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# DS40M Pump

Models:

**X3703-64000, X3703-64001**

**Manuale di Istruzioni  
Bedienungshandbuch  
Notice de Mode D'Emploi  
User Manual**

87-900-147-01(B)

04/2016



**Agilent Technologies**

## Notices

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### WARNING

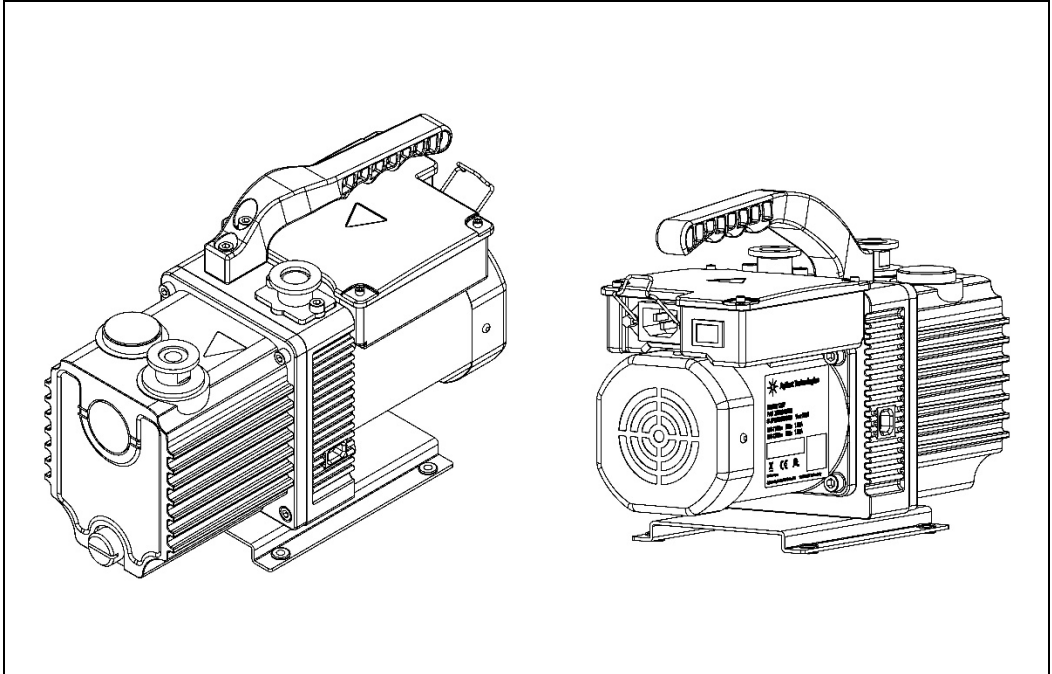
A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a **WARNING** notice until the indicated conditions are fully understood and met.



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## DS40M Pump



## DS40M Pump



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## Contents



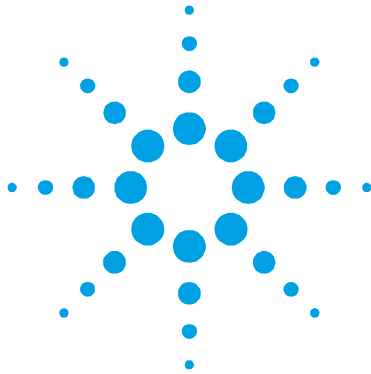
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# 1 Istruzioni per l'uso

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Traduzione delle istruzioni originali



## **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 Agilent prima dell'utilizzo dell'apparecchiatura. La Agilent 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.

Le pompe DS40M sono pompe rotative bistadio a palette, a tenuta in bagno d'olio, azionate da motore elettrico monofase in cui la pompa è comandata direttamente dal motore.

Queste pompe da alto vuoto sono adatte al pompaggio di gas non corrosivi.

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:

---

**AVVERTENZA!**



I messaggi di avvertenza 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.

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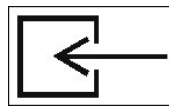
**NOTA**

Le note contengono informazioni importanti estrapolate dal testo.

---

## Simboli usati

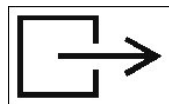
I seguenti simboli sono utilizzati in modo coerente in tutte le illustrazioni:



Flangia  
d'aspirazione



Superficie calda  
"Pericolo di  
scottature se  
vengono toccate le  
parti calde"



Flangia di scarico



Pericolo, rischio di  
scossa elettrica

## Immagazzinamento

Durante il trasporto e l'immagazzinamento delle pompe non devono essere superate le seguenti condizioni ambientali:

- temperatura: da -12 °C a +70 °C
- umidità relativa: da 0 a 85 % (non condensante)

## Preparazione per l'installazione

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

Il peso dell'imballo, comprensivo della pompa è di 13 kg.

Durante l'operazione di disimballaggio, prestare particolare attenzione a non lasciar cadere la pompa e a non sottoporla ad urti o vibrazioni.

Non disperdere l'imballo nell'ambiente. Il materiale è completamente riciclabile e risponde alla direttiva CEE 85/399 per la tutela dell'ambiente.

### NOTA

La pompa non può essere danneggiata rimanendo semplicemente esposta all'atmosfera. Si consiglia comunque di mantenerla chiusa fino al momento dell'installazione sul sistema onde evitare eventuale inquinamento da polvere.

---

### NOTA

La pompa è spedita con l'olio necessario al suo normale funzionamento.

---

## Montaggio della flangia di scarico

Rimuovere il tappo nero e montare la flangia fornita con la pompa, come indicato in Figura 1.

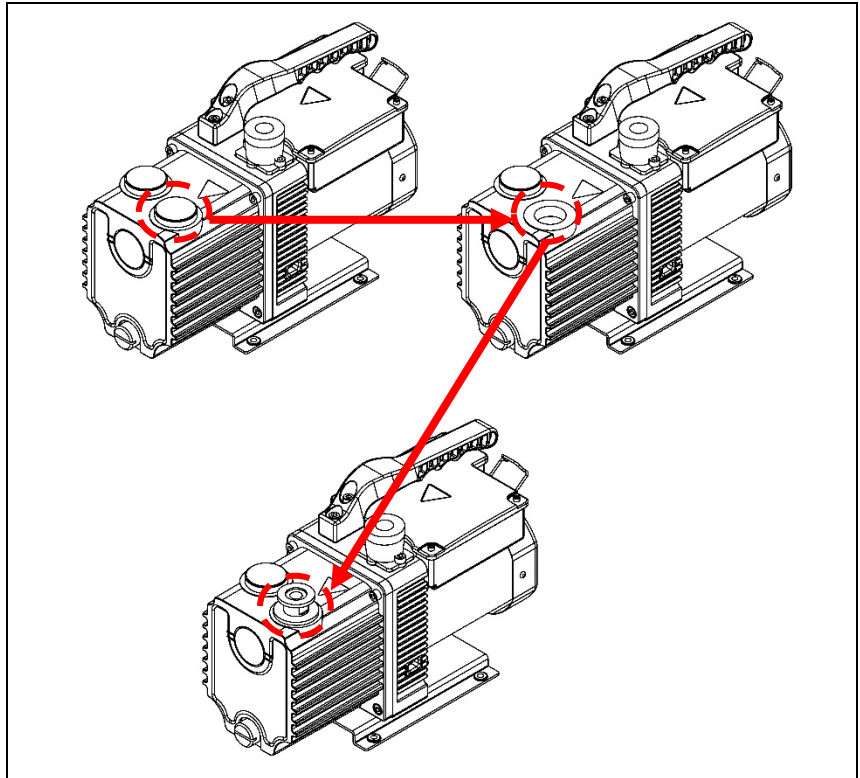
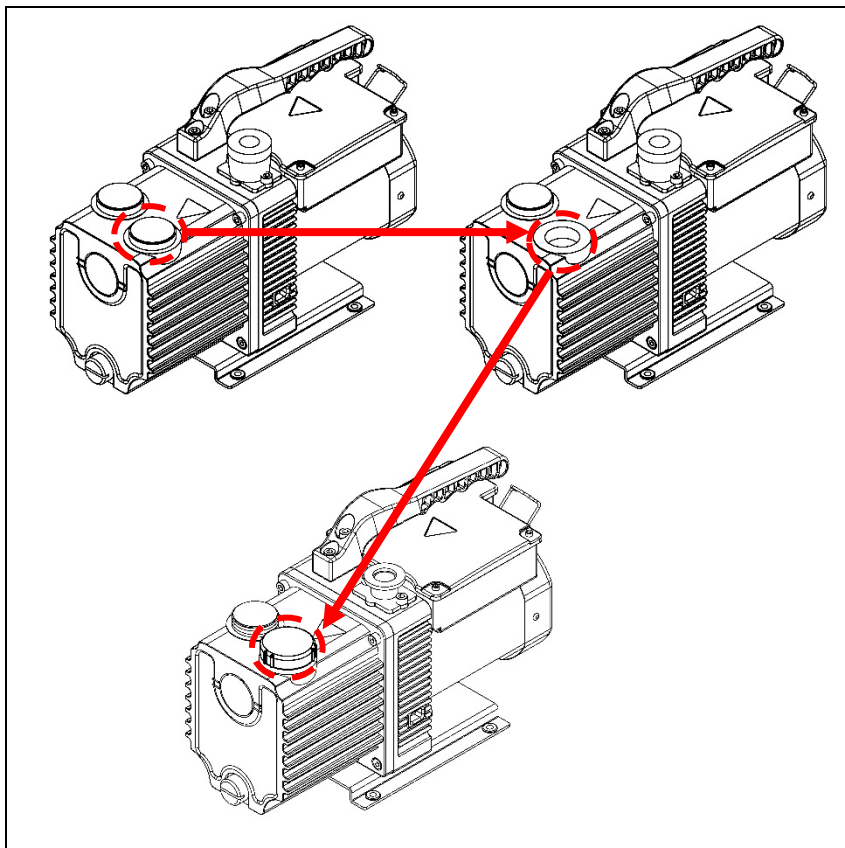


Figura 1

**1 Istruzioni per l'uso**  
**Preparazione per l'installazione**

## Montaggio della valvola di sfiato

Rimuovere il tappo nero e montare la valvola di sfiato fornita con la pompa, come indicato in Figura 2.



**Figura 2**

## Installazione

Non installare e/o utilizzare la pompa 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 +12 °C a +40 °C
- umidità relativa: 0 – 85 % (non condensante)
- altezza massima rispetto al livello del mare 1000 m montata in orizzontale.

