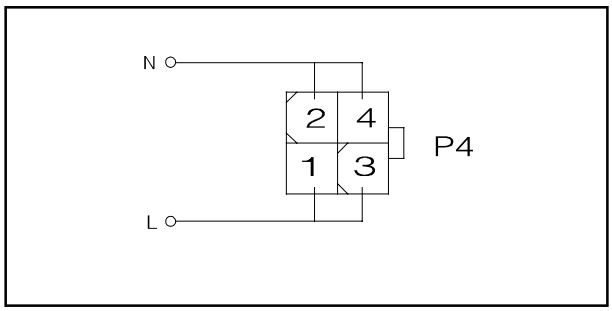


Verpakking van de controller

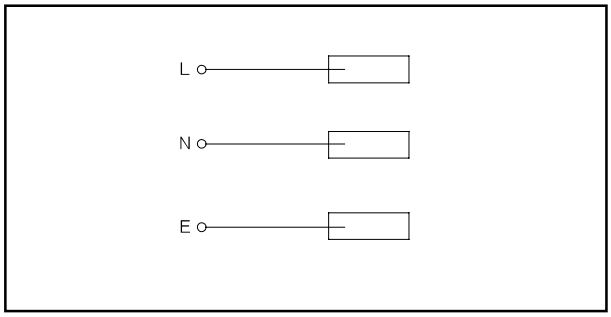
Zorg er bij het uitpakken voor dat de controller niet kan vallen of stoten te verduren krijgt.
Laat de verpakking niet ergens buiten achter. Het verpakkingsmateriaal is volledig recyclebaar en voldoet aan de EEG milieurichtlijn 85/399.
Alvorens de controller te installeren, moeten enkele verbindingskabels 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 Informations".



Verbindingskabel tussen controller en pomp



Verbindingen tussen controller en primaire pomp



Verbindingen tussen voeding en controller

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.

GEVAAR!

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 omgevingscondities 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 Informations". 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 ingangsflens aan het systeem is gekoppeld of de afsluitflens is gesloten.

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 ingangsconnector 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 ingangsconnector van de controller onttrokken worden (pins 1-6 van P1) of, indien de hand-terminal aanwezig is, de STOP knop worden bediend.

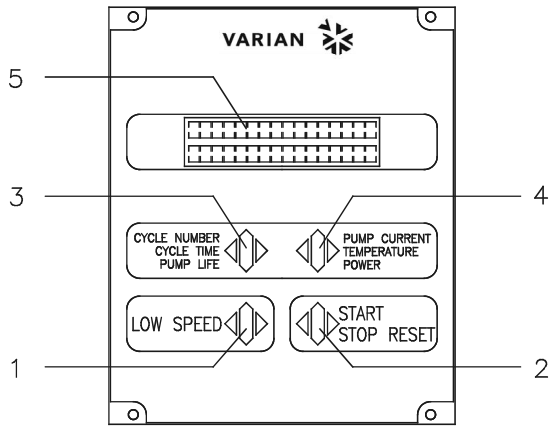
ONDERHOUD

De controllers van de serie Turbo-V 70 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.



1. Drukknop voor selectie van de bedrijfswijze LOW SPEED. Is alleen actief wanneer de bedrijfswijze op het frontpaneel wordt geselecteerd. Door de knop een maal in te drukken, draait de pomp op circa 2/3 van de nominale snelheid. Door de knop opnieuw in te drukken, wordt LOW SPEED geïnactiveerd.
2. Drukknop voor het zenden van de sturingen START, STOP of REST. Is alleen actief wanneer de bedrijfswijze op het frontpaneel wordt geselecteerd. Door de knop een maal in te drukken wordt de startfase geactiveerd; door de knop opnieuw te bedienen wordt de pomp gestopt. Als de pomp automatisch is gestopt ten gevolge van een storing, moet deze knop een eerste maal worden bediend om de controller te resetten en een tweede maal om de pomp weer op te starten.
3. Drukknop voor weergave op het display van de parameters cycle number, cycle time en pump life.
4. Drukknop voor weergave op het display van de parameters pump current, pump temperature, pump power en rotational speed. Is altijd actief, onafhankelijk van de gekozen bedrijfswijze. Door drukknoppen 3 en 4 gelijktijdig gedurende ten minste 2 seconden in te drukken, wordt een programma gestart waarmee enkele bedrijfsparameters kunnen worden geprogrammeerd.
5. Alfanumeriek display met vloeibare kristallen (LCD): puntjespatroon, 2 lijnen x 16 karakters.

Frontpaneel van de “hand terminal”

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 verbindingskabel tussen pomp en controller aan beide uiteinden goed bevestigd is en geen onderbrekingen vertoond. Bedien twee maal de START-knop om de pomp weer op te starten.
PUMP WAITING INTERLOCK	Het interlock-signaal 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-signaal.	Herstel de kortsluiting tussen pin 3 en pin 8 van connector J1 of sluit het externe interlock-signaal.
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.	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 6 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 stoorsignaal 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.

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 Switching 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 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 serien.
Hjælpekontakter forsyner kontrol til fjernstart og -stop af pumpen, signaler om pumpens tilstand, kontrol til start og stop af førvakuum-pumpen, blokeringssignaler (til tryk- og vandføringsafbrydere, osv.).
Styreenheden skal forsynes med en spænding mellem 90 og 265 Vac ved en frekvens på 50/60 Hz. Et indvendigt kredsløb i styreenheden sørger for at kontrollere indgangsspændingen og omforme den til den interne rigtige spænding til styreenheden.
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.

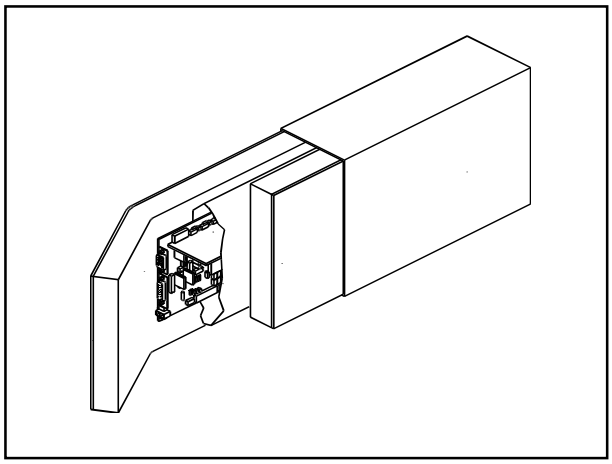
OPBEVARING

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

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

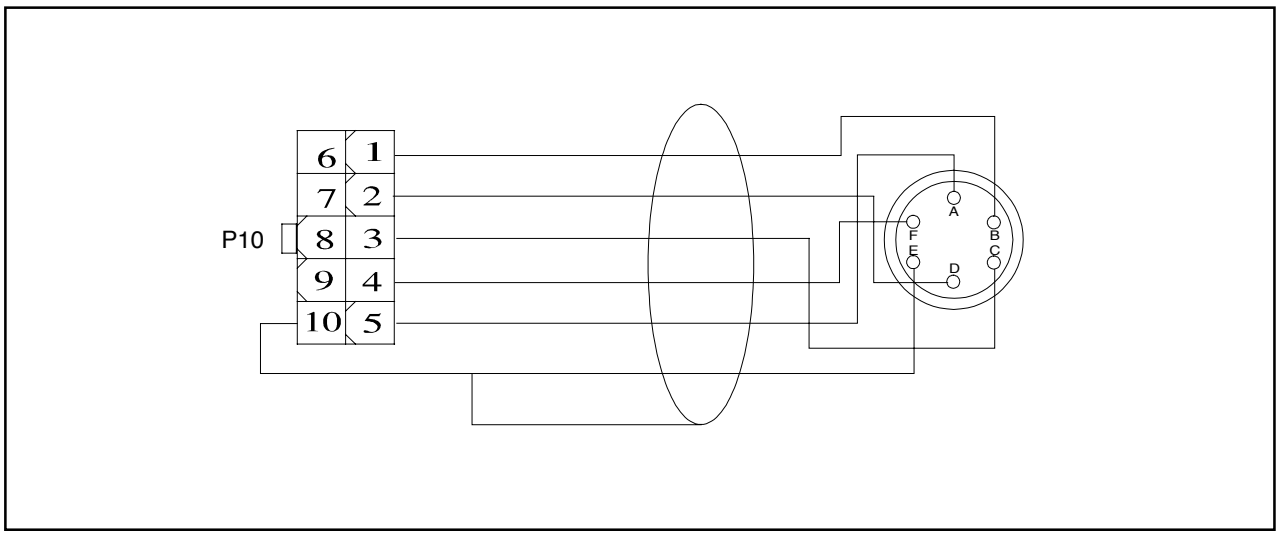
FORBEREDELSER FØR INSTALLATION

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

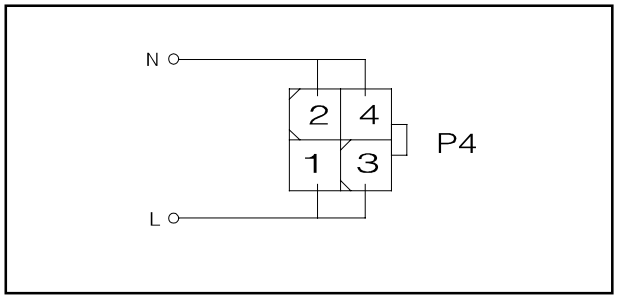


Styreenhedens emballage

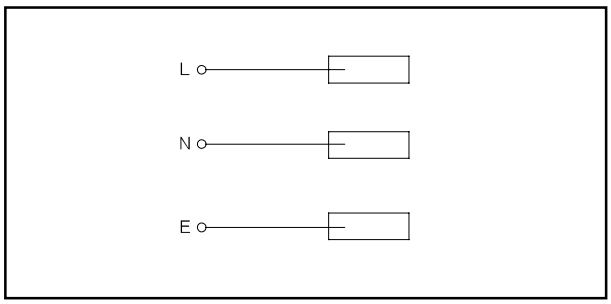
Sørg for at styreenheden ikke tabes eller udsættes for stød ved udpakningen.
Smid ikke emballagen ud. Materialet kan genbruges 100% og opfylder EU-direktiv 85/399 om miljøbeskyttelse.
Inden styreenheden installeres, skal man klargøre de nødvendige forbindelseskabler, d v s forbindelseskabler til strømforsyning 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 styreenheden og pumpen



Forbindelser mellem styreenheden og den primære pumpe



Forbindelser mellem strømkilden og styreenheden

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.

ADVARSEL !

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 omgivelsesforholdene 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.

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.

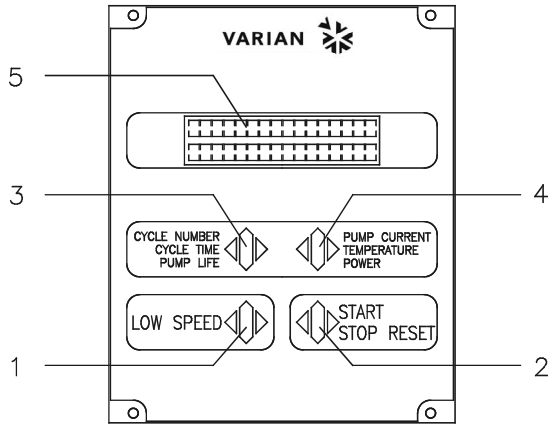
VEDLIGEHOLDELSE

Styreenhederne i Turbo-V 70-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.



1. Trykknap til installering af LOW SPEED driftvalg. Trykknappen fungerer kun, når der vælges fra frontpanelet. Tryk på knappen en gang for at få pumpen til at rotere med 2/3 af nominel hastighed. Tryk på knappen igen for at gå ud af LOW SPEED driften.
2. Trykknap til overføring af START, STOP eller RESET. Trykknappen fungerer kun, når der vælges fra frontpanelet. Tryk på knappen en gang for at starte pumpen, tryk på knappen igen for at standse pumpen. Hvis pumpen standser automatisk ved en fejl, tryk på denne knap en gang for at tilbagestille styreenheden, og yderligere en gang for at starte pumpen igen.
3. Trykknap til at hente cycle number, cycle time og pump lift frem på displayet.
4. Trykknap til at hente pump current, pump temperature, pump power og rotational speed frem på displayet. Trykknappen fungerer altid, uanset den valgte styretype. Når trykknapperne 3 og 4 holdes trykket ind samtidigt i mindst 2 sekunder, starter et program, der tillader, at programmere visse driftparametre.
5. LCD-display med tal og bogstaver: punktmatrice, 2 rader med 16 tegn.

Frontpanelet på "Hand-held terminalen"

FEJLMEDDELELSER

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

BEMÆRK

Fejlmeddelelserne vises kun, hvis tilbeøret "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: 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.	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 6 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.

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 Switching PCB-serien är en mikroprocessorstyrd frekvensomvandlare som består av komponenter med fast tillstånd. Styrenheten är försedda med självdiagnos- och självskyddsfunktion. Styrenheten kontrollerar pumparna i Turbo-V 70-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 serien. Hjälpkontakter erbjuder kontroller för fjärrstart och fjärrstopp av pumpen, signaler för pumpens tillstånd, kontroller för start och stopp av förvakuum-pumpen, blockeringssignaler (för tryckvakter, kontrollbrytare för vattenflöde osv).
Styrenheten ska matas med en spänning på 90 till 265 Vac och en frekvens på 50/60 Hz. En speciell krets inuti styrenheten kontrollerar ingångsspänningen och omvandlar den till den nödvändiga interna spänningen för 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.

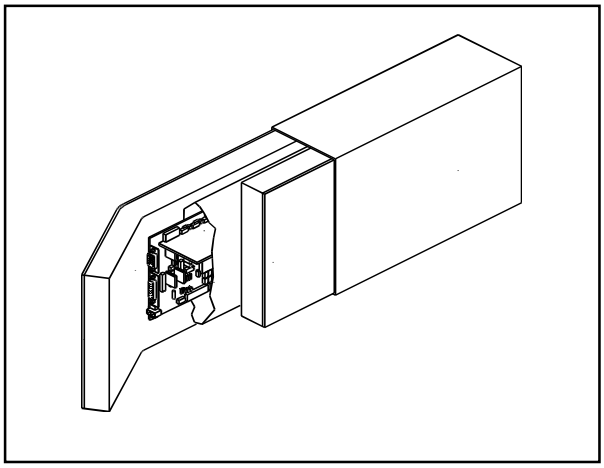
FÖRVARING

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

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

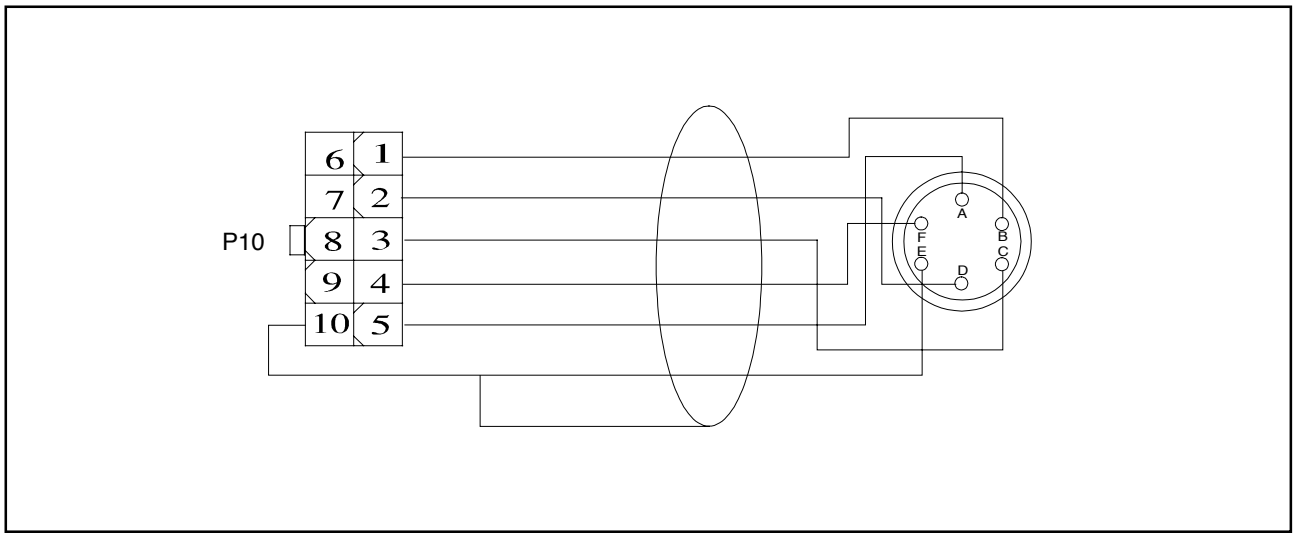
FÖRBEREDELSER FÖR INSTALLATION

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.

