VARIAN

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# *Turbo-V Vent Valve*

## Model 969-9843

*(I) MANUALE DI ISTRUZIONI*

*(D) BEDIENUNGSHANDBUCH*

*(F) NOTICE DE MODE D'EMPLOI*

*(GB) INSTRUCTION MANUAL*

87-900-947-01 (E)
JULY 2006

# *Turbo-V Vent Valve*

VARIAN

vacuum technologies

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

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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 |
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TEL. N° : _____ FAX N° : _____

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PROBLEM / SUGGESTION :

_____

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

_____

DATE _____

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

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

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# PROCEDURA PER L'INSTALLAZIONE DEL KIT TURBO-V VENT VALVE

## GENERALITÀ

Il Turbo-V "Vent Valve" comprende un'unità di controllo ed una valvola, che realizzano un sistema completo per la ventilazione automatica della pompa Turbo-V nella fase di spegnimento o nel caso si verifichi una caduta di tensione. La valvola in condizioni di riposo (senza alimentazione) è normalmente aperta. L'attivazione avviene in modo elettromagnetico, mentre il fissaggio (Viton-sealed) viene realizzato tramite un adattatore di tipo M8 o M5 con relativo O-ring sul foro per alto vuoto della pompa. L'aria di ingresso nella valvola, viene filtrata tramite un opportuno filtro o un adattatore da 1/4" presente sull'ingresso aria della valvola stessa.

L'unità di controllo viene alimentata dal governo Turbo-V che non è predisposto per il montaggio su rack.

L'unità di controllo viene attivata con un ritardo prefissato di circa 2,5 secondi per evitare ventilazioni inopportune durante una caduta di tensione temporanea e per permettere la chiusura delle valvole di sistema prima della ventilazione.

## CARATTERISTICHE TECNICHE

### *Unità di controllo*

- Tensione di ingresso — 120 Vca ± 10%
  - frequenza — da 50 a 60 Hz
  - potenza — 5 A
- Tensione di uscita — 24 Vcc ± 5%
  - potenza (max) — 11 W
- Ritardo — circa 2,5 secondi
- Temperatura operativa — da 0 a 40 °C
- Temperatura di immagazzinamento — da -20 a 50 °C

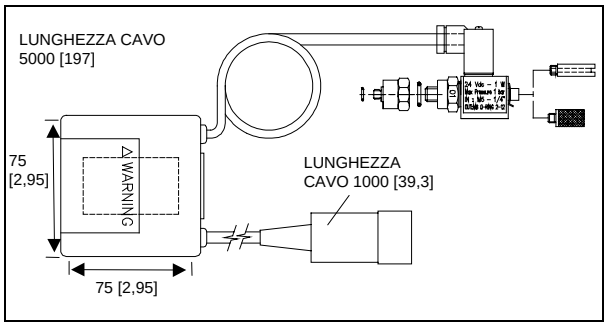
### *Cavi di connessione*

- Ingresso — lungo 0,5 metri, 3 fili
- Uscita alla valvola — lungo 5 metri, 3 fili
- Peso (con cavo) — 0,5 Kg (1,1 lbs)

### *Vent valve*

- Stato valvola — Normalmente aperta (chiusa quando viene alimentata)
- Connessione di alto vuoto — Adattatore M8/M5
- Ingresso aria — Filtro bronzo sinterizzato o un adattatore da 1/4"
- Dimensione foro — 1,2 mm (0,05")
- Gamma di pressioni — da $10^{-6}$ mbar a 1 bar (da$10^{-7}$ Torr a atm)
- Leak rate — ≤ $1x10^{-7}$ mbar l/s
- Vita — 1 milione di cicli
- Tensione di ingresso — 24 Vcc +10% -5%
  - potenza — 2,5 W
- Temperatura di bakeout — 60 °C
- Peso (senza cavo) — 0,1 Kg (0,24 lb)

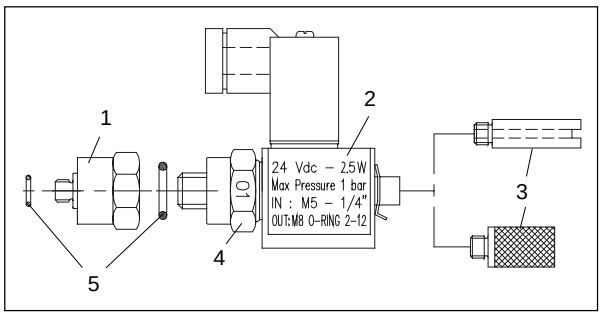
La figura seguente riporta le dimensioni di ingombro del Turbo-V Vent Valve.