**AVVERTENZA!**

Per proteggere contro cortocircuiti o sovraccarichi, si deve installare un interruttore automatico sulla linea d'alimentazione principale verso i dispositivi Agilent, di capacità adeguata (vedere la tabella seguente):

**Tab. 1**

P/N	110 Vac	220 Vac
X3703-64000	10 A	
X3703-64001		10 A

**ATTENZIONE!**

Assicurare uno spazio libero tutto intorno alla pompa di almeno 10 cm per consentire un'adeguata circolazione d'aria.

## 1 Istruzioni per l'uso

### Installazione

**AVVERTENZA!** Togliere i tappi di protezione posti sulle flange di aspirazione e scarico prima di ogni successiva operazione. L'aria contenuta all'interno della pompa, in caso di accensione involontaria, può proiettarli contro l'operatore.



**AVVERTENZA!** Durante l'installazione prestare la massima attenzione che la flangia di aspirazione sia collegata alla camera da evacuare e che la flangia di scarico non sia tappata (vedere la figura seguente). Prestare la massima attenzione a non invertire le flange di aspirazione e scarico. La massima pressione interna al contenitore dell'olio non deve superare 0,03 MPa. L'inosservanza di queste precauzioni può causare danni alla macchina ed all'operatore.

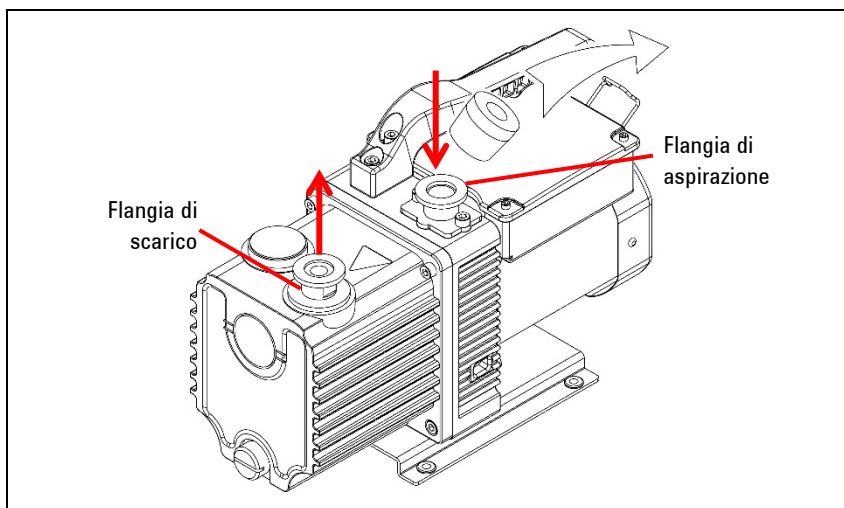


Figura 3



**ATTENZIONE!** Controllare che la tensione di alimentazione corrisponda a quella indicata sul cartellino del motore.

---

Collegare la pompa all'alimentazione.

## 1 Istruzioni per l'uso

### Uso

## Uso

Prima di mettere la pompa in servizio effettivo è necessario, per il raggiungimento del vuoto limite, far marciare per circa un'ora la pompa con aspirazione chiusa allo scopo di eliminare l'umidità nell'olio.

L'accensione della pompa non richiede particolari manovre; è sufficiente collegarla all'alimentazione elettrica e porre l'interruttore principale su "ON".

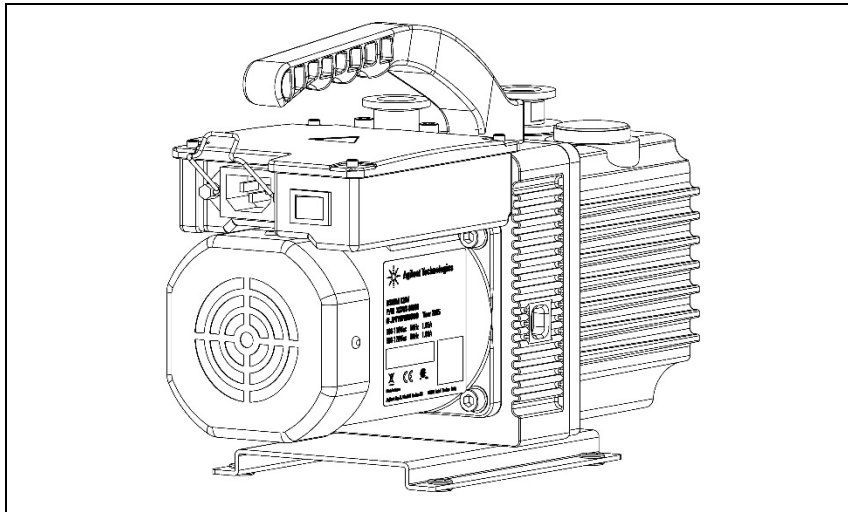


Figura 4

**AVVERTENZA!**



La pompa è progettata per operare con gas neutri o non corrosivi. È assolutamente vietato l'impiego con sostanze potenzialmente esplosive o infiammabili.

Lo spegnimento della pompa non richiede particolari manovre; è sufficiente porre l'interruttore principale su "OFF" e scollegarla dall'alimentazione elettrica.

## Dispositivo di sicurezza anti-estrazione

Il dispositivo di sicurezza anti-estrazione permette di bloccare il cavo di alimentazione in modo da evitare sfilamenti accidentali.

Per installare il dispositivo di sicurezza anti-estrazione, procedere come indicato di seguito.

- 1 Sollevare il dispositivo di sicurezza anti-estrazione.



Figura 5

**1 Istruzioni per l'uso**  
**Uso**

**2** Inserire il cavo di alimentazione nella presa.



**Figura 6**

**3** Abbassare il dispositivo di sicurezza anti-estrazione sul cavo.



**Figura 7**

## Manutenzione

Il personale addetto alla condotta ed alla manutenzione della pompa deve essere ben addestrato e deve avere un'approfondita conoscenza delle norme antinfortunistiche.

---

**AVVERTENZA!**



Le alte tensioni possono causare morte al contatto. Operare sempre con la massima cautela e secondo le norme antinfortunistiche in vigore.

---

---

**AVVERTENZA!**



Quando la pompa è alimentata prestare attenzione per la presenza di parti in movimento e di alta tensione.

---

---

**AVVERTENZA!**



Nel caso si debba procedere ad operazioni di manutenzione della pompa al termine di un periodo di esercizio, è necessario lasciarla raffreddare, poichè la temperatura esterna può superare i 60 °C.

---

## 1 Istruzioni per l'uso

### Manutenzione

---

#### **AVVERTENZA!**



Escludere sempre l'alimentazione della pompa prima di compiere operazioni di manutenzione. Apporre specifici cartelli di avvertenza: **APPARECCHIATURA IN MANUTENZIONE - NON INSERIRE L'ALIMENTAZIONE**, in corrispondenza dell'interruttore di alimentazione. Al termine ripristinare i dispositivi di sicurezza.

---

---

#### **AVVERTENZA!**



Non effettuare la sostituzione dell'olio subito dopo l'arresto della pompa, in quanto la temperatura della stessa può essere elevata.

---

---

#### **NOTA**

Prima di rispedire al costruttore una pompa per riparazioni è indispensabile compilare e far pervenire al locale ufficio vendite la scheda "Request for return" allegata al presente manuale di istruzioni. Copia della stessa deve essere inserita nell'imballo della pompa prima della spedizione.

---

Qualora una pompa dovesse essere rottamata, procedere alla sua eliminazione nel rispetto delle normative nazionali specifiche.

## 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.

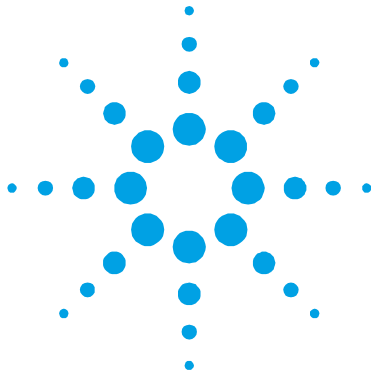


Per maggiori informazioni riferirsi a;

<http://www.agilent.com/environment/product/index.shtml>

**1 Istruzioni per l'uso**  
**Smaltimento**





## 2 Gebrauchsanleitung

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Übersetzung der Originalanleitungen



## **Allgemeine Hinweise**

Dieses Gerät ist für den professionellen Gebrauch bestimmt. Vor dem Gebrauch soll der Benutzer dieses Handbuch sowie alle weiteren von Agilent mitgelieferten Zusatzinformationen genau lesen. Bei vollständiger bzw. teilweiser Nichtbeachtung der enthaltenen Hinweise, unsachgemäßem Gebrauch durch ungeschultes Personal, nicht autorisierten Eingriffen und Benutzung unter Mißachtung der nationalen Bestimmungen übernimmt Firma Agilent keinerlei Haftung.

Die Pumpen DS40M sind dichte ölbadgeschmierte zweistufige Flügelzellenpumpen, die von einem Einphasenstrommotor betätigt werden, wobei die Pumpe direkt vom Motor bewegt wird.

Diese Hochvakuumumpen eignen sich für das Pumpen von nicht korrosiven Gasen.

In den folgenden Abschnitten sind alle erforderlichen Informationen für die Sicherheit des Bedieners bei der Verwendung des Geräts aufgeführt. Detaillierte technische Informationen sind im Anhang "Technical Information" enthalten.

In dieser Gebrauchsanleitung werden Sicherheitshinweise folgendermaßen hervorgehoben:

---

**WARNUNG!**



Die Warnhinweise richten die Aufmerksamkeit des Bedieners auf eine spezielle Prozedur oder Praktik, die bei unkorrekter Ausführung schwere Personenschäden zur Folge haben könnte.

---

**VORSICHT!**

Die Vorsichthinweise vor bestimmten Prozeduren machen den Bediener darauf aufmerksam, daß bei Nichteinhaltung Schäden am Gerät entstehen können.

---

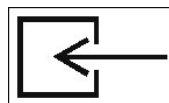
**HINWEIS**

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

---

## Verwendete Symbole

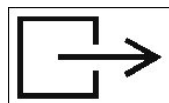
Folgende Symbole wurden durchgängig in allen Illustrationen verwendet:



Saugflansch



Heiße Oberfläche –  
Verbrennungsgefahr  
bei Berührung



Ablassflansch



Gefahr von  
Stromschlägen

## Lagerung

Während des Transports und der Lagerung der Pumpen sollen die folgenden Umgebungsbedingungen gegeben sein:

- Temperatur: -12 °C bis +70 °C
- Relative Feuchtigkeit: 0 – 85 % (nicht kondensierend)

## Vor der Installation

Die Pumpe wird in einer speziellen Schutzverpackung geliefert. Eventuelle Transportschäden sind der zuständigen örtlichen Verkaufsstelle zu melden.