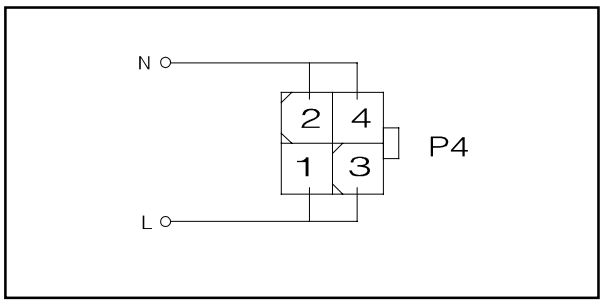


Styrenhetens förpackning

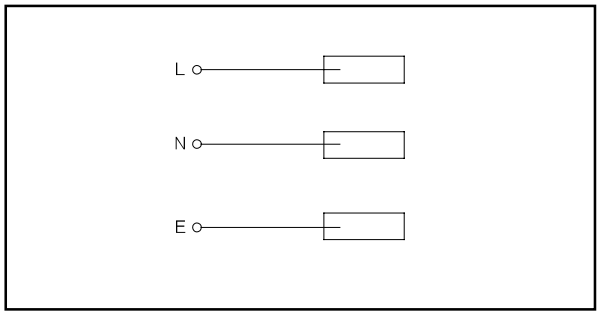
Kasta inte packmaterialet i soporna. Materialet är återvinningsbart till 100% och uppfyller EU-direktiv 85/399 om miljöskydd.
Innan styrenheten installeras ska du förbereda de nödvändiga anslutningskablarna, det vill säga anslutningskablar till matarspänning och pump samt kablar för logiska signaler. 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 styrenheten och pumpen



Anslutning mellan styrenheten och primärpumpen



Anslutning mellan strömkällan och styrenheten

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 underhålls-moment utförs på styrenheten.

VARNING

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.

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.

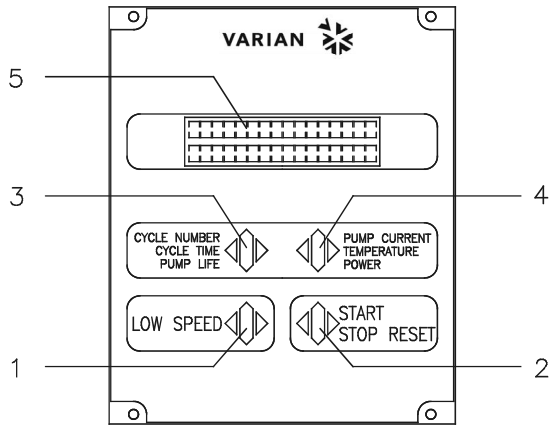
UNDERHÅLL

Styrenheterna i Turbo-V 70-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.



1. Tryckknapp för inställning av LOW SPEED driftsätt. Tryckknappen fungerar endast när styrsätt från frontpanelen har valts. Tryck på knappen en gång för att få pumpen att rotera vid 2/3 av nominell hastighet. Tryck på knappen igen för att gå ur LOW SPEED driftsättet.
2. Tryckknapp för överföring av START, STOP eller RESET. Tryckknappen fungerar endast när styrsätt från frontpanelen har valts. Tryck på knappen en gång för att starta pumpen, tryck på knappen igen för att stanna pumpen. Om pumpen stannat automatiskt i samband med ett fel, tryck på denna knapp en gång för att återställa styrenheten, och ytterligare en gång för att starta om pumpen.
3. Tryckknapp för att hämta parametrarna cycle number, cycle time och pump life på displayen.
4. Tryckknapp för att hämta parametrarna pump current, pump temperature, pump power och rotational speed på displayen. Tryckknappen fungerar alltid, oavsett det valda styrsättet. När tryckknapparna 3 och 4 hålls samtidigt intryckta i minst 2 sekunder, startas ett program som tillåter att programmera vissa driftparametrar.
5. LCD-display med siffror och bokstäver: punktmatris, 2 rader med 16 tecken.

Frontpanelen på "Hand Held Terminalen"

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: 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 start-momentet) förbrukar pumpen en större effekt än det programmerade värdet.	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 start-momentet) har utgången kortslutits (utgångsström högre än 6 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 nödstoppssignal 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.

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 Switching 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 serien (med en titrinnsprosess) 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 serien.
Hjelpekontakter 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 med en spenning mellom 90 og 265 Vac ved en frekvens på 50/60 Hz. Et internt kretsløp i styreenheten kontrollerer inngangsspenningen og omformer den til den interne riktige spenningen til 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 fore til at utstyret skades.

MERK

Merknadene inneholder viktig informasjon som er hentet fra teksten.

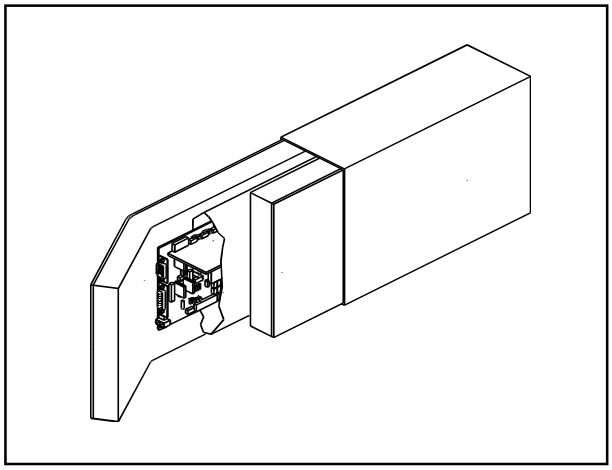
LAGRING

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

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

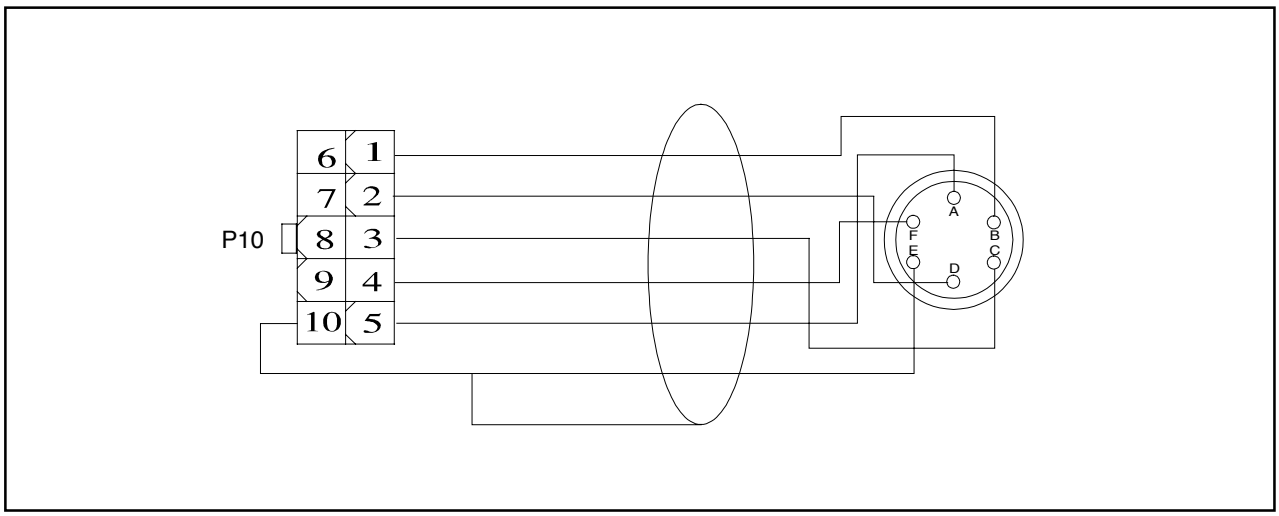
FORBEREDE INSTALLASJONEN

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.

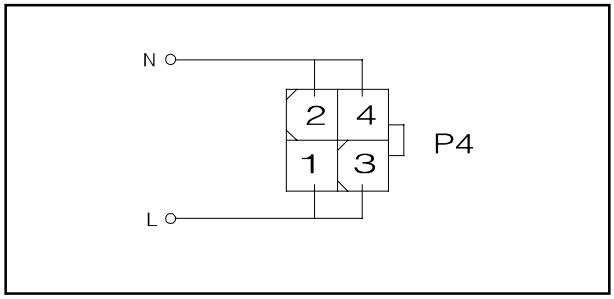


Styreenhetens emballasje

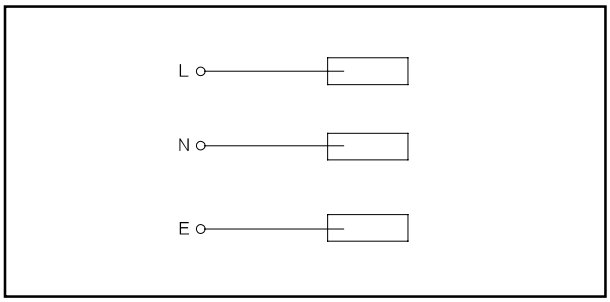
Når styreenheten pakkes ut, må du passe på at den ikke slippes ned eller utsettes for noen form for støt.
Emballasjen må ikke kastes på en ulovlig måte. Alle materialer er 100% resirkulerbare og er i samsvar med EU-direktiv 85/399 om miljøbeskyttelse.
Før styreenheten installeres skal du klargjøre de 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 styreenheten og pumpen



Forbindelser mellom styreenheten og primærpumpen



Forbindelser mellom strømkilden og stryreenheten

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 strømnettet 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 strømnettet før alle installasjons- eller vedlikeholds-arbeider som utføres på styreenheten.

ADVARSEL

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 tilkoplinger eller ekstrautstyr vises det til avsnittet "Use" i vedlegget "Technical Information".
Visse anvisninger som listes nedenfor kan kun gjennomføres på styreenheten når den er utstyrt med ekstrautstyret "Hand Held Terminal".
Før styreenheten tas i bruk bør samtlige elektriske og pneumatiske tilkoplinger gjøres. Les brukerveiledningen for pumpen som er tilkoplet.

ADVARSEL

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

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.

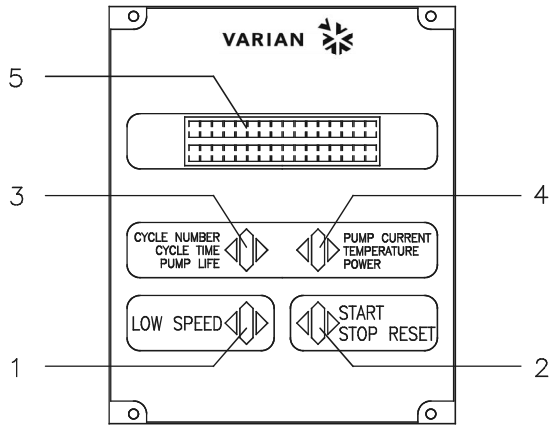
VEDLIKEHOLD

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

ADVARSEL

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

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



1. Trykknapp for innstilling av LOW SPEED drift. Trykknappen fungerer kun når det er valgt styremåte fra frontpanelet. Trykk på knappen en gang for at pumpen skal rotere med 2/3 av nominell hastighet. Trykk på knappen igjen for å gå ut av LOW SPEED drift.
2. Trykknapp for overføring av START, STOP eller RESET. Trykknappen fungerer kun når det er valgt styremåte fra frontpanelet. Trykk på knappen en gang for å starte pumpen, trykk på knappen igjen for å stanse pumpen. Har pumpen stanset automatisk i forbindelse med en feil, trykk en gang på denne knappen for å tilbakestille styreenheten, en gang til for å startet pumpen.
3. Trykknapp for å vise parametrene cycle number, cycle time og pump life på displayet.
4. Trykknapp for å vise parametrene pump current, pump temperature, pump power og rotational speed på displayet. Trykknappen fungerer alltid, uavhengig av styremåten. Når trykknappene 3 og 4 trykkes ned samtidig i minst to sekunder, startes et program som tillater programmering av visse driftsparametre.
5. LCD-display med siffer og bokstaver: punkt-matrise, 2 rader med 16 tegn.

Frontpanelet til "Hand held terminalen"

FEILMELDINGER

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

MERK

Feilmeldingene vises kun dersom ekstrautstyret "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: 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.	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 6 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 strømnettet 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. Vises feilmeldingen om igjen, må du ta kontakt med Varian for nødvendig 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 Switching PCB valvoja on mikroprosessorin valvoma kiinteistä materiaaleista tehtyjä taajuudenmuuntimia, jotka kykenevät itsemäärittelyyn ja itsesuojaukseen. Valvoja ajaa Turbo-V 70-sarjan pumppuja (kymmenportaisessa järjestelmässä) käynnistysvaiheessa valvoen jännitettä ja sähkövirtaa suhteessa pumpun saavuttamaan nopeuteen.
Ne yhdistävät kaikki sähköpiirit, jotka ovat välttämättömiä Turbo-V 70- sarjan pumpun automaattiselle toiminnalle. Apuliittimiä käyttäen on mahdollista käyttää kauko-ohjattua pumpun käynnistystä ja pysähdystä, signaaleja, jotka ilmaisevat pumpun toimintatilan, esityhjennyspumpun käynnistys- ja pysähdyssäätimiä, veden virtauksen säätelykatkaisijaa jne. Valvoja tulee syöttä jännitteellä 90-265 Vac, taajuudella 50/60 Hz. Valvojan erityinen sisäinen piiri tuo sekä kontrolloi sisääntulevan jännitteen ja muuntaa tämän sopivaksi sisäiseksi jännitteeksi joka on itse valvojalle tarpeen. Yhdistäkää valvoja ulko-virtalähteseen muuntajan avulla (muuntaja ostettava erikseen). "Käsin Pidettävä 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 toimintotatapoihin, joiden seuraamatta jättäminen voi aiheuttaa vakavia henkilövaurioita.

HUOMIO !

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

HUOM

Huomiot sisältävät tärkeätä tekstistä otettua tietoa.

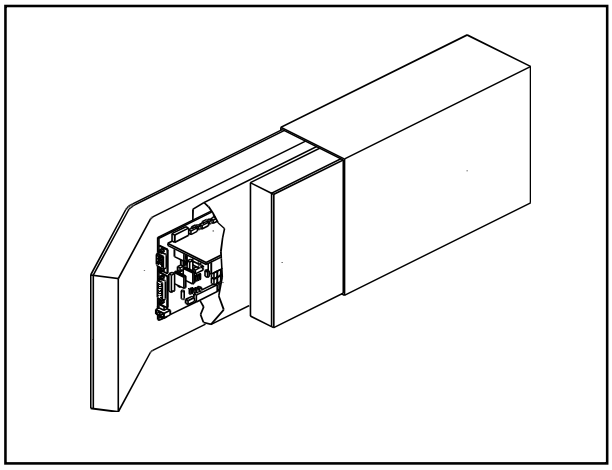
VARASTOINTI

Valvojan kuljetuksen ja varastoinnin aikana tulevat seuraavat ympäristövaatimukset olla täytettyinä:

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

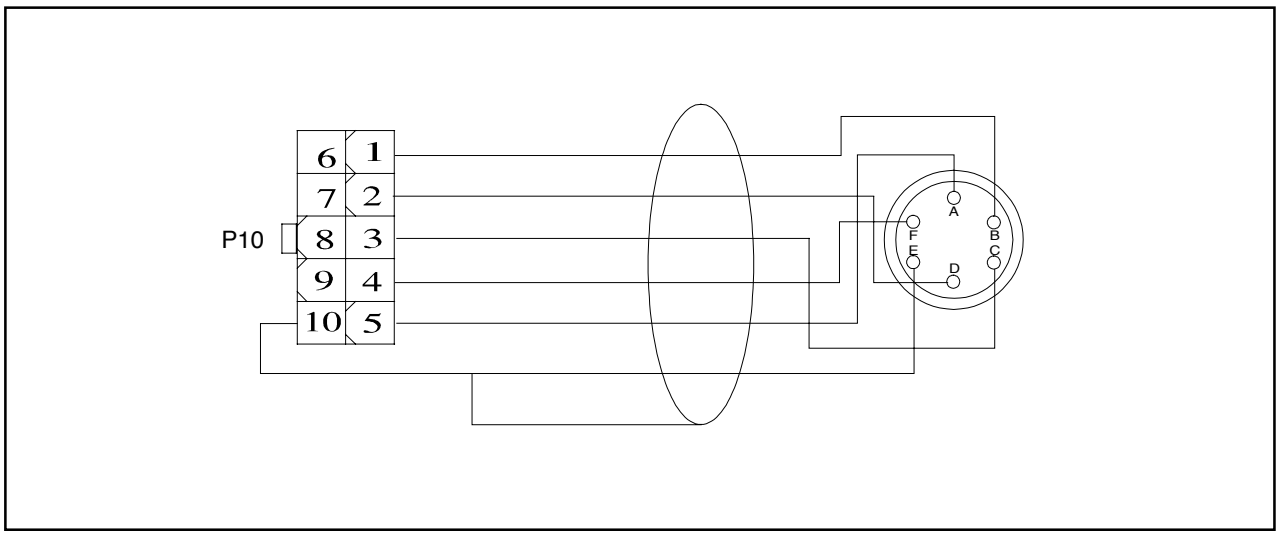
VALMISTELUT ASENNUSTA VARTEN

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

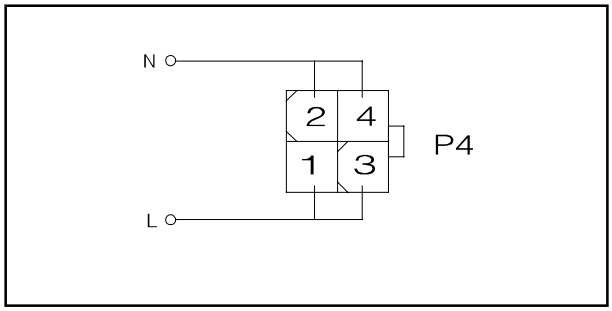


Valvojan pakkaus

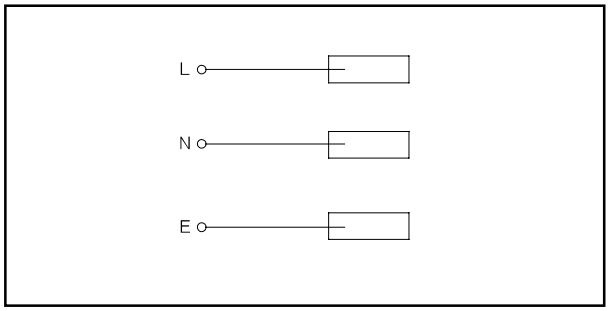
Pakkauksen purkamisen yhteydessä huolehtikaa, että valvoja ei pääse putoamaan ja välttäkää sen joutumista iskujen kohteeksi.
Älkää jättäkö pakkausta ympäristöön. Materiaali voidaan kokonaisuudessaan kierrättää ja se vastaa EY:n 85/399 direktiiviä ympäristön suojelusta.
Ennen kuin asennatte valvojan, pitää valmistaa liitoskaapeleita, esimerkiksi sähkövirtakaapeleita, loogisten signaleiden kaapeleita ja pumpun liitoskaapeli. Seuraavissa piirroksissa näkyy liitännät valvojan ja pumpun välillä ja valvojan ja muuntajan välillä.
Liitännän ja (lisä-) muuntajan lähimmet tiedot löytyvät liitteestä "Tekniset tiedot".



Liitoskapeli valvojan ja pumpun välillä



Liitokset valvojan ja esipumpun välillä



Liitokset sähkösyötön ja valvojan välillä

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.

VAARA!

Valvojan sisällä syntyy ylikuumenemista, joka voi aiheuttaa vakavia vammoja. Suojatkaa valvoja ja muuntaja tahattomalta kosketukselta, kun ne ovat jo asennetut.

HUOM

Valvoja voidaan asentaa tavalla, että riittävä jäähdytysilma pääsee vapaasti kiertämään laitteen sisällä. Älkää asentako ja/tai käyttäkö valvojaa tiloissa, joissa se joutuu alttiiksi ympäristötekijöille (sade, jää, lumi), pölylle, syövyttäville kaasuille, räjähdysallttiissa ympäristössä tai tiloissa, joissa paloriski on suuri.

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 pumppu on asetettu pöydälle, varmistakaa että se on vakaassa asennossa. Näin vältytään vammoilta ihmisille sekä itse koneelle. Älkää myöskään käyttäkö pumppua, mikäli sisääntulon laippaa ei ole kytketty järjestelmään tai mikäli sitä ei ole suljettu laippasulkijalla.

KÄYTTÖTOIMENPITEET

Valvojan päälle pano

Valvoja käynnistyy asettamalla virtakaapeli pistorasiaan.

Pumpun käynnistys

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

Pumpun pysäyttäminen

Pumppu pysähtyy ottamalla START-signaali pois päältä valvojan sisääntulokonnektorin nupeilta (P1:n nupeilta 1-6) tai painamalla STOP painonappia, jos on Käsin Pidettävä Pääte.

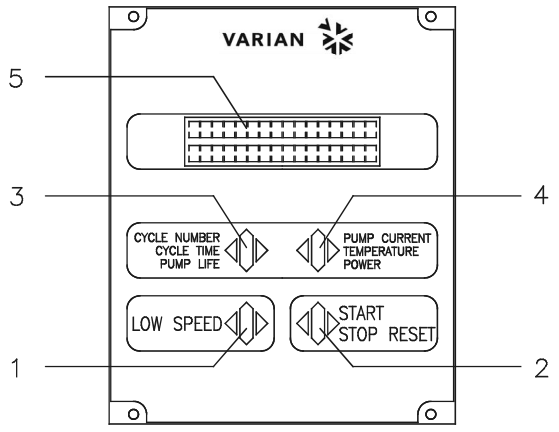
HUOLTO

Turbo-V 70 sarjan valvojat eivät kaipaa minkäänlaista huoltoa. Mahdolliset valvojaan 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 rikkoontunut valvoja ladattuun valvojaan.

VAARA!

Ennen minkätahansa valvojaan tehtävän toimenpiteen suorittamista irroittakaa sähkökaapeli pistorasiasta.

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



1. LOW SPEED -moodin valintaan käytettävä painonappi. Se aktivoituu vain silloin, kun etupaneelin toiminta-moodi on valittu. Yhden kerran painettaessa pumppu kiertää noin 2/3 nimellisnopeudesta. Painonappia uudelleen painettaessa LOW SPEED- moodi disaktivoituu.
2. KÄYNNISTYKSEN, PYSÄYTYKSEN JA UUDELLEN ASETUKSEN käskyjen painonappi. Se aktivoituu vain silloin, kun etupaneelin toiminta-moodi on valittu. Yhden kerran painettaessa käynnistysvaihe aktioituu. Uudelleen painettaessa pumppu pysähtyy. Mikäli pumppu on toimintahäiriön vuoksi pysähtynyt automaattisesti, painakaa painonappia yhden kerran, jolloin valvoja saadaan asetettua uudelleen .Toisen kerran painonappia painettaessa pumppu käynnistyy.
3. Painonappi, jonka avulla näyttöön saadaan kiertonumero, kiertoaika ja pumpun toiminta.
4. Painonappi, jonka avulla näyttöön saadaan pumpun sähkövirran, pumpun lämpötilan, pumpun tehon ja kiertonopeuden parametrit. Tämä on aina aktiivi riippumatta valitusta toimintamoodista. Painamalla painonappeja 3 ja 4 vähintään kahden sekunnin ajan, aktivoituu ohjelma, jonka avulla on mahdollista ohjelmoida joitakin toimintaparametrejä.
5. Kirjainnumerollinen digitaalinäyttö: pistematriisi, 2 riviä x 16 merkkiä.

Käsin Pidettävän Pääteen etupaneli

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 neulojen 3 ja 8 välillä tapahtuneen oikosulun keskeytyksestä tai ulkoisen lukitus-signaalin (interlock) avautumisesta.	Palauttakaa liittimen J1 neulojen 3 ja 8 välinen oikosulku tai sulkekaa ulkopuolinen lukitussignaali (interlock).
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 absor-boima sähkövirta on korkeampi kuin sille on ohjelmoitu.	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 6 A).	Tarkistakaa pumpun ja valvojan välinen liitos. Painakaa painonappia START kaksi kertaa, jolloin pumppu käynnistyy.
SYSTEM OVERRIDE	Kaukokytkimestä 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.

ΓΕΝΙΚΕΣ ΠΛΗΡΟΦΟΡΙΕΣ

Αυτή η συσκευη προοριζεται για επαγγελματικη ξρηση. Ο ξρηστή θα πρεπει να διαβασει προσεκτικα τί οδηγιέ του παροντό εγξειριδιου και οποιαδηποτε αλλη προσθετη πληροφορια που παρεξεται απο τη Varian, πριν απο τη ξρησιμοποιηση τή συσκευή. Η Varian δεν φερει καμια ευθυνη οσον αφορα την ολικη ή μερικη αθετηση των οδηγιων, την ακαταλληλη ξρηση εκ μερού ανεκπαιδευτου προσωπικού, αιθαιρετέ επεμβασεί ή ξρηση που δεν συμφωνει με τί ειδικέ εθνικέ διαταχεί.
Οι ρυθμιστέ τή σειρά Turbo-V 70 Switching PCB ειναι ενά μετατροπεά συξνοτητά, ελεγξομενό απο εναν μικροεπεχεργαστη. Ειναι κατασκευασμενοι με εχαρτηματα σε στερεα κατασταση και εξουν αυαυτοδιαγνωστικη και αυτοπροστατευτικη ικανοτητα. Ο ρυθμιστή ενσωματωνει ολα τα αναγκαια κυκλωματα για την αυτοματη λειτουργια των αντλιων τή σειρά Turbo-V 70.
Ο ρυθμιστή οδηγει τί αντλιέ τή σειρά Turbo-V 70 με μια διαδικασια που διαιρειται σε δεκα σταδια) κατα τη διαρκεια εκκινησή ελεγξοντά την ταση και το ηλεκτρικο ρευμα σε σξεση με την ταξυτητα στην οποια θα φταξει η αντλια.
Με τη βοηθεια βοηθητικων συνδετηρων ειναι διαθεσιμοι ολοι οι ξειρισμοι για την εκκινηση και το σταματημα τή αντλιά εχ αποστασεώ, τα σηματα που δειξνουν την καταξταση λειτουργιά τή αντλιά, οι ξειρισμοι εκκινησή και σταματηματό τή αντλιά προ-κενου, τα σηματα μπλοκαρισματό (για διακοπτέ πιεσή, διακοπτέ ελεγξου τή ροή του νερου, κλπ.).
Ο ρυθμιστή θα πρεπει να τροφοδοτειται με ταση που κυμαινεται μεταχυ 90 και 256 Vac με συξνοτητα 50/60 Hż. Ενα ειδικο εσωτερικο κυκλωμα του ρυθμιστη προνοει στην ακριβωση τή ταση εισοδου και στην μετατροπη τή στην σωστη εσωτερικη ταση που ειναι αναγκαια για την τροφοδοσια του ρυθμιστη.
Για να ελεγξθουν οι λειτουργιέ και να παρουσιαστει στην οθονη η καταξταση λειτουργιά του ρυθμιστη διατιθεται μια ειδικη συσκευη (Hand Held Terminal) η οποια αποτελειται απο ενα πληκτρολογιο διοικησή και μια οθονη. Στί επομενέ παραγραφού αναφερονται ολέ οι απαραιτητέ πληροφοριέ που εγγυουνται την ασφαλεια του ξειριστη κατα τη διαρκεια τή ξρησιμοποιησή τή συσκευή. Λεπτομερεί πληροφοριέ παρεξονται στο παραρτημα "Technical Informations".

Αυτό τό εγχειρίδιο χρησιμοποιεί τις ακόλουθες συμβάσεις:

ΚΙΝΔΥΝΟΣ

Οι ενδειχεί κινδυνου προσελκυουν την προσοξη του ξειριστη σε μια διαδικασια ή σε μια ειδικη εργασια η οποια εαν δεν εκτελεστει σωστα, θα μπορουσε να προκαλεσει σοβαρέ προσωπικέ βλαβέ.

ΠΡΟΣΟΞΗ

Οι ενδειχεί προσοξή εμφανιζονται πριν απο τί διαδικασιέ οι οποιέ εαν δεν εκτελεστουν με προσοξη, θα μπορουσαν να προκαλεσουν ζημιέ στη συσκευη.

ΣΗΜΕΙΩΣΗ

Οι σημειωσεί περιεξουν σημαντικέ πληροφοριέ που εξουν αποσπαστει απο το κειμενο.

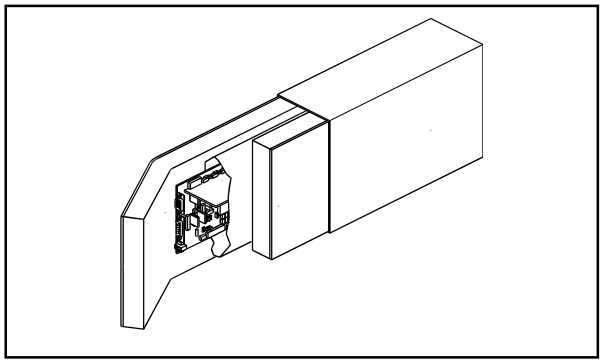
ΑΠΟΘΗΚΕΥΣΗ

Κατα τη διαρκεια τή μεταφορά και τή αποθηκευσή των ρυθμιστων πρεπει να τηρουνται οι ακολουθέ περιβαλλοντικέ συνθηκέ·

- θερμοκρασία: -20 °C έως +70 °C
- σξετικη υγρασια 0 - 95% (ασυμπυκνωτη)

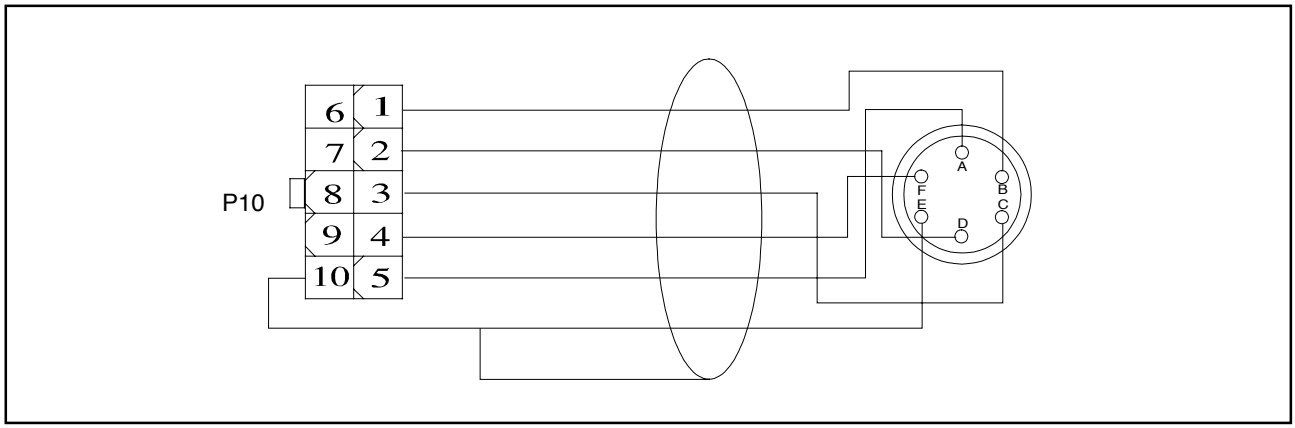
ΠΡΟΕΤΟΙΜΑΣΙΑ ΓΙΑ ΤΗΝ ΕΓΚΑΤΑΣΤΑΣΗ

Ο ρυθμιστή ειναι εχοπλισμενό με μια ευρυξωρη προστατευτικη συσκευασια. Αν υπαρξουν ενδειχεί βλαβή που θα μπορουσαν να ξουν προκληθει κατα τη διαρκεια τή μεταφορά, συμβουλευτειτε το τοπικο τμημα πωλησεων.

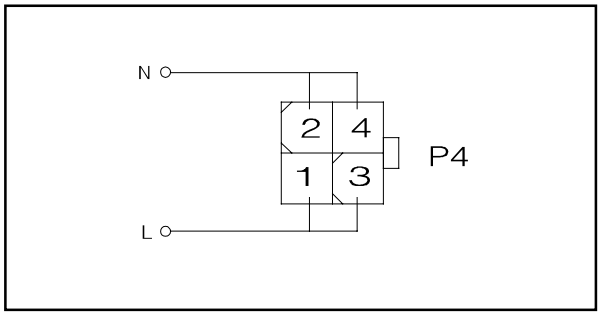


Συσκευασια του ρυθμιστη

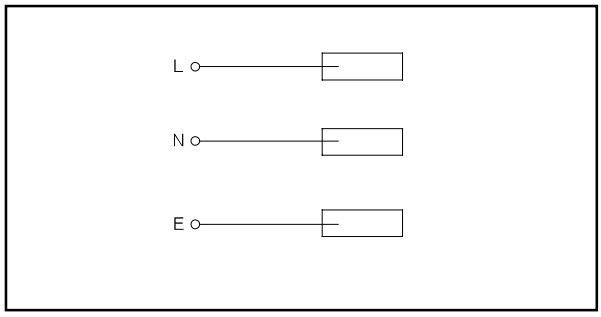
Κατα τη διαρκεια του ανοιγματό τή συσκευασιά, δωστε ιδιαιτερη προσοξη ετσι ωστε να μην πεσει και να μην ξτυπηθει ο ρυθμιστή.
Μην εγκαταλειπετε τη συσκευασια στο περιβαλλον. Το υλικο ανακυκλωνεται πληρω και ανταποκρινεται στην Οδηγια τή E.E. 85/399 για την διαφυλαχη του περιβαλλοντό.
Πριν απο την εγκατασταση του ρυθμιστη ειναι αναγκαιο να προετοιμασετε μερικα καλωδια διασυνδεσή, οπω για παραδειγμα τα καλωδια για τη συνδεση με την τροφοδοσια, τα καλωδια για τί συνδεσεί λογική και τή αντλιά. Στα ακολουθα σξηματα παρουσιαζονται οι συνδεσεί που πρεπει να πραγματοποιηθουν μεταχυ του ρυθμιστη και των αντλιων και μεταχυ του ρυθμιστη και του μετασξηματιστη τροφοδοσιά.
Περισσοτερέ πληροφοριέ οσον αφορα τί παραπανω συνδεσεί και τα τα ξαρακτηριστικα του μετασξηματιστη τροφοδοσιά (διαθεσιμό ω εχτρα) παρεξονται στο παραρτημα "Technical Informations".