*Dimensioni in mm [pollici]*

## INSTALLAZIONE

In figura sono riportati i vari componenti presenti nel Kit Turbo-V Vent Valve. Tali componenti sono forniti disassemblati; sarà quindi cura del cliente provvedere all'assemblaggio del Kit.




*Kit Turbo-V Vent Valve*

1. Adattatore M8 - M5
2. Valvola
3. Filtro/Adattatore da 1/4"
4. Dado di fissaggio bobina
5. O-ring

Il kit contiene due adattatori femmina/maschio, uno M8 ed uno M5. Sarà cura del cliente utilizzare quello specifico per le proprie esigenze.

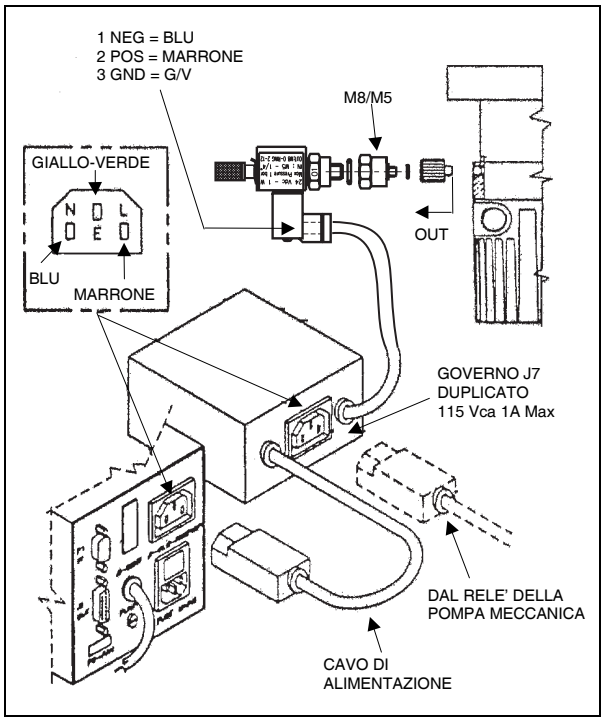
**ATTENZIONE**

**Durante la fase di assemblaggio del kit, fare attenzione a non svitare la ghiera ed il dado di fissaggio della bobina interna alla valvola.**

Completato l'assemblaggio, procedere con l'installazione sulla pompa.

Per pompe dotate di tappo a vite, dopo aver rimosso il tappo stesso, utilizzare l'adattatore appropriato per fissare la valvola alla pompa.

La seguente figura riporta un'installazione tipica su una pompa dotata di tappo.



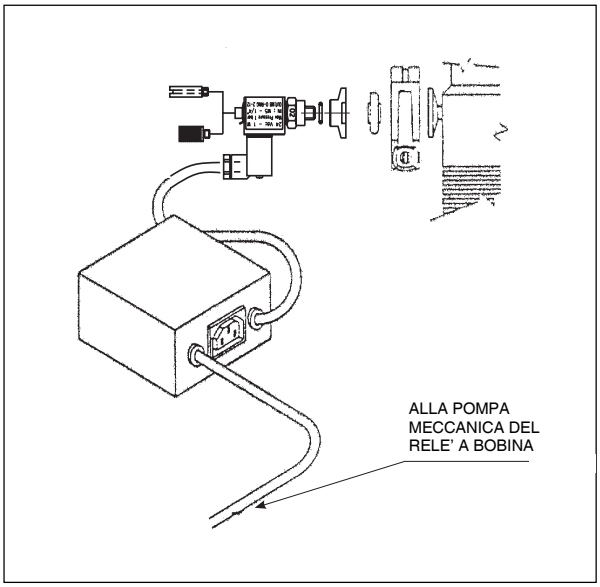

*Installazione su pompa con tappo a vite*

Dopo aver completato l'installazione meccanica, collegare il cavo di alimentazione dell'unità di controllo del Turbo-V vent valve al rispettivo connettore sul pannello posteriore del governo del Turbo pump.

**ATTENZIONE**

**Prima di alimentare il kit, assicurarsi che la tensione di uscita presente sul connettore sia 115 Vca**.

Per l'installazione su pompe non dotate di tappo a vite, occorre utilizzare il sistema di flange in dotazione alla pompa, come riportato in figura.

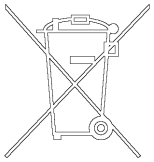



*Installazione su pompa senza tappo a vite*

Se si esegue l'installazione su una pompa il cui governo non dispone della presa di alimentazione valvola a 115 Vca, occorre rimuovere il connettore tagliando il cavo di alimentazione del governo; quindi collegarlo al modulo J21 come riportato nella figura precedente.