Das Gewicht der Verpackung mit Pumpe beträgt 13 kg.

Beim Auspacken ist darauf zu achten, daß die Pumpe nicht fallengelassen oder Stößen oder Vibrationen ausgesetzt wird. Das Verpackungsmaterial ist ordnungsgemäß zu entsorgen. Es ist vollständig recyclebar und entspricht der EG-Richtlinie 85/399 für den Umweltschutz.

### HINWEIS

Die Pumpe kann, wenn sie einfach der Atmosphäre ausgesetzt ist, nicht beschädigt werden. Sie sollte jedoch bis zur Installation an der Anlage geschlossen bleiben, um Verunreinigungen durch Staub zu vermeiden.

---

### HINWEIS

Die Pumpe wird mit dem Öl für den normalen Betrieb geliefert.

---

## Montage des Ausgangsflansches

Entfernen Sie die schwarze Kappe und setzen Sie den mit der Pumpe mitgelieferten Flansch an wie in Abbildung 1 gezeigt.

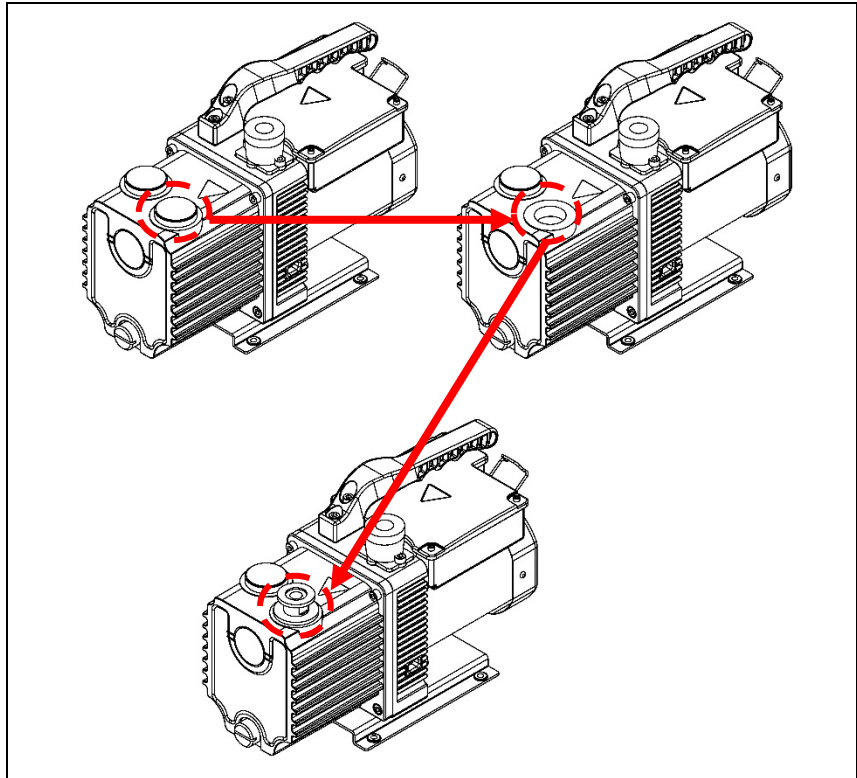


Abbildung 1

## Montage des Ablassventils

Entfernen Sie die schwarze Kappe und setzen Sie das mit der Pumpe mitgelieferte Ventil an wie in Abbildung 2 gezeigt.

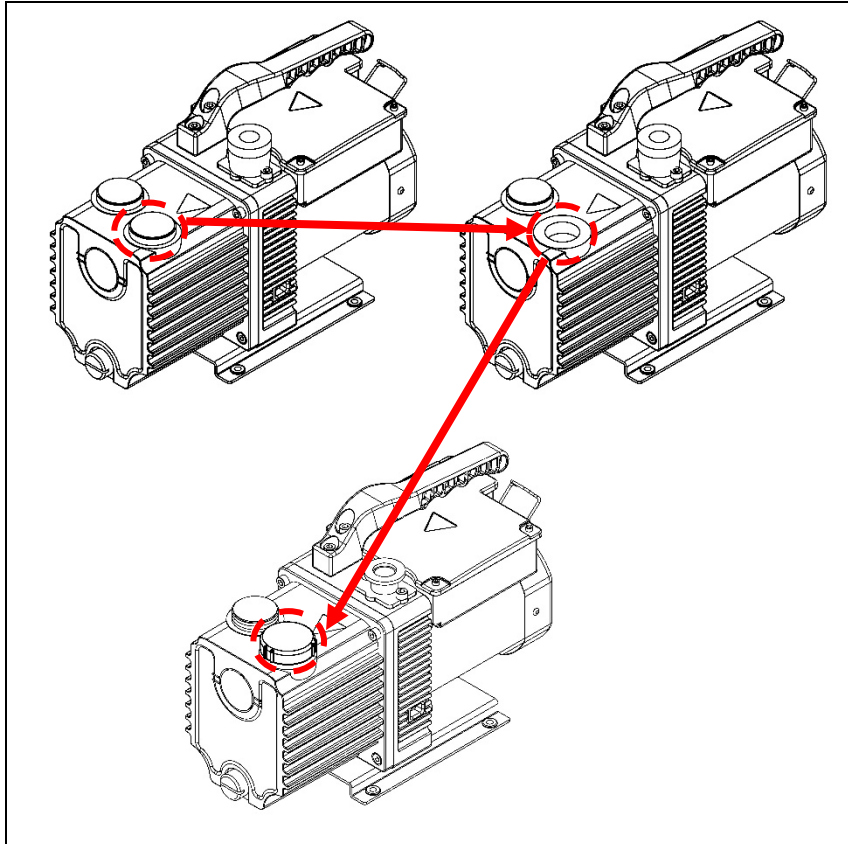


Abbildung 2

## Installation

Die Pumpe darf nicht in Umgebungen installiert und/oder benutzt werden, die ungeschützt vor Witterungsbedingungen (Regen, Frost, Schnee), Staub und aggressiven Gasen sind und in denen Explosions- oder erhöhte Brandgefahr besteht.

Während des Betriebs sollen die folgenden Umgebungsbedingungen gegeben sein:

- Temperatur: +12 °C bis +40 °C
- Relative Feuchtigkeit: 0 – 85 % (nicht kondensierend)
- max. Höhe ü. NN: 1000 m Horizontale Montage.

**WARNUNG!**



Zum Schutz vor Kurzschlüssen oder Überlastungen, muss ein automatischer Schalter in die Hauptspeisungsleitung zu den Agilent-Vorrichtungen installiert werden (siehe folgende Tabelle):

Tab. 1

P/N	110 Vac	220 Vac
X3703-64000	10 A	
X3703-64001		10 A

**VORSICHT!**

Sorgen Sie für einen freien Raum von mindestens 10 cm um die Pumpe, damit die Luft zirkulieren kann.

## 2 Gebrauchsanleitung

### Installation

#### **WARNUNG!**



Vor Aufnahme jeglicher Arbeiten sind die Schutzkappen an den Saug- und Druckflanschen zu entfernen. Die im Pumpeninnern enthaltene Luft könnte diese bei unbeabsichtigter Einschaltung gegen den Bediener schleudern.

#### **WARNUNG!**



Bei der Installation ist unbedingt darauf zu achten, daß der Saugflansch an die zu entleerende Kammer angeschlossen ist und der Abflansch nicht verschlossen ist (siehe folgende Abbildungen). Bitte sehr darauf achten, dass der Abflansch nicht mit der Ansaugung verwechselt wird. Der Druck im Ölbehälter darf nicht größer als 0,03 MPa sein. Bei Nichtbeachtung dieser Anweisungen besteht Schadensgefahr für die Pumpe und die Bedienperson.

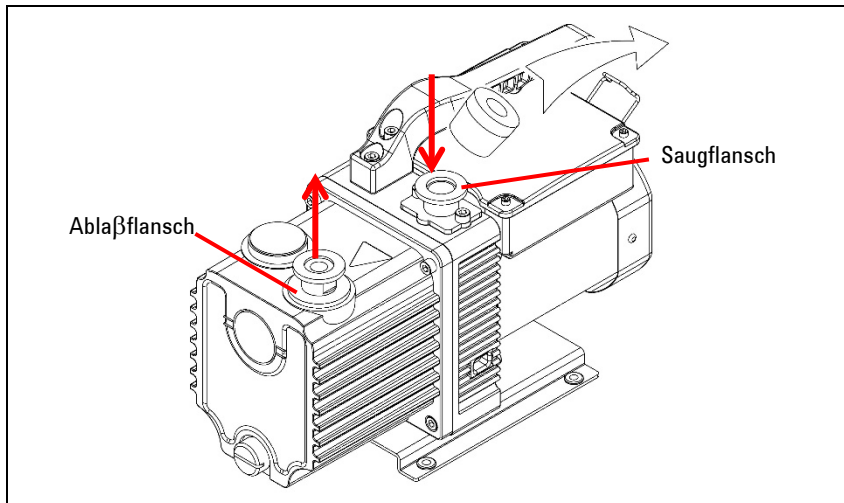


Abbildung 3



**VORSICHT!**

Kontrollieren, daß die Versorgungsspannung mit der Spannungsangabe auf dem Typenschild des Motors übereinstimmt.

---

Die Pumpe an das Versorgungsnetz anschließen.

## Gebrauch

Vor der eigentlichen Inbetriebnahme der Pumpe ist es zur Erreichung des Grenzvakuums erforderlich, die Pumpe ungefähr eine Stunde lang mit geschlossener Ansaugung laufen zu lassen, um die Feuchtigkeit aus dem Öl zu entfernen.

Die Einschaltung der Pumpe erfordert keine speziellen Schritte, sie braucht nur an die elektrische Energieversorgungsquelle angeschlossen werden und stellen Sie den Hauptschalter auf "ON".