Συνδεσεί μεταχυ του ρυθμιστη και τή αντλιά



*Συνδεσεί μεταχυ του ρυθμιστη και τή **Πρωτης** Αντλιά*



*Συνδεσεί μεταχυ **Τροφοσιας** του **Ρυθμιστη***

ΕΓΚΑΤΑΣΤΑΣΗ

ΚΙΝΔΥΝΟΣ

Οι τασεί που αναπτυσσονται στον ρυθμιστη και τον σξετικο μετασξηματιστη, καθώ και μεταχυ του μετασξηματιστη και του δικτυου τροφοδοσιά ειναι τετοιου υψού που να αποτελουν κινδυνο για οποιον ερθει σε επαφη μαζι τού.
Προστατευεται καταλληλα τον ρυθμιστη και τον μετασξηματιστη τροφοδοσιά στην τελικη τού θεση απο τί τυξαιέ επαφέ.

ΚΙΝΔΥΝΟΣ

Στο εσωτερικο του ρυθμιστη αναπτυσσονται υψηλέ τασεί που μπορουν να προκαλεσουν σοβαρού τραυματισμού η και το θανατο. Πριν εκτελεσετε οποιαδηποτε εργασια εγκατασταση η συντηρηση του ρυθμιστη αποσυνδεστε τον απο την πριζα τροφοδοσιά.

ΚΙΝΔΥΝΟΣ

Στο εσωτερικο του ρυθμιστη αναπτυσσονται υψηλέ θερμοκρασιέ που μπορει να προκαλεσουν σοβαρέ βλαβέ η τραυματισμού.
Προστατευεται καταλληλα τον ρυθμιστη τροφοδοσιά στην τελικη του θεση απο τί τυξαιέ επαφέ.

ΣΗΜΕΙΩΣΗ

Ο ρυθμιστὴ που ἐξει εγκατασταθεὶ στο τελικὸ συστημα θα πρεπει να τοποθετηθεὶ με τροπο ὡστε ο αερὰ ψυξὴ να μπορεὶ να κυκλοφορεὶ ελευθερα γυρω απὸ τη συσκευὴ.
Μην τοποθετειτε και③η ξρησιμοποιειτε τον ρυθμιστὴ σε ξωρὸὺ εκτεθειμενὸὺ στὶ καιρικὲ συνθηκὲ (βροξὴ, παγο, ξιονι, σκονὲ, αερια, σε ξωρὸὺ ὸπου υπαρξει κινδυνὸ ἐκρηχὴ ὴ πυρκαγιὰ).

Κατὰ τη διαρκεια τὴ λειτουργιὰ πρεπει να τηρουνται οι ακὸλουθὲ περιβαλλοντικὲ συνθηκὲ·

- θερμοκρασία: 0 °C ἑως +40 °C
- σξετικὴ υγρασια· 0 - 95% (ασυμπυκνωτη).

ΧΡΗΣΗ

Σ αυτὴν την παραγραφο αναφερονται οι κυριοτερὲ διαδικασιὲ λειτουργιὰ. Για περισσοτερὲ λεπτομερειὲ και για διαδικασιὲ που απαιτουν ιδιαιτερὲ συνδεσεὶ ὴ αχεσουαρ, αναφερθητε στην παραγραφο "Χρήση" του Παραρτηματὸ "Technical Informations".
Μερικὲ απὸ τὶ αναφερομενὲ στη συνεξεια πληροφοριὲ μπορουν να εφαρμοστουν και στον ρυθμιστὴ μὸνον αν αυτὸ ειναι συνδεδεμενὸ με το εχαρτημα "Hand held terminal". Πριν ξρησιμοποιησετε τον ρυθμιστὴ καντε ὸλὲ τὶ ηλεκτρικὲ και πνευματικὲ συνδεσεὶ με βαση το εγξειριδιο τὴ αντλιὰ συνδεσὴ.

ΚΙΝΔΥΝΟΣ

Για να αποφυγετε βλαβὲ σε ατομα ὴ στη συσκευὴ, ὸταν η αντλια ειναι τοποθετημενη σε ενα τραπεζι σιγουρευτειτε ὸτι ειναι καλὰ σταθεροποιημενη. Μην θετετε σε λειτουργια την αντλια αν η φλαντζα εισὸδου δεν ειναι συνδεδεμενη στο συστημα ὴ αν δεν ειναι κλειστὴ με την φλαντζα κλεισιματὸ.

ΔΙΑΔΙΚΑΣΙΕΣ ΣΧΕΤΙΚΑ ΜΕ ΤΗ ΧΡΗΣΗ

Άναμμα του Ρυθμιστή

Για να αναψει ο ρυθμιστὴ ειναι αρκετὸ να βαλετε το καλωδιο τροφοδοσιὰ στην πριζα του δικτυου.

Εκκίνηση της Αντλίας

Για να τεθει σε κινηση η αντλια θα πρεπει να πατησετε το μπουτὸν START στα σξετικὰ πιν του συνδετηρα εισὸδου του ρυθμιστὴ ((pin 1 - 6 του P1)) ὴ, αν υπαρξει το ηανδ ηελδ τερμιναλ, πατωντὰ το κουμπι/ START.

Σταμάτημα της αντλίας

Για να τεθει σε κινηση η αντλια θα πρεπει να πατησετε το μπουτὸν START στα σξετικὰ πιν του συνδετηρα εισὸδου του ρυθμιστὴ (pin 1 - 6 του P1)) ὴ, αν υπαρξει το ηανδ ηελδ τερμιναλ, πατωντὰ το κουμπι STOP.

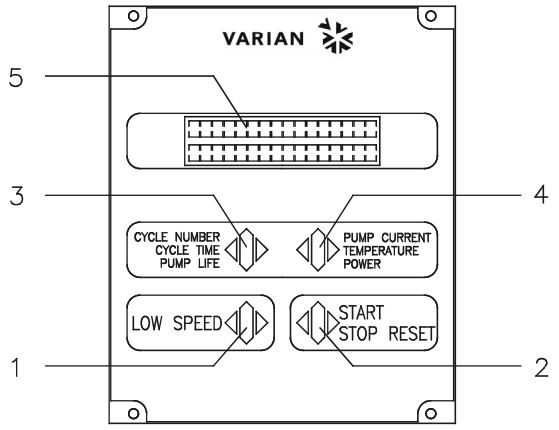
ΣΥΝΤΗΡΗΣΗ

Οι ρυθμιστὲ τὴ σειρὰ Turbo-V 70 δεν απαιτουν καμμια συντηρηση. Οποιαδὴποτε επεμβαση θα πρεπει να πραγματοποιηθεὶ απὸ εγκεκριμενο προσωπικὸ.
Σε περιπτωση βλαβὴ μπορειτε να ξρησιμοποιησετε την υπηρεσια επισκευων τὴ Varian ὴ τὴ "Varian advance exchange service", που σὰ δινει τη δυνατὸτητα να ξετε ενα καθαρισμενο ρυθμιστὴ σε αντικατὰσταση του ξαλασμενου.

ΚΙΝΔΥΝΟΣ

Πριν απὸ οποιαδὴποτε επεμβαση στον ρυθμιστὴ αποσυνδεστε το καλωδιο τροφοδοσιὰ.

Αν πρεπει να καταστραφει ο ρυθμιστὴ ακολουθηστε τη διαδικασια που προβλεπεται απὸ τὸυ ειδικὸὺ εθνικὸὺ κανονισμὸὺ.



1. Μπουτὸν για την επιλογὴ του LOW SPEED (ξαμηλὴ ταξὺτητα). Ενεργοποιειται μὸνον ὸταν ξει επιλεγει η λειτουργια στο μπροστινὸ πινακα. Πατωντὰ το μια φορὰ η αντλια περιστρεφεται περιπου κατὰ τα 2/3 τὴ ονομαστικὴ ταξὺτητὰ. Πατωντὰ το ακὸμη μια φορὰ σταματὰ η λειτουργια του LOW SPEED.
2. Μπουτὸν για τὸὺ ξειρισμὸὺ START, STOP και RESET. Ειναι ενεργὸ μὸνον ὸταν ξει επιλεγει η λειτουργια στο μπροστινὸ πινακα. Πατωντὰ το μια φορὰ ενεργοποιειται η φαση εκκινησὴ. Πατωντὰ το ακὸμα μια φορὰ σταματὰ η αντλια. Αν η αντλια σταματησε αυτὸματα λὸγω βλαβὴ θα πρεπει να πατηθει αυτὸ το μπουτὸν μια φορὰ ἑτσι ὡστε να γινει η επαναρυθμιση του ρυθμιστὴ και μια δευτερη φορὰ για να ενεργοποιηθει η αντλια.
3. Μπουτὸν για να εμφανιστουν στην οθὸνη οι παραμετροι cycle number, cycle time και pump life.
4. Μπουτὸν για την εμφανιση στην οθὸνη των παραμετων pump current, pump temperature, pump power και rotational speed. Ειναι παντα ενεργοποιημενο ασξετα με τη λειτουργια που θα επιλεγει. Πατωντὰ μαζὶ τα μπουτὸν 3 και 4 για τουλἀξιστον 2 δευτερὸλεπτα ενεργοποιειται ενα προγραμμα με το οποιο μπορειτε να προγραμματισετε μερικὲ λειτουργικὲ παραμετρὸὺ.
5. Αλφαριθμητικὴ οθὸνη με υγρὸὺ κρυστἀλλὸὺ, μητρα κουκιδων, 2 σειρὲ X 16 ξαρακτηρὲ.

Εμπροσθιὸ πινακὰ του Hand Held Terminal

ΜΥΝΗΜΑΤΑ ΛΑΘΟΥΣ

Σε ορισμένε περιπτωσεί βλαβή τα κυκλωματα αυτοδιαγνωσή του ρυθμιστη παρουσιαζουν ορισμενα μηνυματα λαθού τα οποια παρουσιαζονται στον πινακα που ακολουθει.

ΣΗΜΕΙΩΣΗ

Τα μηνυματα λαθού παρουσιαζονται μονον αν εχει εγκατασταθει η επιπλεον λειτουργια "held hand terminal".

ΜΗΝΥΜΑ	ΠΕΡΙΓΡΑΦΗ	ΔΙΟΡΘΩΣΗ
CHECK CONNECTION TO PUMP	Κακ η λειτουργια στη συνδεση αντλιας και ρυθμιστη	Ελεγχτε αν το καλωδιο συνδεσή μεταχυ αντλιά και ρυθμιστη ειναι καλα σταθεροποιημενο και στα δυο ακρα και οτι δεν υπαρχει διακοπη. Πατηστε δυο φορε το μπουτον START για να θεσετε χανα σε κινηση την Αντλια.
PUMP WAITING INTERLOCK	Εξει ενεργοποιηθει το σημα ιντερλοχκ που βρισκετε στον συνδετηρα P1 λογω διακοπή του βραξυκυκλωματό μεταχυ του pin 3 και του pin 8 του συνδετηρα J1, η λογω ανοιγματό του σηματό του εχωτερικου interlock.	Επαναφερατε το βραξυκυκλωμα μεταχυ του pin 3 και του pin 8 του συνδετηρα J1, η κλειστε το σημα του εχωτερικου ιντερλοχκ.
FAULT: PUMP OVERTEMP.	Η θερμοκρασια του ανω κουζινετου τή αντλιά χεπερασε τού 60 °C	Περιμενετε ωσπου η θερμοκρασια να κατεβει κατω απο το ανωτατο επιτρεπτο σημειο. Πατηστε δυο φορε το μπουτον START για να θεσετε χανα σε κινηση την Αντλια.
FAULT: CONTROLLER OVERTEMPERATURE	Η θερμοκρασια του μετασξηματιστη χεπερασε τού 90 °C	Περιμενετε ωσπου η θερμοκρασια να κατεβει κατω απο το ανωτατο επιτρεπτο σημειο. Πατηστε δυο φορε το μπουτον START για να θεσετε χανα σε κινηση την Αντλια.
FAULT: TOO HIGH LOAD	Κατα την κανονικη λειτουργια (μετα τη φαση εκκινησή) το απορροφουμενο ρευμα απο την αντλια ειναι μεγαλυτερο απο το προγραμματισμενο.	Ελεγχτε αν ο ροτορά τή αντλιά μπορει να περιστραφει ελευθερα. Πατηστε δυο φορε το μπουτον START για να θεσετε χανα σε κινηση την Αντλια.
FAULT: SHORT CIRCUIT	Κατα την κανονικη λειτουργια (μετα τη φαση εκκινησή) η συνδεση εχοδου εξει βραξυκυκλωσει (ρευμα εχοδου μεγαλυτερο απο 6 A)	Ελεγχτε τί συνδεσεί μεταχυ αντλιά και ρυθμιστη. Πατηστε δυο φορε το μπουτον START για να θεσετε χανα σε κινηση την Αντλια.
SYSTEM OVERRIDE	Η αντλια σταματησε απο ενα σημα κινδυνου που προερξεται απο την μακρινη επαφη.	Βγαλτε το καλωδιο τροφοδοσιά του ρυθμιστη και διορθωστε την αιτια προκλησή του σηματό κινδυνου. Επανασυνδεστε το καλωδιο τροφοδοσιά και πατηστε δυο φορε το μπουτον START για να θεσετε χανα σε κινηση την αντλια.
OVERVOLTAGE	Παρουσιαστηκε βλαβη στον τομεα τροφοδοσιά του ρυθμιστη η ο ρυθμιστή δεξθηκε ενα λανθασμενο σημα.	Πατηστε δυο φορε το μπουτον START για να θεσετε χανα σε εκκινηση την αντλια. Αν χαναπαρουσιαστει το μηνυμα απευθυνθειτε στην Varian για συντηρηση.

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 Switching 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 pump series.
The controller drives (within ten steps) the Turbo-V 70 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 a power supply between 90 and 265 Vac with a frequency of 50/60 Hz. An internal controller circuitry verifies the power supply voltage and generates the necessary voltages to supply the controller. 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.