## SMALTIMENTO

**Significato del logo "WEEE" presente sulle etichette.**
Il simbolo qui sotto riportato è applicato in ottemperanza alla direttiva CE denominata "WEEE". Questo simbolo **(valido solo per i paesi della Comunità Europea)** indica che il prodotto sul quale è applicato, NON deve essere smaltito insieme ai comuni rifiuti domestici o industriali, ma deve essere avviato ad un sistema di raccolta differenziata. Si invita pertanto l'utente finale a contattare il fornitore del dispositivo, sia esso la casa madre o un rivenditore, per avviare il processo di raccolta e smaltimento, dopo opportuna verifica dei termini e condizioni contrattuali di vendita.



# ANLEITUNG ZUR INSTALLATION DER BAUGRUPPE TURBO-V VENT VALVE

## ALLGEMEINES

Die Baugruppe Turbo-V “Vent Valve” umfaßt eine Steuereinheit und ein Ventil, wodurch ein komplettes System zur automatischen Belüftung der Turbo-V - Pumpe beim Ausschalten oder bei Spannungsabfall entsteht. In Ruhestellung (ohne Versorgung) ist dieses Ventil geöffnet. Es wird elektromagnetisch betätigt. Seine Befestigung (Viton-sealed) erfolgt mit einem Adapter Typ M8 oder M5 und mit einem O-Ring an der Bohrung für Hochvakuum der Pumpe. Am Eingang des Ventils ist ein Filter oder Adapter Größe 1/4” vorhanden, der die einströmende Luft filtert.

Die Steuereinheit wird von der Turbo-V - Steuerung versorgt, die nicht zur Montage auf dem Rack vorgesehen ist.

Die Steuereinheit wird mit einer auf zirka 2,5 Sekunden voreingestellten Verzögerung eingeschaltet, um eine unerwünschte Belüftung bei zeitweisem Spannungs-abfall zu verhindern und um das Schließen der Systemventile vor der Belüftung zu ermöglichen.

## TECHNISCHE DATEN

### *Steuereinheit*

- Eingangsspannung — 120 V a.c. ± 10%
  - Frequenz — von 50 bis 60 Hz
  - Leistung — 5 A
- Ausgangsspannung — 24 V d.c ± 5%
  - Leistung (max) — 11 W
- Verzögerung — ca. 2,5 Sekunden
- Betriebstemperatur — von 0 bis 40 °C
- Lagerungstemperatur — von -20 bis 50 °C

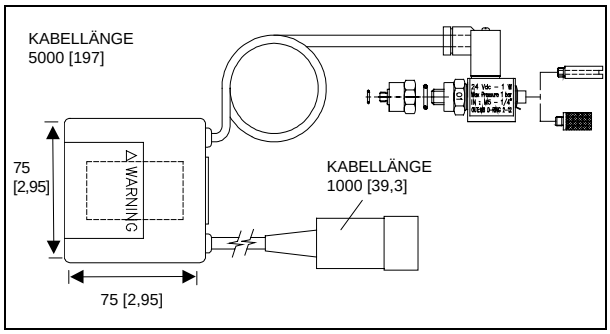
### *Anschlußkabel*

- Eingang — Länge = 0,5 m, 3 Adern
- Ausgang zum Ventil — Länge = 5 m, 3 Adern
- Gewicht (mit Kabel) — 5 Kg (1,1 lbs)

### *Vent valve*

- Ventilzustand — offen (bei Versorgung geschlossen)
- Hochvakuumanschluß — Adapter M8/M5
- Lufteingang — Sinterbronzefilter oder Adapter Größe 1/4”
- Bohrungsdurchmesser — 1,2 mm (0,05")
- Druckwerte — von $10^{-6}$ mbar bis 1 bar (von$10^{-7}$ Torr bis atm)
- Leak rate — ≤ $1x10^{-7}$ mbar l/s
- Lebensdauer — 1 Million Zyklen
- Eingangsspannung — 24 V d.c. +10% -5%
  - Leistung — 2,5 W
- Bakeout - Temperatur — 60 °C
- Gewicht (ohne Kabel) — 0,1 Kg (0,24 lb)

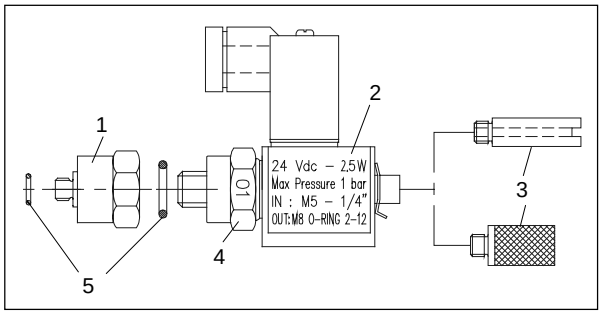
Auf nachstehender Abbildung sind die Abmessungen des Ventils Turbo-V Vent Valve angegeben.




