VARIAN

vacuum technologies

Turbo-V 6000 controller

Model 969-9491
Model 969-9591

MANUALE ISTRUZIONI

BEDIENUNGSHANDBUCH

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MANUAL DE ISTRUÇÕES

BEDRIJFSHANDLEIDING

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OHJEKÄSIKIRJA

ΟΔΗΓΙΕΣ ΧΡΗΣΕΩΣ

INSTRUCTION MANUAL

87-900-855-01 (B)
APRIL 2002

Turbo-V 6000 Controller

VARIAN

vacuum technologies

Dear Customer,

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

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

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

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

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

Sincerely.

Sergio PIRAS

Vice President and General Manager
VARIAN Vacuum Technologies

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

CUSTOMER REQUEST FOR CORRECTIVE / PREVENTIVE / IMPROVEMENT ACTION

TO : VARIAN VACUUM TECHNOLOGIES TORINO - QUALITY ASSURANCE

FAX N° : XXXX - 011 - 9979350

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

E-MAIL : marco.marzio@varianinc.com

NAME	COMPANY	FUNCTION

ADDRESS :

TEL. N° : FAX N° :

E-MAIL :

PROBLEM / SUGGESTION :

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

DATE

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

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

VARIAN

INFORMAZIONI GENERALI

Questa apparecchiatura è destinata ad uso professionale. L'utilizzatore deve leggere attentamente il presente manuale di istruzioni ed ogni altra informazione addizionale fornita dalla Varian prima dell'utilizzo dell'apparecchiatura. La Varian si ritiene sollevata da eventuali responsabilità dovute all'inosservanza totale o parziale delle istruzioni, ad uso improprio da parte di personale non addestrato, ad interventi non autorizzati o ad uso contrario alle normative nazionali specifiche. I controller della serie Turbo-V 6000 sono dei convertitori di frequenza, controllati da un microprocessore, realizzati con componenti a stato solido e con capacità di autodiagnostica e autoprotezione. I controller pilotano le pompe della serie Turbo-V 6000 (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. Essi incorporano tutta la circuiteria necessaria per il funzionamento automatico delle pompe della serie Turbo-V 6000. Tramite un connettore ausiliario 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, i segnali di bloccaggio (per interruttori a pressione, interruttori di controllo del flusso dell'acqua, ecc.). Nei paragrafi seguenti sono riportate tutte le informazioni necessarie a garantire la sicurezza dell'operatore durante L'utilizzo dell'apparecchiatura. Informazioni dettagliate sono fornite nell'appendice "Technical Information".

Questo manuale utilizza le seguenti convenzioni:

PERICOLO!

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

ATTENZIONE!

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

NOTA

Le note contengono informazioni importanti estrapolate dal testo.

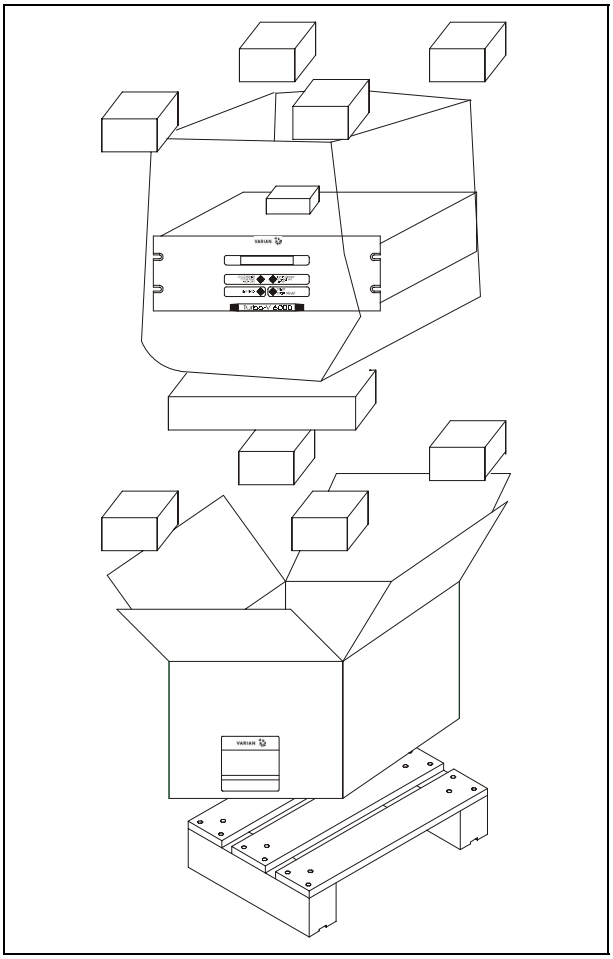
IMMAGAZZINAMENTO

Durante il trasporto e l'immagazzinamento dei 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. 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.



Imballo dei controllers

Ogni controller è fornito dalla Varian predisposto per una certa tensione di alimentazione:

- il modello 969-9491 per 220 Vac
- il modello 969-9591 per 120 Vac

Verificare che sia stata selezionata la tensione corretta e quindi collegare il cavo di alimentazione.

INSTALLAZIONE

PERICOLO!

II controller è fornito di un cavo di alimentazione a tre fili con una spina di tipo approvato a livello internazionale. Utilizzare sempre questo cavo di alimentazione ed inserire la spina in una presa con un adeguato collegamento di massa onde evitare scariche elettriche. 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 presa di alimentazione.

NOTA

Il controller può essere installato su di un tavolo o all'interno di un apposito rack. In ogni caso occorre che l'aria di raffreddamento possa circolare liberamente intorno all'apparato. Non installare né 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 O °C a +40 °C;
- umidità relativa: 0 - 95% (non condensante).

Per il collegamento del controller con la relativa pompa utilizzare il cavo specifico del controller stesso.

Per gli altri collegamenti e l'installazione degli accessori opzionali, vedere la sezione "Technical Information".

USO

In questo paragrafo sono riportate le principali procedure operative. Per ulteriori dettagli e per procedure che coinvolgono collegamenti o particolari opzionali, fare riferimento al paragrafo "Use" dell'appendice "Technical Information". Prima di usare il controller effettuare tutti i collegamenti elettrici e pneumatici e fare riferimento al manuale della pompa collegata.

PERICOLO!

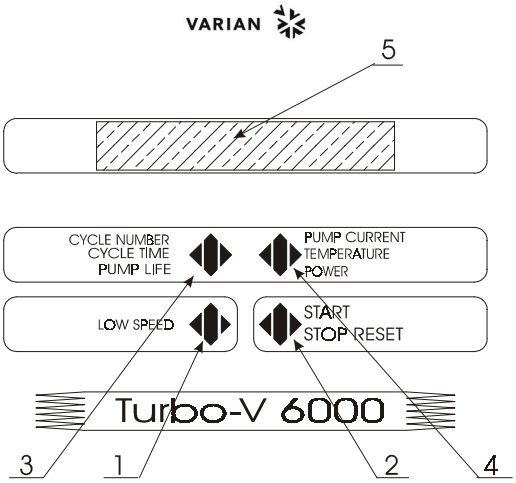
Per evitare danni alle persone ed all'apparato, nel caso in cui la pompa sia appoggiata su di un tavolo assicurarsi che sia stabile. Non fare funzionare mai la pompa se la flangia di ingresso non è collegata al sistema o non è chiusa con la flangia di chiusura.

NOTA

Il connettore di richiusura J1 deve essere lasciato collegato con il suo ponticello se non viene effettuato alcun collegamento esterno. La pompa di pre-vuoto e la pompa Turbo-V possono essere accese contemporaneamente.

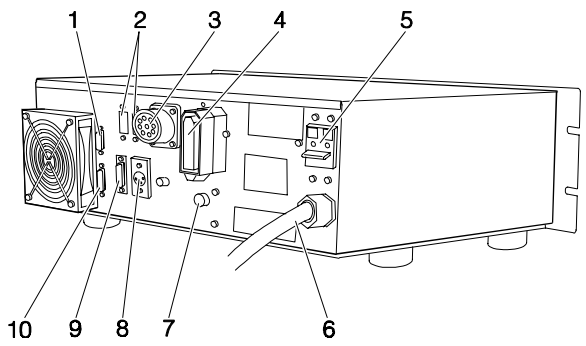
Comandi, indicatori e connettori del Controller

Di seguito sono illustrati il pannello di comando del Controller ed i pannelli di interconnessione. Per maggiori dettagli fare riferimento alla sezione "Technical Information".



1. Pulsante per la selezione del modo LOW SPEED. È attivo solo quando è selezionato il modo di comando dal pennello frontale. Premendolo una volta, la pompa ruota a circa 2/3 dalla velocità nominale. Premendolo ancora una volta 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 power, rotational speed, temperatura cuscinetto inferiore, temperatura cuscinetto superiore, temperatura motore, frequenza di eccitazione. 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 24 caratteri.

Pannello frontale del Controller
969-9491 e 969-9591



1. Connettore di ingresso dei segnali logici (il connettore di accoppiamento viene fornito con l'apposito ponticello di richiusura).
2. Vano previsto per i connettori della porta di comunicazione seriale RS 232/RS 485/RS 422 (fornita come opzione).
3. Connettore di uscita trifase verso la pompa.
4. Connettore di uscita tensione 120 Vac 1 A per alimentare Vent Device e Forepump, 3 A max per Heater Band.
5. Interruttore magnetotermico generale.
6. Cavo alimentazione.
7. Fusibile per Heater Band T5 A 250 Vac.
8. Connettore per ingresso segnale esterno da 0 a 10 Vdc.
9. Connettore per segnali provenienti dalla pompa.
10. Connettore di uscita dei segnali logici e di verifica della corrente e velocità della pompa.

Pannello posteriore dei controller 969-9491 e 969-9591

PROCEDURE DI USO

Accensione del Controller

Per accendere il controller è sufficiente inserire il cavo di alimentazione nella presa di rete e portare l'interruttore di linea in posizione ON.

Avvio della Pompa

Per avviare la pompa occorre premere il pulsante START del pannello frontale dopo aver collegato il cavo fornito con il controller (dal connettore P31 alla pompa).

Arresto della Pompa

Per arrestare la pompa occorre premere il pulsante STOP del pannello frontale.

MANUTENZIONE

I controller della serie Turbo-V 6000 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 advanced exchange service", che permette di ottenere un controller rigenerato in sostituzione di quello guasto.

PERICOLO!

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

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

MESSAGGI DI ERRORE

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

MESSAGGIO	DESCRIZIONE	AZIONE CORRETTIVA
CHECK CONNECTION TO PUMP	Malfunzionamento nel collegamento tra pompa e controller (P31).	Verificare che il cavo di collegamento tra pompa e controller sia ben fissato da entrambe le estremità e non sia interrotto. Premere due volte il pulsante START per riavviare la pompa.
PUMP WAITING INTERLOCK	È attivo il segnale di interlock presente sul connettore P1 a causa dell'interruzione del corto circuito tra il pin 3 ed il pin 8 del connettore J1, o a causa dell'apertura del segnale di interlock esterno.	Ripristinare il corto circuito tra il pin 3 ed il pin 8 del connettore J1, o chiudere il segnale di interlock esterno
FAULT: OVERTIME	La pompa non ha raggiunto la velocità prevista di 5500 KRPM 12 minuti dopo l'avvio con SOFT START deselezionato.	Verificare che il sistema non presenti delle perdite. Premere due volte il pulsante START per riavviare la pompa.
FAULT: PUMP OVERHEATED	La temperatura ha superato uno dei seguenti valori di soglia: - 65 °C per i cuscinetti - 90 °C per il motore - 60 °C per l'acqua.	Attendere che la temperatura ritorni al di sotto della soglia. Premere due volte il pulsante START per riavviare la pompa.
FAULT: CONTROLLER OVERHEATED	La temperatura del trasformatore del controller ha superato i 90 °C oppure la temperatura sul radiatore dei Mosfets di uscita è superiore a 60 °C.	Attendere che la temperatura ritorni al di sotto della soglia. Premere due volte il pulsante START per riavviare la pompa.
FAULT: OVERLOAD	Durante il funzionamento normale (dopo la fase di avvio) la corrente assorbita dalla pompa è maggiore di quella programmata (25 A).	Verificare che il rotore della pompa abbia la possibilità di ruotare liberamente. Premere due volte il pulsante START per riavviare la pompa.
FAULT: SHORT CIRCUIT	Durante il funzionamento normale la connessione di uscita è in corto circuito (corrente di uscita maggiore di 60 A).	Verificare i collegamenti tra pompa e controller. Premere due volte il pulsante START per riavviare la pompa. Verificare l'isolamento tra il motore e la pompa.
SYSTEM OVERRIDE	La pompa è stata fermata da un segnale di emergenza proveniente da un contatto remoto.	Staccare il cavo di alimentazione del controller e correggere la causa dell'emergenza. Ricollegare il cavo di alimentazione e premere due volte il pulsante START per riavviare la pompa.
OVERVOLTAGE	Si è verificato un guasto nella sezione di alimentazione del controller, o il controller ha ricevuto un segnale spurio.	Premere due volte il pulsante START per riavviare la pompa. Se il messaggio si ripresenta rivolgersi alla Varian per la manutenzione.
OIL LEVEL AT MIN	Il sensore del livello olio ha rilevato un livello inferiore a quello di sicurezza.	Provvedere alla manutenzione della pompa secondo le modalità descritte nell'apposito manuale.

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. Die Controller der Serie Turbo-V 6000 sind mikroprozessorgesteuerte Frequenzwandler. Sie sind mit Festkörperbauteilen gefertigt und verfügen über ein Selbstdiagnose- und ein Selbstschutz-system. Die Controller steuern die Pumpen der Serie Turbo-V 6000 (durch einen 10-Schritte-Prozeß) in der Startphase, indem sie die Spannung und die Stromstärke im Verhältnis zur Pumpengeschwindig-keit kontrollieren.
Sie enthalten alle für den automatischen Betrieb der Pumpenserie Turbo-V 6000 erforderlichen Schaltungen.
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.
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 vor bestimmten Prozeduren machen den Bediener darauf aufmerksam, daß bei Nichteinhaltung Schäden an der Anlage entstehen können.

ANMERKUNG

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

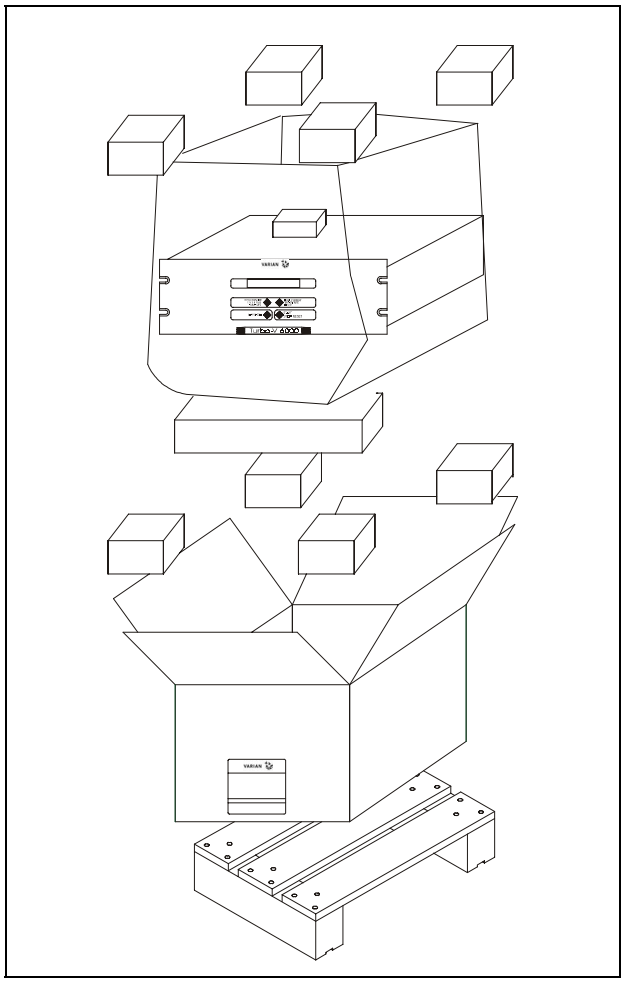
LAGERUNG

Beim Transport und bei der Lagerung der Controller müssen folgende klimatische Verhältnisse einge-halten werden:

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

VOR DER INSTALLATION

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



Verpackung der Controller

Alle Varian-Controller sind werkseitig für eine bestimmte Anschlußspannung ausgelegt:

- Modell 969-9491 für 220 VWs
- Modell 969-9591 für 120 VWs

Sicherstellen, daß die korrekte Spannung gewählt wurde, und das Netzkabel anschließen.

INSTALLATION

GEFAHR!

Der Controller wird mit einem Netzkabel geliefert, das 3 Drähte enthält und mit einem den internationalen Normen entsprechenden Stecker ausgerüstet ist. Es sollte immer dieses Netzkabel benutzt werden, das an eine korrekt geerdete Steckdose anzuschließen ist, um Stromentladungen zu vermeiden. Im Inneren des Controllers entstehen hohe Spannungen, die schwere Schäden verursachen und zum Teil lebensgefährlich sein können. Vor jedem Montage- bzw. Wartungseingriff muß deshalb der Netzstecker gezogen werden.

ANMERKUNG

Der Controller kann auf einen Tisch oder ein Gestell montiert werden. In beiden Fällen muß auf die ungehinderte Zirkulation der Kühlluft im Bereich des Geräts geachtet werden. 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).

Für den Anschluß des Controllers an die Pumpe muß das zum Controller gehörende Kabel benutzt werden.

Für weitere Hinweise bezüglich Anschlüsse und Montage des bestellbaren Zubehörs siehe "Technical Information".

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". Vor Benutzung des Controllers sämtliche elektrischen und pneuma-tischen Anschlüsse ausführen, und die Betriebsanlei-tung der angeschlossenen Pumpe durchlesen.

GEFAHR!

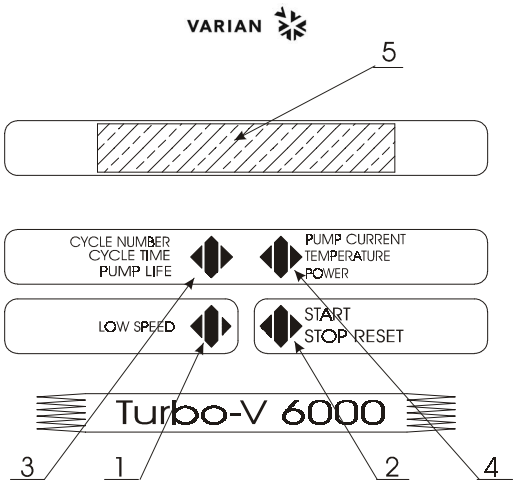
Steht die Pumpe auf einem Tisch, muß auf den stabilen Stand geachtet werden, da sonst die Gefahr von Personen- und Geräteschäden besteht. Die Pumpe nie einschalten, wenn der Eingangsflansch nicht am System angeschlossen bzw. nicht mit dem Schließflansch abgedeckt ist.

ANMERKUNG

Der Wiederverschließ-Verbinder J1 muß mit seiner Brücke angeschlossen bleiben, wenn kein externer Anschluß erfolgt. Die Vorvakuumpumpe und die Turbo-V-Pumpe können gleichzeitig eingeschaltet werden.

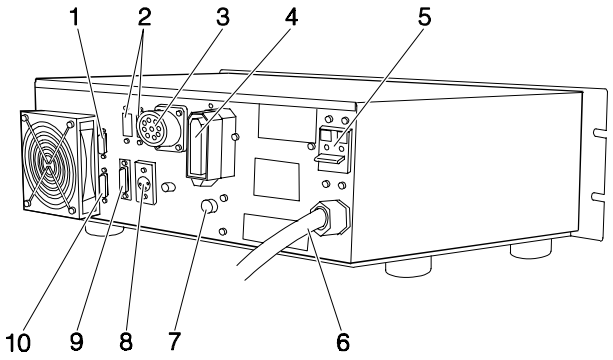
Steuerungen, Anzeigen und Verbinder des Controllers

Nachstehend werden die Steuertafel des Controllers sowie die Verbindungstafeln beschrieben.
Für weitere Einzelheiten siehe "Technical Information".



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 power", "rational speed" und untere Lagertemperatur, obere Lagertemperatur, Motor-temperatur, Anzugsfrequenz. 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 24 Stellen.

Fronttafel der Controller 969-9491 und 969-9591



1. Eingangsanschluß für die logischen Signale (der Anschluß wird mit der dafür vorgesehenen Wiederverschließbrücke geliefert).
2. Vorgesehene Aufnahme für die Steckverbinder des seriellen Anschlusses RS 232/RS 485/RS 422 (als Option geliefert).
3. Dreiphasen-Ausgangssteckverbinder zur Pumpe.
4. Anschluß für den Spannungsausgang 120 Vac 1 A zur Speisung des Vent Device und des Forepump, max. 3 A für Heater Band.
5. Magnetothermischer Hauptschalter.
6. Speisekabel.
7. Schmelzsicherung für Heater Band T5 A 250 Vac.
8. Eingangsanschluß für externe Signale von 0 bis 10 Vdc.
9. Eingangsanschluß für Signale von der Pumpe.
10. Ausgangssteckverbinder für die logischen Signale und die Prüfung der Spannung und der Pumpengeschwindigkeit.

Rückseitige Tafel der Controller 969-9491 und 969-9591

BEDIENUNG

Einschalten des Controllers

Zum Einschalten des Controllers genügt es, das Netzkabel an die Steckdose anzuschließen un den Leitungsschalter in Position ON bringen.

Pumpenstart

Zum Starten der Pumpe ist Taste "START" am Frontpaneel zu betätigen, nachdem das mit dem Steuergerät mitgelieferte Kabel angeschlossen wurde (vom Steckverbinder P31 zur Pumpe).

Pumpenstopp

Zum Stoppen der Pumpe muß die STOPP-Taste an der Fronttafel gedrückt werden.

WARTUNG

Die Controller der Serie Turbo-V 6000 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 defekter Controller sorgt.

GEFAHR!

Vor jedem Eingriff am Controller muß der Netzstecker gezogen werden.

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

FEHLERMELDUNGEN

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

MELDUNG	BESCHREIBUNG	BEHEBUNG
CHECK CONNECTION TO PUMP	Fehlfunktion der Pumpen-Controller Verbindung (P31).	Sicherstellen, daß das Verbindungskabel zwischen Pumpe und Controller an beiden Seiten korrekt befestigt ist und keine Unterbrechung vorliegt. Die Pumpe durch zweimalige Betätigung der START-Taste neustarten.
PUMP WAITING INTERLOCK	Das Interlock-Signal auf dem Verbinder P1 ist wegen der Kurzschlußunterbrechung zwischen Pin 3 und Pin 8 des Verbinders K1 oder wegen der Öffnung des externen Interlock-Signals aktiv.	Den Kurzschluß zwischen Pin 3 und Pin 8 des Verbinders J1 rücksetzen oder das externe Interlock-Signal schließen.
FAULT: OVERTIME	Die Pumpe hat 12 min nach dem Start mit deaktiviertem SOFT START nicht die vorgesehene Geschwindigkeit von 5.500 KRPM erreicht.	Prüfen, ob am System Leckagen vorhanden sind. Für den Wiederanlauf der Pumpe zweimal Druckknopf START drücken.
FAULT: PUMP OVERHEATED	Die Temperatur hat einen der folgenden Schwellenwerte überschritten: - 65 °C für die Lager - 90 °C am Motor - 60 °C für Wasser	Warten bis die Temperatur unter den Schwellenwert gesunken ist. Die Pumpe durch zweimalige Betätigung der START-Taste neustarten.
FAULT: CONTROLLER OVERHEATED	Die Transformatortemperatur des Controllers hat 90 °C überschritten oder die Temperatur am Radiator der Mosfets beträgt über 60 °C.	Warten bis die Temperatur unter den Schwellenwert gesunken ist. Die Pumpe durch zweimalige Betätigung der START-Taste neustarten.
FAULT: OVERLOAD	Während des Normalbetriebs (nach der Startphase) ist die Pumpen stromaufnahme größer als die vorgesehene (25 A).	Sicherstellen,, daß der Pumpenrotor ungehindert drehen kann. Die Pumpe durch zweimalige Betätigung der START-Taste neustarten.
FAULT: SHORT CIRCUIT	Während des Normalbetriebs erfolgt ein Kurzschluß der Ausgangs-verbindung (Ausgangs-strom größer als 60 A).	Die Verbindung zwischen Pumpe und Controller prüfen. Die Pumpe durch zweimalige Betätigung der START-Taste neustarten. Die Isolierung zwischen Motor und Pumpe prüfen.
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-Wartungsdienst gerufen werden.
OIL LEVEL AT MIN	Der Füllstandssensor hat einen Füllstand unter der Sicherheitsgrenze erfaßt.	Die Pumpe entsprechend der Angaben im dafür vorgesehenen Handbuch warten.

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 d'utiliser 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.
Les contrôleurs de la série Turbo-V 6000 sont des convertisseurs de fréquence, contrôlés par un microprocesseur, réalisés avec des éléments à l'état solide et ayant des capacités d'autodiagnostic et d'autoprotection.
Les contrôleurs pilotent les pompes de la série Turbo-V 6000 (par un processus subdivisé en dix pas) lors de la phase de mise en marche, en contrôlant la tension et le courant par rapport à la vitesse atteinte par la pompe.
Ils incorporent l'ensemble de circuits nécessaire au fonctionnement automatique des pompes de la série Turbo-V 6000.
Un connecteur auxiliaire permet 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.).
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 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.

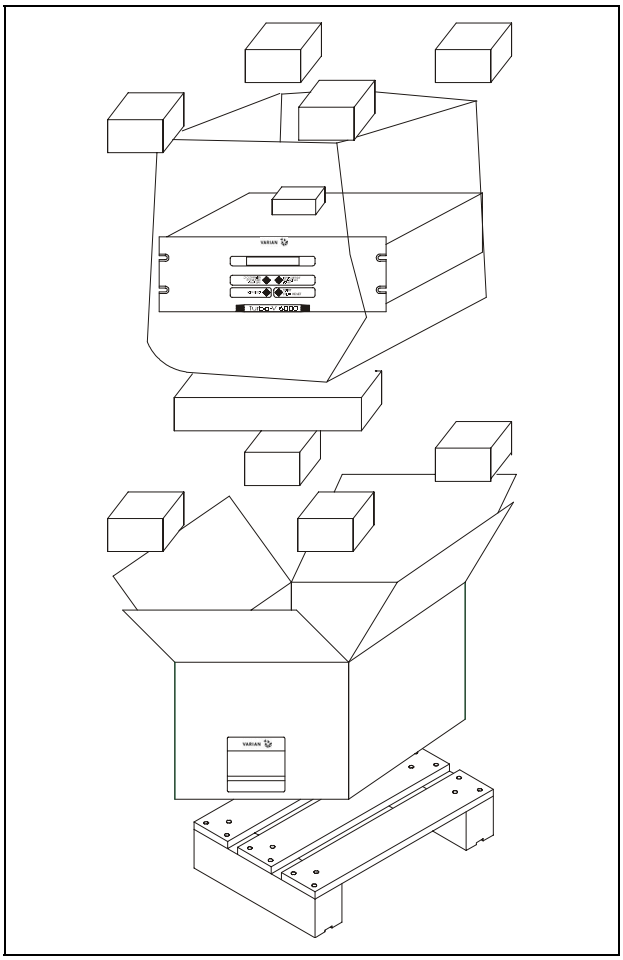
EMMAGASINAGE

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.
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.