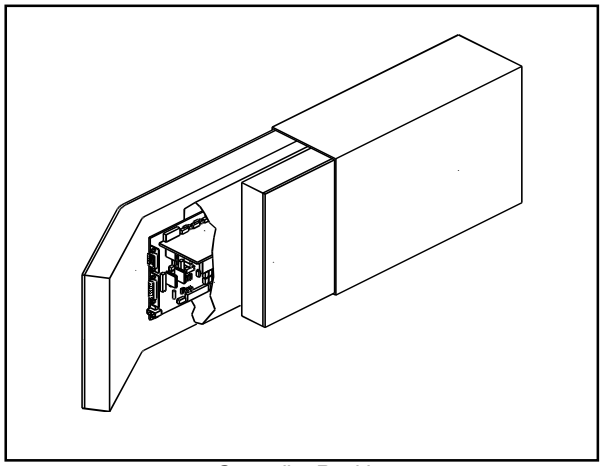
STORAGE

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 conden-sation)

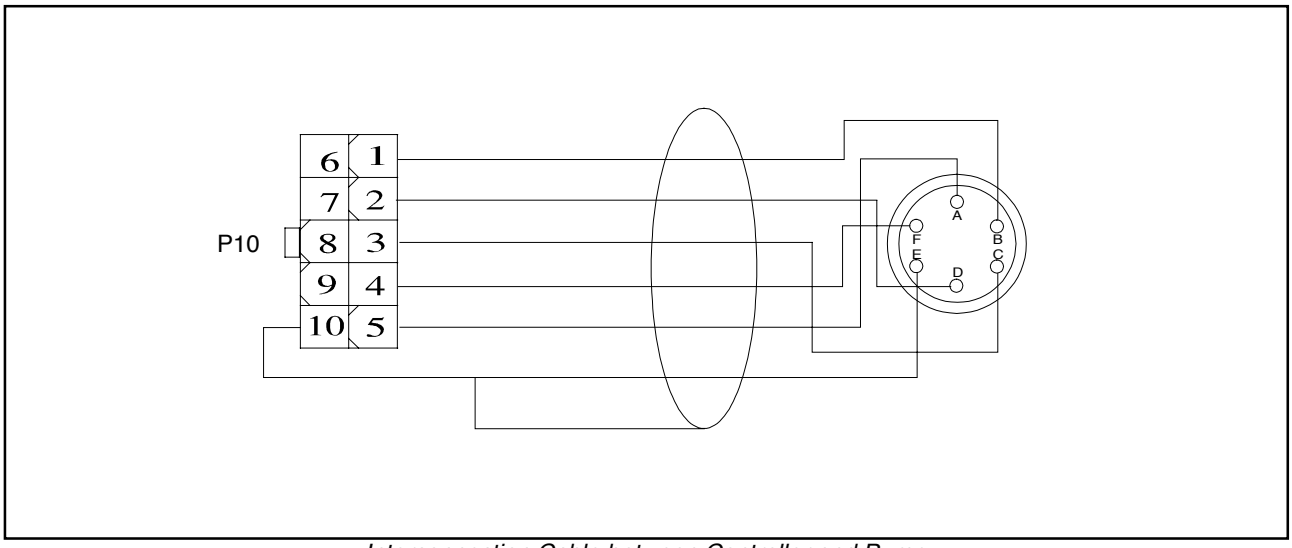
PREPARATION FOR INSTALLATION

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.

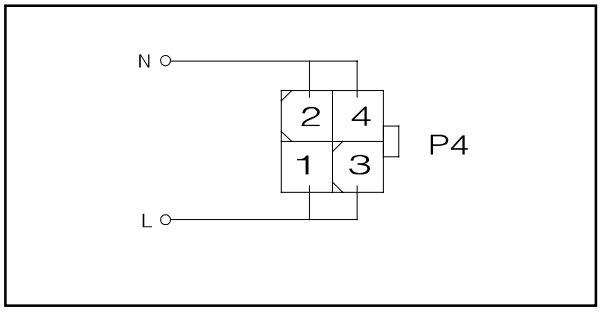


Controller Packing

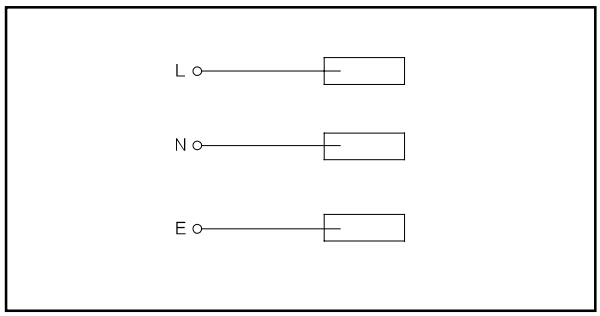
When unpacking the controller, ensure that it is not dropped or subjected to any form of impact.
Do not dispose of the packing materials in an unauthorized manner. The material is 100% recyclable and complies with EEC Directive 85/399.
Before installing the controller you must prepare some interconnection 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 chatacteristics (available as an option) are supplied in the appendix "Technical Information".



Interconnection Cable between Controller and Pump



Interconnections between Controller and Forepump



Interconnections between Power Supply and Controller

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.

WARNING!

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 O °C to +40 °C
- relative humidity: 0 - 95% (without conden-sation).

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 Informations". 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.

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.

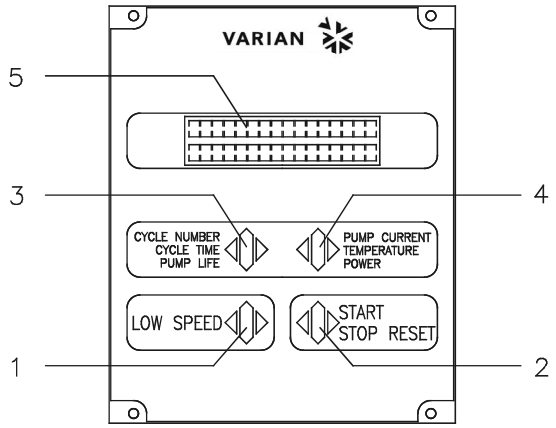
MAINTENANCE

The Turbo-V 70 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.



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

Hand Held Terminal Control Panel

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.

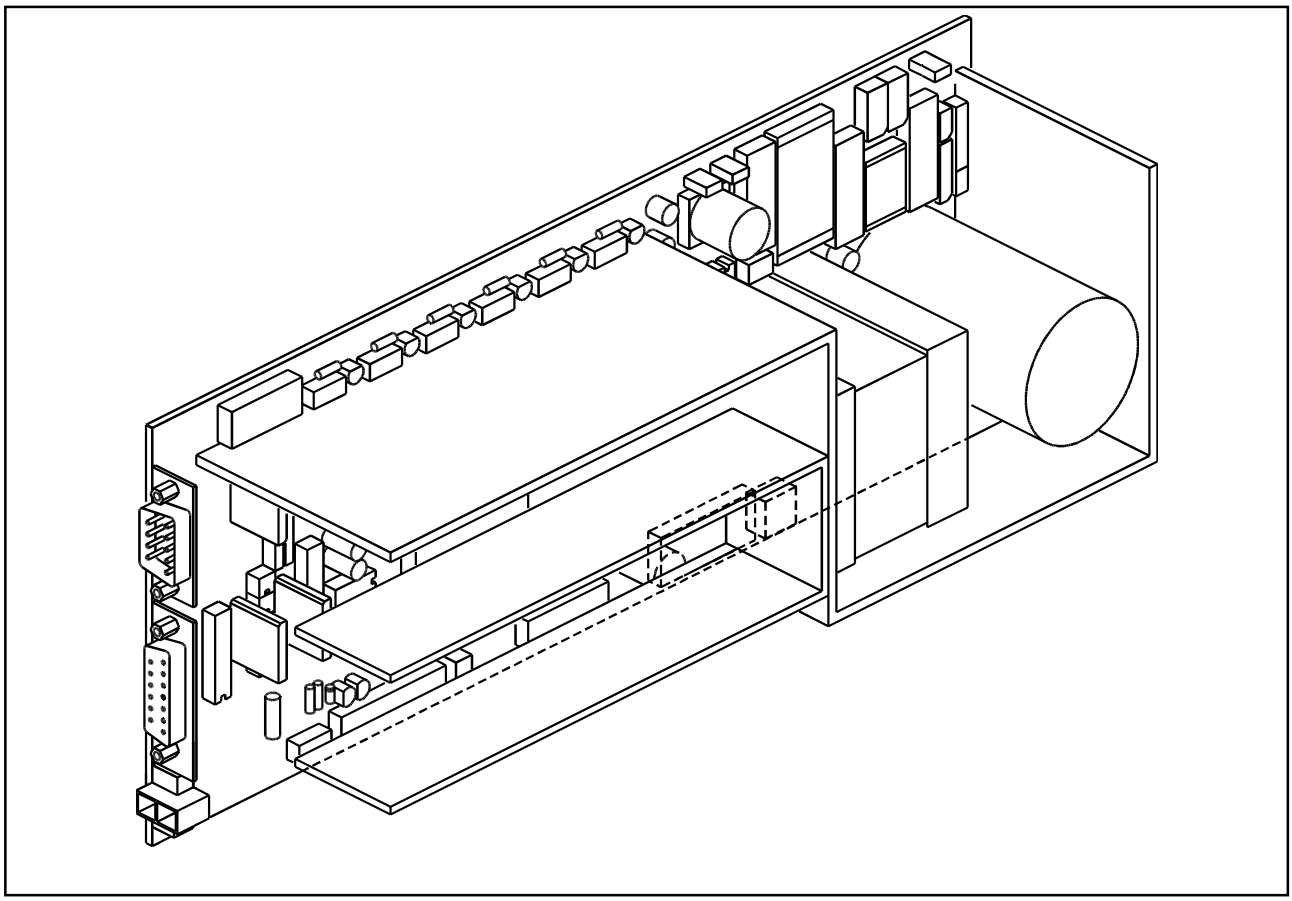
MESSAGE	DESCRIPTION	REPAIR ACTION
CHECK CONNECTION TO PUMP	Wrong connection between the pump and the controller.	Check connection between controller and pump. Press the START push-button twice to start the pump.
PUMP WAITING INTERLOCK	The interlock signal of P1 connector is activated by an interruption 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: PUMP OVERTEMP.	The upper bearing/pump temperature exceeds 60 °C.	Wait until the temperature decrease below threshold value. Press the START pushbutton 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 pushbutton 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.	Check that the pump rotor is free to rotate. Press the START pushbutton twice to start the pump.
FAULT: SHORT CIRCUIT	After the starting phase the output connection is shorted (output current higher than 6 A).	Check connections and shortages between pump and controller. Press the START pushbutton 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 pushbutton twice to start the pump.
OVERVOLTAGE	Controller power supply circuitry is faulty, or the Controller received a spike.	Press the START pushbutton twice to start the pump. Should the message still be present, call the Varian service.

TURBO-V 70 CONTROLLER DESCRIPTION

The controller (model 969-9509) is a solid-state frequency converter which is driven by a single chip microcomputer and is composed of a PCB which includes power supply and 3-phase output, analog and input/output section, microprocessor and digital section.
The power supply section detects the input voltage (from 90 to 265 Vac, 50/60 Hz) and converts it by means of an high frequency switching circuitry into the suitable voltages to supply the unit and the 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 to be displayed, and gives outputs for a fully automatic operation.
A dedicated EEPROM is used to store pump operating parameters and the input/output programmed information upon failure.

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

The following figure is a picture of the Turbo-V controller.



Turbo-V 70 Switching PCB Controller

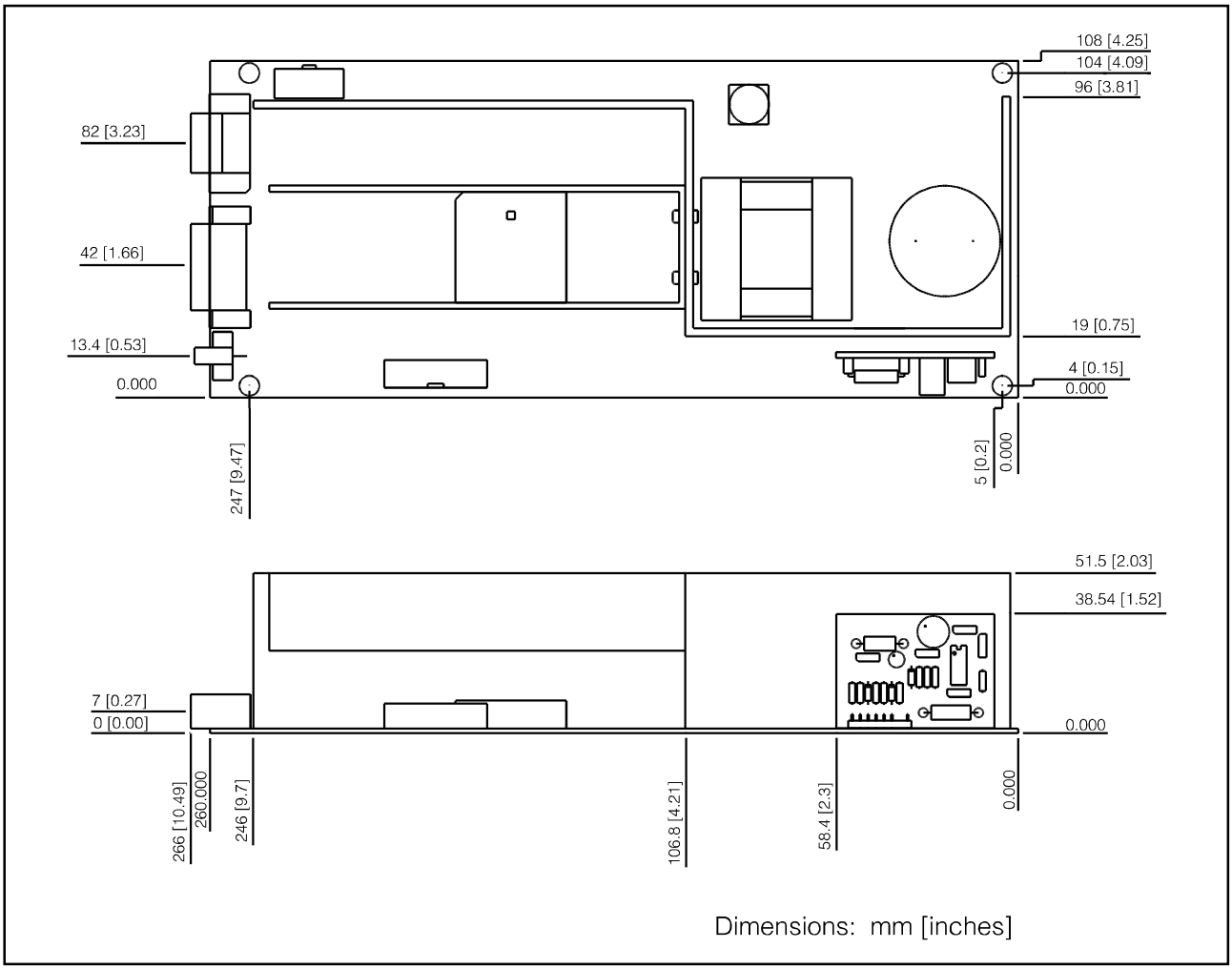
CONTROLLER SPECIFICATIONS

Input:	
Voltage	from 90 to 265 Vac
Frequency	50/60 Hz
Power	150 VA maximum
Output:	
Voltage	54 Vac nominal ±10%, 3-phase
Frequency	1250 Hz, ±2%
Power	70 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, 60 mA
P3 output fan	100 mA

Auxiliary connectors	
P1	External input signals (pins)
J2	Output signals (socket)
P3	Output fan voltage (pins)
P4	Output line voltage (relay contact 1A)
P5	Auxiliary output fan voltage (pins)
Weight	1 kg (2.2 lbs)

CONTROLLER OUTLINE

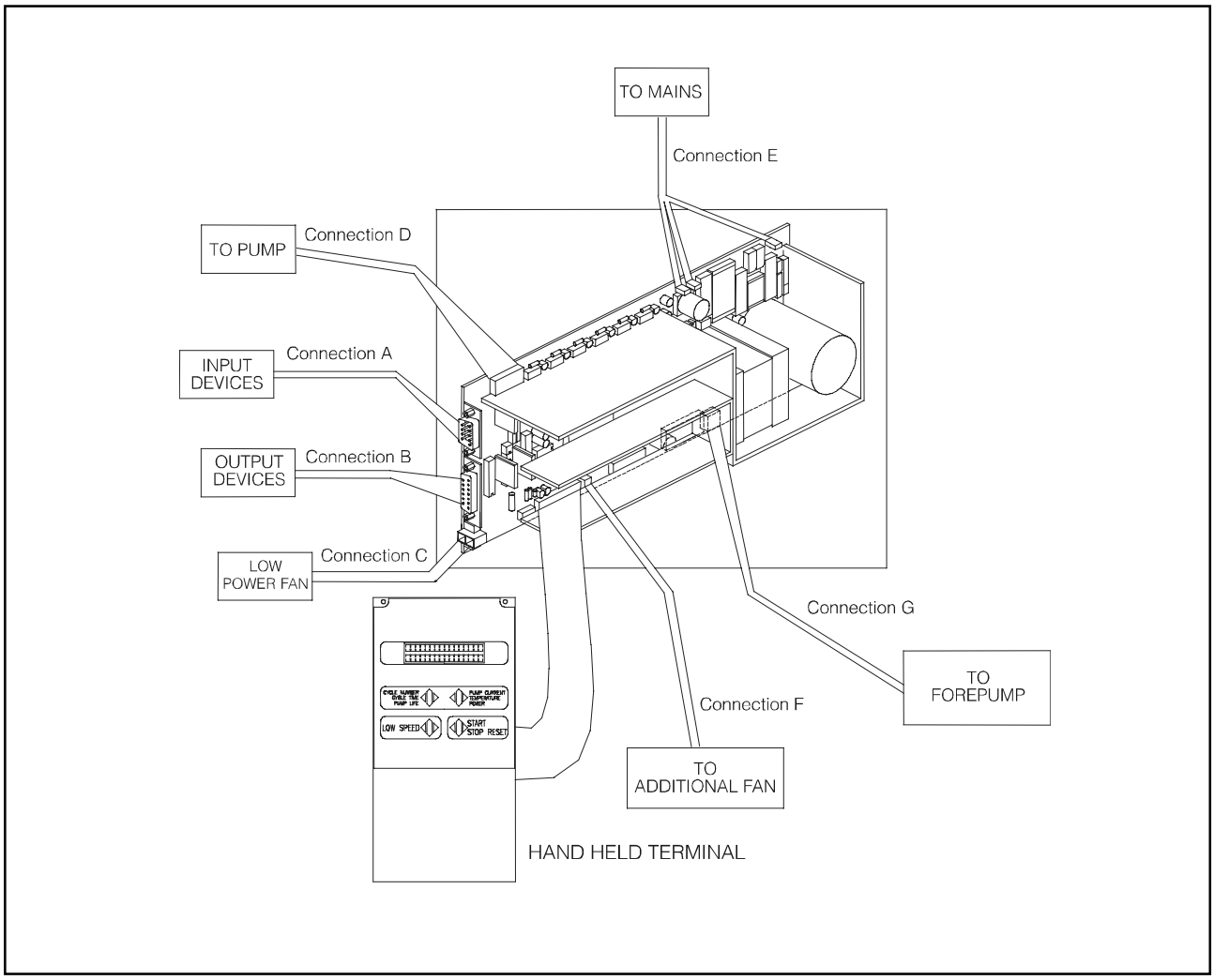
The outline dimensions for the Turbo-V 70 PCB controller are shown in the following figure.