*Maße in mm [Zolli]*

## INSTALLATION

In der Abbildung sind die verschiedenen Bauteile der Baugruppe Turbo-V Vent Valve dargestellt. Diese Bauteile werden lose geliefert und müssen daher vom Kunden zusammengebaut werden.




*Bauteile des Ventils Turbo-V Vent Valve*

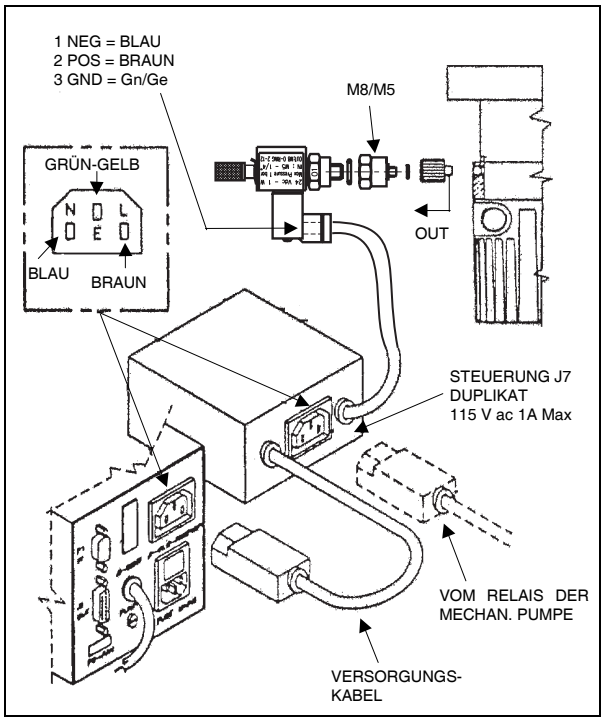
1. Adapter M8- und M5
2. Ventil
3. Filter/Adapter Größe 1/4”
4. Befestigungsmutter für Spule
5. O-Ring

Die Baugruppe enthält zwei Steckstück/Schraub-stück Adapter mit M8- und M5-Gewinde. Der Kunde verwendet jenen Adapter, der seinen Anforderungen entspricht.

**ACHTUNG**

**Beim Zusammenbau dürfen die Nutmutter und die Befestigungsmutter der Spule, die sich im Ventil befindet, nicht losgeschraubt werden.**

Nach dem Zusammenbau muß das Ventil auf der Pumpe installiert werden. Bei Pumpen mit Verschlußschraube muß diese entfernt werden. Danach ist zur Befestigung des Ventils an der Pumpe der geeignete Adapter zu verwenden. Auf der folgenden Abbildung ist eine typische Installation an einer Pumpe mit Verschlußschraube dargestellt.



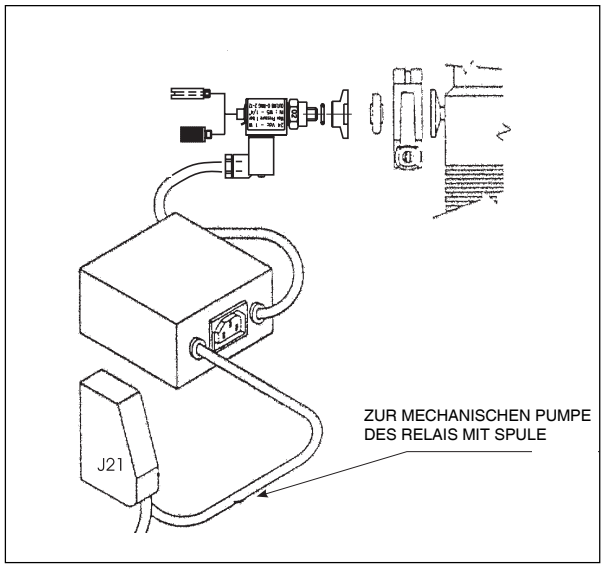

*Installation auf Pumpe mit Verschlußschraube*

Nach erfolgter mechanischer Installation das Verbindungskabel der Steuereinheit des Ventils Turbo-V vent valve an den Stecker an der hinteren Platte der Steuerung der Turbopumpe anschließen.

**ACHTUNG**

**Sicherstellen, daß die am Stecker vorhandene Ausgangsspannung 115 V a.c. beträgt, bevor die Baugruppe unter Spannung gesetzt wird.**

Zur Installation an Pumpen ohne Verschlußschraube muß das mit der Pumpe gelieferte Flanschsystem verwendet werden, wie in der folgenden Abbildung dargestellt.