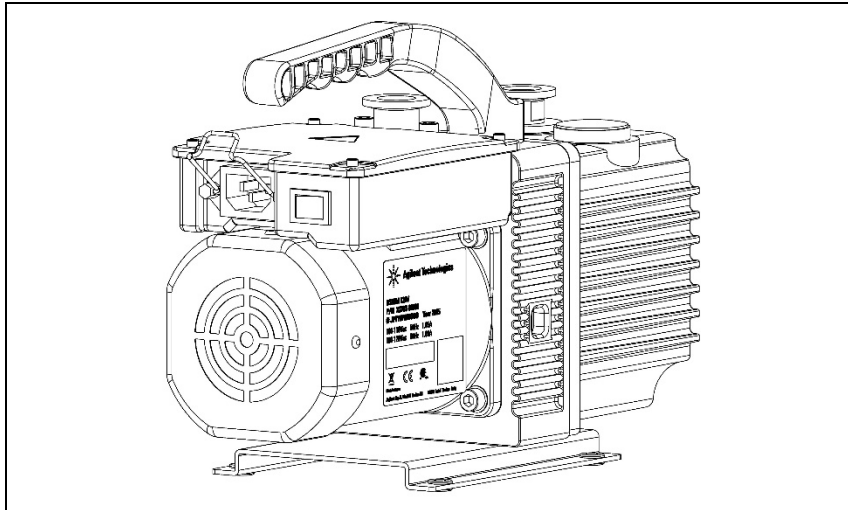


Abbildung 4

**WARNUNG!**



Die Pumpe ist für den Betrieb mit neutralen und nicht korrosiven Gasen konzipiert. Der Einsatz mit potentiell explosions- oder feuergefährlichen Substanzen ist streng verboten.

Die Ausschaltung der Pumpe erfordert keine speziellen Schritte, es muss nur der Hauptschalter auf „OFF“ gestellt und die Pumpe von der Energieversorgungsquelle getrennt werden.

## Sicherheitsbügel zum Schutz gegen Herausziehen des Kabels

Mit dem Sicherheitsbügel wird das Versorgungskabel blockiert, so dass es nicht versehentlich herausgezogen werden kann.

Zur Installation des Bügels gehen Sie wie folgt vor.

- 1 Heben Sie den Bügel an.



Abbildung 5

## 2 Gebrauchsanleitung Gebrauch

- 2 Stecken Sie das Versorgungskabel ein.



**Abbildung 6**

- 3 Klappen Sie den Bügel über den Stecker.



**Abbildung 7**

## Wartung

Das für den Betrieb und die Wartung zuständige Personal soll geschult sein und über eine solide Kenntnis der Unfallschutzvorschriften verfügen.

---

**WARNUNG!**



Hochspannungen können bei Kontakt tödliche Folgen haben. Es ist stets mit größter Vorsicht und gemäß den geltenden Unfallschutzvorschriften vorzugehen.

---

---

**WARNUNG!**



Bei eingeschalteter Pumpe ist Vorsicht im Hinblick auf bewegliche und unter hoher Spannung stehende Teile geboten.

---

---

**WARNUNG!**



Falls die Pumpe im Anschluß an den Betrieb gewartet werden soll, ist abzuwarten, bis sie abgekühlt ist, da ihre Oberfläche eine Temperatur von 60 °C überschreiten kann.

---

## 2 Gebrauchsanleitung

### Wartung

---

#### **WARNUNG!**



Vor Wartungsarbeiten ist die Pumpe stets energiefrei zu schalten. Am Netzschalter sind spezielle Warnschilder "INSTANDHALTUNG AM GERÄT – NICHT EINSCHALTEN" anzubringen. Nach Abschluss der Arbeiten sind die Sicherheitseinrichtungen wieder zu aktivieren.

---

#### **WARNUNG!**



Keine Ölwechsel unmittelbar nach Abschaltung der Pumpe vornehmen, da die Pumpe sehr heiß sein kann.

---

#### **HINWEIS**

Bevor dem Hersteller eine Pumpe zur Reparatur zurückgesandt wird, ist das Formular "Request for Return" in der Anlage zum vorliegenden Handbuch auszufüllen und der lokalen Verkaufsstelle zuzustellen. Eine Kopie des Formulars ist der Pumpenverpackung vor dem Versand beizulegen.

---

Bei eventueller Verschrottung einer Pumpe ist diese entsprechend der einschlägigen nationalen Vorschriften zu entsorgen.

## 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.



Für weitere Informationen:

<http://www.agilent.com/environment/product/index.shtml>

## **2   Gebrauchsanleitung Entsorgung**





## 3 Mode d'emploi

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Traduction de la mode d'emploi originale



## **Indications générales**

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 fournie par Agilent avant d'utiliser l'appareil. Agilent décline par conséquent toute responsabilité en cas de non-respect total ou partiel des instructions fournies, 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 pompes DS40M sont des pompes rotatives à deux stades, à palettes, étanches et à bain d'huile, actionnées par un moteur électrique monophasé entraînant la pompe directement.

Ces pompes à vide poussé sont adaptées au pompage de gaz non corrosifs.

Les paragraphes suivants fournissent toutes les indications nécessaires pour garantir la sécurité de l'opérateur pendant l'utilisation de l'appareillage. Des renseignements plus détaillés se trouvent dans l'appendice "Technical Information".

Cette notice utilise les signes conventionnels suivants:

---

**AVERTISSEMENT!**



Les messages d'avertissement attirent l'attention de l'opérateur sur une procédure ou une manœuvre spéciale dont la mauvaise exécution risque de provoquer de graves lésions.

---

**ATTENTION!**

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

---

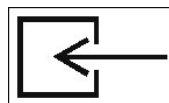
**NOTE**

Les notes contiennent des renseignements importants, extrapolés du texte.

---

## Symboles utilisés

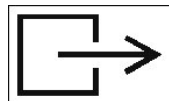
Les symboles suivants sont utilisés dans les différentes illustrations:



Bride  
d'aspiration



Surface chaude  
"Risque de brûlure  
en cas de contact"



Bride  
d'évacuation



Danger, risque  
d'électrisation

## Emmagasinage

Pendant le transport et l'emmagasinage des pompes, veiller à respecter les conditions environnementales suivantes:

- température: de -12 °C à +70 °C
- humidité relative: 0 – 85 % (sans condensation)

## Préparation pour l'installation

La pompe est fournie 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.

Le poids de l'emballage, pompe comprise, est de 13 kg.

Pendant l'opération d'ouverture de l'emballage, veiller tout particulièrement à ne pas laisser tomber la pompe et à ne lui faire subir aucun choc ni aucune vibration.

Ne pas jeter l'emballage dans la nature. Le matériel est entièrement recyclable et il est conforme à la directive CEE 85/399 en matière de protection de l'environnement.

### NOTE

La pompe ne peut être endommagée en restant simplement exposée à l'atmosphère. Il est de toute façon conseillé de la garder dans son emballage jusqu'au moment de sa mise en place sur le système afin d'éviter toute pollution due à la poussière.

---

### NOTE

La pompe est livrée avec l'huile nécessaire pour son fonctionnement normal.

---

## Montage de la bride d'évacuation

Démontez le bouchon noir et montez la bride fournie avec la pompe, comme indiqué sur la Figure 1.

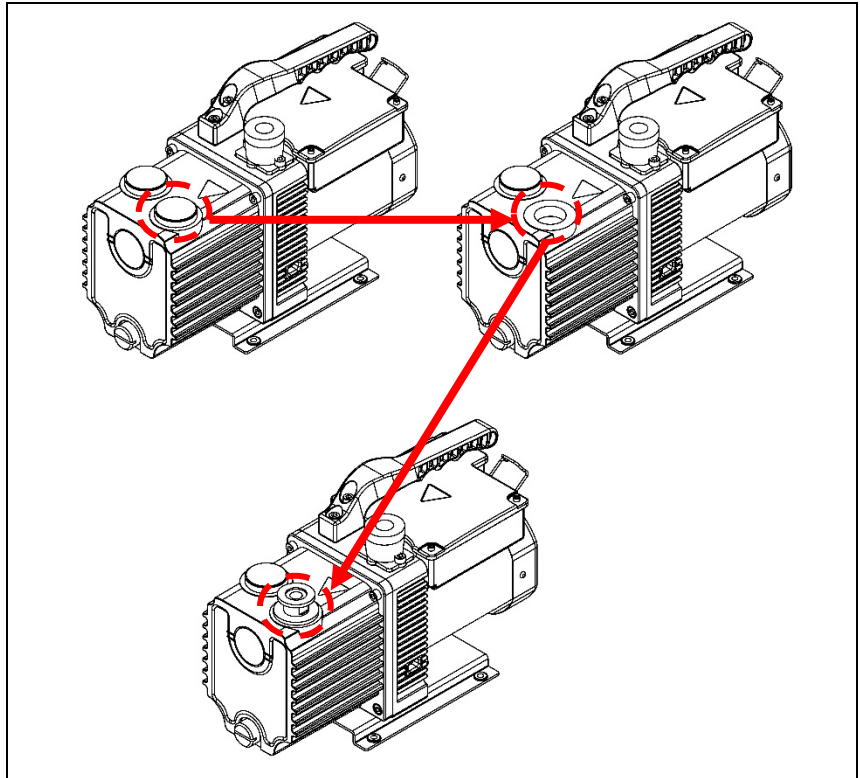


Figure 1

**3 Mode d'emploi**  
**Préparation pour l'installation**

## Montage de l'évent

Démontez le bouchon noir et montez l'évent fourni avec la pompe, comme indiqué sur la Figure 2.