Emballage des contrôleurs

Chaque contrôleur est fourni par Varian pré-équipé pour une certaine tension d'alimentation:

- le modèle 969-9491 pour 220 Vca
- le modèle 969-9591 pour 120 Vca.

S'assurer que la tension correcte a été sélectionnée, puis connecter le câble d'alimentation.

INSTALLATION

DANGER!

Le contrôleur est doté d'un câble d'alimentation à trois fils avec une fiche du type approuvé au niveau international. Utiliser toujours ce câble d'alimentation et introduire la fiche dans une prise pourvue d'un branchement approprié à la masse, afin d'éviter toute décharge électrique.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.

NOTE

Le contrôleur peut être installé sur une table ou à l'intérieur d'un rack prévu à cet effet. Il est en tout cas nécessaire que l'air de refroidissement puisse circuler librement à l'intérieur 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).

Pour la connexion du contrôleur à la pompe correspondante, utiliser le câble du contrôleur prévu à cet effet.

Pour les autres connexions et pour l'installation des accessoires en option, voir la section "Technical Information".

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".Avant d'utiliser le contrôleur, effectuer toutes les connexions électriques et pneumatiques et se référer à la notice de la pompe connectée.

DANGER!

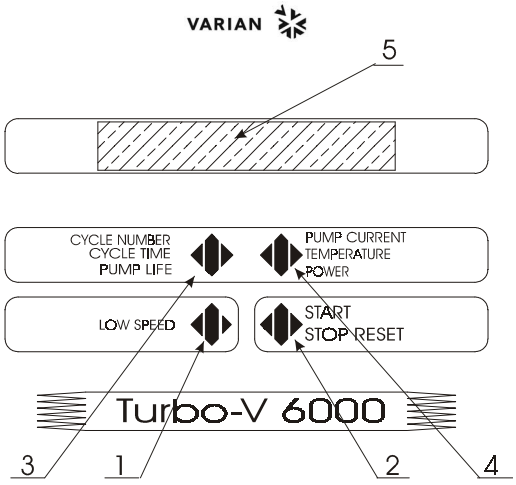
Pour éviter tous dommages aux personnes et à l'appareil, si la pompe est placée sur une table, s'assurer que cette dernière est stable. Ne jamais faire fonctionner la pompe si la bride d'entrée n'est pas connectée au système ou si elle n'est pas fermée à l'aide de la bride de serrage.

NOTE

Laisser le connecteur de réenclenchement J1 connecté à sa barrette s'il n'est procédé à aucune connexion extérieure. La pompe à pré-vide et la pompe Turbo-V peuvent être mises en marche simultanément.

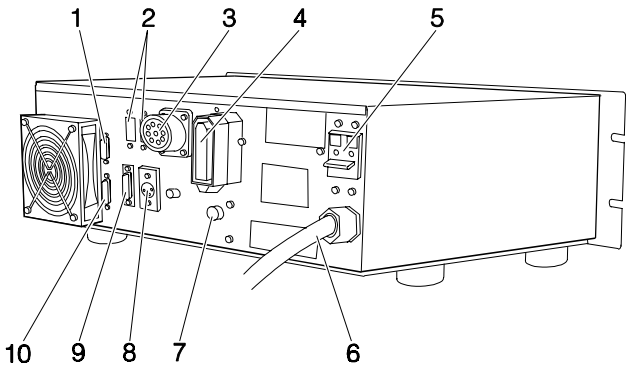
Commandes, indicateurs et connecteurs du Contrôleur

On présente ci-dessous le tableau de commande du Contrôleur ainsi que les tableaux d'interconnexion.Pour de plus amples détails, se reporter à la section "Technical Information".



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 power, rotational speed, température du palier inférieur, température du palier supérieur, température du moteur et fréquence d'excitation. 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 24 caractères.

Tableau frontal des Contrôleurs 969-9491 et 969-9591



1. Connecteur d'entrée des signaux logiques (le connecteur d'accouplement est fourni avec son pontet de fermeture)
2. Logement destiné aux connecteurs de la porte de communication séquentielle RS 232/RS 485/RS 422 (livrée en option).
3. Connecteur de sortie triphasé vers la pompe.
4. Connecteur de sortie de tension 120 Vca 1 A pour alimenter la "Vent Device" et "Forepump", 3 A max. pour la bande chauffante (Heater Band).
5. Interrupteur magnétothermique général.
6. Câble d'alimentation
7. Fusibles pour la bande chauffante (Heater Band) T5 A - 250 Vca.
8. Connecteur pour entrée des signaux extérieurs de 0 à 10 Vcc.
9. Connecteur pour les signaux provenants de la pompe.
10. Connecteur de sortie des signaux logiques et de contrôle du courant et de la vitesse de la pompe.

Tableau arrière des Contrôleurs 969-9491 et 969-9591

PROCEDURES D'UTILISATION

Allumage du Contrôleur

Pour allumer le contrôleur, il suffit d'introduire le câble d'alimentation dans la prise du réseau et placer l'interructor sur la position ON.

Mise en marche de la Pompe

Pour lancer la pomp, appuyer sur la touche START du panneau avant après avoir connecté le câble fourni avec le contrôleur (du connecteur P31 à la pompe).

Arrêt de la Pompe

Pour arrêter la pompe, presser l'interrupteur STOP du tableau frontal

ENTRETIEN

Les contrôleurs de la série Turbo-V 6000 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 d'un contrôleur, procéder à son élimination conformément aux réglementations nationales en la matière.

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.

MESSAGE	DESCRIPTION	INTERVENTION
CHECK CONNECTION TO PUMP	Dysfonctionnement de la connexion entre la pompe (P31).	S'assurer que le câble de connexion entre la pompe et le contrôleur et le contrôleur est bien fixé aux deux extrémités et qu'il n'est pas coupé. Presser deux fois l'interrupteur START pour réactiver la pompe.
PUMP WAITING INTERLOCK	Le signal d'interlock situé sur le connecteur P1 est actif à cause de la coupure du court-circuit entre le pin 3 et le pin 8 du connecteur J1 ou à cause de l'ouverture du signal d'interlock extérieur.	Rétablir le court-circuit entre le pin 3 et le pin 8 du connecteur J1 ou fermer le signal d'interlock extérieur.
FAULT: OVERTIME	12 minutes après le démarrage avec fonction SOFT START invalidée, la pompe n'a pas atteint la vitesse prévue de 5500 K tr/min.	Contrôler que le système ne présente aucune fuite. Appuyer deux fois sur la touche START pour relancer la pompe.
FAULT: PUMP OVERHEATED	La température est supérieure à l'une des valeurs de seuil suivantes: - 65°C pour les paliers - 90 °C pour le moteur - 60°C pour l'eau	Attendre que la température retourne au-dessous du seuil. Presser deux fois l'interrupteur START pour remettre la pompe en marche.
FAULT: PUMP OVERHEATED	La température du transformateur du contrôleur est supérieure a 90°C ou la température sur le radiateur des Mosfets de sortie est supérieure à 60°C.	Attendre que la température retourne au-dessous du seuil. Presser deux fois l'interrupteur START pour remettre la pompe en marche.
FAULT: OVERLOAD	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 (25 A).	S'assurer que le rotor de la pompe a la possibilité de tourner librement. Presser deux fois l'interrupteur START pour remettre la pompe en marche.
FAULT: SHORT CIRCUIT	Pendant le fonctionnement normal la connexion de sortie est en court-circuit (courant de sortie plus grand que 60 A).	Vérifier les connexions entre la pompe et le contrôleur. Presser deux fois l'interrupteur START pour remettre la pompe en marche. Contrôler l'isolation entre le moteur et la pompe.
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.
OIL LEVEL AT MIN	Le jauge d'huile indique un niveau inférieur au niveau de sécurité.	Effectuer l'entretien de la pompe en suivant les indications fournies dans le manuel d'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.
Los controlers de la serie Turbo-V 6000 son convertidores de frecuencia, controlados por un microprocesador, realizados con componentes en estado sólido y con capacidad de autodiagnosis y autoprotección.
Los controlers pilotan las bombas de la serie Turbo-V 6000 (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. Estos incorporan todos los circuitos de la serie Turbo-V 6000.
Mediante un conector auxiliar 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, señales de control del caudal del agua, etc.)
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.

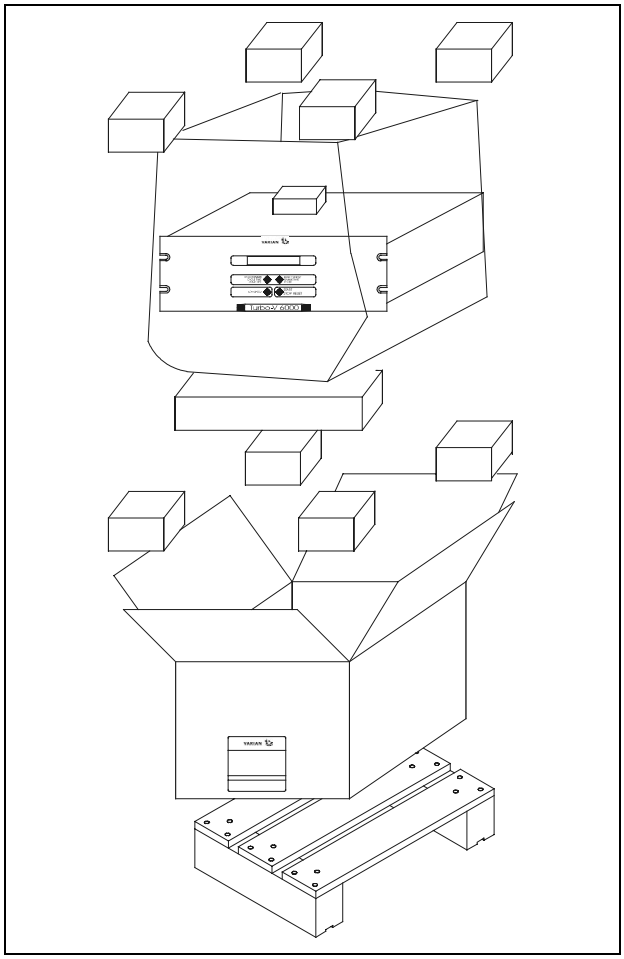
ALMACENAMIENTO

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. 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.



Embalaje de los Controlers

Cada controler llega de Varian preparado para una cierta tensión de alimentación:

- el modelo 969-9491 por 220 Vac
- el modelo 969-9591 por 120 Vac

Comprobar que se ha seleccionado la tensión correcta y luego conectar el cable de alimentación.

INSTALACIÓN

¡PELIGRO!

El controler va dotado de un cable de alimentación de tres hilos con una clavija de tipo aprobado a nivel internacional. Utilizar siempre este cable de alimentación e introducir la clavija en un enchufe con una conexión de masa adecuada para evitar descargas eléctricas. 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 del enchufe de alimentación.

NOTA

El controler puede instalarse en una mesa o dentro de un rack específico. En cualquier caso, es necesario 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).

Para la conexión del controler con la bomba correspondiente utilizar el cable específico del controler.

Para otras conexiones y la instalación de los accesorios opcionales, véase la sección “Technical Information”.

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”. Antes de usar el controler efectuar todas las conexiones eléctricas y neumáticas y consultar el manual de la bomba conectada.

¡PELIGRO!

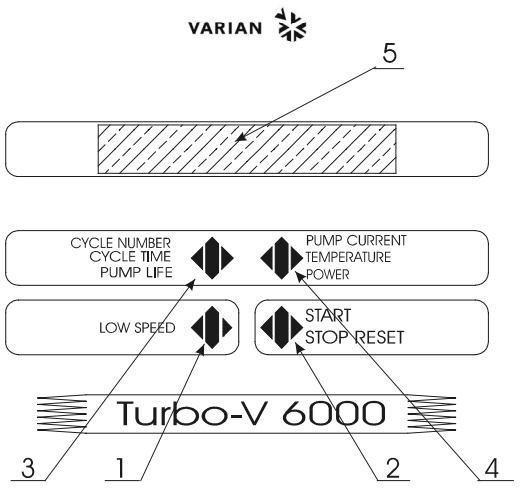
Para evitar lesiones a las personas y al aparato, si la bomba está apoyada sobre una mesa cerciorarse que es estable. No poner en marcha nunca la bomba si la brida de entrada no está conectada al sistema o no está cerrada con la brida de cierre .

NOTA

El conector di cierre J1 ha de dejarse conectado con su conector puente si no se efectúa ninguna conexión exterior. La bomba pre-vacío y la bomba Turbo-V pueden encenderse simultáneamente.

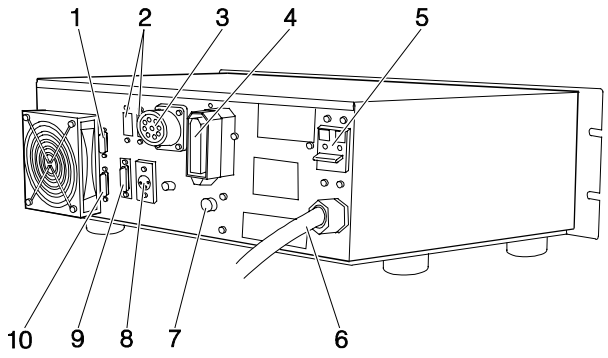
Mandos, indicadores y conectores del controler

A continuación se ilustran el panel de mando del controler y los paneles de interconexión.
Para más detalles consultar la sección “Technical Information”.



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 power, rotational speed y temperatura cojinete inferior, temperatura cojinete superior, temperatura motor, frecuencia de excitación. Está siempre activado independientemen-te 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 24 caracteres.

Panel frontal del controler
969-9491 y 969-9591



1. Conector de entrada de las señales lógicas (el conector de acoplamiento se suministra con el conector puente específico).
2. Alojamiento previsto para los conectores del puerto de comunicación serial RS 232/RS 485/ RS 422 (suministrada como opción).
3. Conector de salida de tres fases hacia la bomba.
4. Conector de salida de potencia 120 Vac 1 A para alimentar Vent Device y Forepump, 3 A máx para Heater Band.
5. Interruptor magnetotérmico generale
6. Cable alimentación.
7. Fusible para Heater Band T5 A 250 Vac.
8. Conector para entrada señales externas de 0 hasta 10 Vdc.
9. Conector para señales procedentes de la bomba.
10. Conector de salida de los señales lógicos y de comprobación de la corriente e y de la velocidad de la bomba.

Panel trasero del controler 969-9491 y 969-9591

PROCEDIMIENTOS DE USO

Encendido del controler

Para encender el controler es suficiente introducir el cable de alimentación en la toma de red y colocar el interruptor de línea en posición ON.

Puesta en marcha de la Bomba

Para poner en marcha la bomba hay que apretar el pulsador START del panel frontal después de conectar el cable suministrado con el controlor (desde al conectro P31 hacia la bomba).

Parada de la Bomba

Para detener la bomba hay que apretar el pulsador STOP del panel frontal.

MANTENIMIENTO

Los controlers de la serie Turbo-V 6000 no necesitan ningún mantenimiento. Cualquier operación ha de ser efectuada por personal autorizado.

En caso de avería es posible utilizar el servicio de reparación Varian o del “Varian advance exchange service”, que permite obtener un controler regenerado en vez del averiado.

¡PELIGRO!

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

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

MENSAJES DE ERROR

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

MENSAJE	DESCRIPCIÓN	ACCIÓN CORRECTIVA
CHECK CONNECTION TO PUMP	Mal funcionamiento en la conexión entre la bomba y el Controler (P31).	Comprobar que el cable de conexión entra en la bomba y el controler está bien fijado por ambos extremos y no está interrumpido. Apretar dos veces el pulsador START para volver a poner en marcha la bomba.
PUMP WAITING INTERLOCK	Está activa la señal de interlock presente en el conector P1 a causa de la interrupción del cortocircuito entre el pin 3 y el pin 8 del conector J1, o a causa de la apertura de la señal de interlock externo.	Eliminar el cortocircuito entre el pin 3 y el pin 8 del conector J1, o cerrar la señal de interlock exterior.
FAULT: OVERTIME	La bomba non ha llegado a la velocidad prevista de 5500 KRPM 12 minutos después de la puesta en marcha con SOFT START deseleccio-nado.	Comprobar que el il sistema non tenga pérdidas. Apretar dos veces el botón START para volver a poner en marcha la bomba.
FAULT: PUMP OVERHEATED	La temperatura excede uno de los siguientes valores límite: - 65 °C para los cojnetes - 90 °C para el motor - 60 °C para el agua.	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 OVERHEATED	La temperatura del transformador del controlor excede los 90 °C o la temperatura sobre el radiator de los Mosfets de salida excede los 60 °C.	Esperar a que la temperatura vuelva por debajo del umbral. Apretar dos veces el pulsador START para volver a poner en marcha la bomba.
FAULT: OVERLOAD	Durante el funcionamiento normal (tras la fase de puesta en marcha) la corriente absorbida por la bomba es superior a la programada (25 A).	Comprobar que el rotor de la bomba tiene la posibilidad de girar libremente. Apretar dos veces el pulsador START para volver a poner en marcha la bomba.
FAULT: SHORT CIRCUIT	Durante el funcionamiento normal la conexión de salida está en cortocircuito (corriente de salida más 60 A).	Comprobar las conexiones entre la bomba y el controler. Apretar dos veces el pulsador START para volver a poner en marcha la bomba. Comprobar el aislamiento entre el motor y 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 mante-nimiento.
OIL LEVEL AT MIN	El sensor de nivel del aceite señala un nivel inferior al de seguridad.	Realizar el mantenimiento de la bomba según lo que se indica en el manual correspondiente.

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.
Os controllers da série Turbo-V 6000 são conversores de frequência, controlados por um microprocessador, realizados com componentes em estado sólido e com capacidade de autodiagnóstico e autoprotecção.Os controllers comandam as bombas da série Turbo-V 6000 (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.
Incorporam todos os circuitos necessários para o funcionamento automático das bombas da série Turbo-V 6000.
Através de um conector auxiliar, 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.).
Nos parágrafos seguintes estão descritas todas as informações necessárias para garantir a segurança do operador durante o uso da aparelhagem. Informações pormenorizadas são fornecidas no apêndice "Technical Information".

Este manual utiliza as seguintes convenções:

PERIGO!

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

ATENÇÃO!

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

NOTA

As notas contêm informações importantes destacadas do texto.

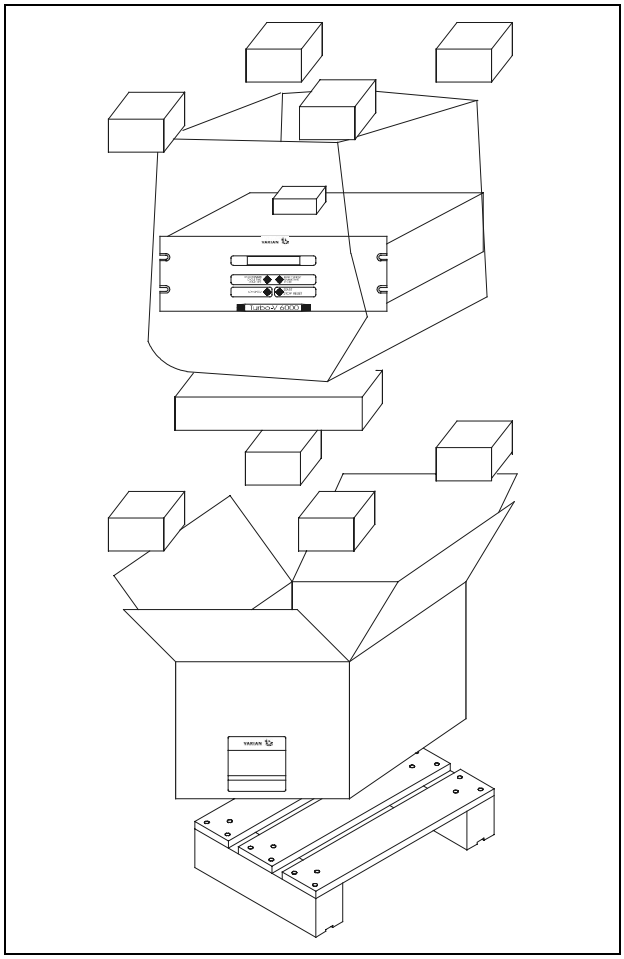
ARMAZENAGEM

Durante o transporte e a armazenagem dos controllers, devem ser satisfeitas as seguintes condições ambientais:

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

PREPARAÇÃO PARA A INSTALAÇÃO

O controller é fornecido numa embalagem protectora especial; se apresentar sinais de danos, que poderiam verificar-se durante o transporte, entrar em contacto com o escritório de vendas local.
Durante a retirada 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 directriz CEE 85/399 para a protecção do meio ambiente.



Embalagem dos controllers

Cada controller chega à Varian predisposto para uma determinada tensão de alimentação:

- o modelo 969-9491 para 220 Vac
- o modelo 969-9591 para 120 Vac

Verificar se foi seleccionada a tensão correcta e, a seguir, ligar o cabo de alimentação.

INSTALAÇÃO

PERIGO!

O controller é fornecido com um cabo de alimentação de três fios com uma tomada de tipo aprovado a nível internacional. Utilizar sempre este cabo de alimentação e ligar a tomada à rede com uma ligação de massa adequada, para evitar descargas eléctricas. No interior do controller desen- volvem-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.

NOTA

O controller pode ser instalado numa mesa ou no interior de um rack específico. Em todo caso, é necessário 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 com perigo de explosão 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 condensante).

Para a ligação do controller à respectiva bomba, utilizar o cabo específico do próprio controller.

Para as outras ligações e a instalação dos acessórios opcionais, ver a secção "Technical Information".

UTILIZAÇÃO

Neste parágrafo são descritos os principais procedimentos operativos. Para maiores detalhes e para procedimentos que envolvem ligações ou peças opcionais, consultar o parágrafo "Use" do apêndice "Technical Information". Antes de usar o controller, efectuar todas as ligações eléctricas e pneumáticas e consultar o manual da bomba ligada.

PERIGO!

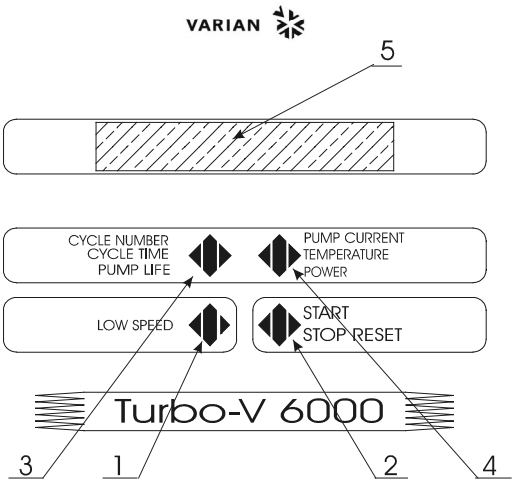
Para evitar danos às pessoas e à aparelhagem, caso a bomba esteja apoiada numa mesa, certificar-se que esteja estável. Nunca activar a bomba se o flange de entrada não estiver ligado ao sistema ou não estiver fechado com o flange de fecho.

NOTA

O conector de fecho J1 deve permanecer ligado à sua ponte se não é efectuada nenhuma ligação externa. A bomba de pré-vácuo e a bomba Turbo-V podem ser ligadas simultaneamente.

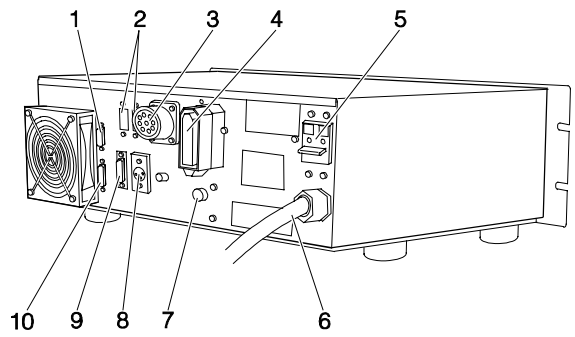
Comandos, Indicadores e Conectores do Controller

A seguir, estão ilustrados o painel de comando do Controller e os painéis de interconexão. Para maiores detalhes, consultar a secção "Technical Information".



1. Botão para a selecção do modo LOW SPEED. Está activo só quando é seleccionado o modo de comando pelo painel frontal. Premendo-o uma vez, a bomba roda a cerca de 2/3 da velocidade nominal. Premendo-o mais uma vez, desactiva-se o modo LOW SPEED.
2. Botão para enviar os comandos de START, STOP ou RESET. Está activo só quando é seleccionado o modo de comando pelo painel frontal. Premendo-o uma vez activa-se a fase de accionamento; premendo-o novamente a bomba pára. Se a bomba parou automaticamente devido a um defeito, é necessário premer este botão uma vez para executar o reset do controller e uma segunda vez para reactivar a bomba.
3. Botão para visualizar no mostrador os parâmetros de cycle number, cycle time e pump life.
4. Botão para visualizar no mostrador os parâmetros de pump current, pump power, rotational speed e temperatura do rolamento inferior, temperatura do rolamento superior, temperatura do motor, frequência de excitação. Está sempre activo, independentemente do modo de funcionamento escolhido. Premendo ao mesmo tempo os botões 3 e 4 por, no mínimo, 2 segundos, é activado um programa com o qual é possível programar alguns parâmetros operativos.
5. Mostrador alfanumérico a cristais líquidos: matriz por pontos, 2 linhas x 24 caracteres.

Painel frontal do Controller
969-9491 e 969-9591



1. Conector de entrada dos sinais lógicos (o conector de acoplamento é fornecido com ponte específica de fecho).
2. Compartimento previsto para os conectores da porta de comunicação serial RS 232/RS 485/ RS 422 (fornecida como opcional).
3. Conector de saída trifásico para a bomba.
4. Conector de saída da tensão 120 Vca 1 A para alimentar a “Vent Device” e o “Forepump”, 3 A máx. para o Heater Band.
5. Interruptor magnetotérmico geral
6. Cabo de alimentação.
7. Fusível para Heater Band T5 A 250 Vca.
8. Conector para entrada sinais externos de 0 a 10 Vcd.
9. Conector para sinais procedentes da bomba.
10. Conector de saída dos sinais lógicos e de verificação da corrente e da velocidade da bomba.