Controller outline

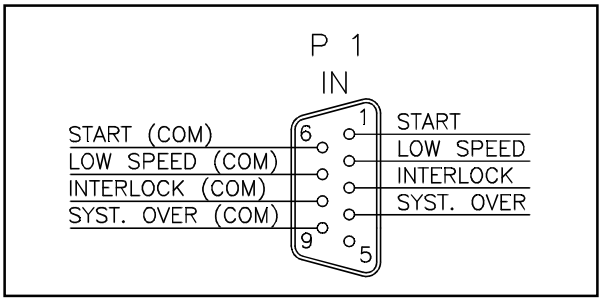
INTERCONNECTIONS

The following figure shows the Controller interconnections.



Controller interconnections

Connection A (P1) - Logic Input Interconnections



P1 input connector

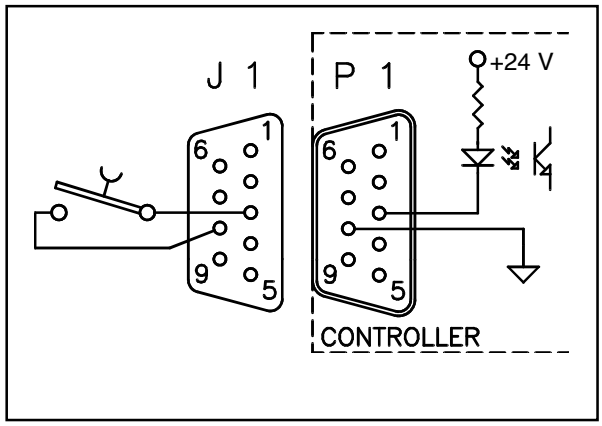
All the logic input to the controller **must** be connected at J1 mating connector.
With the provided J1 mating connector (shipped with pin 3 and pin 8 shorted) make the connections with AWG 24, (0.24 mm^2) or smaller wire to the pins indicated in the figure to obtain the desired capability.
The following table describes the signals available on the connector.

PIN	DESCRIPTION
1-6	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. With the remote mode operation selected, the hand held terminal push-button is inoperative.
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. With the remote mode operation selected, the hand held terminal push-button is inoperative.
3-8	INTERLOCK optically isolated from the internal circuit, this signal can be used to delay the starting of the turbopump, 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

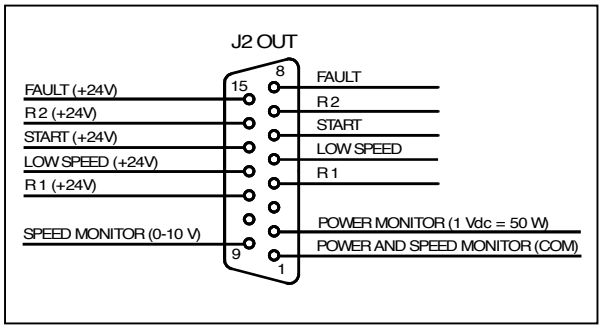
Pin 3-8 must be shorted to allow the Turbo-V 70 pump to start if no interlock contact is connected. If, after starting the pump, the interlock contact opens, it has no effect on the operation and the pump continues to turn.

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



Typical logic input connection

Connection B (J2) - Logic Output Interconnections

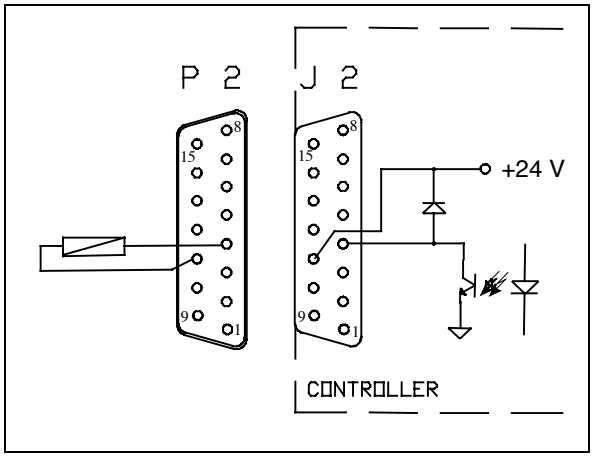


Logic output connector

All the logic output from the controller must be connected at P2 mating connector.
With the optional P2 mating connector make the connections with AWG 24 (0.25 mm^2) 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.

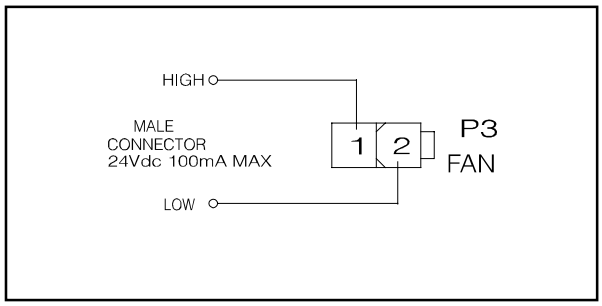
PIN	DESCRIPTION
1-2	Analog output voltage of DC power drawn by the turbopump (pin 2 positive, pin 1 negative). 1 Vdc = 10 W
1-9	Analog output voltage (0 - 10 V) of pump speed (pin 9 positive, pin 1 negative).
4-11	RELAY 1 signal 24 V, 60 mA, optically isolated output (pin 11 positive, pin 4 negative). The output voltage will be present when the rotational speed of the pump is higher than the selected speed threshold.
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, either through the hand held terminal or the remote signal.
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 START pushbutton on hand held terminal is pressed, or the remote start is present, until NORMAL operation is reached.
7-14	R2 signal 24V, 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 24V, 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

Connection C (P3) - Low Power Fan



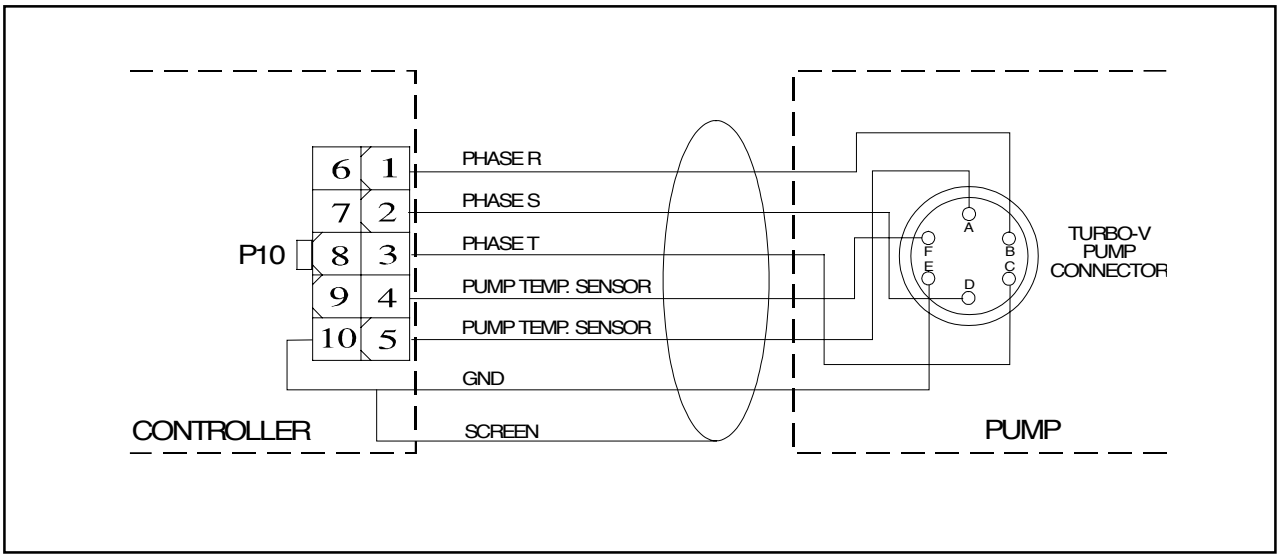
P3 connector

The 24 Vdc, 100 mA maximum output voltage is present on connector P3 after START pushbutton is pressed and will remain present until a fault condition is reached by the system or the turbopump is stopped.
This is a dedicated output for the optional Turbo-V 70 pump cooling fan.
The mating connector and cable are provided assembled with the air cooling kit.

Connection D - Controller-to-Pump Connection

To connect the controller to the pump, an appropriate interconnection cable must be prepared to connect the P10 connector of the controller with the pump connector.
The following figure shows the pump output connector configuration where pins:

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

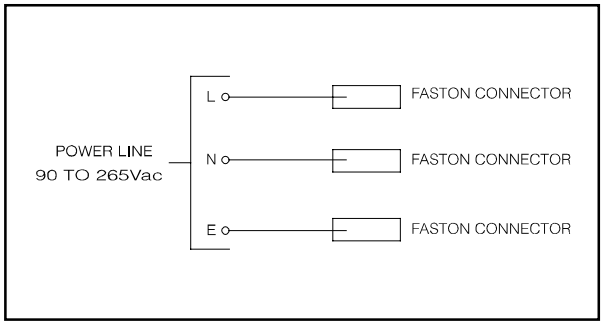


Controller to pump cable

Connection E - Controller to Power Connection

The power supply must be connected to L, N and E faston connectors of the PCB.

The following figure shows the interconnection details.



Power Supply Interconnection

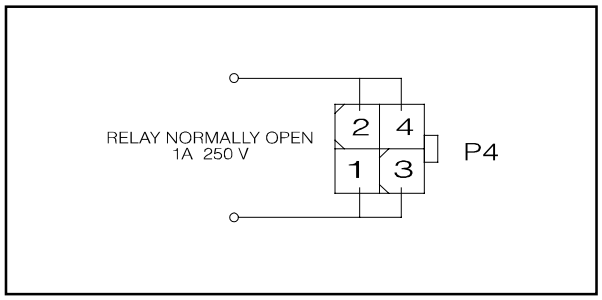
Connection F (P5) - Additional Fan Connection

An unswitched +24 Vdc fan connection is provided in addition to that above mentioned. It is accessible via P5 connector.

Connection G (P4) - Forepump Connection

A forepump connector output is available for controlling a forepump.

The output line voltage is present when the controller is in start condition.



Forepump Connector

CAUTION!

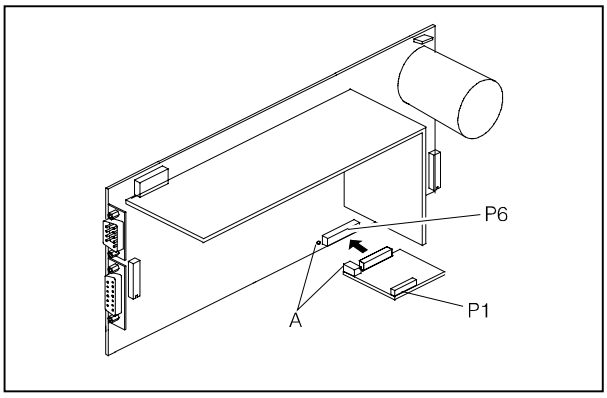
The voltage available is the same as that used to supply the controller, so keep attention to the voltage required by the used forepump.

OPTIONAL SERIAL PORT

Serial Port Installation

An optional RS 232/422/485 kit is available for both models. To install it, proceed as follows:

- Switch off the power
- Attach the interface board connector to connector P6 on thecontroller and then secure it in place using screew A (3x6), which is not provvided..
- Insert the flat cable and plug it into the socket **P1** located on the Interface board.



Serial port connector installation

Serial Communication Port

Communication serial port connections and mini- mum connection configuration are shown in the following figures. The communication port mating connector is supplied with the RS 232 PCB (AMP/Cannon or equivalent 9-pin "D" type male connector). The external cable (not supplied) between the host computer and the controller doesn't require any crossed wires so that signals are connected correctly.
For example, the Transmit data signal from controller (pin 2) must be connected to the host computer's Receive data line (pin 2) and vice versa. Consult the host computer's instruction manual for its serial port connections.

NOTE

Varian cannot guarantee compliance with FCC regulations for radiated emissions unless all external wiring is shielded, with the shield being terminated to the metal shroud on the O-subconnector. The cable should be secured to the connector with screws.

RS 232-422 Communication Descriptions

Communication format:

- 8 data bit
- no parity
- 1 stop bit
- The baud rate is programmable via front panel from 600 to 9600 baud. The controller is factory-set for 9600 baud operation.

NOTE

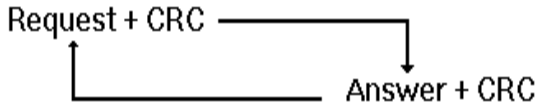
When a baud rate of 2400, 4800, 9600 baud is used, the requested information from to controller must be sent with a minimum interval of 1 second to avoid the controller hang-up.

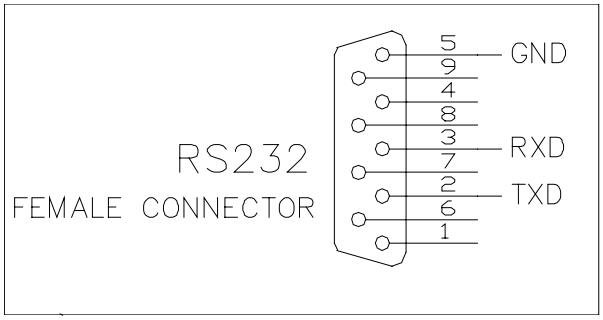
Communication protocol:

Host = Master Turbo-V70SW

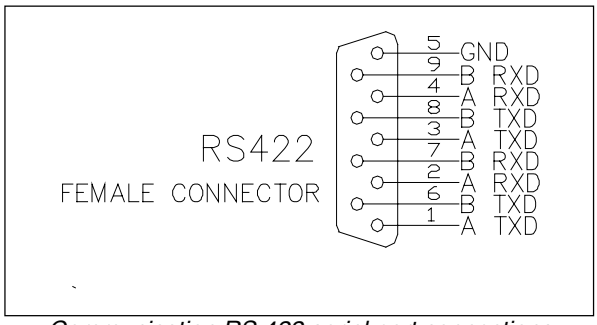
controller = slave

The communication is performed in the following way:





Communication RS 232 serial port connections



Communication RS 422 serial port connections

Request is an ASCII character identifying the action that must be performed by the controller or the requested information.

Allowed ASCII characters:

- "A" = START
- "B" = STOP
- "C" = Low Speed ON
- "D" = Low Speed OFF
- "E" = Request for operational parameters
- "F" = Pump times zeroing
- "G" = Parameters reading
- "H" = Parameters writing
- "I" = Request for operating status
- "J" = Request for numerical reading
- "K" = Request for counters reading.
- "L" = Software version
- "N" = Print to host serial mode change
- "O" = Host to print serial mode change
- "P" = Front panel operation mode selection
- "Q" = Remote operation mode selection
- "R" = RS 232 operation mode selection
- "S" + "number" = Baud rate selection

The command "N", "O", "P", "Q", "R" and "S" are always acknowledged in any chosen operation mode.

CRC corresponds to the sum (with inverted sign) of all the preceding bytes.

e.g., the START command "A" in ASCII code = 41; inverted it will be: FF + 1 - 41 = BF.