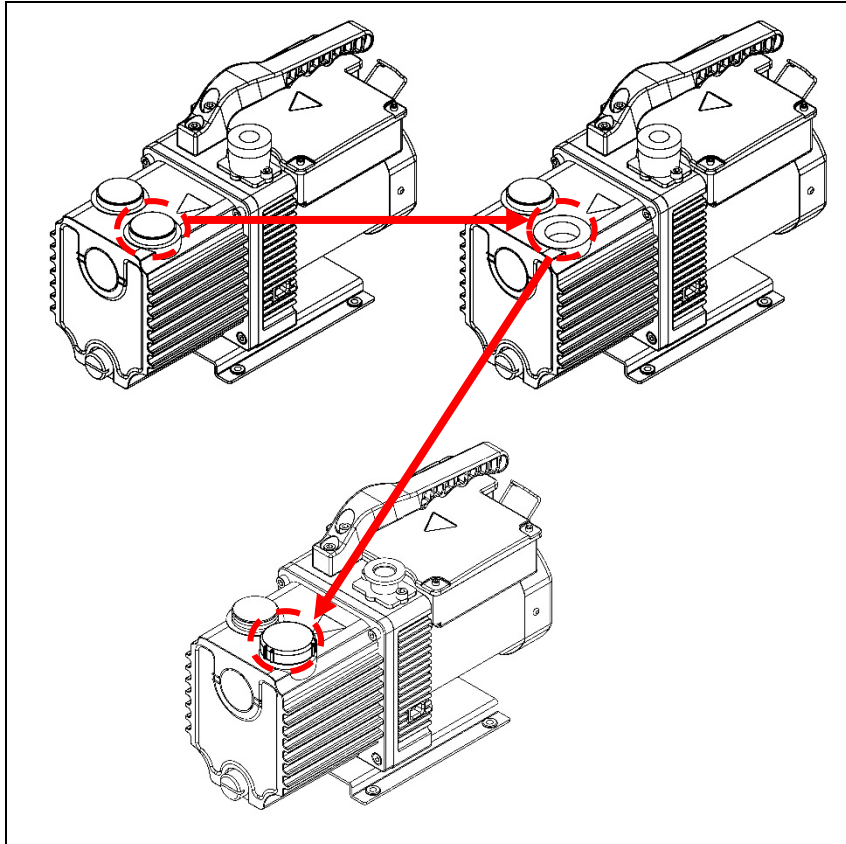


Figure 2

## Installation

Ne pas installer et/ou utiliser la pompe dans des milieux exposés aux agents atmosphériques (pluie, gel, neige), à des poussières, à des gaz agressifs 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 +12 °C à +40 °C
- Humidité relative: 0 - 85 % (sans condensation)
- Altitude maximale de fonctionnement: 1000 m montage horizontal.

**AVERTISSEMENT!**



**Pour protéger contre les court-circuits ou les surintensités, il faut installer un disjoncteur automatique sur la ligne d'alimentation principale vers les dispositifs Agilent, de bonne capacité (voir tableau ci-dessous):**

**Tab. 1**

P/N	110 Vac	220 Vac
X3703-64000	10 A	
X3703-64001		10 A

**ATTENTION!**

Laissez un espace libre de 10 cm minimum autour de la pompe pour garantir la circulation de l'air.

### 3 Mode d'emploi

#### Installation

#### AVERTISSEMENT!



Avant toute autre opération, retirer les bouchons de protection placés sur les brides d'aspiration et de vidange. En cas de mise en marche inopinée de l'appareillage, l'air contenu à l'intérieur de la pompe peut les projeter contre l'opérateur.

#### AVERTISSEMENT!



Pendant l'installation, faire très attention à ce que la bride d'aspiration soit reliée à la chambre à vider et que la bride de sortie ne soit pas bouchée (voir les figures ci-après). Veiller attentivement à ne pas inverser l'entrée et la sortie de la pompe. La pression maximale à l'intérieur du réservoir d'huile ne doit pas dépasser 0,03 MPa. Le non-respect de ces précautions peut entraîner un danger pour l'opérateur et endommager la machine.

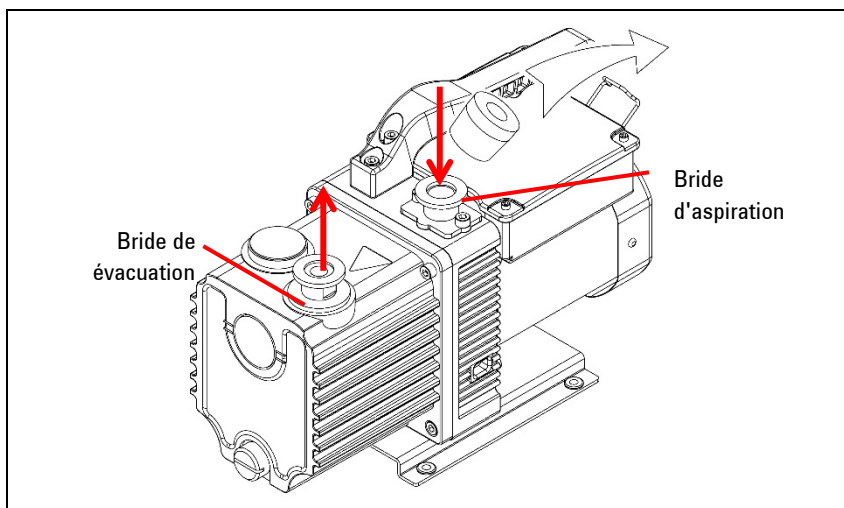


Figure 3



**ATTENTION!** Contrôler que la tension d'alimentation correspond à la gamme de tensions indiquées sur la plaquette du moteur.

---

Brancher la pompe à la source d'alimentation.

### 3 Mode d'emploi Utilisation

## Utilisation

Avant la mise en service de la pompe, il est nécessaire, pour atteindre le vide maximum, de faire fonctionner la pompe avec l'aspiration fermée pendant environ une heure afin de supprimer l'humidité de l'huile.

La mise en marche de la pompe ne requiert aucune manœuvre particulière; il suffit de la brancher à l'alimentation électrique et de placer l'interrupteur principal sur "ON".

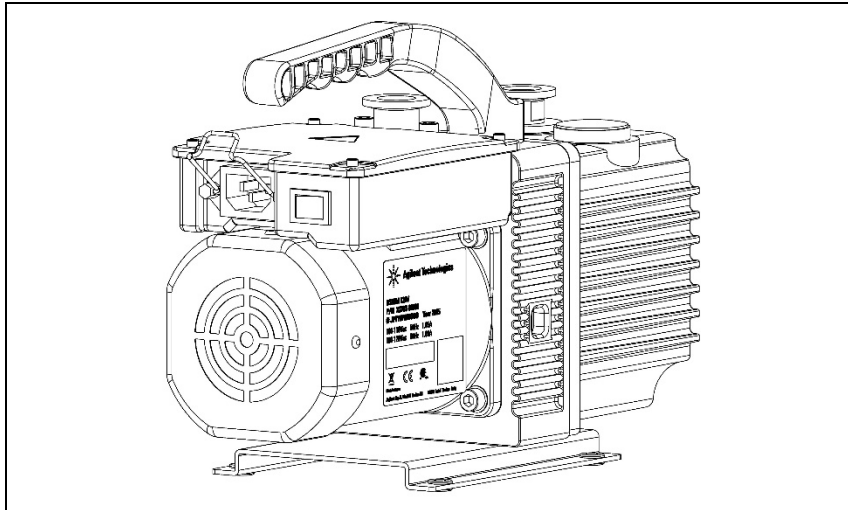


Figure 4

**AVERTISSEMENT!**



**La pompe a été conçue pour fonctionner avec des gaz neutres ou non corrosifs. L'emploi de substances potentiellement explosives ou inflammables est strictement interdit.**

---

L'arrêt de la pompe ne requiert aucune manœuvre particulière; il suffit de placer l'interrupteur principal sur "OFF" et de la débrancher de l'alimentation électrique.

### 3 Mode d'emploi Utilisation

## Dispositif de sécurité anti-débranchement

Le dispositif de sécurité anti-extraction permet d'immobiliser le cordon d'alimentation de manière à éviter un débranchement accidentel.

Pour installer le dispositif de sécurité anti-débranchement, procédez comme suit.

- 1 Soulevez le dispositif de sécurité anti-débranchement.



Figure 5

- 2 Branchez le cordon d'alimentation dans la prise.



Figure 6

- 3 Refermez le dispositif de sécurité anti-débranchement sur le cordon.



Figure 7

## Maintenance

Le personnel chargé de la conduite et de la maintenance de la pompe doit avoir la formation nécessaire et posséder une connaissance approfondie des normes de prévention des accidents du travail.

---

**AVERTISSEMENT!**



Les hautes tensions peuvent entraîner la mort par contact. Veiller à toujours opérer avec le maximum de prudence et dans le respect des normes de prévention des accidents du travail en vigueur.

---

---

**AVERTISSEMENT!**



Lorsque la pompe est sous tension, faire attention à la présence d'organes en mouvement et de haute tension.

---

---

**AVERTISSEMENT!**



En cas de nécessité de procéder à des opérations de maintenance de la pompe au terme d'une période de fonctionnement, il est indispensable de la laisser refroidir car sa température extérieure peut être supérieure à 60 °C.

---

---

**AVERTISSEMENT!**



Avant toute opération de maintenance, il est impératif de toujours couper l'alimentation de la pompe. Placer les panneaux spécifiques d'avertissement: **APPAREIL EN COURS DE MAINTENANCE – NE PAS BRANCHER L'ALIMENTATION**, près de l'interrupteur d'alimentation. Au terme des opérations de maintenance, restaurer les dispositifs de sécurité.

---

**AVERTISSEMENT!**



Ne pas effectuer la substitution d'huile immédiatement après l'arrêt de la pompe car la température de cette dernière peut être très élevée.

---

**NOTE**

Avant de retourner une pompe au constructeur pour réparation, il est indispensable de remplir et d'adresser au bureau local de vente la fiche "Request for Return" jointe à la présente notice. Une copie de celle-ci devra être mise dans l'emballage de la pompe avant expédition.

---

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

## Mise au rebut

### Signification du logo "WEEE" figurant sur les étiquettes.

Le symbole ci-dessous est appliqué conformément à la directive CE nommée "WEEE".

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



Pour plus d'informations, rendez-vous à l'adresse:

<http://www.agilent.com/environment/product/index.shtml>





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Original Instructions





## General Information

This equipment is destined for use by professionals. The user should read this instruction manual and any other additional information supplied by Agilent before operating the equipment. Agilent will not be held responsible for any events occurring due to non-compliance, even partial, with these instructions, improper use by untrained persons, non-authorized interference with the equipment or any action contrary to that provided for by specific national standards.

DS40M pumps are dual stage, rotary vane pumps oil sealed, driven by a single-phase electrical motor in which the pump is directly driven by the motor.

These high vacuum pumps are suitable for pumping non corrosive gases.

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".



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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.

---

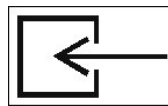
**NOTE**

The notes contain important information taken from the text.

---

## Symbols used

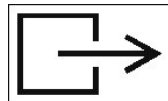
The following symbols are used consistently throughout in all illustration:



Suction flange



Hot surface “Danger of burns if hot parts are touched”



Exhaust flange



Electrical shock

## Storage

When transporting and storing the pumps, the following environmental requirements should not be exceeded:

- temperature: from -12° to +70° C
- relative humidity: 0 – 85 % (non-condensing)

## Preparation for Installation

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

Total weight of the pack, including the pump, is 13 kg.

When unpacking the pump, be sure not to drop it and avoid any kind of sudden impact or shock vibration to it.