Painel posterior dos Controllers 969-9491 e 969-9591

PROCEDIMENTOS DE USO

Acendimento do Controller

Para ligar o controller, é suficiente inserir o cabo de alimentação na tomada de rede e coloque ó interruptor de linha en posição ON.

Activação da bomba

Para activar a bomba é necessário premer o botão START do painel frontal após ter ligado o cabo fornecido com o controller (do conector P31 à bomba).

Paragem da bomba

Para parar a bomba, é necessário premer o botão STOP do painel frontal.

MANUTENÇÃO

Os controllers da série Turbo-V 6000 não requerem 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 advanced exchange service", que permite obter um controller regenerado que substitua o controller com defeito.

PERIGO!

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

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

MENSAGENS DE ERRO

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

MENSAGEM	DESCRIÇÃO	ACÇÃO CORRECTIVA
CHECK CONNECTION TO PUMP	Mau funcionamento na ligação entre a bomba e o controller (P31).	Verificar se o cabo de ligação entre a bomba e o controller está bem fixado em ambas as extremidades e não está interrompido. Premer duas vezes o botão START para reactivar a bomba.
PUMP WAITING INTERLOCK	É activado o sinal de interlock existente no conector P1 devido à interrupção do curto circuito entre o pin 3 e o pin 8 do conector J1 ou devido à abertura do sinal de interlock externo.	Restabelecer o curto circuito entre o pin 3 e o pin 8 do conector J1 ou fechar o sinal de interlock externo.
FAULT: OVERTIME	A bomba não atingiu a velocidade prevista de 5500 KRPM 12 minutos após a partida com SOFT START desactivado.	Verificar se o sistema não apresenta perdas. Premer duas vezes o botão START para reactivar a bomba.
FAULT: PUMP OVERHEATED	A temperatura superou um dos seguintes valores máximos: - 65°C para os rolamentos - 90° C para o motor - 60°C para a água.	Aguardar até que a temperatura volte ao limite estabelecido. Premer duas vezes o botão START para reactivar a bomba.
FAULT: CONTROLLER OVERHEATED	A temperatura do transformador do controller superou os 90°C ou a temperatura no radiador dos Mosfets de saída é superior a 60°C.	Aguardar até que a temperatura volte ao limite estabelecido. Premer duas vezes o botão START para reactivar a bomba.
FAULT: OVERLOAD	Durante o funcionamento normal (após a fase de accionamento) a corrente absorvida pela bomba é maior do que a programada (25 A).	Verificar se o rotor da bomba pode rodar livremente. Premer duas vezes o botão START para reactivar a bomba.
FAULT: SHORT CIRCUIT	Durante o funcionamento normal a conexão de saída está em curto circuito (corrente de saída maior que 60 A).	Verificar as ligações entre a bomba e o controller. Premer duas vezes o botão START para reactivar a bomba. Inspeccionar o isolamento entre o motor e 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 reapresentar, dirigir-se à Varian para a manutenção.
OIL LEVEL AT MIN	O sensor de nível do óleo detectou um nível inferior ao de segurança.	Executar a manutenção da bomba conforme as modalidades contidas no manual de instruções.

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 controllers van de Turbo-V 6000 serie zijn frequentieomzetters die gestuurd worden door een microprocessor, zijn gemaakt van halfgeleiderelementen en zijn in staat om zelfdiagnose en zelfbescherming uit te voeren.
De controllers sturen de pompen van de serie Turbo-V 6000 (met een proces bestaande uit tien stappen) tijdens de startfase, en controleren hierbij de spanning en de stroom in verhouding tot de door de pomp bereikte snelheid.
De controllers zijn van circuits voorzien die noodzakelijk zijn voor de automatische werking van de pompen van de serie Turbo-V 6000.
Via een hulpconnector 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 pre-vacuümpomp, blokkeersignalen (voor drukschakelaars, regelschakelaars van de waterstroom, enz.). 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

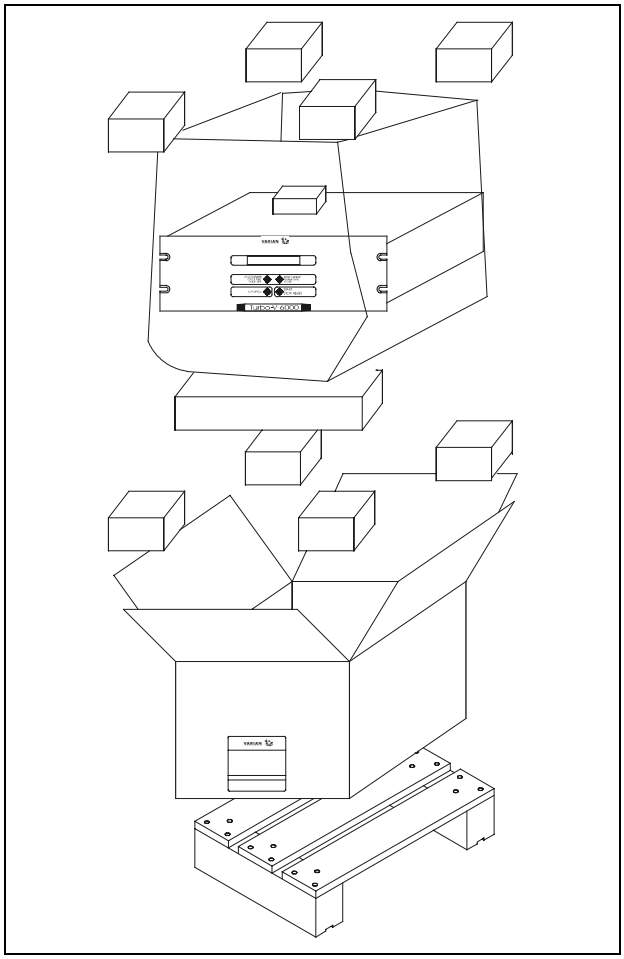
De opmerkingen bevatten belangrijke informatie die uit de tekst is gelicht.

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.
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.



Verpakking van de controllers

Varian heeft elke controller voorbereid voor een bepaalde voedingsspanning:
- het model 969-9491 voor 220 Vac
- het model 969-9591 voor 10 Vac

Controleer of de juiste spanning is gekozen en sluit de voedingskabel weer aan.

INSTALLATIE

GEVAAR!

De controller is voorzien van een voedingskabel met drie draden en een stekker van het internationaal goedgekeurde type. Gebruik altijd deze voedingskabel en steek de stekker in een geaard contactstop om elektrische ontladingen te voorkomen. In de controller ontwikkelen zich hoge spanningen die zware beschadigingen of de dood kunnen veroorzaken. Alvorens installatie- of onderhoudswerk-zaamheden uit te voeren, de controller van de contactstop afkoppelen.

OPMERKING

De controller kan op een tafel of in een speciaal rack worden geïnstalleerd. In ieder geval moet de koellucht vrij rondom het apparaat kunnen 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 voor aansluiting van de controller op de pomp de speciale kabel van de controller.

Voor de overige aansluitingen en de installatie van de accessoires wordt verwezen naar het hoofdstuk "Technical Information".

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". 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!

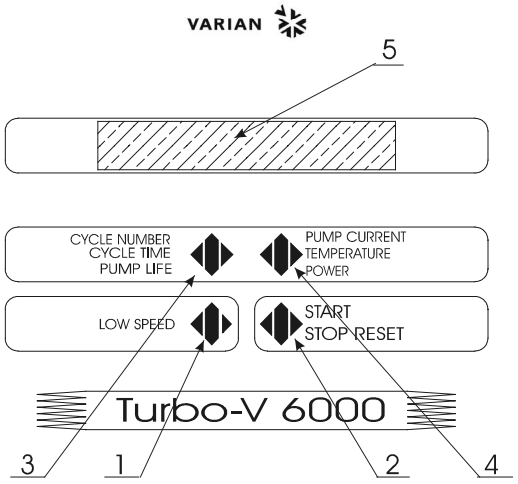
De Indien de pomp op een tafel is geplaatst, controleren of deze stabiel staat om letsel aan personen en schade aan het apparaat te voorkomen. Laat de pomp nooit werken zonder dat de ingangsflens aan het systeem is gekoppeld of de afsluitflens is gesloten.

OPMERKING

De connector J1 moet met zijn jumper aangesloten blijven als geen externe aansluiting tot stand wordt gebracht. De prevacuümpomp en de Turbo-V pomp mogen beide gelijktijdig ingeschakeld zijn.

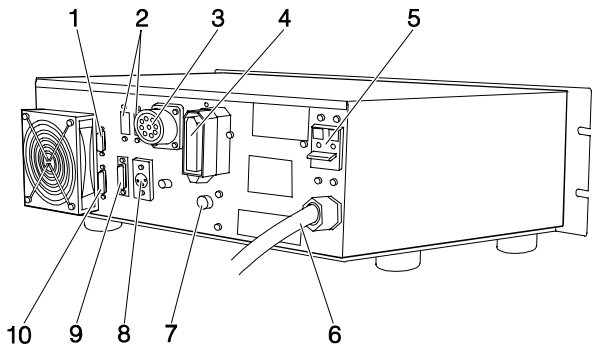
Bedieningsorganen, controlelampjes en connectoren van de controller

Hier volgt de beschrijving van het bedieningspaneel van de controller en van de doorverbindingspanelen. Voor meer informatie wordt verwezen naar het hoofdstuk "Technical Information".



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 power, rotational speed, temperatuur onderste lager, temperatuur bovenste lager, motortemperatuur en bekrachtigings-frequentie. 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 24 karakters.

Frontpaneel van de controllers 969-9491 en 969-9591



1. Ingangsconnector van de logische signalen (de koppelconnector wordt geleverd met het speciale sluitbruggetje).
2. Ruimte voorzien voor de connectors van de poort voor seriële communicatie RS 232/RS 485/RS 422 (geleverd als optie).
3. Connector driefase-uitgang naar pomp.
4. Uitgangsconnector spanning 120 Vac 1 A voor voeding “Vent Device” en “Forepump”, 3 A max. voor Heater Band.
5. Algemene thermomagnetische schakelaar.
6. Voedingskabel
7. Zekering voor Heater Band T5 A 250 Vac.
8. Connector voor ingang externe signalen van 0 tot 10 Vdc.
9. Connector voor signalen afkomstig van de pomp.
10. Uitgangsconnector logische signalen en controle-signalen van stroom en pompsnelheid.

Achterpaneel van de controllers 969-9491 en 969-9591

GEBRUIKSPROCEDURES

Inschakelen van de controller

Om de controller in te schakelen, de voedingskabel in de netcontactdoos inbrengen en de stroomschakelaar in stand ON zetten.

Starten van de pomp

Om de pomp te starten moet de drukknop START op het frontpaneel worden bediend, nadat de bij de controller geleverde kabel is aangesloten (van connector P31 naar de pomp).

Stoppen van de pomp

Voor het stoppen van de pomp de STOP knop op het frontpaneel bedienen.

ONDERHOUD

De controllers van de serie Turbo-V 6000 zijn onderhoudsvrij. Eventuele werkzaamheden moeten door bevoegd personeel worden uitgevoerd.

In geval van storing is het mogelijk om de reparatiedienst van Varian of de "Varian advanced exchange service" in te schakelen: zo krijgt men een ruilcontroller ter vervanging van de defecte controller.

GEVAAR!

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

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

FOUTMELDINGEN

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

BOODSCHAP	OMSCHRIJVING	REMEDIE
CHECK CONNECTION TO PUMP	Foutieve verbinding tussen pomp en controller (P31).	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: OVERTIME	De pomp heeft niet de voorgeschreven snelheid van 5000 KRPM bereikt binnen 12 minuten na de start, met SOFT START ontmachtigd.	Controleer of het systeem geen lekkages vertoont. Bedien twee maal de drukknop START om de pomp opnieuw te starten.
FAULT: PUMP OVERHEATED	De temperatuur heeft een van de volgende drempelwaarden overschreden: - 65 °C voor de lagers - 90° C voor de motor - 60 °C voor het water.	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 OVERHEATED	De temperatuur van de transformator van de controller heeft 90 °C overschreden of de temperatuur op de radiator van de uitgangsMosfets 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: OVERLOAD	Tijdens normale werking (na startfase) ligt de door de pomp geabsorbeerde stroom hoger dan de geprogrammeerde waarde (25 A).	Controleer of de pomprotor vrij kan draaien. Bedien twee maal de START-knop om de pomp weer op te starten.
FAULT: SHORT CIRCUIT	Tijdens normale werking is de uitgangsverbinding in kortsluiting (uitgangsstroom groter dan 60 A).	Controleer de verbindingen tussen pomp en controller. Bedien twee maal de START-knop om de pomp weer op te starten. Controleer de isolatie tussen motor en pomp.
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.
OIL LEVEL AT MIN	De sensor van het oliepeil heeft een peil gemeten dat lager dan het veiligheidsniveau ligt.	Zorg voor het onderhoud van de pomp overeenkomstig de instructies in de bijbehorende handleiding.

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. Styreenhederne i Turbo-V 6000 serien er mikroprocessorstyrede frekvens-omformere, der består af komponenter med fast tilstand.
Styreenhederne er udstyrede med selvdiagnose- og selvbeskyttelsesfunktioner.
Styreenhederne kontrollerer pumperne i Turbo-V 6000 serien (med en ti-trins-proces) i forbindelse med start. Spænding og strøm reguleres i forhold til pumpens opnåede hastighed. Styreenhederne omfatter alle midler, der kræves for automatisk drift af pumperne i Turbo-V 6000 serien.
En hjælpekontakt 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.). 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 standard-drubrikker:

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.

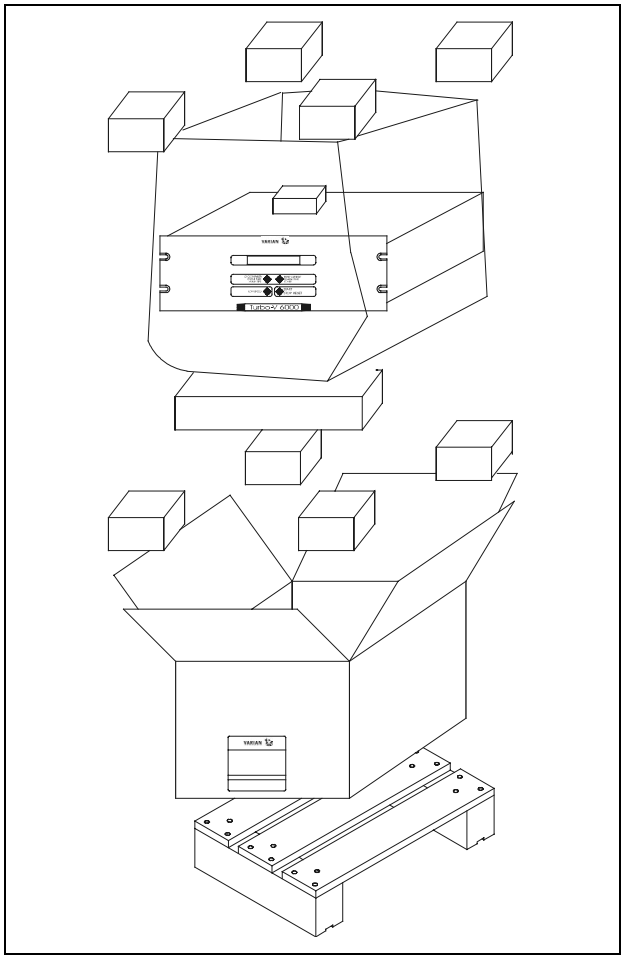
OPBEVARING

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.
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.



Styreenhedens emballage

Styreenheden leveres fra Varian forindstillet til en vis strømforsyning:

- modellen 969-9491 til 220 V vekselstrøm
- modellen 969-9591 til 120 V vekselstrøm

Kontrollér at den valgte spænding er korrekt. Tilslut strømkablet.

INSTALLATION

ADVARSEL!

Advarselsmeddelelserne Styreenheden leveres med strømkabel med tre ledere og godkendt stik efter internationale standarder. Anvend udelukkende det medleverede strømkabel. Stikket må kun tilsluttes et vægudtag med fungerende jordtilslutning, for at undgå elektriske stød. Spænding frembragt i styreenheden kan nå høje værdier og forårsage stor skade og dødsfald. Frakobel altid strømkablet, inden der udføres installations- eller vedligeholdelsesarbejde på styreenheden.

BEMÆRK

Styreenheden kan installeres på et bord eller et velegnet stativ. I begge tilfælde skal der være plads nok til, 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)

Pumpen og styreenheden tilsluttes med det specielle kabel, der leveres med styreenheden.

For øvrige tilslutninger og installation af tilbehør henvises til afsnittet "Technical Information".

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". Inden styreenheden anvendes, bør samtlige elektriske og pneumatiske tilslutninger udføres. Læs brugsanvisningen før pumpen tilsluttes.

ADVARSEL!

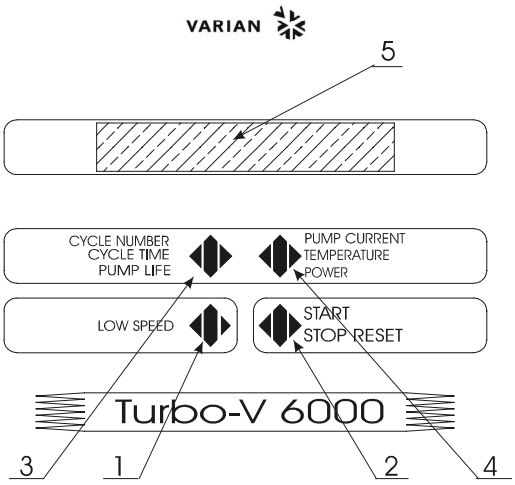
Advarselsmeddelelserne sørg for, at pumpen står fast, hvis den er installeret på et bord. Dette er for at forebygge skader på apparatet og personer. Start aldrig pumpen, hvis pumpetilløbet ikke er tilsluttet systemet eller er blokeret.

BEMÆRK

Afbryderkontakten J1 skal forblive tilsluttet med aktuel bro, når der ikke udføres eksterne tilslutninger. Før-vakuumpumpen og Turbo-V-pumpen skal fungere samtidigt.

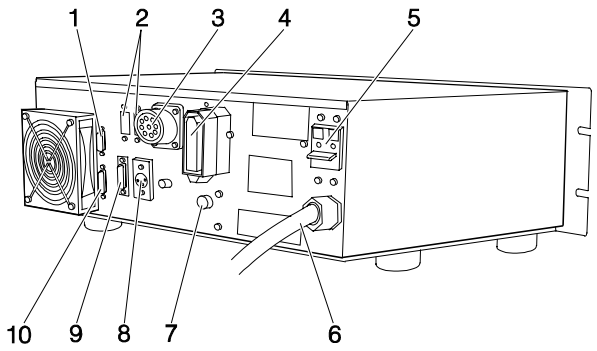
Kontroller, indikatorer og kontakter på styreenheden

Følgende beskriver manøvrepanelet til styreenheden samt tilslutningspanelerne. For yderligere information henvises til bilag "Technical Information".



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, rotational speed, temperaturen i nederste leje, temperaturen i øverste leje, motortemperatur og magnetiseringsfrekvens 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 24 tegn.

Frontpanelet på Styreenheden
969-9491 og 969-9591



1. Indgangsstik for logiske signaler (forbindelsesstikket leveres med broen til genlukning).
2. Åbning til stikkene til seriekanalen RS 232/ RS 485/RS 422 (leveres som tilbehør).
3. Trefaset udgangsstik mod pumpen.
4. Udgangsstik med spænding på 120 Vac 1 A til forsyning af "Vent Device" (udluftningsventil) og "Forepump", 3 A max til Heater Band (varmeelement).
5. Termomagnetisk hovedafbryder.
6. Forsyningskabel.
7. Sikring til Heater Band (varmeelement) T5 A 250 Vac.
8. Indgangsstik til eksterne signaler fra 0 til 10 Vdc.
9. Stik for signaler fra pumpen.
10. Udgangsstik med logiske signaler og til kontrol af strøm og pumpens hastighed.

Bagpanelet på Styreenheden 969-9491 og 969-9591

INSTRUKTION

Start af styreenheden

Styreenheden startes ved at sætte strømkablet i vægudtaget og sæt hovedafbryderen i stilling ON.

Start af pumpen

Pumpen startes ved at trykke på START knappen på frontpanelet efter tilslutning af kablet, der leveres sammen med kontrolenheden (fra stik P31 til pumpen).

Stop af pumpen

Pumpen stopper ved at trykke på STOP-trykknappen på frontpanelet.

VEDLIGEHOLDELSE

Styreenhederne i Turbo-V 6000 serien behøver ikke nogen vedligeholdelse. Ethvert indgreb på pumpen skal foretages af autoriseret personale.

Hvis pumpen går i stykker, kan man benytte sig af Varians reparations-service eller Varian udvekslingsservice, hvor man kan få en repareret pumpe i bytte for den, der er gået i stykker.

ADVARSEL!

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

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

FEJLMEDDELELSER

Når visse fejl opstår, viser styreenheden ved selvdiagnose aktuelle fejl på displayet. De mulige meddelelser listes i følgende tabel.

MEDDELELSE	BESKRIVELSE	KONTROL
CHECK CONNECTION TO PUMP	Tilslutning mellem pumpe og styreenhed er defekt (P31).	Controllér at tilslutningskabel mellem pumpe og styreenhed er korrekt monteret samt at ingen afbrydninger forekommer. Tryk to gange på START for at starte pumpen igen.
PUMP WAITING INTERLOCK	Interlocksignalet findes på kontakt P1 p.g.a. kortslutning mellem stift 3 og stift 8 i kontakten J1 eller p.g.a. at det eksterne interlocksignal er åbent.	Tilbagestil kortslutningen mellem stift 3 og stift 8 på kontakt J1 eller sluk for det eksterne interlocksignal.
FAULT: OVERTIME	Pumpen har ikke opnået den fastsatte hastighed på 5500 o/min 12 minutter efter start med frakoblet BLØDSTART.	Kontrollér, at der ikke er lækager i systemet. Tryk to gange på START knappen for at starte pumpen på ny.
FAULT: PUMP OVERHEATED	Temperaturen har overskredet en af de følgende tærskelværdier: - 65°C for lejerne - 90°C til motoren - 60°C for vand.	Vent på at temperaturen falder til under tærskelværdi. Tryk to gange på START for at starte pumpen igen.
FAULT: CONTROLLER OVERHEATED	Temperaturen i kontrolenhedens transformator har overskredet 90° C, eller temperaturen på radiatoren til Mosfet-kredsløbene i udgangen er over 60° C.	Vent på at temperaturen falder til under tærskelværdi. Tryk to gange på START for at starte pumpen igen.
FAULT: OVERLOAD	Under normal drift (efter startfasen) forbruger pumpen en større effekt end den programmerede værdi (25 A).	Kontrollér om pumpens rotor kan rotere frit. Tryk to gange på START for at starte pumpen igen.
FAULT: SHORT CIRCUIT	Under normal drift er udgangseffekten kortsluttet (udgangsstrømmen højere end 60 A).	Kontrollér forbindelserne mellem pumpe og styreenhed. Tryk to gange på START for at starte pumpen igen. Kontrollér isoleringen mellem motoren og pumpen.
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.
OIL LEVEL AT MIN	Føleren for olieniveau har affølt en oliemængde, der er mindre end sikkerhedsniveauet.	Foretag vedligeholdelsesindgreb i pumpen i overensstemmelse med fremgangsmåderne, der er beskrevet i den respektive manual.

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.
Styrenheterna i Turbo-V 6000 serien är mikroprocessorstyrda frekvensomvandlare som består av komponenter med fast tillstånd. Styrenheterna är försedda med självdiagnos- och självskyddsfunktion. Styrenheterna kontrollerar pumparna i Turbo-V 6000 serien (med en tiostegs-process) i samband med start. Spänning och ström regleras i förhållande till pumpens uppnådda hastighet.
Styrenheterna omfattar alla kretsar som behövs för automatisk drift av pumparna i Turbo-V 6000 serien. En hjälpkontakt 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).
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 standar-drubriker:

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.

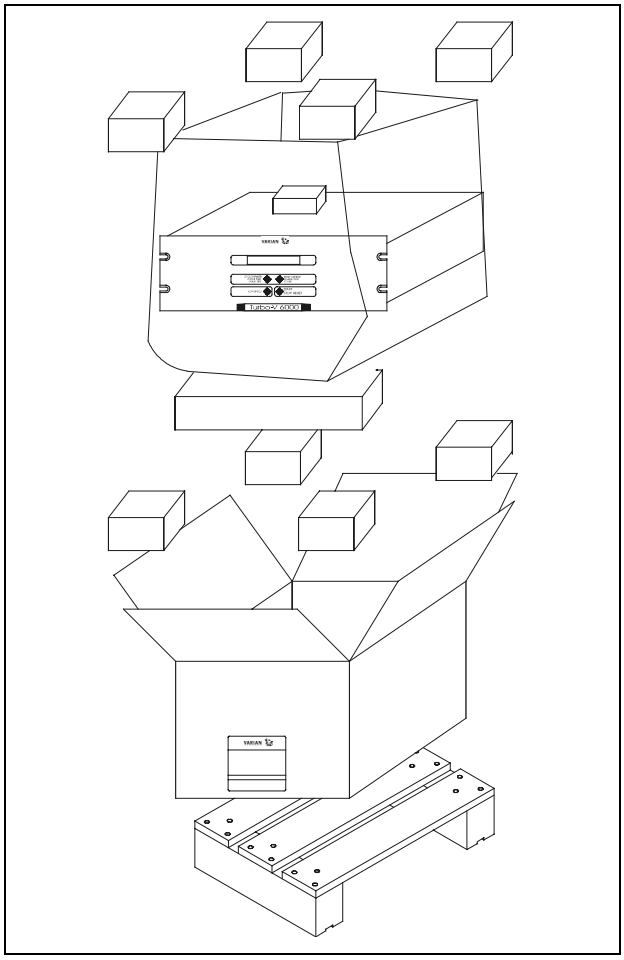
FÖRVARING

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.
Kasta inte packmaterialet i soporna. Materialet är återvinningsbart till 100% och uppfyller EU-direktiv 85/399 om miljöskydd.



Styrenhetens förpackning

Styrenheten levereras från Varian med förinställning för en viss matningsspänning:

- modellen 969-9491 för 220 V växelström
- modellen 969-9591 för 120 V växelström

Kontrollera att den valda matningsspänningen är korrekt. Återanslut strömkabeln.