Character	ASCII	Converted ASCII for CRC calculation
"A"	41h	-
CRC	-	BFh
"B"	42h	-
CRC	-	BEh
"C"	43h	-
CRC	-	BDh
"D"	44h	-
CRC	-	BCh
"E"	45h	-
CRC	-	BBh
"F"	46h	-
CRC	-	BAh
"G"	47h	-
CRC	-	89h
"H"	48h	-
"I "	49h	-
CRC	-	B7h
"J"	4Ah	-
CRC	-	B6h
"K"	4Bh	-
CRC	-	B5h
"L"	4Ch	-
CRC	-	B4h
"N"	4Eh	-
CRC	-	B2h
"O"	4Fh	-
CRC	-	B1h
"P"	50h	-
CRC	-	B0h
"Q"	51h	-
CRC	-	AFh
"R"	52h	-
CRC	-	AEh
"S"	53h -	-
"ACK"	06h	-
CRC	-	FAh
"NACK"	15h	-
CRC	-	EBh

Answer = after a request from the host, the Turbo-V70 SW controller will answer in one of the following ways:

- ACK
- NACK
- Message

When the Request is "A, "B", "C", "D", "F", "N", "O", "P", "Q", "R", the Turbo-V70 SW controller will Answer the ACK or NACK.

When the Request is "E, the **Answer** will contain the complete set of the following parameters:

Bytes	Meaning
LSB X X X X 1 X X X MSB X	0000=STOP 0001=WAITING INTERLOCK 0010= STARTING 0011 = NORMAL OPERATION 0100= HIGH LOAD 0101= "" "" 0110 =FAILURE 0111=APPROACHING LOW SPEED ... ...
2÷5	Cycle Time
6÷9	Pump Life
10÷11	Pump Temperature
12	Power*
13	Voltage*
14÷17	Frequency
18÷19	Cycle #
20	R1 Status
21	R2 Status
22	CRC

*The values for current and voltage are given as numbers, scaled from 0 to 255, where 0 corresponds to 0 V and 255 to the full scale voltage (100V) or power (100 W).

When the ***Request*** is "G", the ***Answer*** will contain a string of 12 characters with the following parameters:

Bytes	Meaning
1	Speed adjust value (in KRPM)
2-3	Pump cycles number (integer coded in 2 bytes)
4	Speed threshold
5-8	Run up time in seconds (long coded in 4 bytes)
9	Deat time (0 = NO 1 = YES)
10	Soft Start mode (0 = NO 1=YES)
11	Water cooling (0 = NO 1=YES)
12	CRC

When the configuration parameters have to be changed, send a ***Request*** string with H characters of the following type:

"H" + ... data .... + CRC

The following parameters can be changed:

Bytes	Meaning
1	Speed adjust value (in KRPM)
2	Speed threshold
3-6	Run up time in seconds (long coded in 4 bytes)
7	Deat time (0 = NO 1 = YES)
8	Soft Start mode (0 = NO I=YES)
9	Water cooling (0 = NO I=YES)
10	CRC

When the ***Request*** is "I" (Status readings), the ***Answer*** will contain a string of 2 characters with the following parameters:

Bytes	Meaning
	0000 = STOP
	0001 = WAITING INTERLOCK
LSB X	0010 = STARTING
X	0011 = NORMAL OPERATION
X	0100 = HIGH LOAD
X	0101 = " " " "
	0110 = FAILURE
	0111 = APPROACHING LOW SPEED
1	
X	R2 status (0 = OFF 1 = ON)
X	R1 status (0 = OFF 1 = ON)
X	...
MSB X	...
2	CRC

When the ***Request*** is "J" (Numerical readings), the ***Answer*** will contain a string of 5 characters with the following parameters:

Bytes	Meaning
1	Power (0-255 scaled)
2	Voltage (0-255 scaled)
3	Rotational speed KRPM
4	Pump temperature °C (0-70 temperature reading, 255 = fail)
5	CRC

When the ***Request*** is "K" (Counters readings), the ***Answer*** will contain a string of 11 characters with the following parameters:

Bytes	Meaning
1-4	Cycle time
5-8	Pump life
9-10	Cycle number
11	CRC

When the ***Request*** is "L" (software version), the ***Answer*** will contain a string of 12 characters with the following parameters:

Bytes	Meaning
1-3	Software version
4-7	CRC 16 EPROM
8-11	CRC 16 parameters
12	CRC

On request a sample program in QBasic language is available by Varian.

When the configuration parameters have to be changed, send a ***Request*** string with the letter “S” and a series of characters as shown below:

"S" + ... DATA .... + CRC

The CRC is calculated on the string consisting of S + DATA.

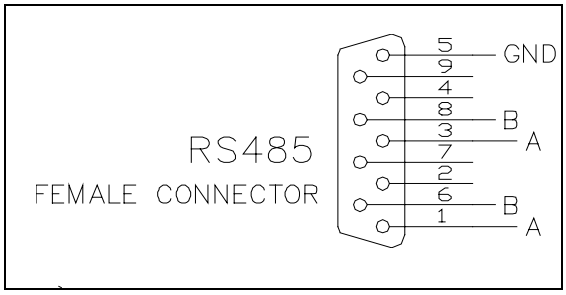
This field is structured as follows:

Bytes	Meaning
1	0 ÷ 4
2	CRC

The values assumed by byte “1” have the following meaning:

- 0 = 600 baud
- 1 = 1200 baud
- 2 = 2400 baud
- 3 = 4800 baud
- 4 = 9600 baud

RS 485 Communication Description



Communication RS 485 serial port connections

Transmission channel characteristics

levels:	RS485
baud rate:	9600/4800/2400/1200/600 programmable
character lenght:	8 bits
parity:	none
stop bit:	1 bit
protocoll:	master (PC) / slave (converter)
max. devices:	32

Message structure
(request and answer have the same format)

The master system (PC) starts every session sending the following message to the slave units connected:

<STX> + <ADDR> + <WINDOW> + <COMMAND> + <DATA> + <ETX> + <CRC>

where :

<STX>= 0x02

<ADDR> = 0x80 (for RS 232 and RS 422 only)

<ADDR> = 0x80 + device number (0...31)
0xFF: brodcasting command (recognized by all the devices, it doesn't implicate any answer) (for RS 485 only)

<WINDOWS>= ' 000 '...' 999' window number the meaning of the window depends to the device type

<COMMAND>= 0x30: window value reading
0x31: window writing

<DATA> = alphanumeric ASCII string containing, in the case of writing operation,the parameter to input into the window addressed by the field <WINDOW>This field may have variable length according to the data type contained in the window where you are working in. In the case of reading request of a window, the data field doesn't exist.

<ETX>= 0x03

<CRC>= XOR among all the characters following <STX>=(with exception of <STX>), including the end character <ETX> hexadecimally encoded by two ASCII characters.

When a slave device is addressed by the master :

1) In case of reading request of the value contained in a window, the slave answers a string equal to the one sent by the master but in addition there is the field <DATA> containing the value of the window.The format of the field <DATA> depends to the window type.
The different types are :

	Lenght	**Characters permitted**
logic	1	'0'=OFF ,'1'=ON
analog	6	'-', '-','0'...'9' (to the right with '0')
alphanumeric	max 10	' '...' _'

EXAMPLES:

Command : START
Source : PC
Destination : Inverter

02	80	30	30	30	31	31	03	42	33
STX	ADDR	WINDOW			WR	ON	ETX	CRC	

Source : Inverter
Destination : PC

02	80	06	03	38	35
STX	ADDR	ACK	ETX	CRC	

Command : STOP
Source : PC
Destination : Inverter

02	80	30	30	30	31	30	03	42	32
STX	ADDR	WINDOW			WR	OF F	ETX	CRC	

Source : Inverter
Destination : PC

02	80	06	03	38	35
STX	ADDR	ACK	ETX	CRC	

Command : SOFT-START (ON)
Source : PC
Destination : Inverter

02	80	31	30	30	31	31	03	42	32
STX	ADDR	WINDOW			WR	ON	ETX	CRC	

Source : Inverter
Destination : PC

02	80	06	03	38	35
STX	ADDR	ACK	ETX	CRC	

Command : SOFT-START (OFF)
Source : PC
Destination : Inverter

02	80	31	30	30	31	30	03	42	33
STX	ADDR	WINDOW			WR	OF F	ETX	CRC	

Source : Inverter
Destination : PC

02	80	06	03	38	35
STX	ADDR	ACK	ETX	CRC	

Command : LOW SPEED (ON)
Source : PC
Destination : Inverter

02	80	30	30	31	31	31	03	42	32
STX	ADDR	WINDOW			WR	ON	ETX	CRC	

Source : Inverter
Destination : PC

02	80	06	03	38	35
STX	ADDR	ACK	ETX	CRC	

Command : LOW SPEED (OFF)
Source : PC
Destination : Inverter

02	80	30	30	31	31	30	03	42	33
STX	ADDR	WINDOW			WR	OF F	ETX	CRC	

Source : Inverter
Destination : PC

02	80	06	03	38	35
STX	ADDR	ACK	ETX	CRC	

Command : CURRENT
Source : PC
Destination : Inverter

02	80	32	30	30	30	03	38	31
STX	ADDR	WINDOW			RD	ETX	CRC	

Source : Inverter
Destination : PC

02	80	32	30	30	30	30	30	30	2E	30	30	03	39	44
STX	ADD	WINDOW			RD	000.00						ETX	CRC	

Command : FREQUENCY
Source : PC
Destination : Inverter

02	80	32	30	33	30	03	38	32
STX	ADDR	WINDOW			RD	ETX	CRC	

Source : Inverter
Destination : PC

02	80	32	30	33	30	30	30	30	30	33	38	03	38	38
STX	ADD	WINDOW			RD	000038						ETX	CRC	

Command : ERR-CODE
Source : PC
Destination : Inverter

02	80	32	30	36	30	03	38	37
STX	ADDR	WINDOW			RD	ETX	CRC	

Source : Inverter
Destination : PC

02	80	32	30	36	30	30	30	30	30	30	30	03	38	33
STX	ADD	WINDOW			RD	000000						ETX	CRC	

WIN	R	W	T	Description
000	X	X	L	START/STOP
001	X	X	L	LOW SPEED ON/OFF
100	X	X	L	SOFT START YES/NO
101	X	X	L	DEAT TIME YES/NO
102	X	X	L	WATER COOLING YES/NO
103	X	X	N	SPEED THRESHOLD
104	X	X	N	RUN UP TIME (0÷359.999 sec)
106	X	X	N	SPEED ADJUST
107	X	X	N	MODE (0, 1, 2) [FRONT, REMOTE, SERIAL]
108	X	X	N	BAUD_RATE (0-4) [600, 1200, 2400, 4800, 9600]
109		X	L	PUMP LIFE RESET (WRITE ON TO RESET)
200	X		N	CURRENT [A]
201	X		N	VOLTAGE [V]
202	X		N	POWER [W]
203	X		N	FREQUENCY [Krpm]
204	X		N	TEMPERATURE (0÷99) [°C]
205	X		N	PUMP STATE (0÷6) [STOP, WAITING INTERLOCK, STARTING, NORMAL, HIGH LOAD,
				FAILURE, APPROACHING]
206	X		N	ERROR CODE (0÷7) [NO ERROR, OVERVOLTAGE, SHORT CIRCUIT, CHECK CONN.,
				TOO HIGH LOAD, OVERRIDE, OVERTEMP PUMP, OVERTEMP CONTR.]
207	X		L	STATE R1 ON/OFF
208	X		L	STATE R2 ON/OFF
300	X		N	CYCLE TIME (0-999.999) IN HOURS
301	X		N	CYCLE NUMBER (0- 65.535) IN COUNTS
302	X		N	PUMP LIFE (0-999.999) IN HOURS
400	X		A	CRC PROGRAM LISTING
402	X		A	CRC PARAMETER LISTING

WIN = Window
R = Read
W = Write

T = Type:
L = Logical
N = Numeric
A = Alphanumeric

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-V70 pump is baked by a membrane pump, the Soft Start mode should be deselected.

NOTE

The following instructions are applicable to Turbo-V70 Switching PCB Controller only when the optional "hand held terminal" is installed.

Startup

- Apply the mains to the controller.
- The display lights, and shows:

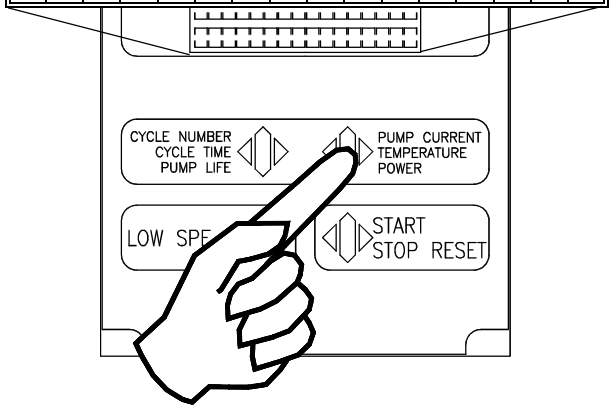
R	E	A	D	Y		F	O	R		L	O	C	A	L	
S	O	F	T			S	T	A	R	T					

The controller with the Soft Start mode allows the pump to ramp-up to Normal speed slowly with a minimum ramp-up time of 30 minutes and a maximum of about 55 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 60 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			

- Press the CURRENT pushbutton and the display shows (e.g.):

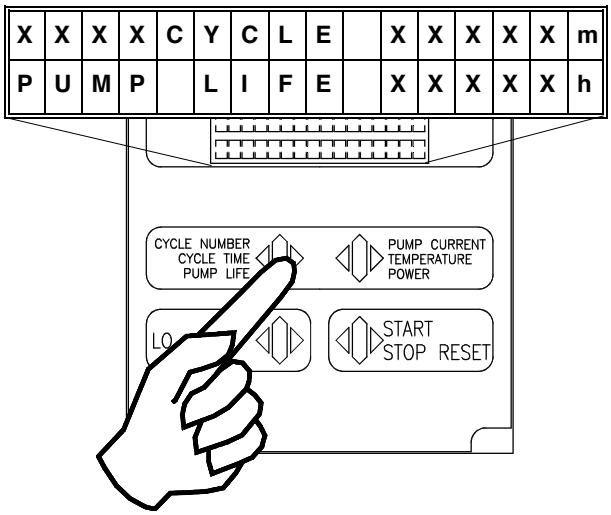
	P	=	X	X	X	W					X	X	°	C	
Y	Y				X	X		K	R	P	M				



where:

- **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)
- **Y** = 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 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

- Press CYCLE NUMBER and PUMP CURRENT pushbuttons together for at least 2 seconds and the processor enters in a routine where it is possible to program the controller.

In this routine, the CYCLE pushbutton is used for choosing/changing the value or condition; the PUMP CURRENT pushbutton is used to enter and confirm the value.

At any time it is possible to exit this routine by pressing the CYCLE and PUMP CURRENT pushbuttons at the same time for at least 2 seconds.

The display shows:

S	**O**	**F**	**T**		**S**	**T**	**A**	**R**	**T**		**M**	**O**	**D**	**E**	
S	**E**	**L**	**E**	**C**	**T**	**I**	**O**	**N**	**:**		**X**	**X**	**X**		

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

If YES is selected, the Soft Start mode allows the pump to rump-up the Normal speed within ten steps.

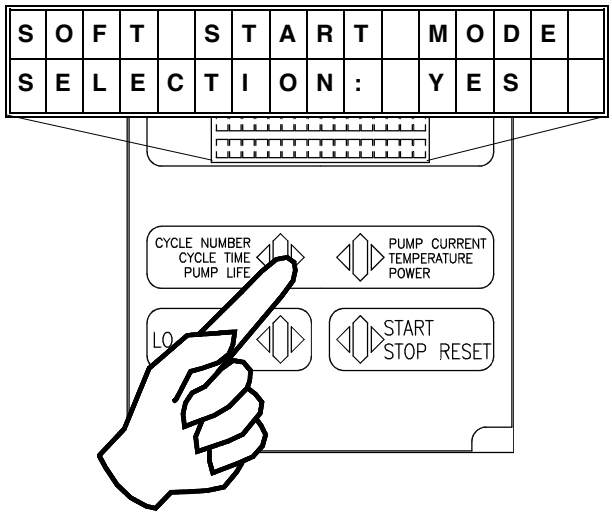
When NO is selected, the Soft Start mode is deselected and the rump-up of the pump will be done within 60 seconds.

The controller is factory set to YES.