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

### NOTE

Normal exposure to the environment cannot damage the pump. Nevertheless, it is advisable to keep it closed until it is installed in the system, thus preventing any form of pollution by dust.

---

### NOTE

The pump is delivered with the oil needed to its normal functioning.

---



## Assembly of exhaust flange

Remove the black cap and mount the flange provided with the pump, as shown in Figure 1.

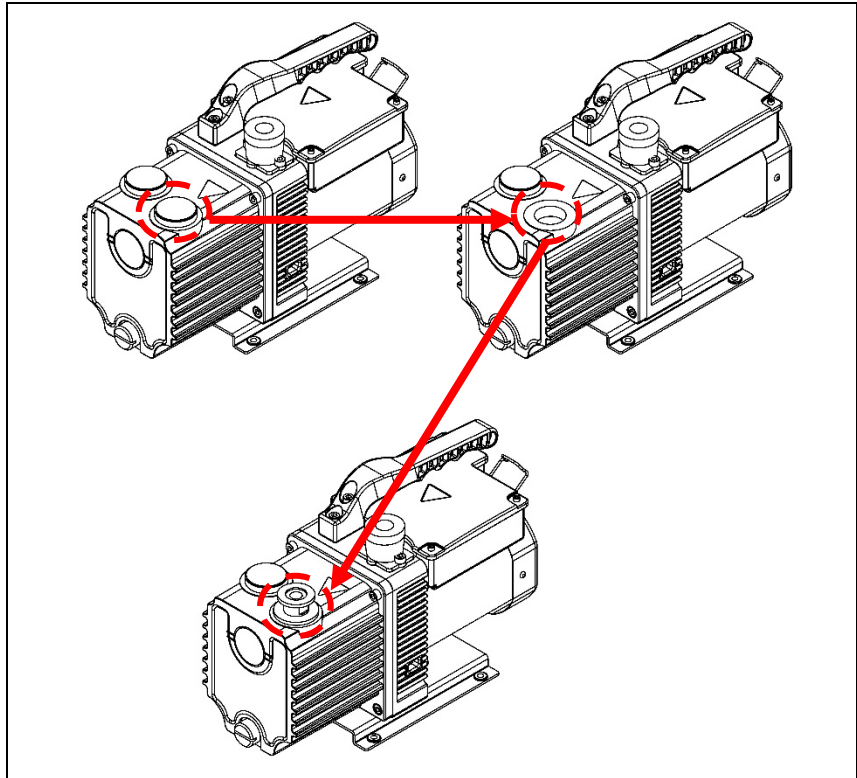


Figure 1

## Assembly of exhaust valve

Remove the black cap and mount the exhaust valve provided with the pump, as shown in Figure 2.

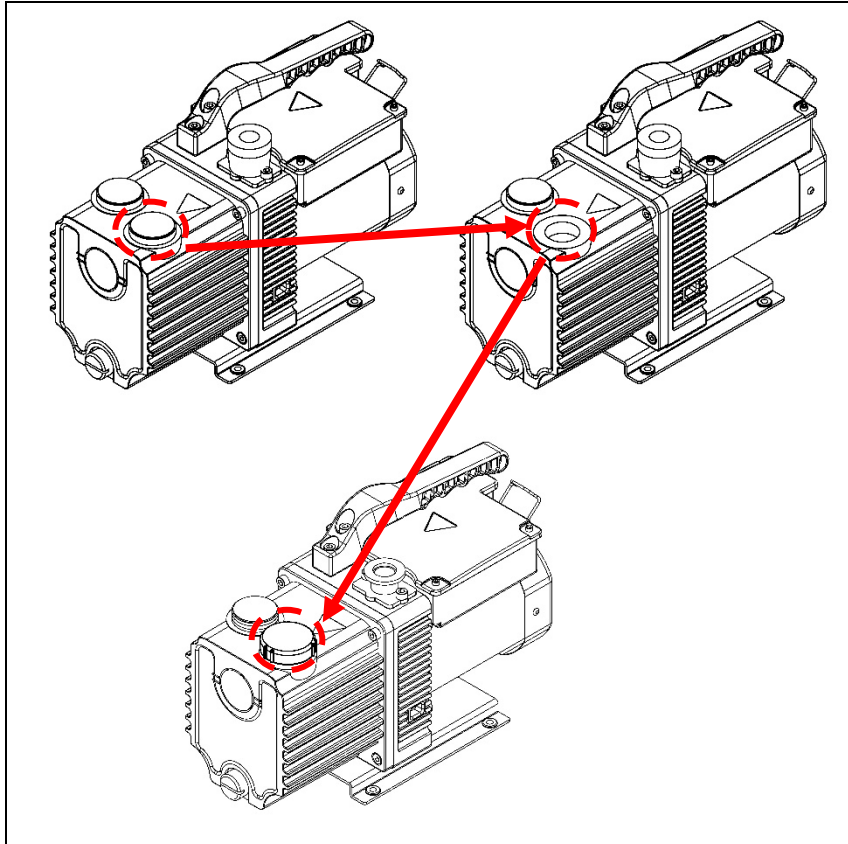


Figure 2

## Installation

Do not install or use the pump 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 +12 °C to +40 °C
- relative humidity: 0 – 85 % (non-condensing)
- maximum height above sea level 1000 m mounted horizontally.

**WARNING!**



Protect against short circuits and overload by installing on Agilent Device electrical main line an automatic circuit breaker of proper capacity (see table here below):

**Tab. 1**

P/N	110 Vac	220 Vac
X3703-64000	10 A	
X3703-64001		10 A

**CAUTION!**

Assure a free space all around the pump at minimum of 10 cm to allow proper air circulation.

## 4 Instructions for Use Installation

### WARNING!



Take out the protective caps on the suction and exhaust flanges before doing anything else. In the event of an accidental start-up, the air inside the pump could violently expel the protective caps and harm the operator.

### WARNING!



During installation, pay maximum attention that the suction flange is connected to the vacuum chamber and the exhaust flange is not closed (see figures below). Be very careful not to invert exhaust and suction. Maximum pressure inside the oil container must not exceed 0.03 MPa. Non-observance of these precautions may be dangerous for the pump and the operator.

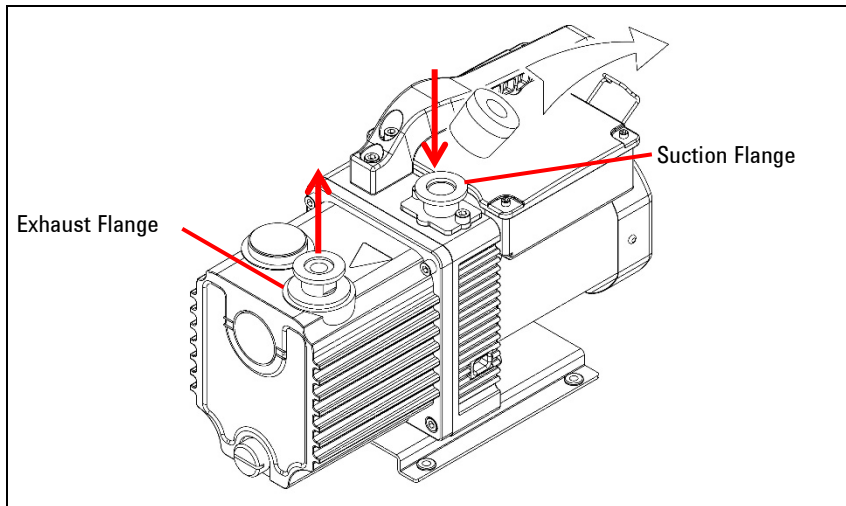


Figure 3



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**CAUTION!**

Check that your electrical mains voltage corresponds to that indicated on the motor's plate.

---

Connect the pump to the power supply.



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## 4 Instructions for Use

### Use



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## Use

Before being put into service, in order to reach maximum vacuum, the pump must be left running with intake port close for about an hour. This will eliminate any humidity from the oil.

There are no special procedures for switching the pump on; it needs to be connected to the electric power, and positioning the main switch “ON”.

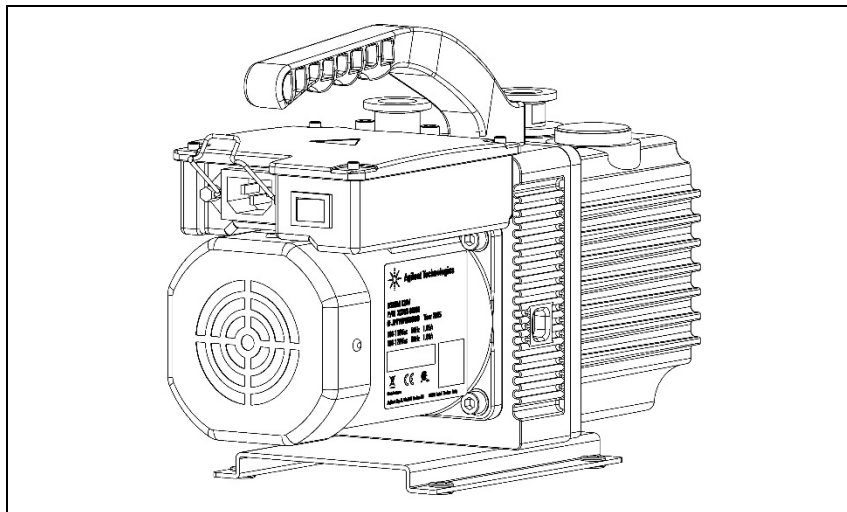


Figure 4

### WARNING!



The pump is designed for operation with neutral or non-corrosive gas. It is absolutely forbidden to use potentially explosive or flammable substances.

There are no special procedures for switching the pump off; it needs to positioning the main switch “OFF”, the disconnect ti from the electric power.

## Unplug safety device

The unplug safety device allows you to secure the power cable in order to avoid accidental disconnection.

In order to install the unplug safety device, proceed as follows:

- 1 Mounting and raise the unplug safety device.



**Figure 5**

#### 4 Instructions for Use Use



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- 2 Insert the power cable firmly into the socket.



**Figure 6**

- 3 Lower the unplug safety device on the cable.



**Figure 7**

## Maintenance

Personnel responsible for pump operation and maintenance must be well-trained and must be aware of the accident prevention rules.

---

**WARNING!**

Death may result from contact with high voltages. Always take extreme care and observe the accident prevention regulations in force.



**WARNING!**

When machine is powered take care on account of moving parts and high voltages.