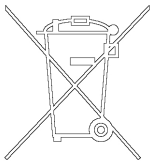



*Installation an Pumpe ohne Verschlußschraube*

Wenn die Installation an einer Pumpe vorgenommen wird, deren Steuerung über keinen Anschluß 115 V a.c. zur Ventilversorgung verfügt, muß der Stecker entfernt werden, indem das Versorgungskabel der Steuer-einheit durchgeschnitten und an das Modul J21 angeschlossen wird, wie in obiger Abbildung dargestellt.

## ENTSORGUNG

**Bedeutung des "WEEE" Logos auf den Etiketten.**
Das folgende Symbol ist in Übereinstimmung mit der EU-Richtlinie WEEE (Waste Electrical and Electronic Equipment) angebracht.
Dieses Symbol (**nur in den EU-Ländern gültig**) zeigt an, dass das betreffende Produkt nicht zusammen mit Haushaltsmüll entsorgt werden darf sondern einem speziellen Sammelsystem zugeführt werden muss.
Der Endabnehmer sollte daher den Lieferanten des Geräts - d.h. die Muttergesellschaft oder den Wiederverkäufer - kontaktieren, um den Entsorgungsprozess zu starten, nachdem er die Verkaufsbedingungen geprüft hat.



# PROCÉDURE POUR L'INSTALLATION DU KIT TURBO-V VENT VALVE

## GÉNÉRALITÉS

Le Turbo-V "Vent Valve" comporte un système de commande et une valve qui composent un dispositif complet pour la ventilation automatique de la pompe Turbo-V pendant la phase d'extinction ou en cas de chute de tension. La valve en condition de repos (non alimentée) est normalement ouverte. L'activation est réalisée de manière électromagnétique, alors que la fixation (Viton-sealed) est réalisée grâce à un adaptateur de type M8 ou M5 avec le joint torique correspondant sur l'orifice pour vide de la pompe. L'air en entrée dans la valve est filtré par un filtre ou un adaptateur
de 1/4" pour tuyaux présent sur l'entrée d'air de la valve elle-même.

Le système de commande est alimenté par le gérant Turbo-V qui n'est pas prédisposé pour être monté sur rack.

Le système de commande est activé avec un retard prédéfini de 2,5 secondes environ pour éviter une ventilation inopportune pendant une chute de tension temporaire et pour permettre aux valves de système de se fermer avant la ventilation.

## CARACTÉRISTIQUES TECHNIQUES

### *Système de commande*

- Tension en entrée — 120 Vca ± 10%
  - fréquence — de 50 à 60 Hz
  - puissance — 5 A
- Tension en sortie — 24 Vcc ± 5%
  - puissance (maxi) — 11 W
- Retard — 2,5 secondes environ
- Température d'exercice — de 0 à 40 °C
- Température de stockage — de -20 à 50 °C

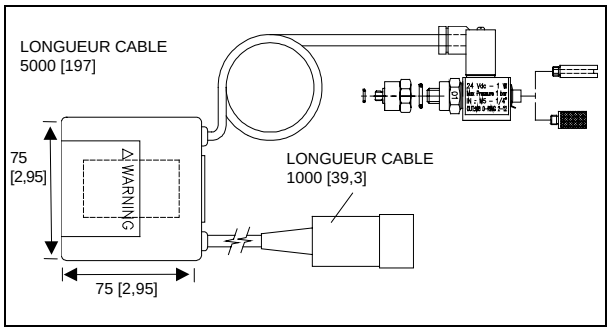
### *Câbles de connexion*

- Entrée — 0,5 mètres de long, 3 fils
- Sorties à la valve — 5 mètre de long, 3 fils
- Poids (avec câble) — 0,5 Kg (1,1 lbs)

### *Vent Valve*

- Etat valve — Ouverte normalement (fermée sous alimentation)
- Connexion du vide — Adaptateur M8/M5
- Entrée d'air — Filtre bronze fritté ou un adaptateur de 1/4" pour tuyaux
- Dimension orifice — 1,2 mm (0,05")
- Gamme de pressions — de $10^{-6}$ mbar à 1 bar (de$10^{-7}$ Torr à atm)
- Leak rate — ≤ $1x10^{-7}$ mbar l/s
- Durée de vie — 1 million de cycles
- Tension en entrée — 24 Vcc +10% -5%
  - puissance — 2,5 W
- Température de bakeout — 60 °C
- Poids (sans câble) — 0,1 Kg (0,24 lb)

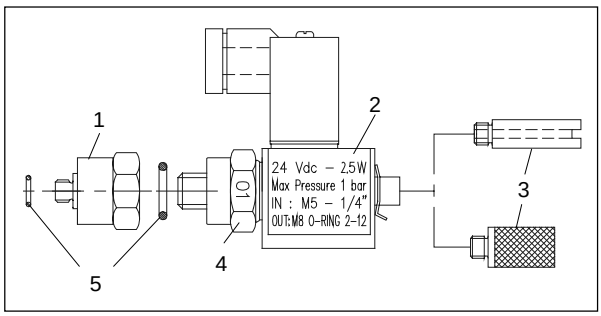
La figure ci-dessous indique les dimensions d'encombrement du Turbo-V Vent Valve.