INSTALLATION

VARNING!

Styrenheten levereras med strömkabel med tre ledare och godkänd stickpropp enligt internationella standarder. Använd endast den medlevererade strömkabeln. Stickproppen får endast anslutas till ett vägguttag med fungerande jordanslutning för att undvika elstötar. 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.

OBSERVERA

Styrenheten kan installeras på ett bord eller inuti ett därtill avsett rack. I samtliga fall måste dock kylluften kunna 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)

Pumpen och styrenheten ansluts med den speciella kabeln, som levereras med styrenheten.

Beträffande övriga anslutningar och installation av tillbehör hänvisas till avsnittet "Technical Information".

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". Innan styrenheten används bör samtliga elektriska och pneumatiska anslutningar utföras. Läs bruksanvisningen för den anslutna pumpen.

VARNING!

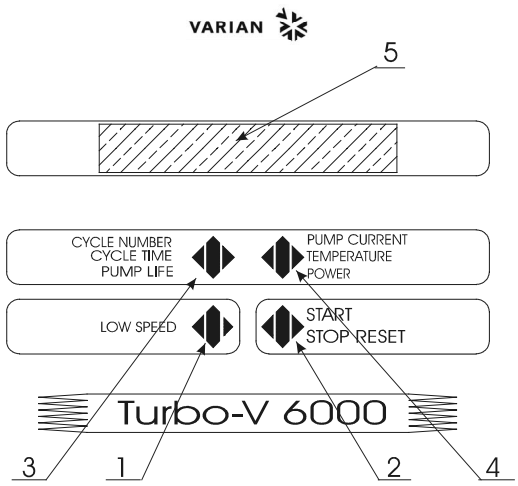
Försäkra dig att pumpen står stadigt, om den är installerad på ett bord, detta för att förebygga skador på apparaten och personer. Sätt aldrig igång pumpen, om intagsflänsen varken är kopplad till systemet eller är blockerad på plats med låsflänsen.

OBSERVERA

Stängningskontakten J1 måste lämnas ansluten med aktuell brygga om ingen extern anslutning utförs. Förvakuum-pumpen och Turbo-V-pumpen kan fungera samtidigt.

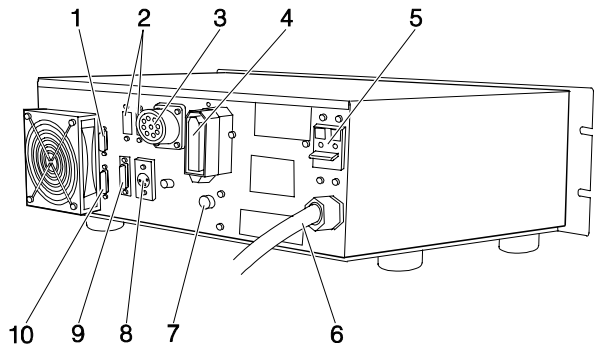
Kontroller, indikatorer och kontakter på Styrenheten

Nedan beskrivs manöverpanelen för styrenheten samt anslutningspanelerna. För ytterligare information hänvisas till bilaga "Technical Information".



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 power, rotational speed, nedre lagrets temperatur, övre lagrets temperatur, motorns temperatur och magnetiseringsfrekvens 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 24 tecken.

Frontpanelen på Styrenheten 969-9491 och 969-9591



1. Kontaktdon för digitala insignaler (anslutningsdonet levereras med en därtill avsedd brygga för återstängning).
2. Utrymme för kontaktdonen till den seriella kommunikationsporten RS 232/RS 485/RS 422 (levereras som tillval).
3. Trefas utgångskontakt mot pumpen.
4. Kontaktdon för utspänning 120 Vac 1 A för spänningsförsörjning till "Vent Device" och "Forepump", max. 3 A för Heater Band (Värmeslinga).
5. Termomagnetisk huvudströmbrytare.
6. Elkabel.
7. Säkring för Heater Band (Värmeslinga) T5 A 250 Vac.
8. Kontaktdon för externa insignaler från 0 till 10 Vdc.
9. Kontaktdon för signaler från pumpen.
10. Utgångskontakt för logiska signaler och för signaler för kontroll av pumpens ström och hastighet.

Bakre panel på Styrenheten 969-9491 och 969-9591

INSTRUKTIONER FÖR BRUK

Start av styrenheten

Styrenheten startas enkelt genom att sätta strömkabeln i vägguttaget och sätt huvudströmbrytaren i läge ON.

Start av pumpen

För att starta pumpen är det nödvändigt att trycka på knappen START på den främre instrumentpanelen efter det att kabeln som skickats med styrenheten har kopplats (från kontakt P31 till pumpen).

Stopp av pumpen

Pumpen stoppas genom att trycka på tryckknappen STOPP på frontpanelen.

UNDERHÅLL

Styrenheterna i Turbo-V 6000 serien är underhållsfria. Allt servicearbete måste utföras av auktoriserad personal.

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

VARNING!

Innan något arbete utförs på styrenheten måste dess strömförsörjning brytas.

Skrotning av pumpen skall ske enligt gällande lagstiftning.

FELMEDDELANDEN

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

MEDDELANDE	BESKRIVNING	ÅTGÄRD
CHECK CONNECTION TO PUMP	Anslutningen mellan pump och styrenhet (P31) är defekt .	Kontrollera att anslutningskabeln mellan pump och styrenhet är ordentligt monterad samt att inget avbrott förekommer. Tryck två gånger på knappen START för att starta om pumpen.
PUMP WAITING INTERLOCK	Interlock-signalen finns på kontakt P1 på grund av kortslutning mellan stift 3 och stift 8 i kontakten J1, eller på grund av att den externa interlock-signalen är öppen.	Åtgärda kortslutningen mellan stift 3 och stift 8 på kontakt J1 eller stäng den externa interlock- signalen.
FAULT: OVERTIME	Pumpen har inte nått den önskade hastigheten på 5500 varv/min 12 minuter efter start med deaktiverad MJUKSTART.	Kontrollera att systemet inte läcker. Tryck två gånger på tryckknappen START för att återstarta pumpen.
FAULT: PUMP OVERHEATED	Temperaturen har överskridit ett av följande tröskelvärden: - 65 °C för lagren. - 90°C för motorn - 60 °C för vattnet.	Vänta tills temperaturen sjunker under tröskelvärdet. Tryck två gånger på knappen START för att starta om pumpen.
FAULT: CONTROLLER OVERHEATED	Temperaturen för styrenhetens transformator har överstigit 90°C eller temperaturen vid kylaren till Mosfet utgångskretsar överstiger 60°C.	Vänta tills temperaturen sjunker under tröskelvärdet. Tryck två gånger på knappen START för att starta om pumpen.
FAULT: OVERLOAD	Under normal drift (efter startmomentet) förbrukar pumpen en större effekt än det programmerade värdet (25 A).	Kontrollera att pumpens rotor kan rotera fritt. Tryck två gånger på knappen START för att starta om pumpen.
FAULT: SHORT CIRCUIT	Under normal drift har utgången kortslutits (utgångsström högre än 60 A).	Kontrollera anslutningarna mellan pump och styrenhet. Tryck två gånger på knappen START för att starta om pumpen. Kontrollera isoleringen mellan motorn och 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.
OIL LEVEL AT MIN	Oljenivåsensorn har upptäckt en nivå som underskrider säkerhetsnivån.	Utför underhåll på pumpen enligt det tillvägagångssätt som beskrivs i den tillhörande manualen.

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.
Styreenhetene i Turbo-V 6000 erien er mikroprosessorstyrte frekvensomvendere, som består av komponenter med fast tilstand. Styreenhetene har funksjoner for selvdiagnose og selvbeskyttelse.
Styreenhetene kontrollerer pumpene i Turbo-V 6000 serien (med en titrinnsprosess) ved oppstart. Spenning og strømstyrke justeres i forhold til pumpens oppnådde hastighet.
Styreenhetene omfatter alle kretser som er nødvendige for automatisk drift av pumpene i Turbo-V 6000 serien.
En hjelpekontakt 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).
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

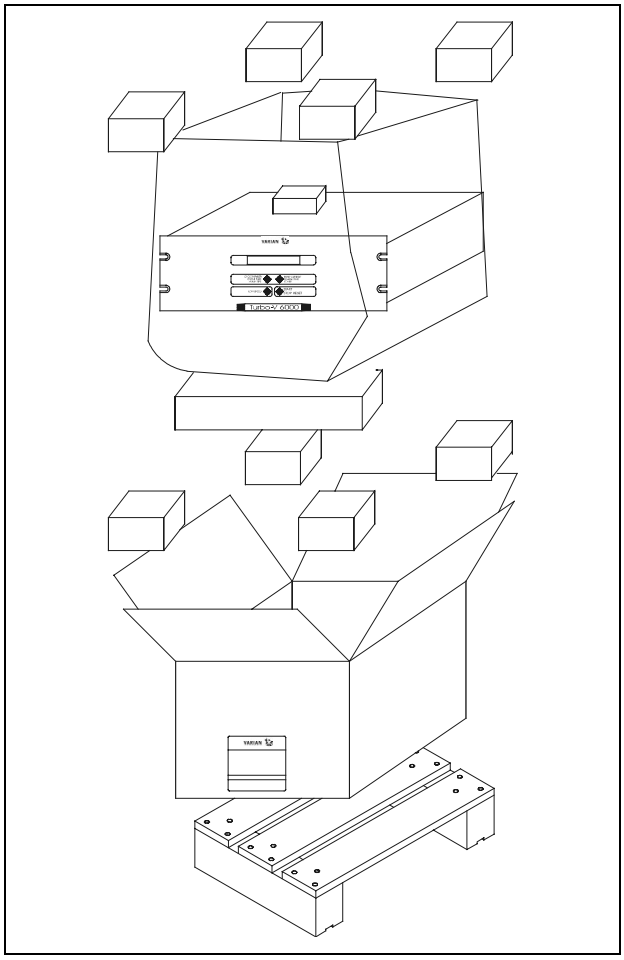
Merknadene inneholder viktig informasjon som er hentet fra teksten.

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.
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.



Styreenhetens emballasje

Styreenheten leveres fra Varian med forhåndsinnstillinger for en viss nettspenning:
- modellen 969-9491 for 220 V vekselstrøm
- modellen 969-9591 for 120 V vekselstrøm

Kontroller at den valgte nettspenningen er korrekt, og kople maskinen til strømnettet.

INSTALLASJON

ADVARSEL!

Styreenheten leveres med strømkabel med tre ledere og godkjent støpsel i henhold til internasjonale standarder. Bruk kun den vedlagte strømkabelen. Støpslet må kun benyttes i en veggkontakt som har tilfredsstillende jording, slik at faren for strømstøt kan unngås.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 vedlikeholdsarbeider som utføres på styreenheten.

MERK

Styreenheten kan installeres på et bord eller inne i et passende stativ. Uansett så må kjøleluften kunne 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 +35 °C
- relativ fuktighet: 0 - 95% (uten kondens)

Pumpen og styreenheten tilkoples den spesielle kabelen som leveres sammen med styreenheten.

Når det gjelder andre tilkoplinger og installasjon av ekstrautstyr vises det til avsnittet "Technical Information".

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". Før styreenheten tas i bruk bør samt-lige elektriske og pneumatiske tilkoplinger gjøres. Les brukerveiledningen for pumpen som er tilkoplet.

ADVARSEL!

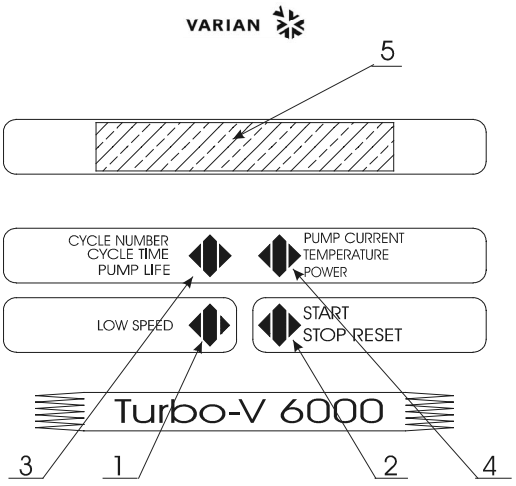
Dersom pumpen er installert på et bord må du kontroller at pumpen står støtt. Dette er viktig for å forhindre skader på apparatet og på personer. Dersom inngangsflensen hverken er tilkoplet systemet eller dersom den er blokkert av låseflensen må pumpen aldri startes opp.

MERK

Lukkekontakten J1 må være tilkoplet aktuell brygge dersom det ikke skjer en annen ekstern tilkopling. Forvakuum-pumpen og Turbo-V-pumpen må fungere sammen.

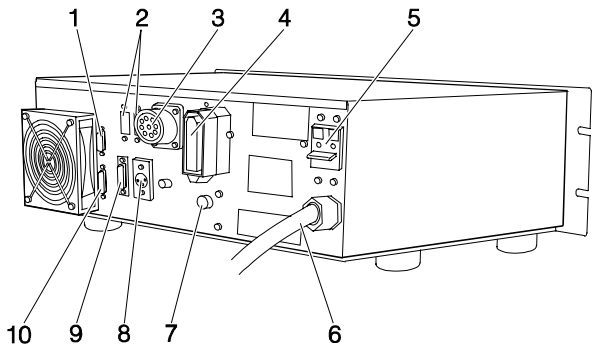
Kontroller, indikatorer og kontakter på styreenheten

Nedenfor beskrives styrepanelet til styreenheten samt tilkoplingspanelene. For ytterligere informasjon vises det til avsnittet "Accessories and Spare Parts" i vedlegget "Technical Information".



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 power, rotational speed, temperaturen i det nederste lageret, temperaturen i det øverste lageret, motortemperatur og magnetiseringsfrekvens 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: punktmatrise, 2 rader med 24 tegn.

Frontpanelet på styreenheten 969-9491 og 969-9591



1. Inngangskopling for logiske signaler (koplingsstykket blir levert med den bestemte gjenlukkingsbroen).
2. Åpning for koplingene til seriekanalen RS 232/ RS 485/RS 422 (leveres som tilbehør).
3. Trefaset utgangskontakt mot pumpen.
4. Utgangskopling for spenning på 120 Vac 1 A for forsyning av "Vent Device" og "Forepump", 3 A max for Heater Band (varmebånd).
5. Termomagnetisk hovedbryter.
6. Nettkabel.
7. Sikring for Heater Band (varmebånd) T5 A 250 Vac.
8. Inngangskopling for eksterne signaler fra 0 til 10 Vdc.
9. Kopling for signaler fra pumpen.
10. Utgangskontakt med logiske signaler og signaler for kontroll av pumpens strøm og hastighet.

Bakpanelet på styreenheten 969-9491 og 969-9591

INSTRUKSJONER FOR BRUK

Starte styreenheten

Styreenheten startes ved å sette strømkabelen i veggkontakten og sett hovedbryteren i stilling ON.

Starte pumpen

Pumpen startes ved å trykke på START knappen på frontpanelet etter at kabelen som er levert med styreenheten er tilkoplet (fra kontakt P31 til pumpen).

Stoppe pumpen

Pumpen stoppes ved å trykke på knappen STOPP på frontpanelet.

VEDLIKEHOLD

Turbo-V 6000 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!

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

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

FEILMELDINGER

Når det oppstår visse feil viser selvdiagnosekretsen i styreenheten den aktuelle feilmeldingen i displayet. De aktuelle feilmeldingen fremgår av tabellen nedenfor.

MELDING	BESKRIVELSE	FORHOLDSREGEL
CHECK CONNECTION TO PUMP	Defekt kopling mellom pumpe og styreenhet (P31).	Kontroller at tilkoplingskabelen mellom pumpe og styreenhet er skikkelig montert samt at kabelen ikke er skadet. Trykk to ganger på knappen START for å starte pumpen.
PUMP WAITING INTERLOCK	Låsesignalet for kontakt P1 skyldes en kortslutning mellom stift 3 og stift 8 i kontakten J1 eller fordi det eksterne låsesignalet er åpent.	Tilbakestill kortslutningen mellom stift 3 og stift 8 på kontakt J1 eller steng det eksterne låsesignalet.
FAULT: OVERTIME	Pumpen har ikke nådd den innstilte hastigheten på 5500 o/min 12 minutter etter start med deaktivert MYKSTART.	Kontroller at det ikke finnes lekkasjer i systemet. Trykk to ganger på START knappen for å starte opp pumpen igjen.
FAULT: PUMP OVERHEATED	Temperaturen har oversteget en av de følgende terskelverdiene: - 65 °C for lagrene - 90°C til motoren - 60 °C for vannet.	Vent til temperaturen synker under terskelverdien. Trykk to ganger på knappen START for å starte pumpen.
FAULT: CONTROLLER OVERHEATED	Temperaturen i styreenhetens transformator har overskredet 90°C, eller temperaturen på kjøleren til Mosfet-kretsløpene i utgangen er over 60°C.	Vent til temperaturen synker under terskelverdien. Trykk to ganger på knappen START for å starte pumpen.
FAULT: OVERLOAD	Ved normal drift (etter startmomentet) bruker pumpen mer effekt enn den programmerte verdien (25 A).	Kontroller om pumpens rotor kan rotere fritt. Trykk to ganger på knappen START for å starte pumpen.
FAULT: SHORT CIRCUIT	Ved normal drift er utgangen kortsluttet (utgangsstrøm over 60 A).	Kontroller tilkoplingene mellom pumpe og styreenhet. Trykk to ganger på knappen START for å starte pumpen. Kontroller isoleringen mellom motoren og 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.
OIL LEVEL AT MIN	Føleren for oljenivået har registrert en oljemengde som ligger under sikkerhetsnivået.	Utfør vedlikehold på pumpen, og gå frem som beskrevet i bruksanvisningen.

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 6000 valvojat ovat mikroprosessoreiden valvomia kiinteistä materiaaleista tehtyjä taajuudenmuuntimia, jotka kykenevät itsemäärittelyyn ja itsesuojaukseen.
Valvojat ajavat Turbo-V 6000-sarjan pumppuja (kymmenportaisessa järjestelmässä) käynnistys-vaiheessa valvoen jännitettä ja sähkövirtaa suhteessa pumpun saavuttamaan nopeuteen.
Ne yhdistävät kaikki sähköpiirit, jotka ovat välttämättömiä Turbo-V 6000-sarjan pumpun automaattiselle toiminnalle. Apuliittimiä käyttäen on mahdollista käyttää kauko-ohjattua pumpun käynnistystä ja pysähdystä, signaaleja, jotka ilmaisevat pumpun toimintatilan, esityhjennys-pumpun käynnistys- ja pysähdyssäätimiä, veden virtauksen säätelykatkaisijaa jne. 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.

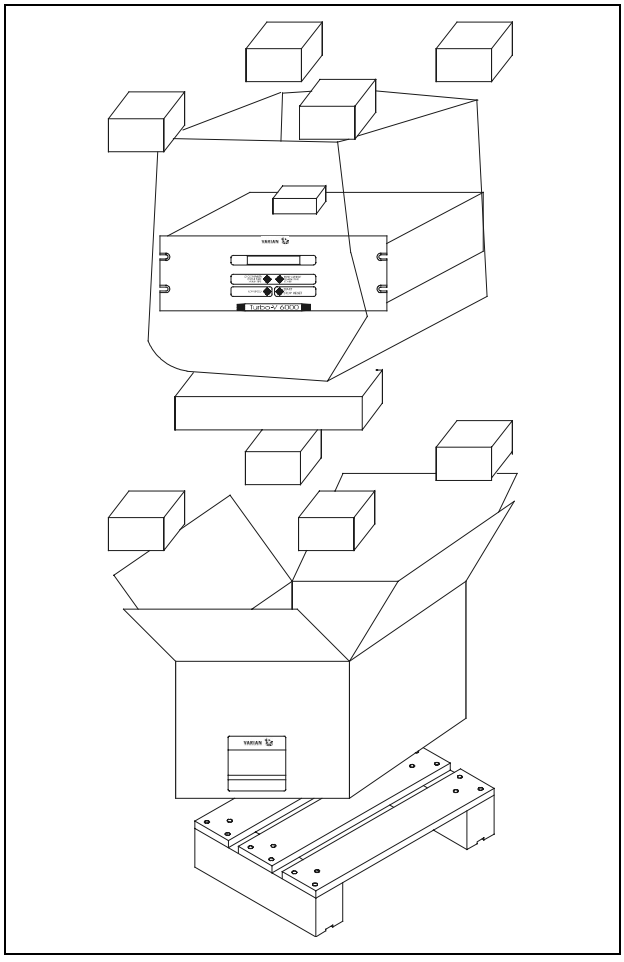
VARASTOINTI

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.
Pakkauksen purkamisen yhteydessä huolehtikaa, että valvoja eipääse 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.



Valvojan pakkaus

Jokainen valvoja on Varianilla säädetty tietylle sähköjännitteelle:

- malli 969-9491 säädetty 220 vaihtovirta
- malli 969-9591 säädetty 120 vaihtovirta

Tarkistakaa, että valittu jännite on oikea ja kytkekää virtakaapeli uudelleen.

ASENNUS

VAARA!

Vaara alvoja toimitetaan kolmijohtoisella sähkökaapelilla, jonka pistoke on kansainvälisesti hyväksytty. Käyttäkää aina tätä kaapelia ja asettakaa pistoke riittävästi maadoitettuun pistorasiaan, jotta sähköiskuilta vältytään. Valvojan sisällä syntyy korkeajännitettä, joka voi aiheuttaa vakavia vammoja tai jopa kuoleman. Ennen minkätahansa valvojan huolto-tai asennustoimenpiteen suorittamista, irroittakaa valvoja sähköverkosta.

HUOM

Valvoja voidaan asentaa pöydän päälle tai siihen tarkoitukseen sopivan hyllyn sisään. Joka tapauksessa huolehtikaa siitä, 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)

Valvojaa kytkettäessä sille tarkoitettuun pumppuun käyttäkää valvojalle tarkoitettua erityiskaapelia.

Muiden kytkentöjen ja valinnaisten lisälaitteiden asennusten suorittamiseksi, katsokaa kappaletta "Tekniset tiedot".

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. Ennen valvojan käyttöä suorittaakaa kaikki sähkökytkennät seuraten kytkettävän pumpun käyttöohjeita.

VAARA!

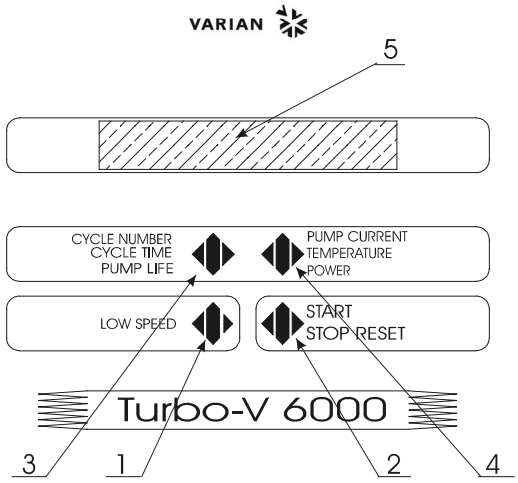
Mikäli pumppu on asetettu pöydälle, varmistakaa että se on vakaa. Näin vältytään vammoilta ihmisille sekä itse koneelle. Älkää myöskään käyttäkö pumppua, mikäli sisääntulon laippaa ei ole kytketty järjestelmään tai mikäli sitä ei ole suljettu laippasulkijalla.

HUOM

Sulkimen J1 liitin tulee jättää yhdyskaapelilla kytkettynä, mikäli ulkoisia kytkentöjä ei suoriteta. Esityhjennyspumppu ja Turbo-V pumppu voidaan käynnistää samanaikaisesti.

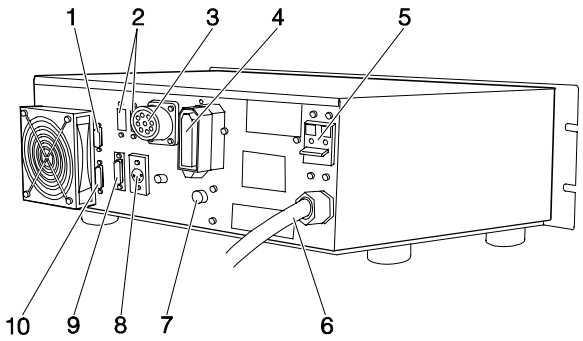
Valvojan säätimet, osoittimet ja liittimet

Seuraavassa on esitelty Valvojan valvontapaneeli ja yhteyspaneeli. Tarkempia lisätietoja saatte kappaleesta "Tekniset Tiedot".



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 pump current, pump power, rational speed, alalaakerin lämpötila, ylälaakerin lämpötila, moottorin lämpötila ja herätystaajuus 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 24 merkkiä.

Valvojien 969-9491 ja 969-9591 etupaneelit



1. Syötettyjen logiikkasignaalien liitin (liitin toimitetaan yhdessä suljettavien hyppyjohtimien kanssa).
2. Rinnakkaiskytkentäportin liittimille tarkoitettu tila RS 232/RS 485/RS 422 (toimitetaan lisävarusteena).
3. Kolmivaiheinen ulostuloliitin pumppua kohti.
4. Jännitteen lähtöliitin 120 Vac 1 A “Vent Device” ja “Forepump” virran saantiin, 3 A max kuumennusnauhalle.
5. Sähkömagneettinen pääkytkin.
6. Sähköjohto.
7. Kuumennusnauhan sulake T5 A 250 Vac.
8. Ulkoa tulevien signaalien syöttöliitin 0 ja 10 Vdc välillä.
9. Pumpusta tulevien signaalien liitin.
10. Loogisten signaalien sekä pumpun virran ja nopeuden tarkistussignaalien ulostuloliitin.

Valvojien 969-9491 ja 969-9591 takapaneeli

KÄYTTÖTOIMENPITEET

Valvojan päälle pano

Valvoja käynnistyy asettamalla virtakaapeli pistorasiaan ja käännä pääkatkaisin asentoon ON.

Pumpun käynnistys

Kytke valvojan mukana toimitettu kaapeli (liittimestä P31 pumppuun) ja käynnistä pumppu painamalla etupaneelin START-painiketta.

Pumpun pysäyttäminen

Pumppu pysähtyy painamalla etupaneelissa olevaa STOP painonappia.

HUOLTO

Turbo-V 6000 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!

Vaara Ennen minkätahansa valvojaan tehtävän toimenpiteen suorittamista irroittakaa sähkökaapeli pistorasiasta.