**WARNING!**

If you have to perform maintenance on the pump after a considerable time in operation, leave it to cool as temperature of the outer surface may be in excess of 60 °C.



## 4 Instructions for Use Maintenance



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### **WARNING!**



Always disconnect the power supply to the pump before starting maintenance work. Place a special warning signs over the power supply breaker switch: **MACHINE UNDERGOING MAINTENANCE - DO NOT POWER ON.** When finished, remove the safety warning.

### **WARNING!**



Do not change the oil immediately after stopping the pump as the pump temperature may still be high.

### **NOTE**

Before returning the pump to the constructor for repairs the "Request for Return" sheet attached to this instruction manual must be filled-in and sent to the local sales office. A copy of the sheet must be inserted in the pump package before shipping.

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

## Disposal

### Meaning of the "WEEE" logo found in labels

The following symbol is applied in accordance with the EC WEEE (Waste Electrical and Electronic Equipment) Directive.

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



For more information refer to;

<http://www.agilent.com/environment/product/index.shtml>

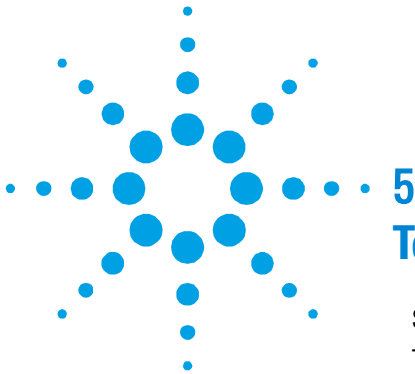
## 4 Instructions for Use Disposal



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## 5 Technical Information

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Original Instructions



**5 Technical Information**  
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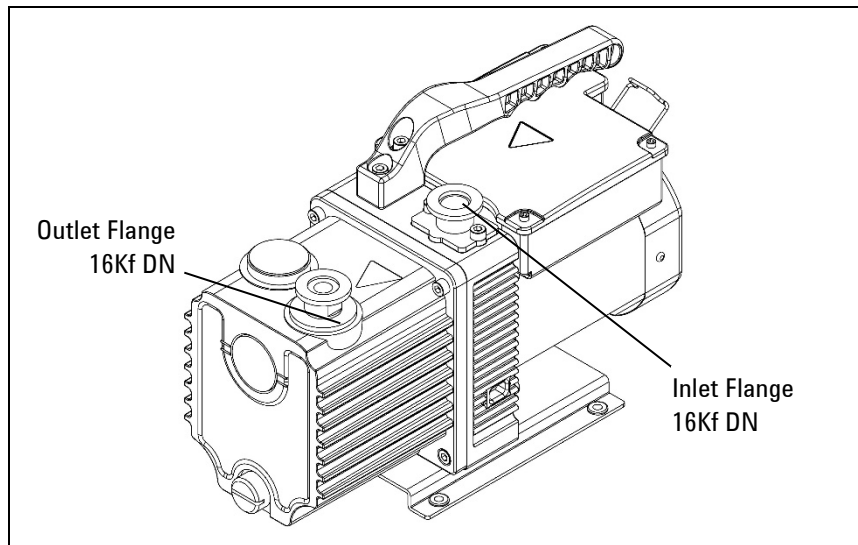
## Section I

### Technical Description

DS40M is a dual-stage, rotary vane pump oil sealed, driven by a single phase electrical motor in which the pump is directly driven by the motor.

It is available in two models:

- X3703-64000, DS40M 100-120 Vac 50/60 Hz nominal voltage
- X3703-64001, DS40M 200-240 Vac 50/60 Hz nominal voltage



**Figure 8**

This vacuum pump is suitable for pumping non corrosive gases only.

## 5 Technical Information

### Technical Description



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The main features are:

- all materials are carefully selected to provide extended life;
- all the parts composing the pump are fully replaceable due to the close machining tolerances and to the centering obtained by using reference pins.

The pump works with force-feed lubrication, provided by an auxiliary vane-pump driven by the rotor of the vacuum pump itself. This ensures proper lubrication even when pressures are close to atmospheric.

The entire pump functional block is immersed in the oil contained in the casing. The oil guarantees perfect sealing of the discharge valves, enters the pump to ensure lubrication and sealing of the parts inside, facilitates heat dissipation and reduces pump noise.

The pump is equipped with a special antisuckback device.

The vacuum pumps are connected directly to the electrical motor through a magnet coupling, so that motion is transmitted even in case of poor alignment.

## Lubrication

The pump's lubricating system is force-feed type. Oil circulation is obtained by means of a vane pump connected to the rotor shaft.

The required flow of oil under pressure passes through ducts that are drilled in the walls of the pump and lubricates the bushings and the inside parts.

**Tab. 2**

1	X3703-64003	DS40M OIL MIST TRAP
2	X3703-64004	DS40M OIL MIST TRAP CARTDRIGE
3	X3703-64005	DS40M MAINTENANCE KIT
4	X3703-64006	ROTARY VANE FLUID AVF 20S 0.5 L

## Thermal protector

An overload protector (Auto reset thermal protector) is incorporated. Thermal protector activates when the pump motor is overloaded (e.g. locked rotor, out range of voltage, close ventilation).

**Tab. 3** Characteristics of the thermal protector

Operation temperature	Reset temperature
120° C ± 5° C	76° C ± 15° C

When the thermal protector has been actuated, turn off the power and contact your local AGILENT Service.

**WARNING!**



**The motor is very hot when the thermal protector has actuated. Never touch it with your hand.**

When the cause of the malfunction has been eliminated, check that the motor has cooled down, and restart the pump.

The use of another protective device (such as an earth leakage breaker) in addition to the overload protector is recommended.

## Oil mist trap

An oil mist trap can be installed in order to remove oil mist from the pump. The oil mist trap model X3703-64003 is available for this pump.

Remove the standard outlet pipe from the outlet port of the pump and install an oil mist trap instead. The oil mist trap not only prevents oil mist generation but also reduces exhaust noise by half. For further details, refer to the Instruction Manual of the Oil Mist Trap.

## Restriction on operation with oil mist trap installed

When using the oil mist trap, there are some restrictions on operation.

When the filter is clogged, replace it.

---

**WARNING!**



**If the filter trap oil mist is clogged, there is a risk of explosion due to the rise of the internal pressure of the pump, the oil level gauge may come off and there is a danger of overloading of the electrical motor.**

---

## Technical Data

The following table lists the main technical data of the DS40M.

**Tab. 4**

<b>Technical data</b>	<b>Hz</b>	<b>Units</b>	<b>Value</b>
PUMPING SPEED *	60	l/min	36
	50	l/min	30
ULTIMATE TOTAL PRESSURE *		Pa	6.7x10 <sup>-1</sup>
OIL CAPACITY		l	0.37
MOTOR RATING 1ph	50/60	kW	0.1
NOMINAL ROTATION SPEED	50	rpm	2600
	60	rpm	3300
Installation category	II		
Pollution degree	2		
OPERATING TEMPERATURE RANGE		°C	12-40
WEIGHT		Kg	9.3
		lb	20,5
INLET FLANGE		KF	16
EXHAUST FLANGE		KF	16
Dimensions (max):			
- length		mm	288.8
- width		mm	120
- height (with handle)		mm	163.3 (202,4)
Input single phase versions			
Nominal voltages:	50/60	V	200-240
	50/60	V	100-120
Maximum currents:	50	A	1.85
	60	A	1.89
Fuse (slow-blow type)		A	5
Rotary Vane Fluid (P/N X3703-64006)	0.5	l	AVF20S



Technical data	Hz	Units	Value
Noise Level	50 dB(A) max (**)	with Oil Mist Trap installed	
Leak rate		Pa*m <sup>3</sup> /s	1x10 <sup>-6</sup>
IP Class		20	

\* According to ISO 21360

\*\* According to ISO 3744

# DS40M Outline

The following figures show the DS40M (dimensions are in mm).

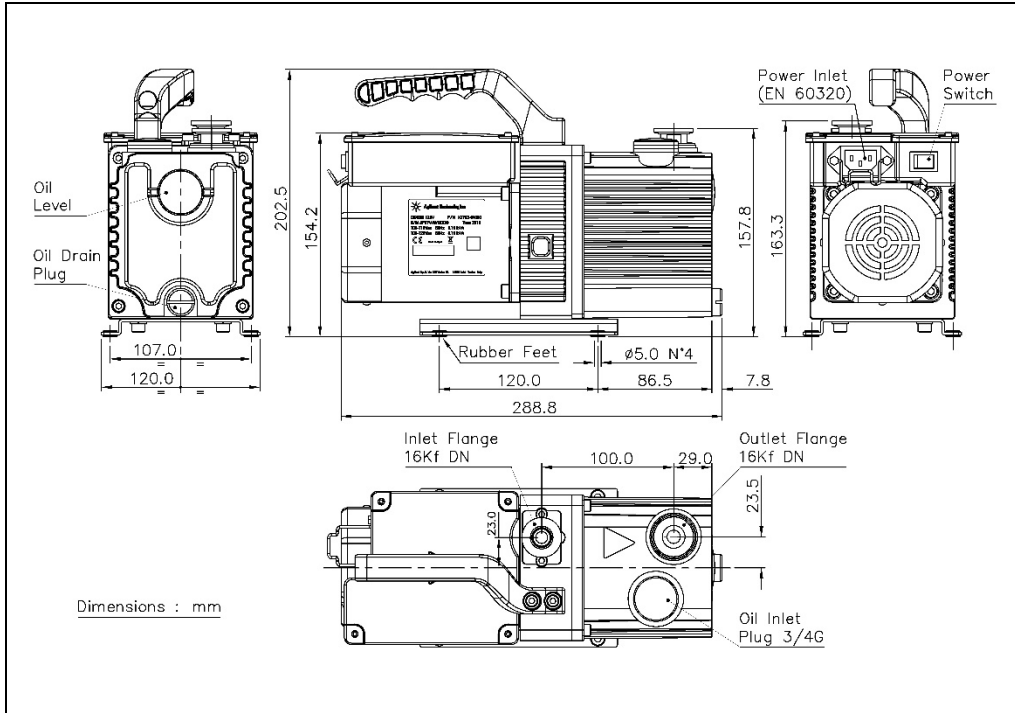
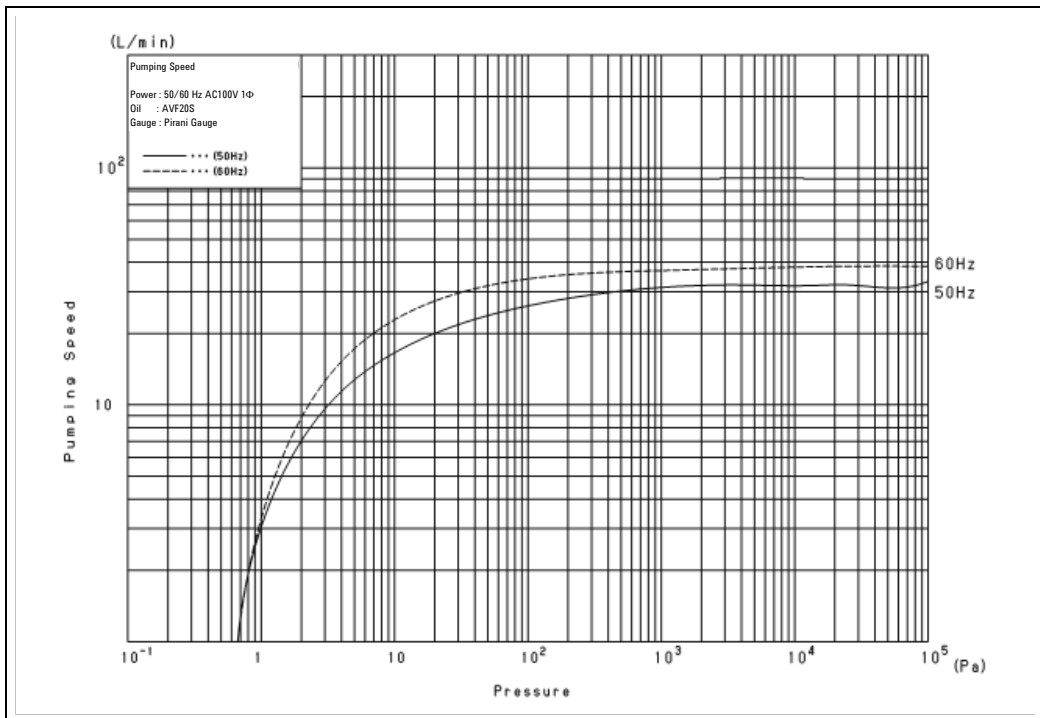