*Dimensions en mm (pouces)*

## INSTALLATION

La figure illustre les différents composants présents dans le kit Turbo-V Vent Valve. Ces composants sont fournis démontés; il faudra donc que le client fasse l'assemblage du kit.




*Kit Turbo-V Vent Valve*

1. Adaptateur M8 - M5
2. Valve
3. Filtre/Adaptateur de 1/4" pour tuyaux
4. Ecrou de fixation bobine
5. Joint torique

Le kit contient deux adaptateurs femelle/mâle, un M8 et un M5. Ce sera au client d'utiliser celui qui convient à ses nécessités.

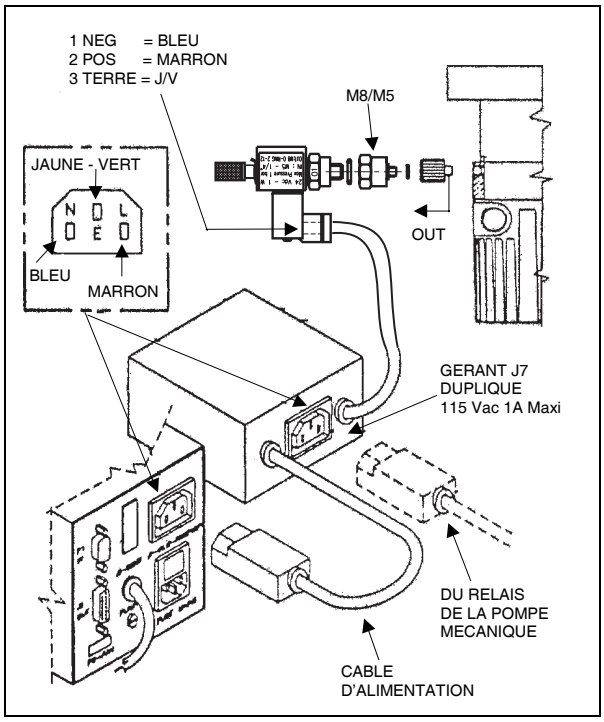
**ATTENTION**

**Pendant la phase d'assemblage du kit, il faut faire attention à ne pas dévisser la baïonnette et l'écrou de fixation de la bobine interne à la valve.**

Une fois l'assemblage effectué, procéder à l'installation sur la pompe.

Pour les pompes qui comportent un bouchon à vis, après avoir enlevé ce dernier, utiliser l'adaptateur approprié pour fixer la valve à la pompe.

La figure ci-après illustre une installation caractéristique sur une pompe munie de bouchon.



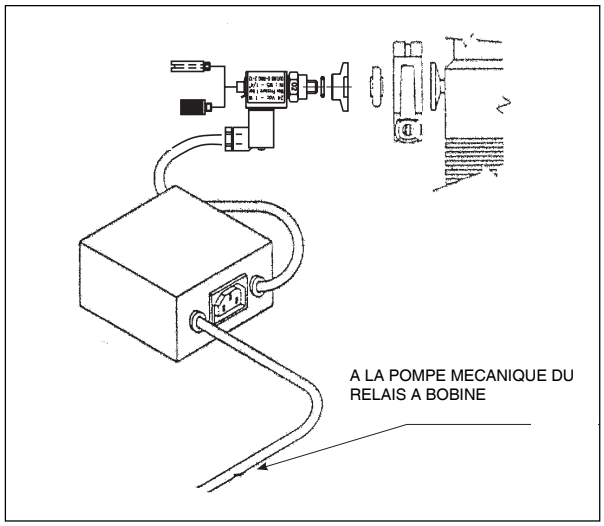

*Installation sur pompe avec bouchon à vis*

Après avoir achevé l'installation mécanique, brancher le câble d'alimentation du système de commande du Turbo-V Vent Valve à son connecteur sur le panneau arrière du gérant du Turbo pump.