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

VIANETSINTÄ

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

VIESTI	VIKA	KORJAUSTOIMENPITEET
CHECK CONNECTION TO PUMP	Toimintahäiriö pumpun ja valvojan liitännässä (P31).	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 lukitussignaalin (interlock) avautumisesta.	Palauttakaa liittimen J1 neulojen 3 ja 8 välinen oikosulku tai sulkekaa ulkopuolinen lukitussignaali (interlock).
FAULT: OVERTIME	Pumppu ei ole saavuttanut asetettua nopeutta 5500 KIER/MIN 12 minuutin kuluessa käynnistyksen jälkeen silloin, kun SOFT START ei ole käytössä.	Tarkista ettei järjestelmä vuoda. Paina painiketta START kaksi kertaa, jolloin pumppu käynnistyy uudelleen.
FAULT: PUMP OVERHEATED	Lämpötila on ylittänyt yhden kynnysarvoista: - 65 °C laakereille - 90°C moottorille - 60 °C vedelle.	Odottakaa että lämpötila putoaa kynnysarvon alapuolelle. Painakaa painonappia START kaksi kertaa jolloin pumppu käynnistyy.
FAULT: CONTROLLER OVERHEATED	Valvojan muuntajan lämpötila on ylittänyt 90°C tai ulostulon Mosfets-piirikorttien jäähdyttimen lämpötila on yli 60°C.	Odottakaa, että lämpötila putoaa kynnysarvon alapuolelle. Painakaa painonappia START kaksi kertaa jolloin pumppu käynnistyy.
FAULT: OVERLOAD	Normaalityöskentelyn aikana (käynnistyksen jälkeen) pumpun absorboima sähkövirta on korkeampi kuin sille on ohjelmoitu (25 A).	Tarkistakaa, että pumpun roottori pyörii vapaasti. Painakaa painonappia START kaksi kertaa jolloin pumppu käynnistyy.
FAULT: SHORT CIRCUIT	Normaalityöskentelyn aikana poistoliitin on oikosulussa (poistuva virta suurempi kuin 60 A).	Tarkistakaa pumpun ja valvojan välinen liitos. Painakaa painonappia START kaksi kertaa jolloin pumppu käynnistyy. Tarkista moottorin ja pumpun välinen eristys.
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.
OIL LEVEL AT MIN	Öljyn tason anturi on havainnut tason olevan turvarajaa alhaisempi.	Suorita pumpun huolto ohjekirjan ohjeiden mukaisesti.

ΓΕΝΙΚΕΣ ΠΛΗΡΟΦΟΡΙΕΣ

Αυτή η συσκευή προορίζεται για επαγγελματική χρήση. Ο χρήστης θα πρέπει να διαβάσει προσεκτικά τις οδηγίες του παρώντος εγχειριδίου και οποιαδήποτε άλλη πρόσθετη πληροφορία που παρέχεται από τη Varian, πριν από τη χρησιμοποίηση της συσκευής. Η Varian δεν φέρει καμία ευθύνη όσον αφορά την ολική ή μερική αθέτηση των οδηγιών, την ακατάλληλη χρήση εκ μέρους ανεκπαίδευτου προσωπικού, αυθαίρετες επεμβάσεις ή χρήση που δεν συμφωνεί με τις ειδικές εθνικές διατάξεις. Οι ρυθμιστές της σειράς Turbo-V 6000 είναι μετατροπείς συχνότητας, ελεγχόμενοι από έναν μικροεπεξεργαστή. Είναι κατασκευασμένοι με εξαρτήματα σε στερεά κατάσταση και έχουν αυτοδιαγνωστική και αυτοπροστατευτική ικανότητα.
Οι ρυθμιστές οδηγούν τις αντλίες της σειράς Turbo-V 6000 (με μια διαδικασία που διαιρείται σε δέκα στάδια) κατά τη διάρκεια εκκίνησης ελέγχοντας την τάση και το ηλεκτρικό ρεύμα σε σχέση με την ταχύτητα στην οποία θα φτάσει η αντλία. Ενσωματώνουν όλα τα ανγκαία κυκλώματα για την αυτόματη λειτουργία των αντλιών της σειράς Turbo-V 6000. Με τη βοήθεια ενός βοηθητικού συνδετήρα είναι διαθέσιμοι όλοι οι χειρισμοί για την εκκίνηση και το σταμάτημα της αντλίας εξ αποστάσεως, τα σήματα που δείχνουν την κατάσταση λειτουργίας της αντλίας, οι χειρισμοί εκκίνησης και σταματήματος της αντλίας προ - κενού, τα σήματα μπλοκαρίσματος (για διακόπτες πίεσης, διακόπτες ελέγχου της ροής του νερού, κλπ.).
Στις επόμενες παραγράφους αναφέρονται όλες οι απαραίτητες πληροφορίες που εγγυούνται την ασφάλεια του χειριστή κατά τη διάρκεια της χρησιμοποίησης της συσκευής. Λεπτομερείς πληροφορίες παρέχονται στο παράρτημα "Technical Information".

Αυτό το εγχειρίδιο χρησιμοποιεί τις ακόλουθες συμβάσεις:

⚠ **ΚΙΝΔΥΝΟΣ**

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

☞ **ΠΡΟΣΟΧΗ**

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

ΣΗΜΕΙΩΣΗ

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

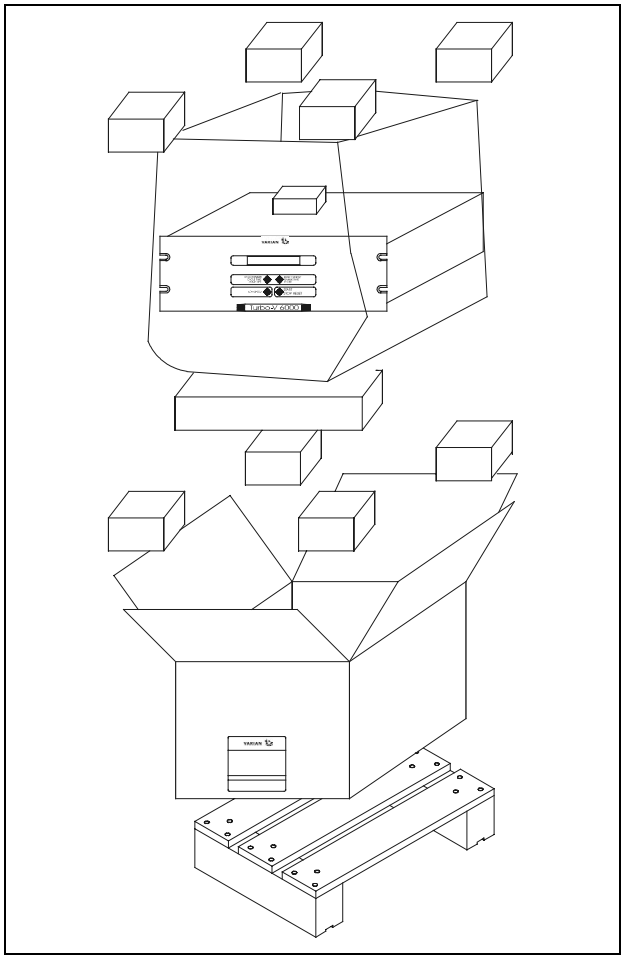
ΑΠΟΘΗΚΕΥΣΗ

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

- θερμοκρασία· -20 °C °C + 70 °C
- σχετική υγρασία· 0 - 95% (ασυμπύκνωτη)

ΠΡΟΕΤΟΙΜΑΣΙΑ ΓΙΑ ΤΗΝ ΕΓΚΑΤΑΣΤΑΣΗ

Ο ρυθμιστής είναι εξοπλισμένος με μία ευρύχωρη προστατευτική συσκευασία. Αν υπάρχουν ενδείξεις βλάβης που θα μπορούσαν να έχουν προκληθεί κατά τη διάρκεια της μεταφοράς, συμβουλευτείτε το τοπικό τμήμα πωλήσεων.
Κατά τη διάρκεια του ανοίγματος της συσκευασίας, δώστε ιδιαίτερη προσοχή έτσι ώστε να μην πέσει και να μην χτυπηθεί ο ρυθμιστής.
Μην εγκαταλείπετε τη συσκευασία στο περιβάλλον. Το υλικό ανακυκλώνεται πλήρως και ανταποκρίνεται στην Οδηγία της CEE 85/399 για τη διαφύλαξη του περιβάλλοντος.



Συσκευασία των ρυθμιστών

Κάθε ρυθμιστής βγαίνοντας από την Varian έχει μία συγκεκριμένη τάση τροφοδότησης:

- το μοντέλο 969-9491 220 Vac
- το μοντέλο 969-9591 120 Vac

Ελέγξτε αν επιλέχθηκε η σωστή τάση και συνδέστε το καλώδιο τροφοδότησης.

ΕΓΚΑΤΑΣΤΑΣΗ

ΚΙΝΔΥΝΟΣ

Ο ρυθμιστής είναι εφοδιασμένος με τριπολικό καλώδιο τροφοδότησης με μία πρίζα που έχει εγκριθεί διεθνώς. Να χρησιμοποιείτε πάντα αυτό το καλώδιο τροφοδοσίας και να το βάζετε σε πρίζα που να διαθέτει την κατάλληλη γείωση έτσι ώστε να αποφεύγονται ηλεκτρικές εκκενώσεις. Στο εσωτερικό του ρυθμιστή αναπτύσσονται υψηλές τάσεις που μπορούν να προκαλέσουν σοβαρούς τραυματισμούς ή και το θάνατο. Πριν εκτελέσετε οποιαδήποτε εργασία εγκατάστασης ή συντήρησης του ρυθμιστή αποσυνδέστε τον από την πρίζα τροφοδότησης.

ΣΗΜΕΙΩΣΗ

Ο ρυθμιστής μπορεί να τοποθετηθεί επάνω σε ένα τραπέζι ή στο εσωτερικό μίας κατάλληλης θήκης. Σε οποιαδήποτε περίπτωση είναι αναγκαίο ο αέρας να κυκλοφορεί ελεύθερα στο εσωτερικό της συσκευής.
Μην τοποθετείτε, ούτε να χρησιμοποιείτε τον ρυθμιστή σε χώρους εκτεθειμένους στις καιρικές συνθήκες (βροχή, πάγος, χιόνι, σκόνες, αέρια, σε χώρους όπου υπάρχει κίνδυνος έκρηξης ή πυρκαγιάς).

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

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

Για τη σύνδεση του ρυθμιστή με την αντλία χρησιμοποιήστε το αντίστοιχο καλώδιο του ρυθμιστή.

Για τις άλλες συνδέσεις και για την εγκατάσταση των επιπλέον εξαρτημάτων, βλέπε το παράρτημα "Technical Information".

ΧΡΗΣΗ

Σ' αυτήν την παράγραφο αναφέρονται οι κυριότερες διαδικασίες λειτουργίας. Για περισσότερες λεπτομέρειες και για διαδικασίες που απαιτούν ιδιαίτερες συνδέσεις ή αξεσουάρ, αναφερθείτε στην παράγραφο sΧρήσης του παραρτήματος sΤεχνικές Πληροφορίες. Πριν χρησιμοποιήσετε τον ρυθμιστή κάντε όλες τις συνδέσεις ηλεκτρικές και αέρος με βάση το εγχειρίδιο της αντλίας σύνδεσης.

ΚΙΝΔΥΝΟΣ

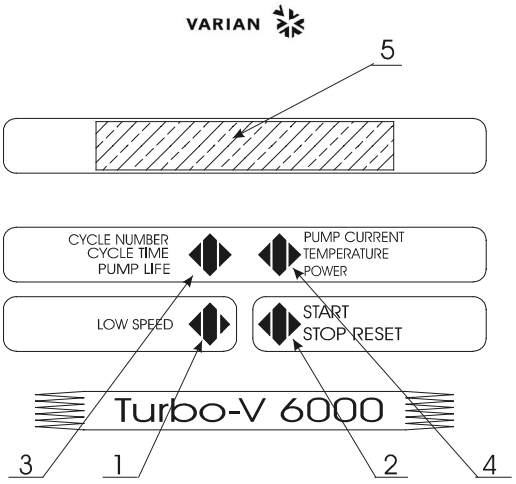
Για να αποφύγετε βλάβες σε άτομα ή στη συσκευή, όταν η αντλία είναι τοποθετημένη σε ένα τραπέζι σιγουρευτείτε ότι είναι καλά σταθεροποιημένη. Μην θέτετε σε λειτουργία την αντλία αν η φλάντζα εισόδου δεν είναι συνδεδεμένη στο σύστημα ή αν δεν είναι κλειστή με την φλάντζα κλεισίματος.

ΣΗΜΕΙΩΣΗ

Ο συνδετήρας J1 θα πρέπει να αφεθεί συνδεδεμένος με τη γέφυρα αν δεν γίνεται καμμία εξωτερική σύνδεση. Η αντλία προ - κενού και η αντλία Turbo-V μπορούν να ενεργοποιηθούν προσωρινά.

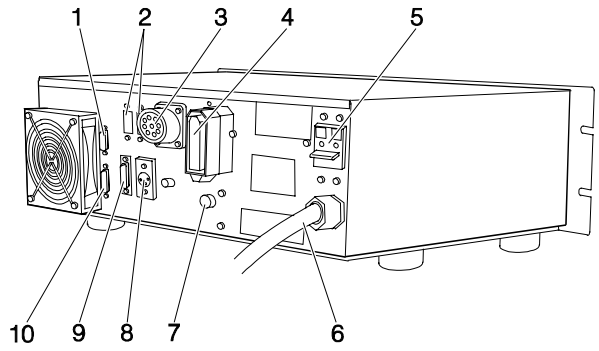
Χειριστήρια, ενδείξεις και συνδετήρες του Ρυθμιστή

Στη συνέχεια παρουσιάζονται ο πίνακας ελέγχου του ρυθμιστή και οι πίνακες σύνδεσης. Για περισσότερες λεπτομέρειες αναφερθείτε στο παράρτημα "Technical Information".



1. Κουμπί για την επιλογή του **LOW SPEED** (χαμηλή ταχύτητα). Ενεργοποιείται μόνον όταν έχει επιλεγεί η λειτουργία στον μπροστινό πίνακα. Πατώντας το μία φορά η αντλία περιστρέφεται περίπου κατά τα 2/3 της ονομαστικής ταχύτητας. Πατώντας το ακόμη μία φορά σταματά η λειτουργία του **LOW SPEED**.
2. Κουμπί για τους χειρισμούς **START**, **STOP** και **RESET**. Είναι ενεργό μόνον όταν έχει επιλεγεί η λειτουργία στον μπροστινό πίνακα. Πατώντας το μία φορά ενεργοποιείται η φάση εκκίνησης. Πατώντα το ακόμα μία φορά σταματά η αντλία. Αν η αντλία σταμάτησε αυτόματα λόγω βλάβης θα πρέπει να πατηθεί αυτό το κουμπί μία φορά έτσι ώστε να γίνει η επαναρύθμιση του ρυθμιστή και μία δεύτερη φορά για να ενεργοποιηθεί η αντλία.
3. Κουμπί για να εμφανιστούν στην οθόνη οι παράμετροι **cycle number**, **cycle time** και **pump life**.
4. Κουμπί για την εμφάνιση στην οθόνη των παράμετρων **pump current**, **pump power**, **rotational speed** και θερμοκρασία κάτω εδράνου, θερμοκρασία άνω εδράνου, θερμοκρασία κινητήρα, συχνότητα διέγερσης. Είναι πάντα ενεργοποιημένο άσχετα με τη λειτουργία που θα επιλεγεί. Πατώντας μαζί τα κουμπιά 3 και 4 για τουλάχιστον 2 δευτερόλεπτα ενεργοποιείται ένα πρόγραμμα με το οποίο μπορείτε να προγραμματίσετε μερικές λειτουργικές παραμέτρους
5. Αλφαριθμητική οθόνη με υγρούς κρυστάλλους: μήτρα κουκίδων, 2 σειρές x 24 χαρακτήρες.

Εμπρόσθιος πίνακας του Ρυθμιστή 969-9491 και 969-9591



1. Βύσμα εισόδου των σημάτων λογικής (το βύσμα ζευγάρωσης προμηθεύεται με την ειδική γεφύρωση κλεισίματος).
2. Προβλεπόμενη θήκη για τα βύσματα της πόρτας γραμμικής επικοινωνίας RS 232/RS 485/RS 422 (προμηθεύεται προαιρετικά).
3. Τριφασικό βύσμα εξόδου προς την αντλία.
4. Βύσμα εξόδου τάσης 120 Vac 1 A για την τροφοδότηση Vent Device και Forepump, 3 A μαξ για Heater Band.
5. Γενικός μαγνητικός - θερμικός διακόπτης.
6. Καλώδιο τροφοδότησης.
7. Ασφάλεια για Heater Band T5 A 250 Vac.
8. Βύσμα για είσοδο σημάτων που προέρχονται από έξω από 0 έως 10 Vdc.
9. Βύσμα για σήματα που προέρχονται από την αντλία.
10. Βύσμα εξόδου των λογικών σημάτων και των σημάτων επαλήθευσης του ρεύματος και της ταχύτητας της αντλίας.

Εμπρόσθιος πίνακας του Ρυθμιστη
969-9491 και 969-9591

ΔΙΑΔΙΚΑΣΙΕΣ ΣΧΕΤΙΚΑ ΜΕ ΤΗ ΧΡΗΣΗ

Αναμμα του Ρυθμιστή

Για να ανάψει ο ρυθμιστής είναι αρκετό να βάλετε το καλώδιο τροφοδότησης στην πρίζα του δικτύου. και θέτετε το διακόπτη της γραμμής στη θέση ON.

Εκκίνηση της Αντλίας

Για να εκκινήσετε την αντλία πρέπει να πιέσετε το κουμπί START του εμπρόσθιου πίνακα αφού έχετε συνδέσει το καλώδιο που προμηθεύεται με τον ελεγκτή (controller) (από το βύσμα P31 στην αντλία).

Σταμάτημα της Αντλίας

Για να σταματήσει η αντλία αρκεί να πατήσετε το κουμπί STOP του εμπρόσθιου πίνακα.

ΣΥΝΤΗΡΗΣΗ

Οι ρυθμιστές της σειράς Turbo-V 6000 δεν απαιτούν καμία συντήρηση. Οποιαδήποτε επέμβαση θα πρέπει να πραγματοποιηθεί από εγκεκριμένο προσωπικό.

Σε περίπτωση βλάβης μπορείτε να χρησιμοποιήσετε την υπηρεσία επισκευών της Varian ή το ˙αριαν αδανχε εξχηανγε σερίχε±, που σας δίνει τη δυνατότητα να έχετε έναν καθαρισμένο ρυθμιστή σε αντικατάσταση του χαλασμένου.

ΚΙΝΔΥΝΟΣ

Πριν κάνετε οποιαδήποτε επέμβαση στον Ρυθμιστή αποσυνδέστε το καλώδιο τροφοδότησης.

Για την καταστροφή του ρυθμιστή ακολουθήστε ότι αναφέρετε στους εθνικούς κανονισμούς.

ΜΗΝΥΜΑΤΑ ΛΑΘΟΥΣ

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

ΜΗΝΥΜΑ	ΠΕΡΙΓΡΑΦΗ	ΔΙΟΡΘΩΣΗ
CHECK CONNECTION TO PUMP	Κακή λειτουργία στη σύνδεση αντλίας και ρυθμιστη (P31).	Ελέγξτε αν το καλώδιο σύνδεσης μεταξύ αντλίας και ρυθμιστή είναι καλά σταθεροποιημένο και στα δύο άκρα και ότι δεν υπάρχει διακοπή. Πατήστε δύο φορές το κουμπί START για να θέσετε ξανά σε κίνηση την αντλία.
PUMP WAITING INTERLOCK	Εχει ενεργοποιηθεί το σήμα ιντερλοχκ που βρίσκεται στον συνδετήρα P1 λόγω διακοπής του βραχυκυκλώματος μεταξύ του pin 3 και του pin 8 του συνδετήρα J1, ή λόγω ανοίγματος του σήματος του εξωτερικού ιντερλοχκ.	Επαναφέρατε το βραχυκύκλωμα μεταξύ του pin 3 και του pin 8 του συνδετήρα J1, , κλείστε το σήμα του εξωτερικού ιντερλοχκ.
FAULT: OVERTIME	Η αντλία δεν έφτασε στην προβλεπόμενη ταχύτητα 5500 KRPM 12 λεπτά μετά την εκκίνηση με μη επιλεγμένο το SOFT START	Επαληθεύστε αν το σύστημα παρουσιάζει απώλειες. Πιέστε δύο φορές το κουμπί START για την επανεκκίνηση της αντλίας.
FAULT: PUMP OVERHEATED	Η θερμοκρασία ξεπέρασε μία από τις ακόλουθες οριακές τιμές: – 65 °C για τα έδρανα – 90 °C για τον κινητήρα – 60 °C για το νερό	Περιμένετε ώσπου η θερμοκρασία να κατεβεί κάτω από το ανώτατο επιτρεπτό σημείο. Πατήστε δύο φορές το κουμπί START για να θέσετε ξανά σε κίνηση την αντλία.
FAULT: CONTROLLER OVERHEATED	Η θερμοκρασία του μετασχηματιστή του ελεγκτή ξεπέρασε τους 90 °C ή άλλως η θερμοκρασία στο ψυγείο των Mosfets εξόδου είναι ανώτερη των 60 °C.	Περιμένετε ώσπου η θερμοκρασία να κατεβεί κάτω από το ανώτατο επιτρεπτό σημείο. Πατήστε δύο φορές το κουμπί START για να θέσετε ξανά σε κίνηση την αντλία.
FAULT: OVERLOAD	Κατά την κανονική λειτουργία (μετά τη φάση εκκίνησης) το απορροφούμενο ρεύμα από την αντλία είναι μεγαλύτερο από το προγραμματισμένο (25 A).	Ελέγξτε αν ο ρότορας της αντλίας μπορεί να περιστραφεί ελεύθερα. Πατήστε δύο φορές το κουμπί START για να θέσετε ξανά σε κίνηση την αντλία.
FAULT: SHORT CIRCUIT	Κατά την κανονική λειτουργία η σύνδεση εξόδου έχει βραχυκυκλώσει (ρεύμα εξόδου μεγαλύτερο από 60 A).	Ελέγξτε τις συνδέσεις μεταξύ αντλίας και ρυθμιστή. Πατήστε δύο φορές το κουμπί START για να θέσετε ξανά σε κίνηση την αντλία. Επιθεωρείτε τη μόνωση μεταξύ του κινητήρα και της αντλίας.
SYSTEM OVERRIDE	Η αντλία σταμάτησε από ένα σήμα κινδύνου που προέρχεται από την μακρινή επαφή.	Βγάλτε το καλώδιο τροφοδόρτησης του ρυθμιστή και διορθώστε την αιτία πρόκλησης του σήματος κινδύνου. Επανασυνδέστε το καλώδιο τροφοδότησης και πατήστε δύο φορές το κουμπί START για να θέσετε ξανά σε κίνηση την αντλία
OVERVOLTAGE	Παρουσιάστηκε βλάβη στον τομέα τροφοδοσίας του ρυθμιστή ή ο ρυθμιστής δέχθηκε ένα λανθασμένο σήμα.	Πατήστε δύο φορές το κουμπί START για να θέσετε ξανά σε εκκίνηση την αντλία. Αν ξαναπαρουσιαστεί το μήνυμα απευθυνθείτε στην Varian για συντήρηση.
OIL LEVEL AT MIN	Ο καθετήρας της στάθμης λαδιού διαπίστωσε μία στάθμη κατώτερη από το επίπεδο ασφαλείας.	Προνοείτε για τη συντήρηση της αντλίας σύμφωνα με τους τρόπους που περιγράφηκαν στο ειδικό εγχειρίδιο.

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 people, non-authorized interference with the equipment or any action contrary to that provided for by specific national standards. The Turbo-V 6000 series controllers are microprocessor-controlled, solid-state, frequency converters with self-diagnostic and self-protection features.
The controllers drive (within ten steps) the Turbo-V 6000 by the pump. They incorporate all the facilities required for the automatic operation of the Turbo-V 6000 pump series.
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 following paragraphs contain all the information necessary to guarantee the safety of the operator when using the equipment. Detailed information is supplied in the appendix "Technical Information".

This manual uses the following standard protocol:

WARNING!

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

CAUTION!

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

NOTE

The notes contain important information taken from the text.

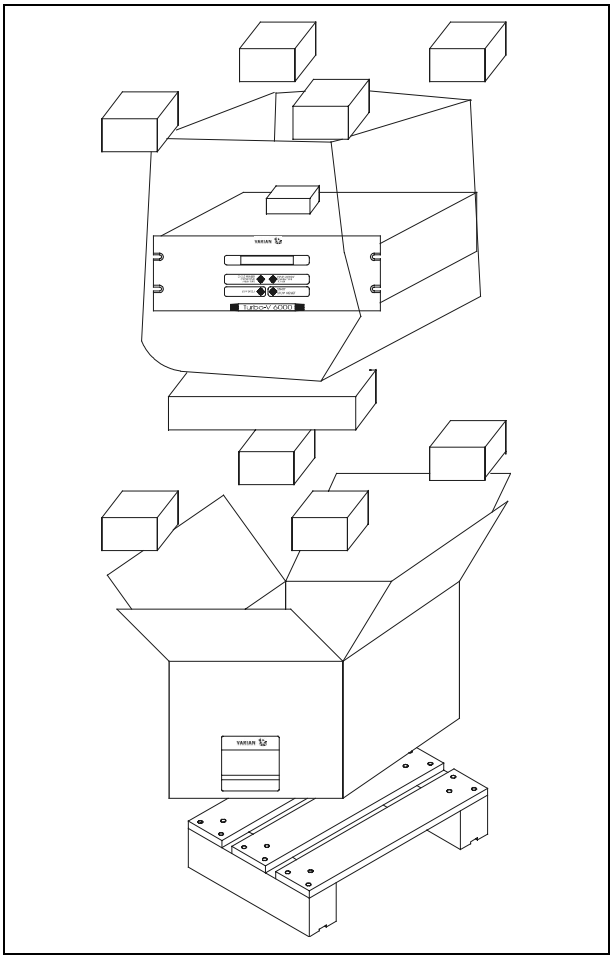
STORAGE

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

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

PREPARATION FOR INSTALLATION

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



Controller packing

Each controller is factory set for a specific power supply:

- model 969-9491 is factory set for 220 Vac operation
- model 969-9591 is factory set for 120 Vac operation

Check voltage selector window for correct set and connect power cord.

INSTALLATION

WARNING!

The Turbo-V controller is equipped with a 3-wire power cord and plug (internationally approved) for user safety. Use this power cord and plug in conjunction with a properly grounded power socket to avoid electrical shock.
High voltage developed in the controller can cause severe injury or death. Before servicing the unit, disconnect the input power cable.