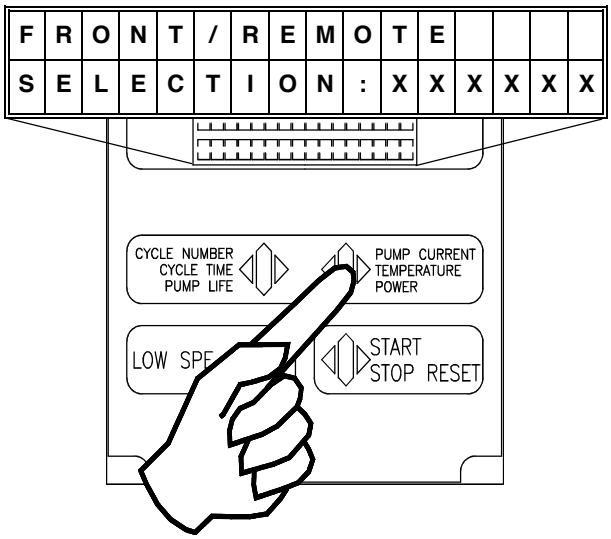
NOTE

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

- Press CYCLE NUMBER to select YES or NO

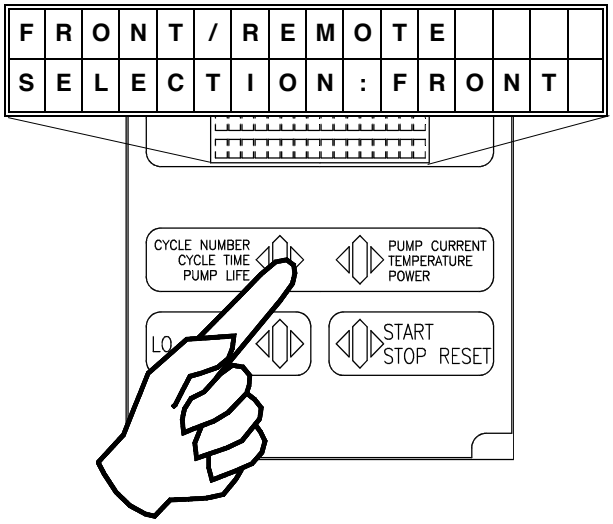


- Enter the selection by pressing the PUMP CURRENT pushbutton, and the display shows:



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

- Choose the desired selection by pressing the CYCLE pushbutton.

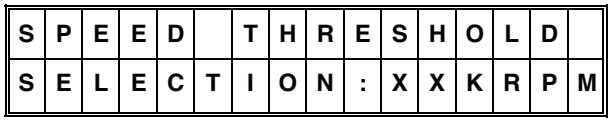


- Confirm the selection by pressing the PUMP CURRENT pushbutton.

- In this way you enter into an operating phase named "Monitor Relay Programming" described in the following paragraph.

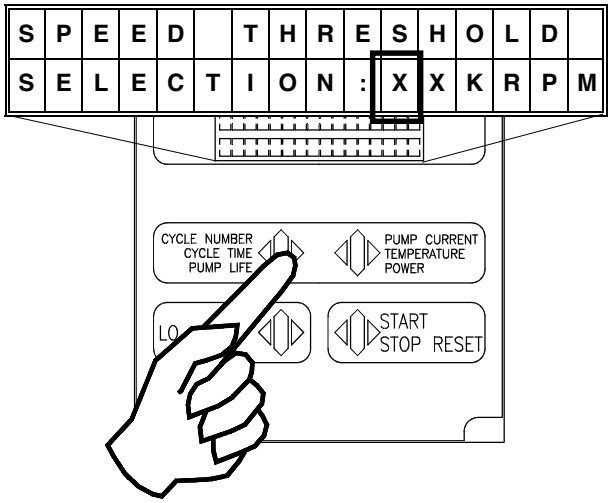
Monitor Relay Programming

- The display shows:

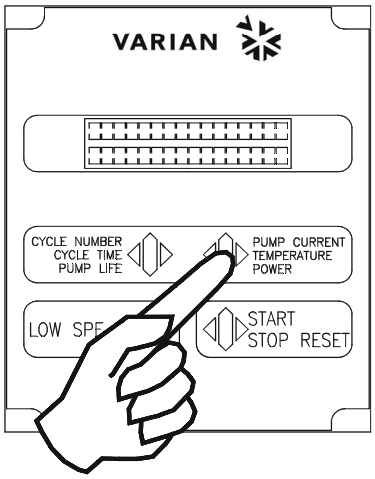


where: **XXKRPM** = is the switch point of relay R1 at the preset turbopump speed, adjustable from 00 to 99 KRPM.
The speed threshold will condition the R1 and R2 operation (see the following cycle diagram) and it is factory-set to 67 KRPM.

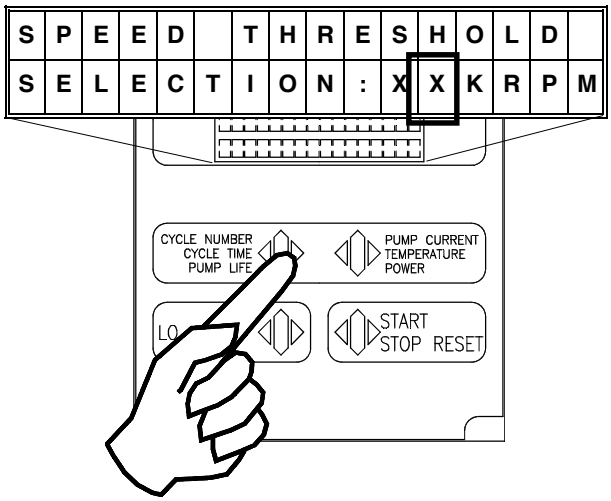
- Press the CYCLE NUMBER pushbutton to select the first number.

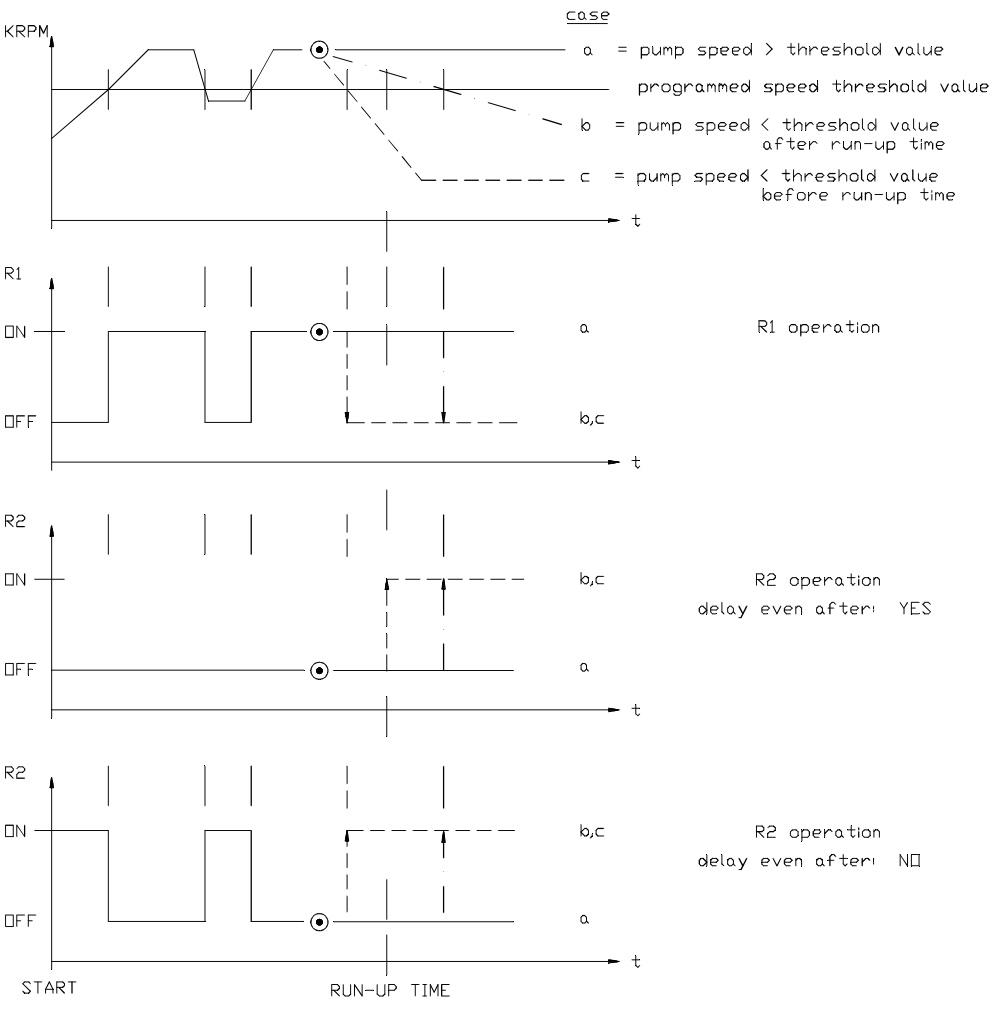


- Enter the value by pressing the PUMP CURRENT pushbutton.



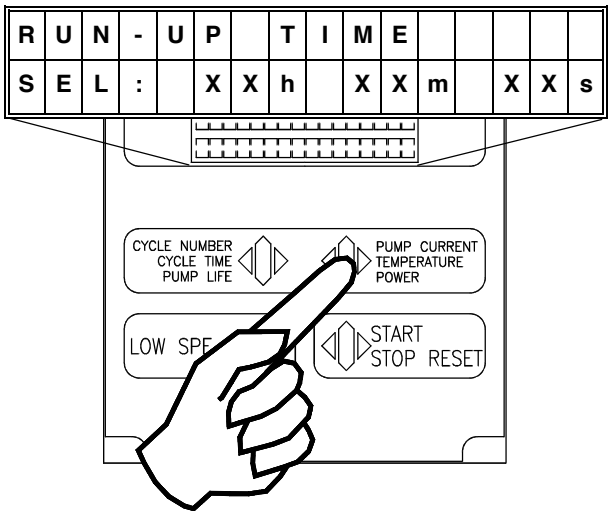
- Press the CYCLE NUMBER pushbutton to select the second number.





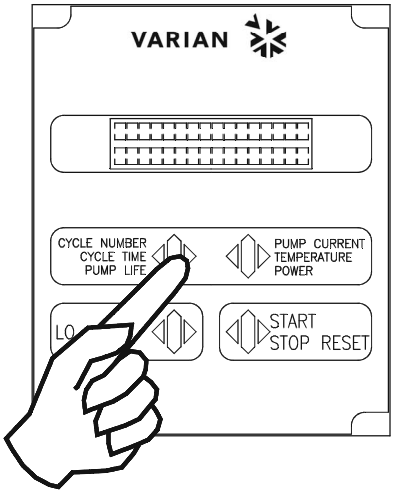
Cycle diagram

- Enter the value by pressing the PUMP CURRENT push-button, and the display shows:

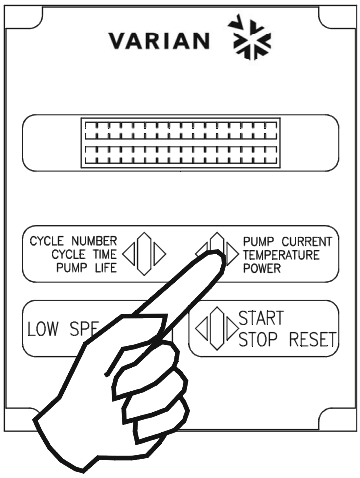


where: **RUN-UP TIME** = is the interval time from start to speed threshold value in hours, minutes, seconds. Select from 00 to 99 hours, and from 00 to 59 minutes or seconds.

- Select the run-up time according to the chamber volume and/or operating cycle feature (see the preceeding cycle diagram) by pressing the CYCLE NUMBER pushbutton to select the desired number.



- Press the PUMP CURRENT pushbutton to enter the data.



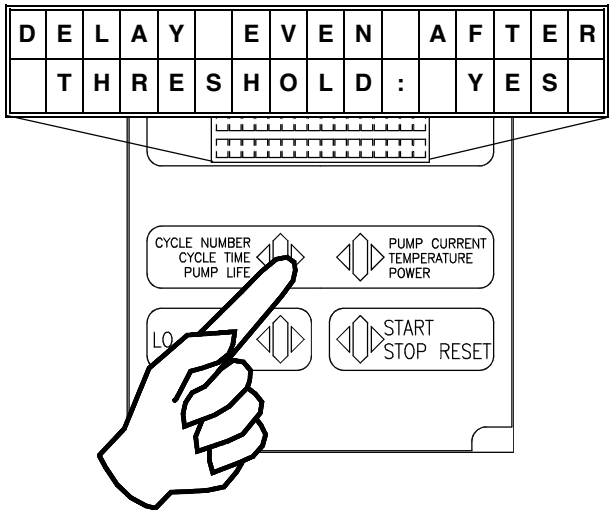
The run up time is factory-set to: 00h 08m 00s.

- When the last digit is entered, the display shows:

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.

- Press the CYCLE NUMBER pushbutton and 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 (see the preceeding cycle diagram).
This function is factory-set to YES.



- Press PUMP CURRENT to confirm. and 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.

The controller is factory-set to 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:

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

or

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

and the controller is ready to restart (see paragraph "Startup").

NOTE

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

Starting the Pump

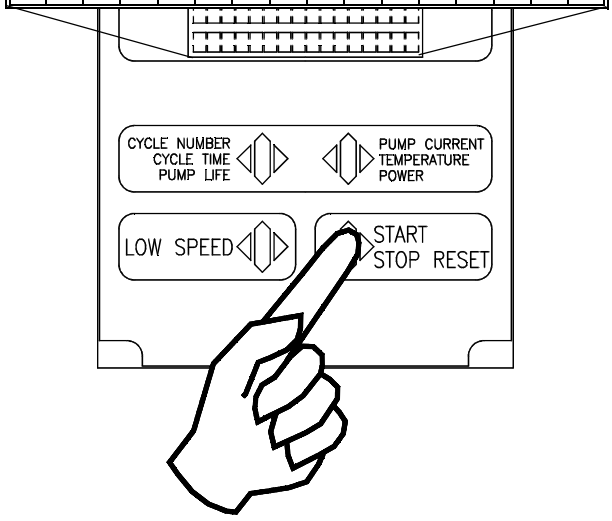
If the forepump and vent device are not operated by the controller, close the vent valve and switch on the forepump.

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 pushbutton (or use the remote start signal), and the display shows:

S	O	F	T		S	T	A	R	T		O	N			
		[	.	.	.	.	.	.	.	.	.	]			



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

- 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 100 W the speed of the pump is decreased to maintain the maximun current allowable (100 W).

- 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 and the related output is 24V.

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, voltage and frequency output will be at the maximum level, then the frequency will decrease to a value proportional to the pump rotational speed (about 9 KRMP if the pump is completely stopped). The pump will accelerate to its normal rotational speed.

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

- When the normal rotational 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).

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. Than the Turbo-V pump is slowed down in proportion to the gas load at least until it reaches about 9 KRPM and the display shows.

N	O	R	M	A	L		O	P	E	R	A	T	I	O	N
1	2			X	X		K	R	P	M					

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

Low Speed Operation

NOTE

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

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 pushbutton 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						

or:

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

or:

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

and when the pump reaches the low speed value, display reverts to:

N	O	R	M	A	L		O	P	E	R	A	T	I	O	N
				5	0		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 1/8 of the nominal speed.
If the LOW SPEED mode is selected after normal operating condition is reached, the display shows:

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

while approaching the low speed value.

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

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 Selection") and when ready to start, the display shows:

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 front panel push-buttons are inoperative, while the CYCLE NUMBER and PUMP CURRENT pushbuttons are always active.

ELECTRICAL DIAGRAMS

In the following pages are shown the Turbo-V controller electrical diagrams.

ACCESSORIES AND SPARE PARTS

DESCRIPTION	PART NUMBER
J1 input mating connector	969-9853

OPTIONS

DESCRIPTION	PART NUMBER
P2 output mating connector	969-9852
Hand held terminal	969-9860

VARIAN

Request for Return

ISO 9001 REGISTERED

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

North and South America	**Europe and Middle East**	**Asia and ROW**
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CUSTOMER INFORMATION

Company name: ……

Contact person: Name: …… Tel: ……

Fax: …… E-Mail: ……

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

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

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

…… ……

…… ……

PRODUCT IDENTIFICATION

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

TYPE OF RETURN *(check appropriate box)*

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

HEALTH and SAFETY CERTIFICATION

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

The equipment listed above (check one):

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

OR

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

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

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

……

Print Name: …… Customer Authorized Signature: ……

Print Title: …… Date: ……/……/……

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

Do not write below this line

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

VARIAN

Request for Return

ISO 9001 REGISTERED

FAILURE REPORT

TURBO PUMPS and TURBOCONTROLLERS

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

TURBOCONTROLLER ERROR MESSAGE:

ION PUMPS/CONTROLLERS

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

Customer application:

VALVES/COMPONENTS

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

Customer application:

LEAK DETECTORS

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

Customer application:

INSTRUMENTS

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

Customer application:

PRIMARY PUMPS

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

Customer application:

DIFFUSION PUMPS

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

Customer application:

FAILURE DESCRIPTION

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

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

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