**ATTENTION**

**Avant d'alimenter le kit, vérifier que la tension de sortie présente sur le connecteur est de 115 Vac.**

Pour l'installation sur des pompes non pourvues de bouchon à vis, il faut utiliser le système de brides fourni avec la pompe, comme l'indique la figure.

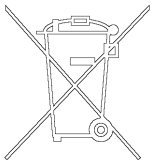



*Installation sur pompe sans bouchon à vis*

Si l'on exécute l'installation sur une pompe dont le gérant ne dispose pas de la prise d'alimentation valve à 115 Vac, il faut enlever le connecteur en coupant le câble d'alimentation du gérant; puis le brancher au module J21 ainsi que sur la figure ci-dessus.

## MISE AU REBUT

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



# TURBO-V VENT VALVE KIT INSTALLATION PROCEDURE

## OVERVIEW

The Turbo-V “Vent Valve”, consisting of a control unit and a valve, is a complete unit for automatic venting of the Turbo-V vent pump when it is switched off or during a power failure. The valve is a normally-open (power off) valve, electro-magnetically-actuated and Viton-sealed with an M8 and M5 thread with O-ring on the high vacuum port and a filter or tube 1/4” adapter on the air inlet.

The control unit is powered by the Turbo-V controller and is not suitable for rack mounting.

The control unit is provided with a fixed delay time of about 2.5 seconds to avoid undesired venting during a temporary power failure and to allow closure of the system valves before venting.

## TECHNICAL CHARACTERISTICS

### *Control unit*

- Input voltage — 120 Vac ± 10%
  - frequency — 50 to 60 Hz
  - power 5 A
- Output voltage — 24 Vdc ± 5%
  - power (max) — 11 W
- Delay time — about 2.5 sec.
- Operating temperature — 0 to 40 °C
- Storage temperature — -20 to 50 °C

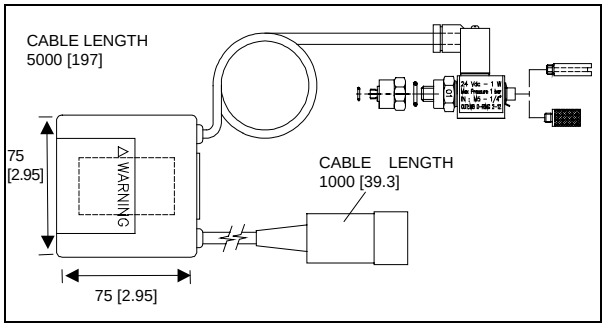
### Connection Cables

- Input — 0.5 meter long, 3 wire
- Output to valve — 5 meters long, 3 wire
- Weight (with cable) — 0.5 Kg (1.1 lbs)

### Vent Valve

- Valve status — Normally open (closed when power is applied)
- High vacuum connection — M8/M5 thread
- Air intake — sintered bronze filter or tube 1/4” adapter
- Orifice size — 1.2 mm (0.05")
- Pressure range — $10^{-6}$ mbar to 1 bar ($10^{-7}$ Torr to atm)
- Leak rate — $\leq 1 \times 10^{-7}$ mbar l/s
- Life cycle — one million cycles
- Input voltage — 24 Vdc +10% -5%
  - power — 2.5 W
- Bakeout temperature — 60 °C
- Weight (w/o cable) — 0.1 Kg (0.24 lb)

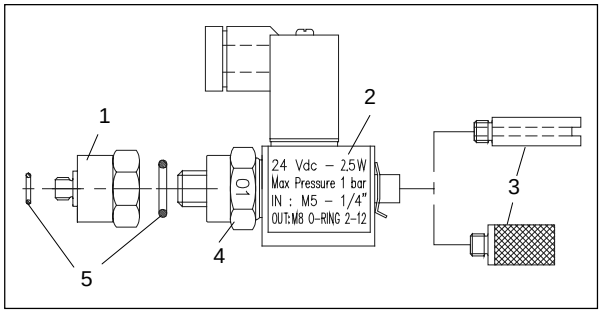
The following figure gives the overall dimensions of the Turbo-V Vent Valve.




*Dimensions in mm [inches]*

## INSTALLATION

The following figure shows the different components of the Turbo-V Vent Valve kit. These will be supplied to the client disassembled.




*Turbo-V Vent Valve Kit*

1. M8 - M5 adapter
2. Valve
3. Filter/ Tube 1/4” adapter
4. Coil securing nut
5. O-ring

The kit contains an M8 and M5 female/male adapter. It is up to the client to decide which adapter to use.