NOTE

The Turbo-V controller can be used as a bench unit or a rack module, but it must be positioned so that free air can flow through the holes.
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 condensation).

To connect the controller to the pump use the specific cable supplied with the controller.

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

USE

This paragraph describes the fundamental operating procedures. Detailed information and operating procedures that envolve optional connection or option are supplied in the paragraph “USE” of the appendix “Technical Information”.
Make all vacuum manifold and electrical connections and refer to Turbo-V pump instruction manual before operating the Turbo-V controller.

WARNING!

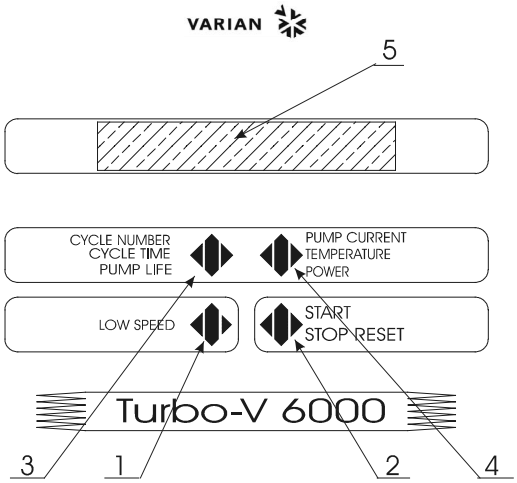
To avoid injury to personnel and damage to the equipment, if the pump is laying on a table make sure it is steady .
Never operate the Turbo-V pump if the pump inlet is not connected to the system or blanked off.

NOTE

The input signal J1connector should be left in position including the shipping links if no external connections are made. The forepump and Turbo-V pump can be switched on at the same time.

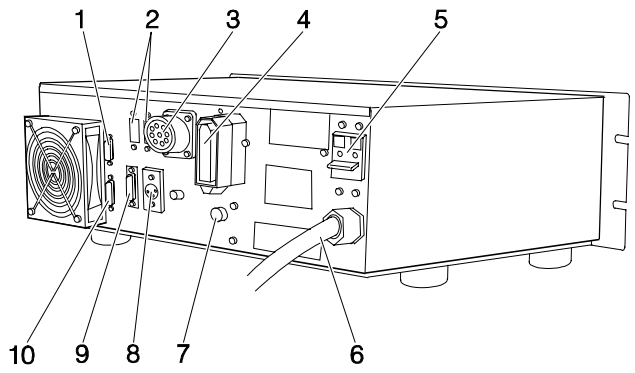
Controller controls, indicators and connectors

The following paragraph illustrates the Controller control panel and interconnection panel.
More details are contained in the appendix “Technical Information".



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 power, rotational speed and lower bearing temperature, upper bearing temperature, motor temperature, excitacion frequency. 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 24 characters.

Controller 969-9491, 969-9591 front panel



1. Logic signals input connector (mating connector supplied with the appropriate loopback plug).
2. Slot for an RS 232, RS 485 RS 422 serial port connector (provided as option).
3. Logic signals three-phase output connector to pump.
4. 120 Vac 1 A output connector to power the Vent Device and Forepump, 3 A max for the Heater Band.
5. General thermal switch.
6. Power cable.
7. Heater Band T5 A 250 Vac fuse.
8. 0 to 10 Vdc external signals input connector.
9. Connector for signals deriving from the pump.
10. Outgoing connector of logical and current check and speed of the pump signals.

Controller 969-9491 and 969-9591 rear panel

USE PROCEDURE

Controller Startup

To startup the controller plug the power cable into a suitable power source and set the line switch to the position ON.

Starting the pump

In order to start the pump, press the START pushbutton on the front panel, after connecting it to the cable supplied with the controller (from P31 connector to the pump).

Pump Shutdown

To shutdown the pump press the STOP push-button on the controller front panel.

MAINTENANCE

The Turbo-V 6000 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 pump is to be scrapped, it must be disposed off in accordance with the specific national standards.

ERROR MESSAGES

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

MESSAGE	DESCRIPTION	REPAIR ACTION
CHECK CONNECTION TO PUMP	Wrong connection between the pump and the controller (P31).	Check connection between controller and pump. Press the START push-button twice to start the pump.
PUMP WAITING INTERLOCK	The interlock signal of P1 connector is activated by an interruption of the link between pin 3 and 8 of J1 connector, or because the external interlock signal is open.	Reset the short circuit between pin 3 and pin 8 of J1 connector, or close the external interlock signal.
FAULT: OVERTIME	The pump did not reach the expected speed of 5500 KRPM 12 minutes after startup with SOFT START deselected.	Make sure that the system does not leak. Press the START button twice to restart the pump.
FAULT: PUMP OVERHEATED	The temperature has exceeded one of the following threshold values: - 65 °C for the bearings - 90 °C for motor. - 60 °C for the water.	Wait until the temperature decrease below threshold value. Press the START push-button twice to start the pump.
FAULT: CONTROLLER OVERHEATED	The controller transformer temperature exceeds 90 °C or the temperature on the outgoing Mosfets radiator exceeds 60 °C.	Wait until the temperature decrease below threshold value. Press the START push-button twice to start the pump.
FAULT: OVERLOAD	In normal operation (after the starting phase) the current drawn by the pump is higher than programmed (25 A)	Check that the pump rotor is free to rotate. Press the START push-button twice to start the pump.
FAULT: SHORT CIRCUIT	After the starting phase the output connection is shorted (output current higher than 60 A).	Check connections and shortages between pump and controller. Press the START push-button twice to start the pump. Check the insulation between motor and pump.
SYSTEM OVERRIDE	The pump is stopped by an emergency stop signal provided via a remote contact.	Remove the controller power cable and check the emergency condition. Then reconnect the power cable and press the START push-button twice to start the pump.
OVERVOLTAGE	Controller power supply circuitry is faulty, or the Controller received a spike.	Press the START push-button twice to start the pump. Should the message still be present, call the Varian service
OIL LEVEL AT MIN	The oil level sensor detects a level less than the minimum allowed.	Carry out pump maintenance as provided by the manual.

TURBO-V 6000 CONTROLLER DESCRIPTION

The controller is available in two versions:

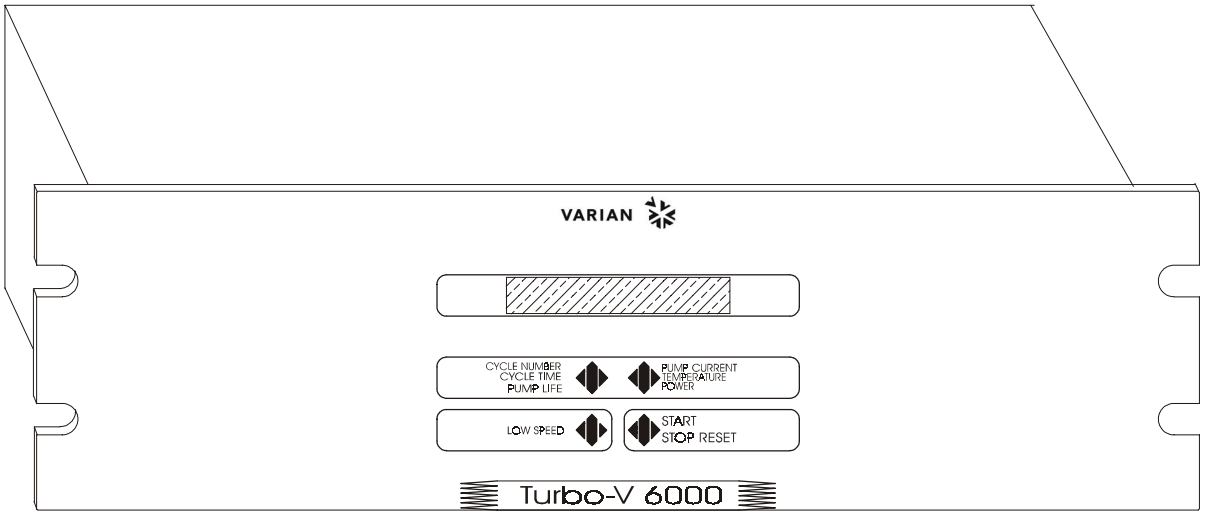
- Model 969-9491 (220 Vac, 50-60 Hz)
- Model 969-9591 (120 Vac, 50-60 Hz)

The controllers are provided with a front panel with an LCD alphanumeric display to indicate the operating conditions/parameters of the Turbo-V pump and a keyboard, and a rear panel with input/output connectors.
The following figure is a picture of the Turbo-V controllers. The controller is a solid-state frequency converter which is driven by a single chip microcomputer and is composed of:

- Power transformer
- Front panel display and keyboard
- Rear panel with input/output connectors
- Power PCB including: power supply and 3-phase output.
- Control PCB including: analog and input/output section, microprocessor and digital section.

The power supply converts the single phase (50-60 Hz) AC mains supply into a 3-phase, low voltage, medium frequency output which is required to power the Turbo-V pump.
The microcomputer generates the variable output frequency and controls the 3-phase output voltage according to the software and the gas load condition of the pump.
Moreover, it manages signals from sensors, input/output connection information to be displayed, and gives outputs for a fully automatic operation.
An EEPROM internal to the microprocessor is used to store pump operating parameters and the input/output programmed information.
The controller can be operated via:

- Front panel switches
- Remote signals via rear panel connectors
- RS 232/422/485 serial link (option) .



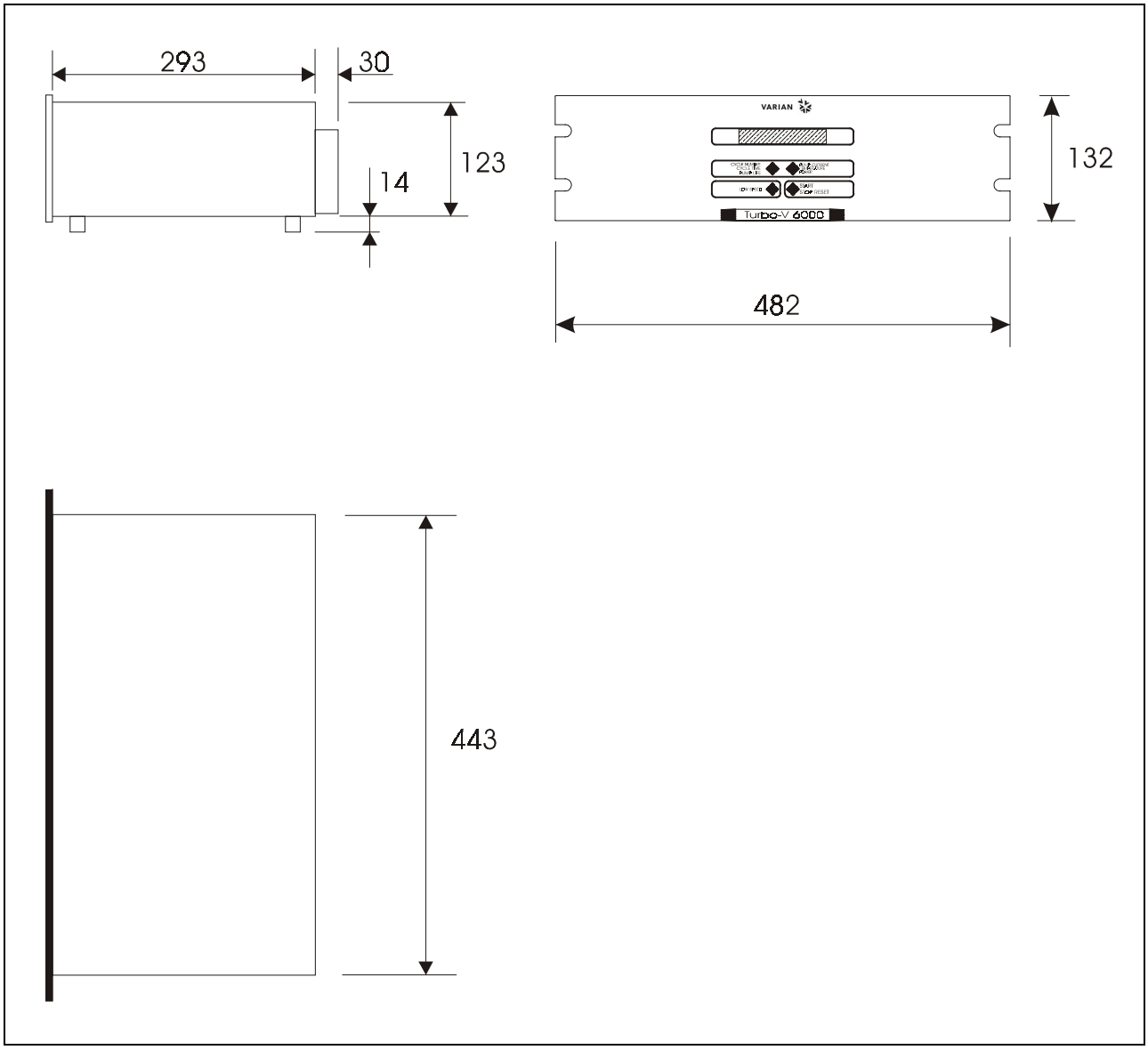
Turbo-V 6000 controllers

CONTROLLER SPECIFICATIONS

Input:	
Voltage	100, 120, 220, 240 Vac±10%, 1-phase
Frequency	50 to 60 Hz
Power	3000 VA maximum
Output:	
Voltage	100 Vac nominal ±10%
Frequency	233 Hz ±2%
Power	2000 W maximum
During operation	1200 W
Operating temperature	0°C to +40 °C
Storage temperature	-20°C to +70°C
Circuit breaker	20 A for 220 or 240 input Voltage 40 A for 100 or 120 input Voltage
P1 optoisolator input	Minimum ON 3mA Maximum 5 mA
J2 optoisolator output	24 Vdc, 60 mA and analog output 0-10 V
J21 power output interc.	120 Vac, disregarding the mains (3A for heater band 1 A for forepump relay coil and Vent Device)
P31 signal inputs	Temperature sensors Speed detector Oil level detector
J23 three-phase output	100 Vac
Radio interference suppression	Conforms to EN 55011 class A group 1 Conforms to IEC1000-4-2, 1000-4-3, 1000-4-4 Conforms to EN 61010-1
Auxiliary connectors	
P1	External INPUT commands (pins)
J2	OUTPUT signals (sockets)
J21	Vent Device, forepump and heater band (socket)
P34	Spare external input connector
J17/J18	RS 232/422/485 connection (optional)
Cables	Mains cable (3-wire, 3-meter long) Signals cable (10 m) Pump cable (4-wire, 10-meter long)
Weight (both models)	33 kg (72,8 lbs)

CONTROLLER OUTLINE

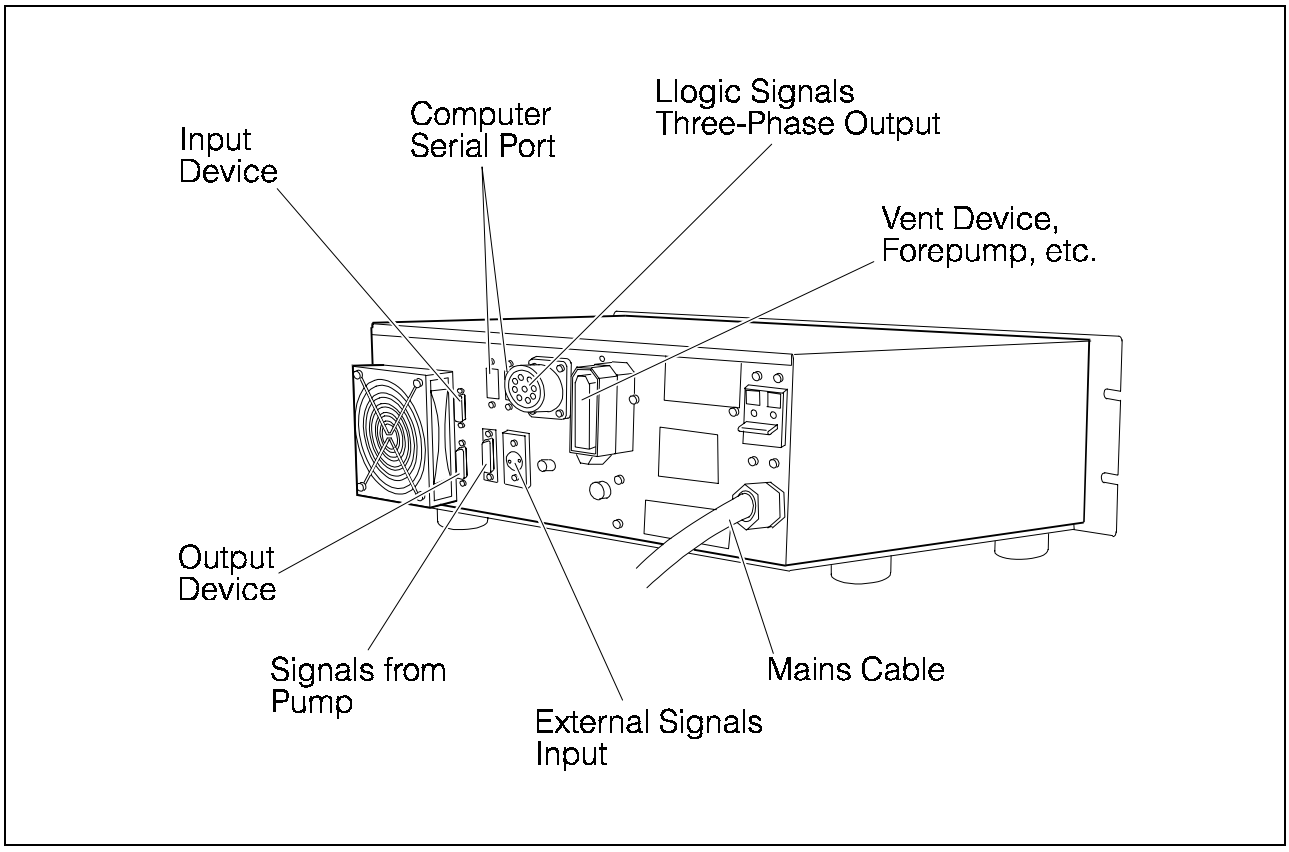
The outline dimensions for the Turbo-V 6000 controllers are shown in the following figures:



Controller models 969-9491 and 969-9591 outline

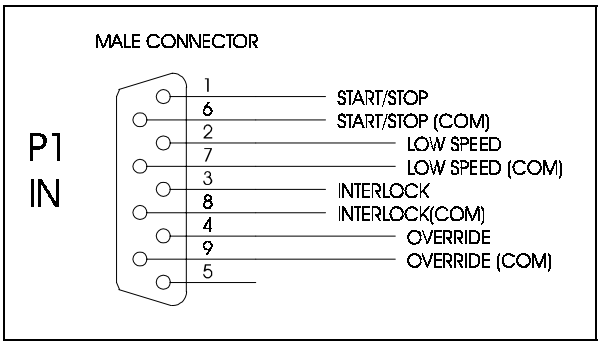
INTERCONNECTIONS

The following figure shows the Controller interconnections.



Controller models 969-9491 and 969-9591 interconnection

Connection P1
Logic Input Interconnections



P1 input connector

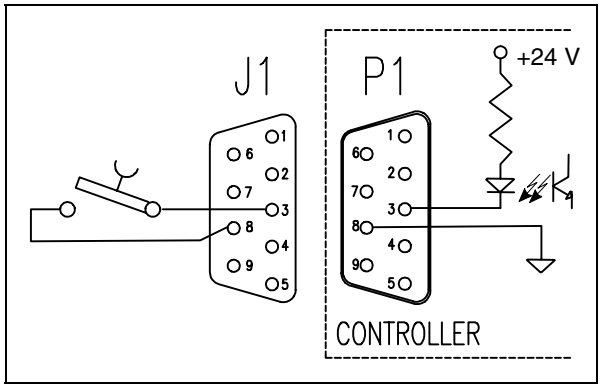
All the logic input to the controller must be connected at J-1 mating connector. With the provided J1 mating connector (shipped with pin 3 and pin 8 shorted) make the connections with AWG 24, (0.24 mm) or smaller wire to the pins indicated in the figure to obtain the desired capability. The following 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 front panel 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 front panel 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

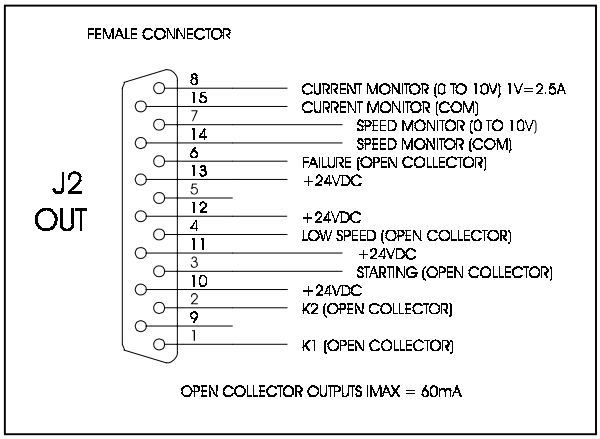
Pin 3-8 must be shorted to allow the Turbo-V 6000 pump to start if no interlock contact is connected. if, after starting the pump, the interlock contact opens, it has no effect on the operation and the pump continues to turn.

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



Typical logic input connection

Connection J2
Logic Output Interconnections

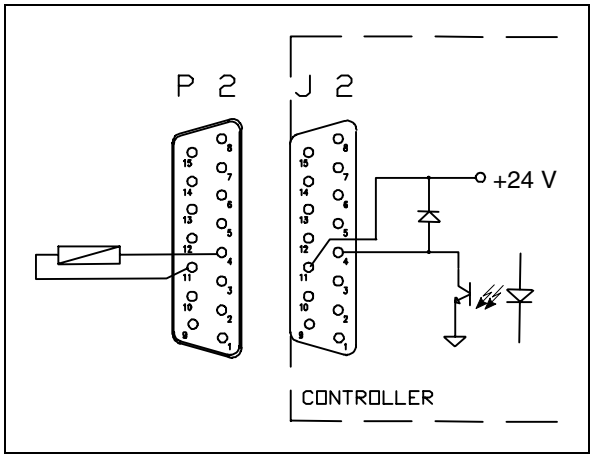


Logic output connector

All the logic output from the controller must be connected at P2 mating connector. With the optional P2 mating connector make the connection with AWG 24 (0.25 mm) 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
8-15	Analog output Voltage of DC current drawn by the turbopump (pin 8 positive, pin 15 negative). 1 Vdc proportional to 2,5 A.
1-10	RELAY 1 signal 24 V. 60 mA, optically isolated output (pin 10 positive, pin 1 negative). The output Voltage will be present when the rotational speed of the pump is higher than the selected high speed threshold.
4-12	LOW SPEED signal, 24 V, 60 mA, optically isolated output (pin 12 positive, pin 4 negative). The output Voltage will be present when the low speed mode is selected either through the front panel the remote signal, or serial port.
3-11	START signal 24 V. 60 mA, optically isolated output (pin 11 positive, pin 3 negative). The output Voltage will be present when the START push-button on front panel is pressed or the remote start is present. or the function has been requested by RS 232, until NORMAL operation is reached.
2-10	RELAY2 signal 24 V. 60 mA, optically isolated output (pin 10 positive, pin 2 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 = OFF
6-13	FAULT signal 24 V, 60 mA, optically isolated output (pin 13 positive. pin 6 negative). The output Voltage will be present when a fault condition is displayed on the front panel display.
7-14	Analog output voltage (0÷10 V) of pump speed (pin 7 positive, pin 14 negative).

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.

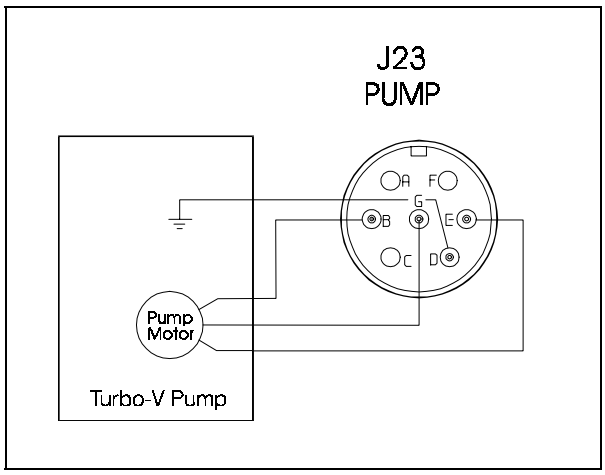


Typical output connection (T.B.D.)

Controller-to-Pump Connection

A ten-meter long cable is to connect the controller to the pump. The following figures show the controller output connector configuration where pins:

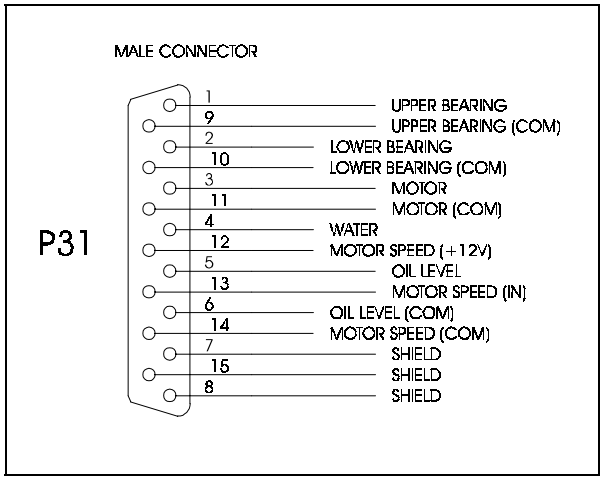
- B-G-E = 100 Vac 3-phase output to pump motor stator
- D = ground



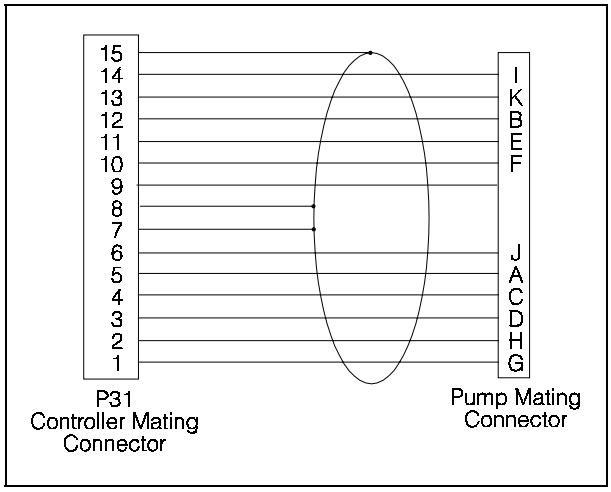
Controller-to-pump connector
(applicable to model 969-9491 and 969-9591)

Connection P31 Turbo-V Pump Signals

A cable is provided to connect the controller to the pump. If this cable is not connected on both sides, the pump does not start. The signal cable is shown in the following figure and has the following pin configuration:



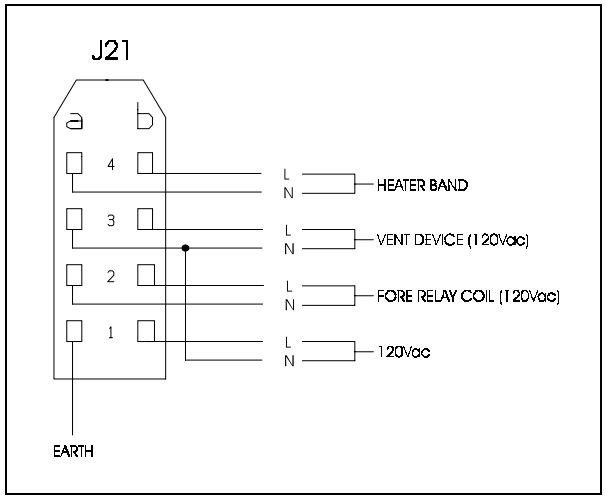
P31 connector



Signals cable

Connection J21 Accessories and Options Interconnections

The controller is provided with a power connector plug J21. Ensure that the main circuit breaker is off, then remove the plug and wire the pins (maximum wire size 18 AWG) as indicated below, to obtain the desired capability as shown in the following figure.