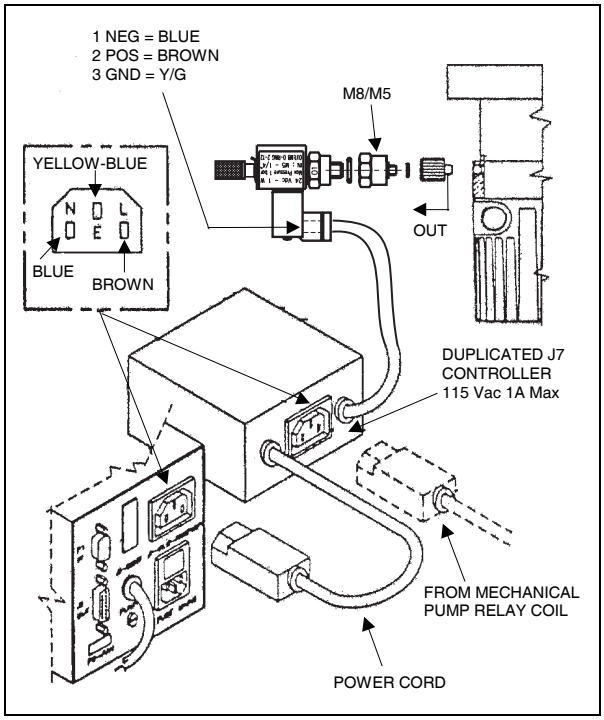
**WARNING**

When assembling the kit, be careful not to unscrew the coil securing ring and nut inside the valve.

Once the kit is assembled, install it on the pump.

For pumps equipped with a screw cap, once the screw cap is removed use the appropriate adapter to secure the valve to the pump.

The following figure shows a tipical installation on a pump equipped with a screw cap.



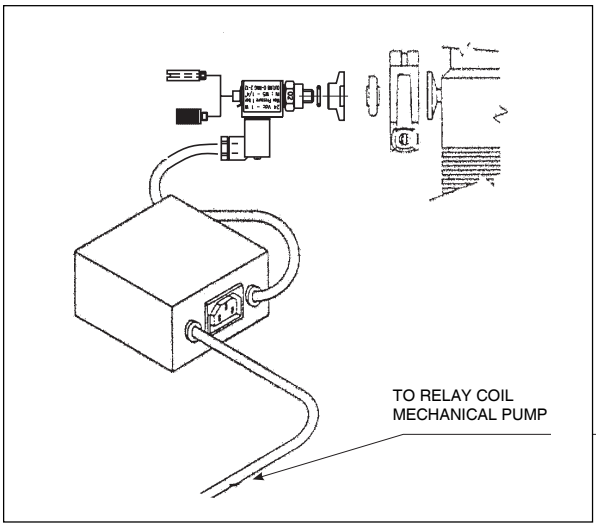

*Installation on a Pump Equipped with a Screw Cap*

Upon completion of the mechanical installation, attach the Turbo-V vent valve controller unit power cord to the related connector on the rear panel of the Turbo pump controller.

**WARNING**

Before powering on the kit, be sure that the output voltage on the connector is 115 Vac.

For installation on pumps that are not equipped with a screw cap, use the flange system provided with the pump as shown in the following figure.

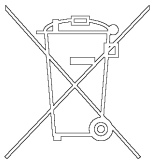



*Installation on a Pump not Equipped with a Screw Cap*

For installation on a pump whose controller is not equipped with a 115 Vac valve power supply socket, remove the connector after cutting the controller power cord and connect it to module J21 as shown in the previous figure.

## DISPOSAL

**Meaning of the "WEEE" logo found in labels**
The following symbol is applied in accordance with the EC WEEE (Waste Electrical and Electronic Equipment) Directive.
This symbol (**valid only in countries of the European Community**) indicates that the product it applies to must NOT be disposed of together with ordinary domestic or industrial waste but must be sent to a differentiated waste collection system.
The end user is therefore invited to contact the supplier of the device, whether the Parent Company or a retailer, to initiate the collection and disposal process after checking the contractual terms and conditions of sale.



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.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**Asia and ROW**
Varian Vacuum Technologies
Local Office


***CUSTOMER INFORMATION***

Company name: ……

Contact person: Name: …… Tel: ……

Fax: …… E-Mail: ……

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

*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**

| | | POSITION | PARAMETERS | |
|---|---|---|---|---|
| ☐ Does not start | ☐ Noise | ☐ Vertical | Power: | Rotational Speed: |
| ☐ Does not spin freely | ☐ Vibrations | ☐ Horizontal | Current: | Inlet Pressure: |
| ☐ Does not reach full speed | ☐ Leak | ☐ Upside-down | Temp 1: | Foreline Pressure: |
| ☐ Mechanical Contact | ☐ Overtemperature | ☐ Other: | Temp 2: | Purge flow: |
| ☐ Cooling defective | | …… | 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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03/06