Power socket output signals

Pin 1a - Ground

Pin 1b-3a, 3b-3a, 2b-2a -Output of 120 Vac (independent of line voltage), 1 A total for vent device and forepump relay coil.
Voltage is present after START push button is pressed and remains present until an overload condition occurs or power is removed from the turbo-pump.

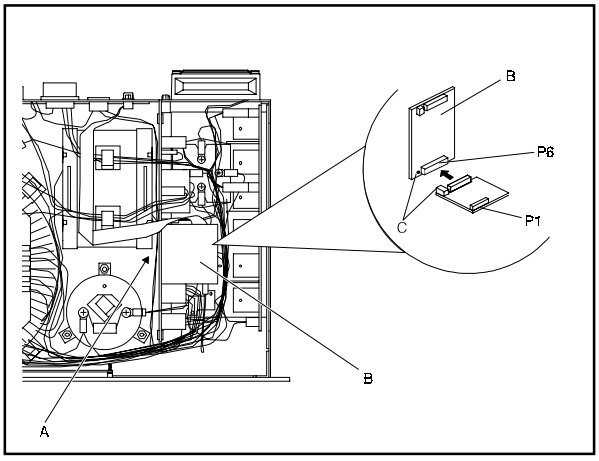
Pin 4b-4a -Output mains voltage 3 A max. for heater band. Voltage is present when the turbopump is running and the heater band enable is selected YES.

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.
- Unscrew the cover screws and remove the cover.
- Unscrew screw **A** and remove board **B**.
- Attach the interface board connector to connector P6 on the board **B** and then secure it in place using screw **C** (3x6), which is not provided.
- Reinstall board **B** and lock it to the controller through the screw.
- Insert the flat cable through the rear panel and plug it into the socket **P1** located on the Interface board.
- Restore the main board into its original position.
- Install and tighten the connector screws and turrets.
- Replace the cover.



Serial port connector installation

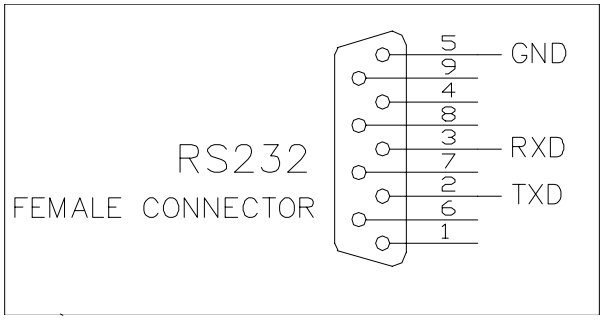
Serial Communication Port J13 and J14

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 does not require 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.

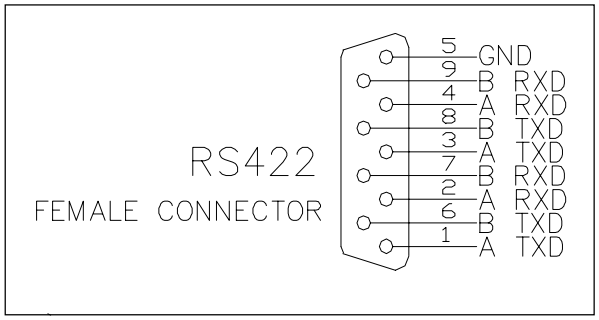
NOTE

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 RS 232 serial port connections



Communication RS 422 serial port connections

Transmission Channel Characteristics

levels:	RS232/RS422
baud rate:	9600/4800/2400/1200/600 programmable
character length:	8 bits
parity:	none
stop bit:	1 bit
protocoll:	master (PC) / slave (converter)

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> / <ADR> + <WINDOW> + <COMMAND> + <DATA> + <ETX> + <CRC>

In this case the value to be assigned to the ADDRESS field must be 80 hex.
where :

<STX>= 0x02
<ADR> = 0x80

<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:

	Length	**Characters Permitted**
Logic (L)	1	'0'=OFF '1'=ON
Numeric (N)	6	'-', '.','0'...'9' (Justifield to the right with '0')
Alphanumeric (A)	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	

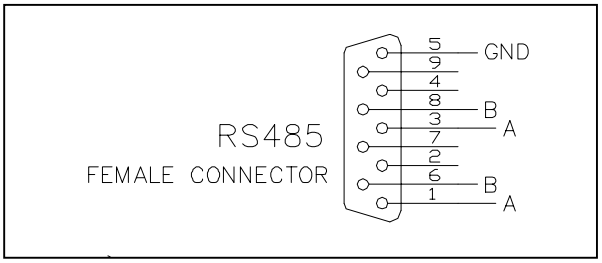
Command : ERR-CODE
Source : PC
Destination : Inverter

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	

RS 485 Communication Description



Communication RS 485 serial port connections

Transmission Channel Characteristics

levels:	RS485
baud rate:	9600/4800/2400/1200/600 programmable
character length:	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> + <ADR> + <WINDOW> + <COMMAND> + <DATA> + <ETX> + <CRC>

where :

<STX>= 0x02

<ADR>= 0x80 + device number (0...31)

0xFF: brodcasting command (recognized by all the devices, it doesn't implicate any answer)

<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:

	Length	**Characters Permitted**
Logic (L)	1	'0'=OFF '1'=ON
Numeric (N)	6	'-', '.','0'...'9' (Justifield to the right with '0')
Alphanumeric (A)	max 10	' '...' _ '

NOTE

Using the RS485 interface, the message structure remains identical to the one used for the RS232/422 interface, the only difference being that the value assigned to the ADDRESS <ADR> field in this case can be any hex value, while for the RS 232/422 this value must be set to 80 hex.

Window-Based Protocol

The following table, valid for the RS 232, RS 422 and RS 485 interfaces, describes each single window used in the protocol.

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)
105	X	X	N	LOW SPEED ADJUST
106	X	X	N	HIGH 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 (TYPE “ON” TO RESET)
120	X	X	L	EXTERNAL INPUT READ ENABLE [YES/NO]
121	X	X	L	HEATER BAND ENABLE [YES/NO]
200	X		N	CURRENT [A]
201	X		N	VOLTAGE [V]
202	X		N	POWER [W]
203	X		N	EXCITEMENT FREQUENCY [Hz]
205	X		N	PUMP STATE (0÷6) [STOP, WAITING INTERLOCK, STARTING, NORMAL, HIGH LOAD, FAILURE,APPROACHING]
206	X		N	ERROR CODE (0÷8) [NO ERROR, OVERVOLTAGE, SHORT CIRCUIT, CHECK CONNECTION, TOO HIGH LOAD, OVERRIDE, PUMP OVERTEMP, CONTROLLER OVERTEMP, OIL LEVEL AT MIN]
207	X		L	STATE R1 ON/OFF
208	X		L	STATE R2 ON/OFF
209	X		N	UPPER BEARING TEMPERATURE (0÷90) [°C]
210	X		N	LOWER BEARING TEMPERATURE (0÷90) [°C]
217	X		N	MOTOR TEMPERATURE (0÷90) [°C]
218	X		N	ROTATION SPEED [Krpm]
219	X		N	EXTERNAL INPUT [V]
300	X		N	CYCLE TIME (0-999.999) IN MINUTES
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.

Startup

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

							A	U	T	O	T	E	S	T					
										O	K								

				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 80 minutes and a maximum of about 105 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 25 minutes and the display changes as follows:

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

NOTE

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

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

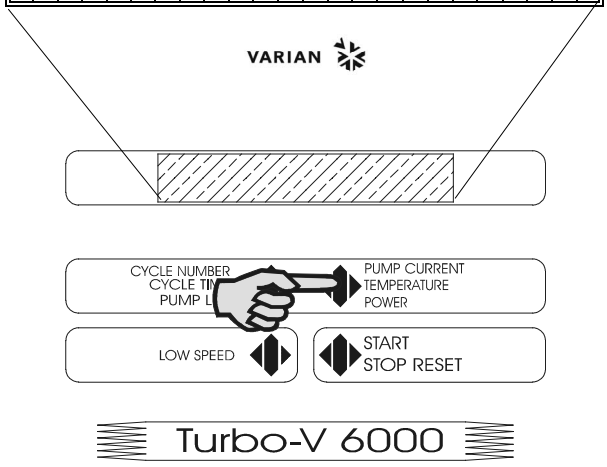
NOTE

After pressing the START push-button, if the P1 connector is not in place with the link or the external interlock connection are open, the display will be as shown in the following figure.
Unplug the controller power cable and verify the P1 connection.

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

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

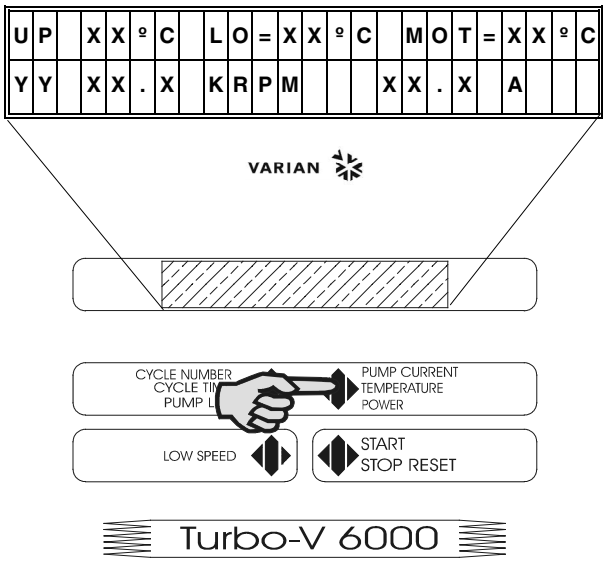
				P	U	M	P		I	S		S	T	A	R	T	I	N	G
				X	X	.	X		K	R	P	M							



where:

- XX.X= pump rotation speed range (0 to 14 KRPM)

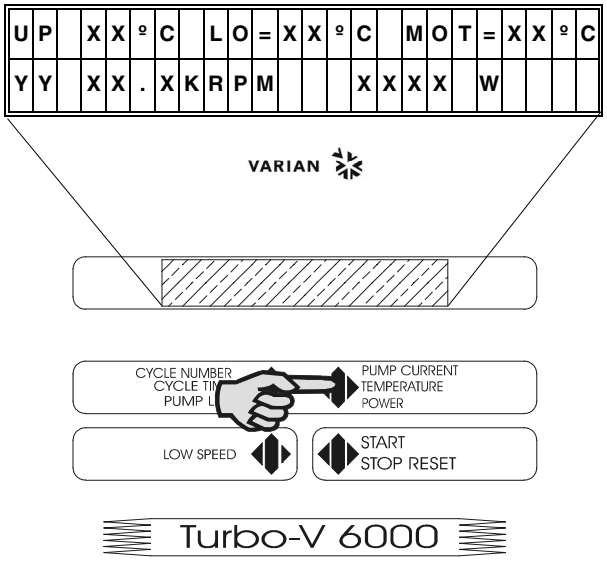
- Press the PUMP CURRENT push-button and the display shows:



where:

- **UP** = Upper bearing temperature
- **LO** = Lower bearing temperature
- **MOT** = Motor temperature
- **XX.X KRPM** = Rotation speed
- **XX.X A** = DC absorption by the controller 00.0 to 25.0 A
- **YY** = during operation a selected set point condition (1 or 2 contrast inverted) appears when the programmed threshold speed value is not reached.

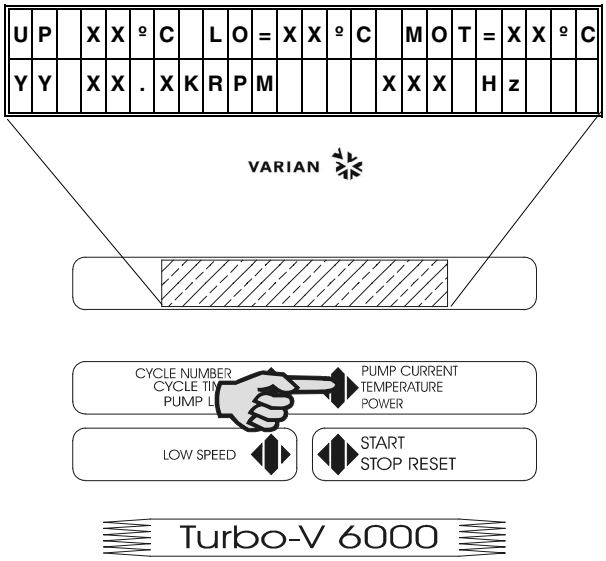
- Press the PUMP CURRENT push-button and the display shows:



where:

- **UP** = Upper bearing temperature
- **LO** = Lower bearing temperature
- **MOT** = Motor temperature
- **XX.X KRPM** = Rotation speed
- **XXXX W** = Power absorption by the controller 0 to 2.000 W
- **YY** = during operation a selected set point condition (1 or 2 contrast inverted) appears when the programmed threshold speed value is not reached.

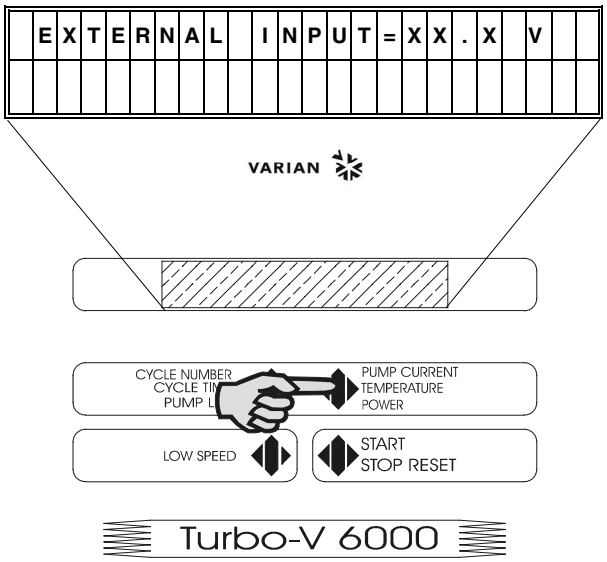
- Press the PUMP CURRENT push-button and the display shows:



where:

- **UP** = Upper bearing temperature
- **LO** = Lower bearing temperature
- **MOT** = Motor temperature
- **XX.X KRPM** = Rotation speed
- **XXX Hz** = frequency range 12 to 234 Hz
- **YY** = during operation a selected set point condition (1 or 2 contrast inverted) appears when the programmed threshold speed value is not reached.

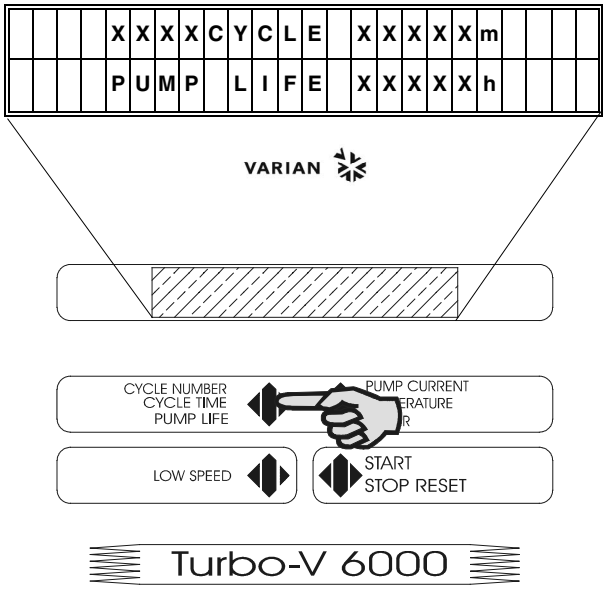
- Press PUMP CURRENT push-button and the display shows:



This screen will only be displayed if YES was selected in EXTERNAL INPUT.

where: **XX.X** = is the voltage rating measured on connector P34 0 to 10 Vdc.

- Press the CYCLE NUMBER twice and the display shows:



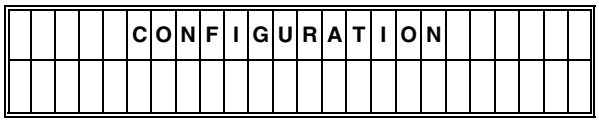
where:

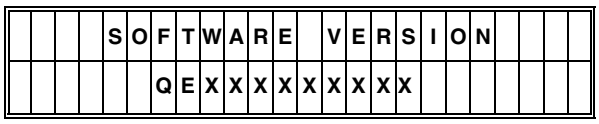
- **CYCLE** = are the cycles performed (range 0 to 9999)
- **m** = is the elapsed time related to the cycle number displayed (range 0 to 99999 minutes)
- **PUMP LIFE** = is the total operation time of the pump (range 0 to 99999 hours).

Front / Remote / Serial Selection

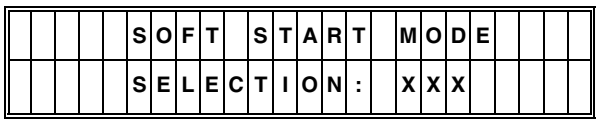
Press CYCLE NUMBER and PUMP CURRENT pushbuttons together for at least 2 seconds and the processor enters in a routine where it is possible to program the controller.
In this routine, the CYCLE push-button is used for choosing/changing the value or condition;
the PUMP CURRENT push-button is used to enter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





and then:



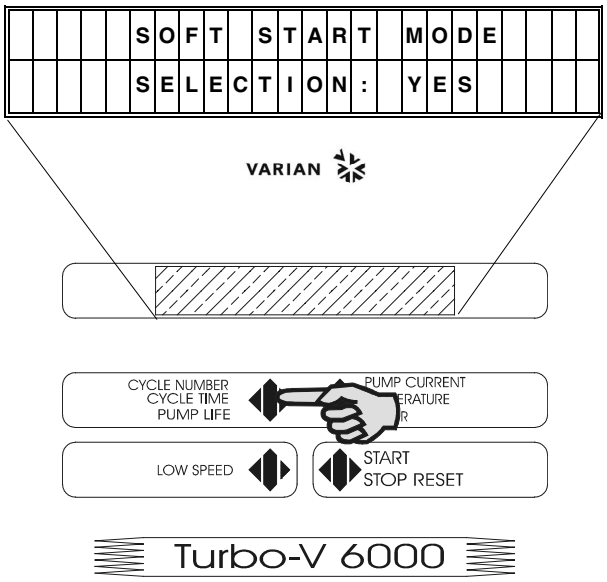
where: **XXX** = YES or NO.

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 25 minutes.
The controller is factory set to YES.

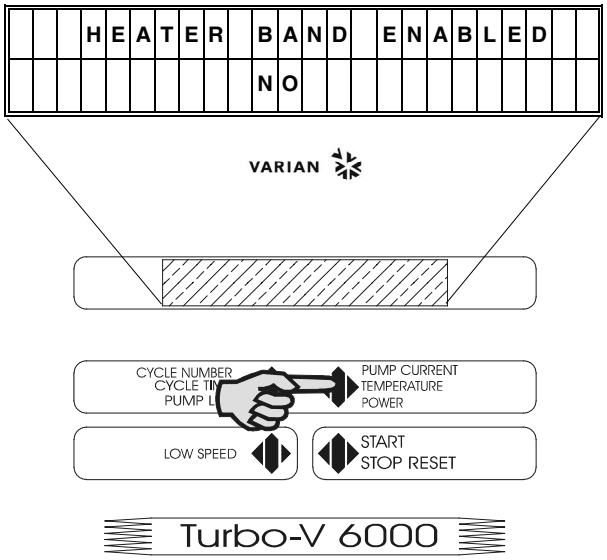
NOTE

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

- Press CYCLE NUMBER to select YES or NO

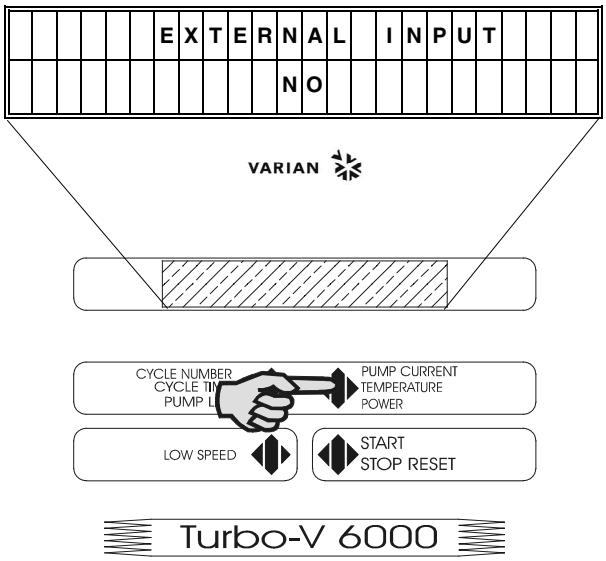


- Press PUMP CURRENT push-button and the display shows:



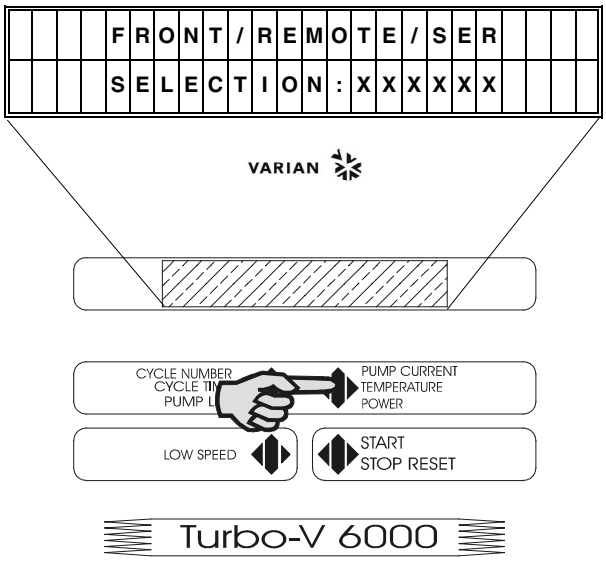
where: **NO** = is the default value. Press the CYCLE NUMBER key to select YES.

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



where: **NO** = is the default value. Press the CYCLE NUMBER key to select YES.

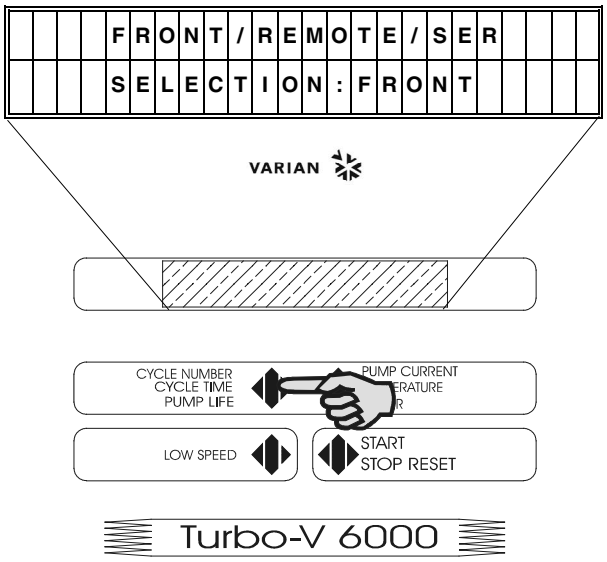
- Press PUMP CURRENT push-button and the display shows:



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

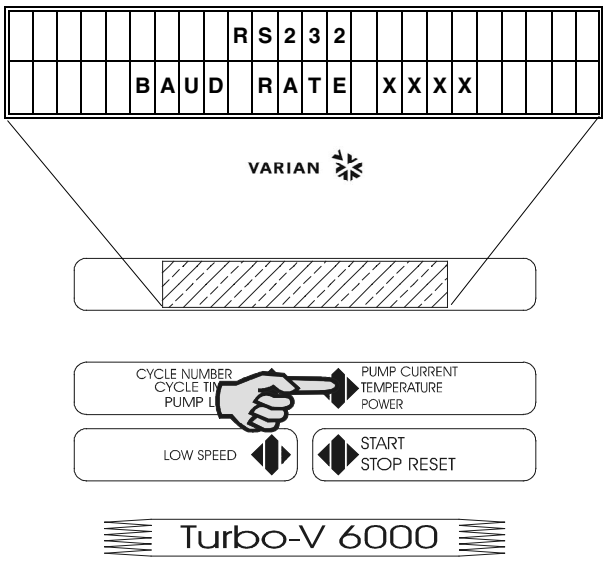
Instead of SER, one of configured RS 232, RS 485, RS 422 ports will be displayed.

- Choose the desired selection by pressing the CYCLE push-button.



Instead of SER, one of configured RS 232, RS 485, RS 422 ports will be displayed.

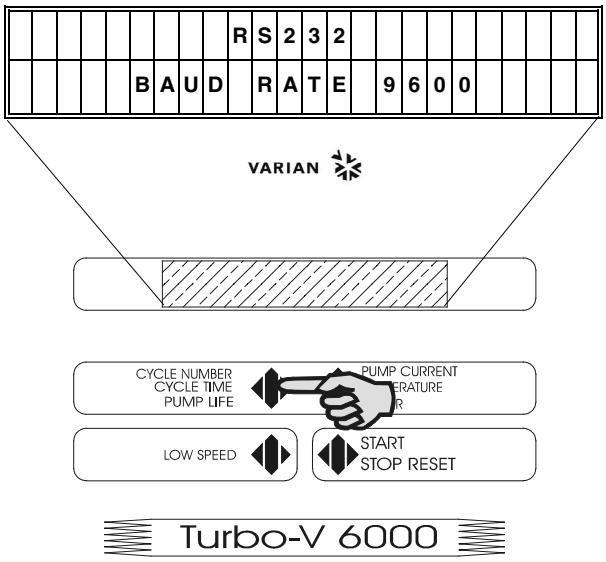
- Press the PUMP CURRENT push-button to enter the value and, if the serial option is installed, the display shows:



where: **XXXX** = means 600, 1200, 2400, 4800, 9600 baud rate for the host computer or printer communication. The controller is factory-set for 9600 baud rate operation.

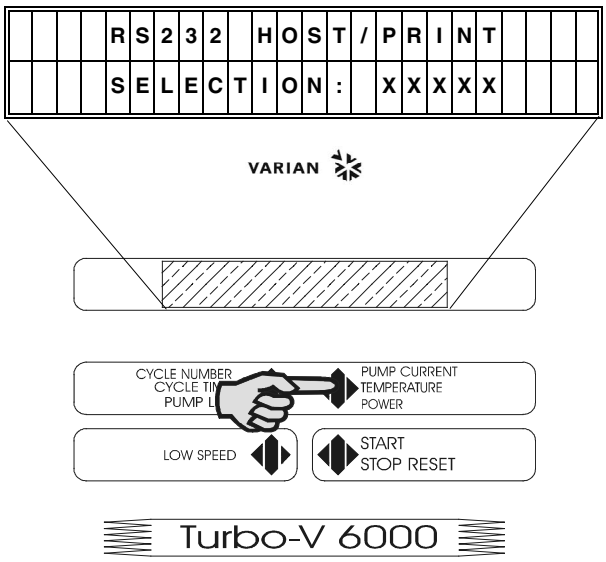
Instead of RS 232, one of configured RS 232, RS 485, RS 422 ports will be displayed.

- Select the desired value by pressing the CYCLE NUMBER.



Instead of RS 232, one of configured RS 232, RS 485, RS 422 ports will be displayed.

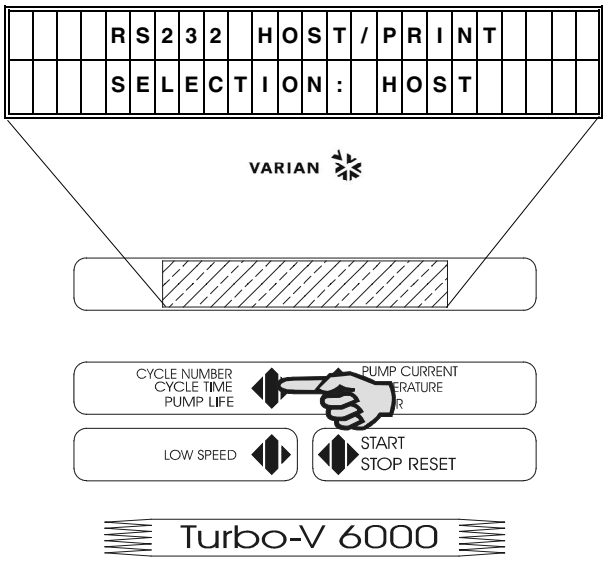
- Enter the value by pressing the PUMP CURRENT push-button and, if the serial option is installed, the display shows:



where: **XXXXX** = means HOST or PRINT.

This screen will only be displayed if the RS 232 interface is selected.

- Select HOST or PRINT by pressing the CYCLE push-button.



This screen will only be displayed if the RS 232 interface is selected.

With the RS 232 connected, a bi-directional communication is established by selecting HOST. Data are sent to an external computer every time the external computer asks for the values. The data available are:

- Speed adjust
- Pump/controller operating condition
- Cycle time
- Pump life
- Pump temperature
- Pump current
- Pump voltage
- Controller output frequency
- Pump speed
- Cycle number
- R1 condition
- R2 condition
- Life time
- Cycle # zeroing
- Configuration parameter readings
- Configuration parameter setting

Note that the new input value are put in effect only at the next STOP/START of the pump.
If PRINT is selected and a printer is connected on RS 232 line, an unidirectional communication is established and every minute the data are sent to the printer, even if the pump is not running.

The set of data available are:

- Pump speed KRPM
- Pump temperature
- Pump current A
- Pump power W
- R1 condition
- R2 condition

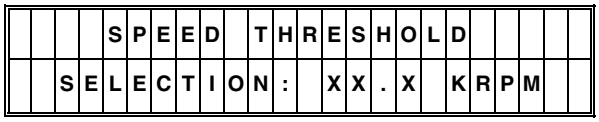
The controller is factory-set to HOST.

- Confirm the selection by pressing the PUMP CURRENT push-button.

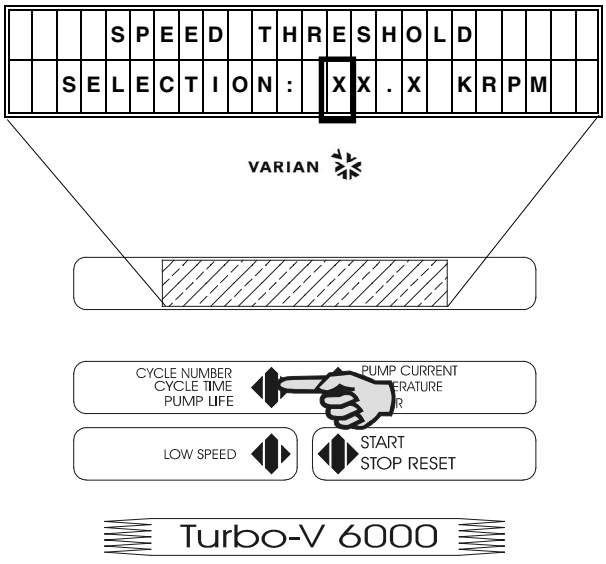
- In this way you enter into an operating phase named "Monitor Relay Programming" described in the following paragraph.

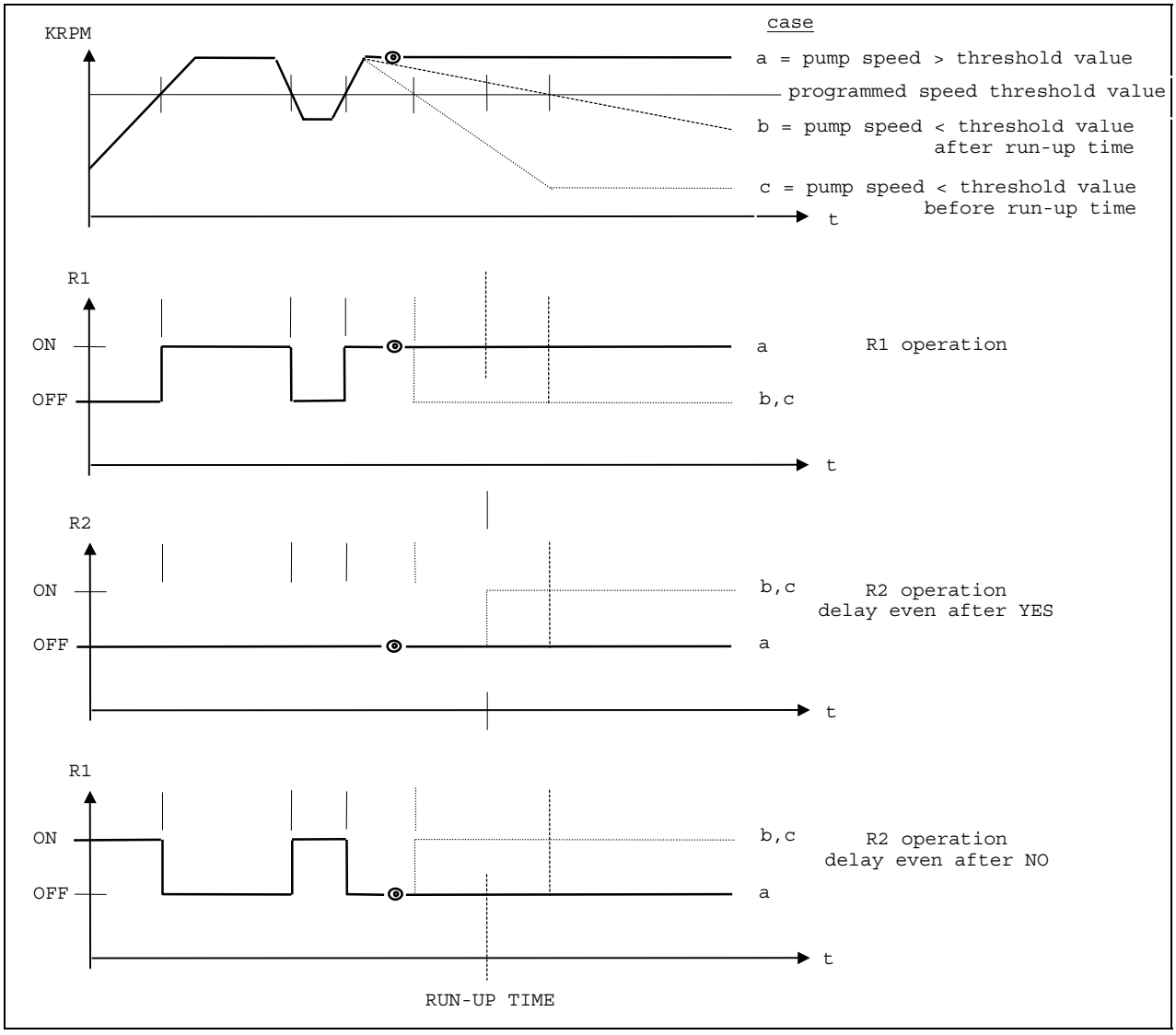
Monitor Relay Programming

The display shows:



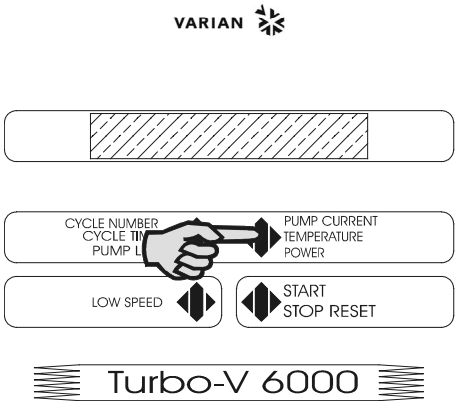
where: **XXKRPM** = is the switch point of relay R1 at the preset turbopump speed, adjustable from 00 to 99 KRPM.
The speed threshold will condition the R1 and R2 operation (see the following cycle diagram) and it is factory-set to 13.0 KRPM. Press the CYCLE NUMBER push-button to select the first number.



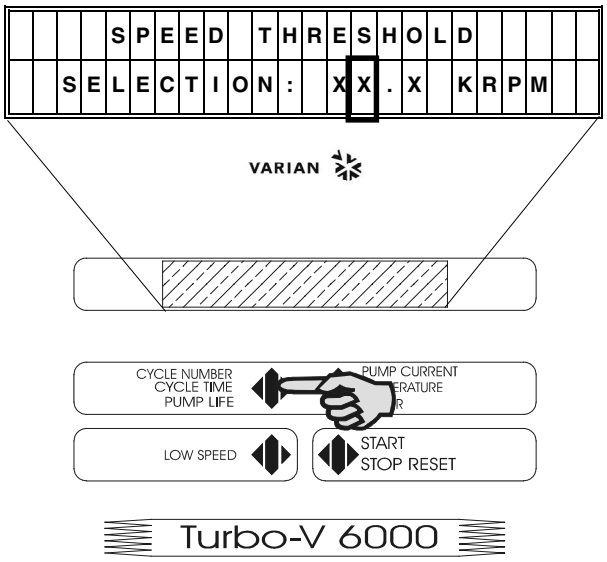


Cycle diagram

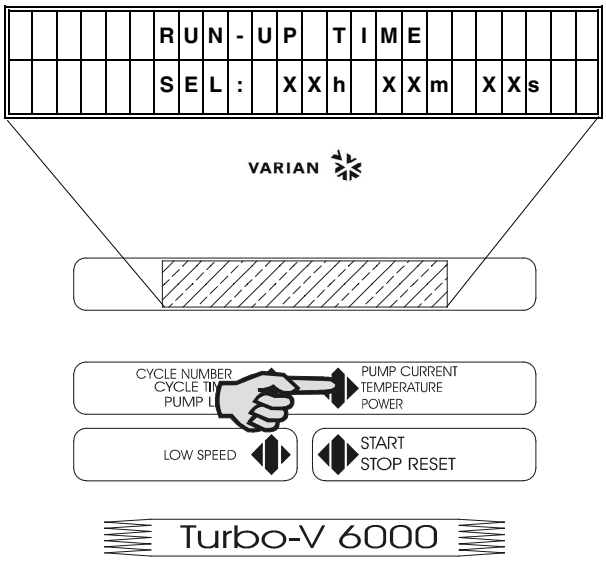
- Enter the value by pressing the PUMP CURRENT push-button.



- Press the CYCLE NUMBER push-button to select the second number.

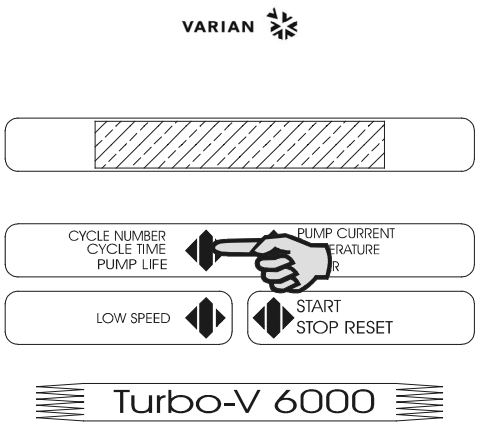


- Enter the value by pressing the PUMP CURRENT push-button, and the display shows:

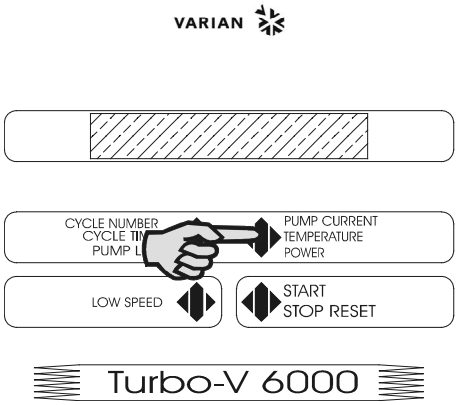


where: **RUN-UP TIME** = is the interval time from start to speed threshold value in hours, minutes, seconds. Select from 00 to 99 hours, and from 00 to 59 minutes or seconds.

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



- Press the PUMP CURRENT push-button to enter the data.



The run up time is factory-set to:

00h 30m 00s.

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

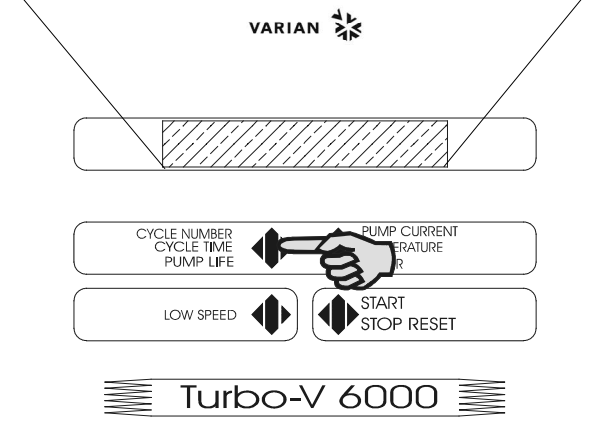
D	E	L	A	Y		E	V	E	N		A	F	T	E	R				
T	H	R	E	S	H	O	L	D	:			X	X	X					

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

- Press the CYCLE NUMBER push-button 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 preceding cycle diagram).

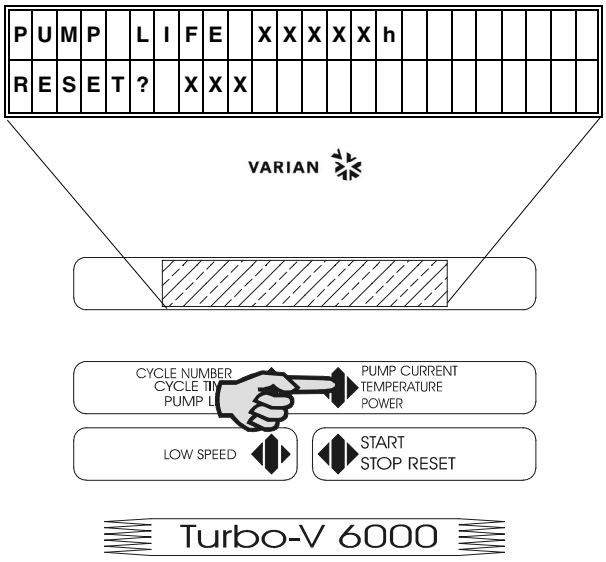
This function is factory-set to YES.

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



- 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.

Speed adjustment

By pressing CYCLE NUMBER and PUMP CURRENT push button together for at least five seconds the processor enters in a routine where it is possible to adjust the rotational speed.

The display shows:

						S	P	E	E	D		A	D	J	U	S	T							
						1	4	.	0		K	R	P	M										

Press the PUMP push button to select the digit to be changed and when press the CYCLE push button to change the value.

The speed value can be changed from 9 to 14 KRPM. Different values are rejected. The speed adjustment sets the LOW SPEED freq. to 2/3 in any case not less than 9.

Starting the Pump

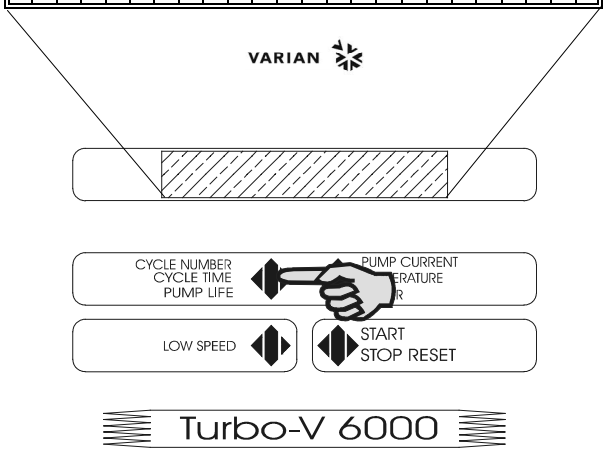
If the forepump and vent device are not operated by the controller, close the vent valve and switch on the forepump.

NOTE

With the FRONT panel operation selected, the REMOTE and RS 232 operations are inoperative; conversely, the CYCLE NUMBER and PUMP CURRENT push-buttons are always active, even when the operating mode selected is REMOTE or RS 232 / 422 / 485.

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

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



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

As the ten steps are fully covered, the pump will reach the Normal operation. If during the Soft Start mode the current drawn by the pump exceed 1600 W the speed of the pump is decreased to maintain the maximum power allowable (1600 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	.	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 24 V.

XX KRPM = indicates the actual rotational speed of the pump (range 0 to 14 KRPM).

After START command, frequency output will be at the maximum level, then the frequency will decrease to a value proportional to the pump rotational speed (about 12 Hz 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.

- After the runup time or 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	.	X		K	R	P	M												

where: **XX.X** = indicates the rotational speed (14.0 KRPM for high speed, or 9 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 (1200 W).
Than the Turbo-V pump is slowed down in pro- portion to the gas load at least until it reaches about 0.7 KRPM.
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

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

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

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	C	H	I	N	G			L	O	W		S	P	E	E	D		
			X	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					
							9	.	0		K	R	P	M								L	S	

With normal LOW SPEED operation, the pump will run at about 2/3 (in any case not less than 9) 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 0.7 KRPM.
If the LOW SPEED mode is selected after normal operating condition is reached, the display shows:

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

while approaching the low speed value.
When the low speed mode is deselected, the pump starts to accelerate to its rotational speed. During the acceleration, the display shows:

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

Pump Shutdown

Press the front panel STOP push-button 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 "Operating parameter selections") 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.

RS 232 Control Mode Operation

If the RS 232 option is installed and the controller has been programmed for RS 232 operation, the controller may be driven by a computer and when ready to operate, the display shows:

P	U	M	P		R	E	A	D	Y	:														
U	S	E		R	S	X	X	X		L	I	N	E											

RSXXX = is the type of the serial port installed

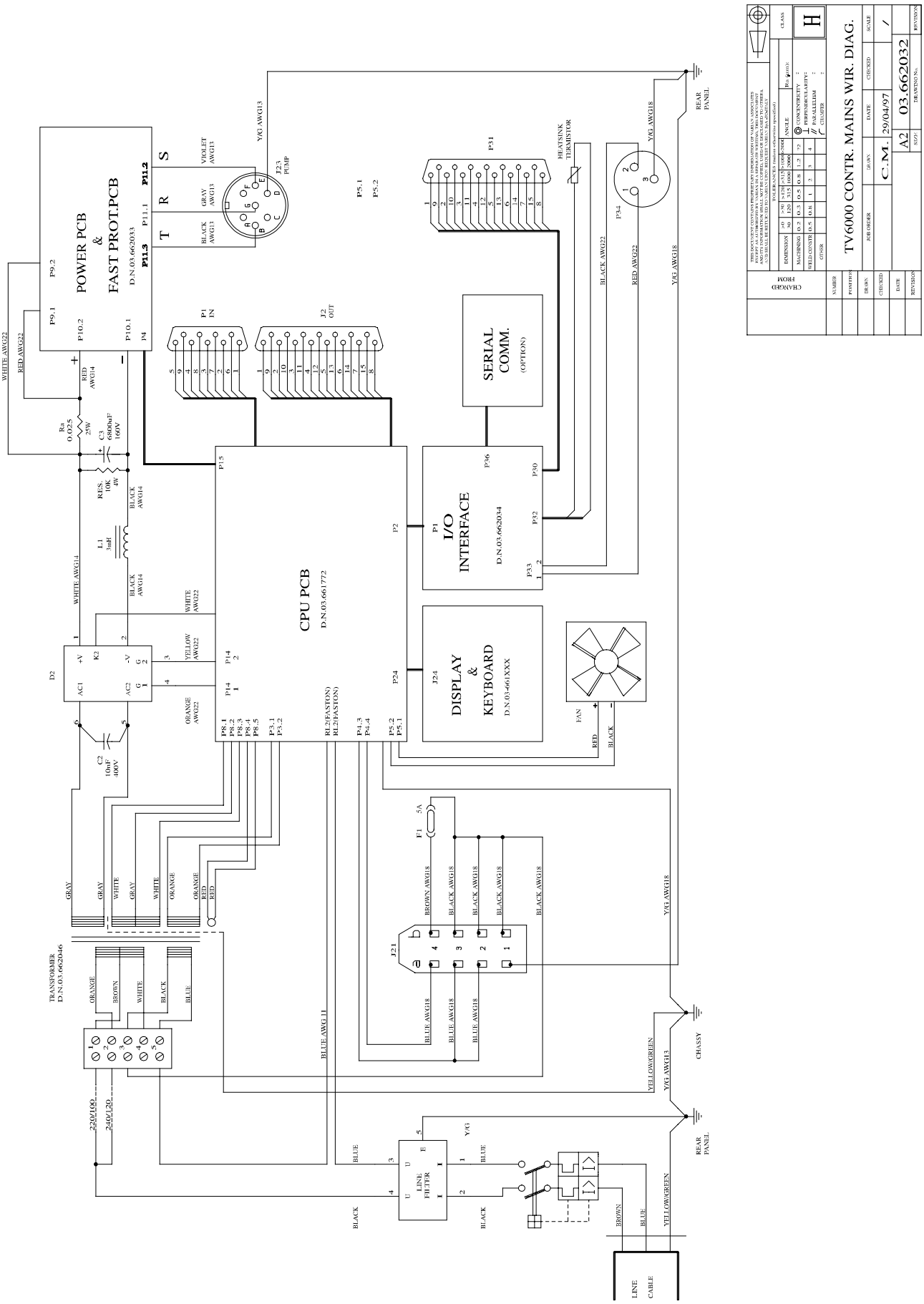
If the Soft Start has been deselected the display shows:

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

With or without Soft Start mode selected the START/STOP, LOW SPEED functions are under computer control, while the CYCLE NUMBER and PUMP CURRENT front panel pushbuttons
are always active.

ACCESSORIES AND SPARE PARTS

Description	Part number
RS 232 computer communication kit	969-9857
RS 422 computer communication kit	969-9858
RS 485 computer communication kit	969-9856
P2 output mating connector	969-9852
J1 input mating connector	969-9853
Mains cable (European plug, 3m long)	SR-03-660441-01
Mains cable (American plug, 120V, 3m long)	SR-03-660441-02
Controller to pump extension cable (5m extension)	969-9951 L0500
J31 Turbo-V 6000 Controller signal cable	03.662030 (drawing number)


POWER PCB
&
FAST PROT.PCB
D.N.03.662033
CPU PCB
D.N.03.661772
I/O
INTERFACE
D.N.03.662034
DISPLAY
&
KEYBOARD
D.N.03-661XXX
SERIAL
COMM.
(OPTION)
LINE
FILTER
TRANSFORMER
D.N.03.662046
FAN
T23
PUMP
HEATSINK
TERMISTOR
REAR
PANEL
CHASSY
LINE
CABLE
220/100
240/120
TV6000 CONTR. MAINS WIR. DIAG.
C.M. 29/04/97
A2
03.662032

VARIAN

Request for Return

ISO 9001 REGISTERED

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

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

CUSTOMER INFORMATION

Company name: ……

Contact person: Name: …… Tel: ……

Fax: …… E-Mail: ……

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

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

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

…… ……

…… ……

PRODUCT IDENTIFICATION

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

TYPE OF RETURN *(check appropriate box)*

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

HEALTH and SAFETY CERTIFICATION

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

The equipment listed above (check one):

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

OR

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

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

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

……

Print Name: …… Customer Authorized Signature: ……

Print Title: …… Date: ……/……/……

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

Do not write below this line

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

VARIAN

Request for Return

ISO 9001 REGISTERED

FAILURE REPORT

TURBO PUMPS and TURBOCONTROLLERS

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

TURBOCONTROLLER ERROR MESSAGE:

ION PUMPS/CONTROLLERS

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

Customer application:

VALVES/COMPONENTS

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

Customer application:

LEAK DETECTORS

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

Customer application:

INSTRUMENTS

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

Customer application:

PRIMARY PUMPS

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

Customer application:

DIFFUSION PUMPS

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

Customer application:

FAILURE DESCRIPTION

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

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

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