Figure 9 DS40M (X3703-64000 and X3703-64001)

## Pumping Speed

The pumping speed depends on the type and pressure of the gas to be evacuated. The pumping speed usually reaches the maximum at a high pressure range and it gradually decreases as the pressure reduces.

The nominal pumping speed of this pump corresponds to the maximum pumping speed when dry air is evacuated. The following shows the relationship between the evacuation pressure and pumping speed.



**Figure 10** Pumping Speed

## Safety Precautions

The pump must be set in position taking the utmost care in order to avoid accidental falls.

---

### **WARNING!**



**In case of a need to handle the pump after a period of operation, it must be left to cool first as the external surface temperature may be in excess of 60 °C.**

---

### **CAUTION!**

Never block the pump exhaust line. This would cause overpressure in the casing with the risk of breaking the glass window of the level indicator and/or expelling the oil seal gasket.

---

## Transport and Installation

The pumps are shipped to the customer inside cardboard boxes. Total weight of the pack, including the pump, is about 13 kg.

The case must be handled with care, using appropriate lifting equipment.

### CAUTION!

When moving the case, ensure that it is securely bound to the lifting equipment and that the equipment is strong enough to support the weight.

---

The pump working environment is a traditional industrial environment. Naturally sites with corrosive vapors or excessive heat are best avoided.

Room temperature should ideally be between 12 °C and 40 °C. If the temperature is not inside this range, consult Agilent technical service for the changes required.

Setting the pump in position should be performed as follows:

- Pump laid on the ground. There are no special instructions for this type of installation, except that the floor should be as flat as possible and suited to bear the weight of the pump (it should ideally be a concrete floor) and of any accessories mounted on it. Note that the pump is stable on its base plate and it should not be necessary to anchor it to the floor with bolts and screws; also vibrations to and from the pump are greatly reduced by the use of rubber feet.
- Pump off the ground. In this case, the user must design a suitable support structure, remembering the following points:
  - the plane supporting the pump must be perfectly horizontal;
  - the structure should be adequately rigid;
  - the relevant safety precautions should be applied.

## 5 Technical Information

### Transport and Installation

Note also that the pump should be attached to the supporting structure after replacing the rubber feet with special anti-vibration feet, which should be screwed to the pump base and to the supporting plane. After taking the pump out of its packing case, you are advised to ensure that the pump has not suffered any damage during shipping.



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## Preliminary Operations

---

**WARNING!**



Take out the protective caps on the suction and exhaust flanges before doing anything else. In the event of an accidental start-up, the air inside the pump could violently expel the protective caps and harm the operator.

---

**CAUTION!**

Assure a free space all around the pump at minimum of 10 cm to allow proper air circulation.

---

## Section II

### Electrical Motor

The pump is tested according to major international standards (UL, CSA, CE).

To connect the pump to the mains the relevant power cord should be suitable with the mains voltage. The available power cord are;

- Model 9499397 for X3703-64000, DS40M 100-120 V 50/60 Hz nominal voltage (USA plug)
- Model 9499396 for X3703-64001, DS40M 200-240 V 50/60 Hz nominal voltage (Shuko plug)
- Model 9499398 for X3703-64001, DS40M 200-240 V 50/60 Hz nominal voltage (UK plug).

---

**WARNING!**



**The electrical installation of the pump must be performed by person with an adequate education in electrical installations, only.**

---

**CAUTION!**

Before connecting to the mains, check that your electrical mains voltage corresponds to the motor voltage.

---

**WARNING!**



**A switch on circuit breaker must be included in the building installation. It shall be in the close proximity to the equipment and within easy reach of the operator. It shall be marked as the disconnecting device for the equipment.**

---



**NOTE**

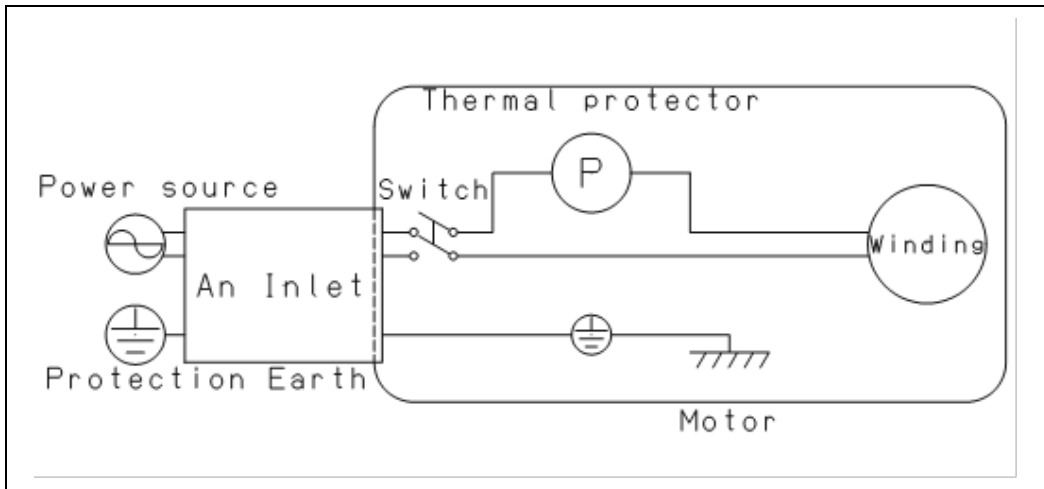
If you start a pump at low temperature, the current absorbed by the motors will be for several seconds higher than the nominal one, for this reason the fuse or the protection device on the line must be of the slow-blow type.

**WARNING!**



If you use a mains cable with a length of 3 m max and a separable plug, it is recommended to connect the pump to mains power through a dedicated switch on the main electrical panel of the installation, or in proximity of the power supply connection point.

In all other cases (cable length more than 3 m or permanently connection) the pump must be connected to mains power through a dedicated switch in the building installation.

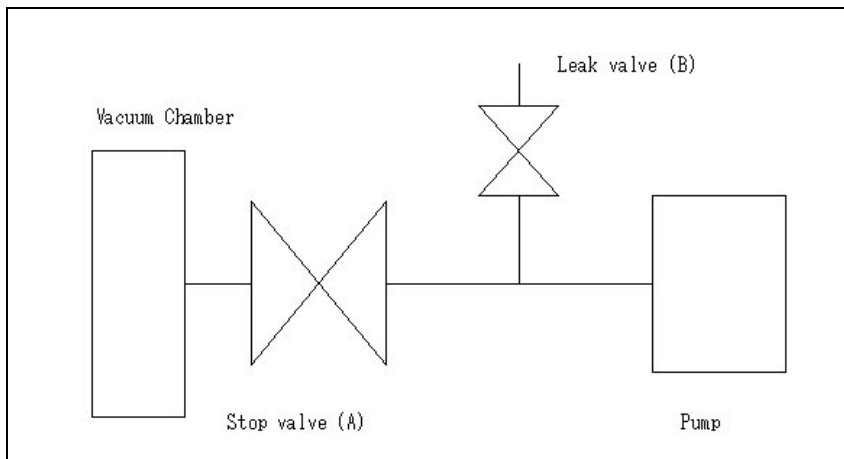


**Figure 11** Electric wiring diagrams

## Connections to the Inlet and Exhaust Flanges

Remove the protective caps from both flanges. Connect the system to be evacuated to the inlet flange, using a centering ring with OR and a locking collar.

Our recommendation is that between the system to be evacuated and the pump a stop valve (A) and leak valve (B) should be installed.



**Figure 12** Inlet flange connection diagram

**NOTE**

For guaranteed reliable sealing, use an OR gasket in Perbunan or Viton.

The inlet port is equipped with a sieve filter preventing solid particles from entering and damaging the pump.

**NOTE**

When the gases to be pumped out contain dust, it is advisable to insert a dust filter before the inlet flange.

**NOTE**

When the gases to be pumped out contain large quantities of vapor, it is advisable to include a condense separator before the inlet flange.

---

To make best use of the pump capacity, use only short, straight piping, with a diameter not smaller than that of the inlet flange.

**NOTE**

If rigid piping is used, it is good practice to use a flexible joint in order to avoid undue forcing of the connection on the pump.

---

The exhaust port must be connected to a pipe that will take away the pumped out gases.

**NOTE**

Application of an oil trap filter is necessary to avoid pollution of the surrounding atmosphere by the oil present in the exhaust port during pump operation.

---

**CAUTION!**

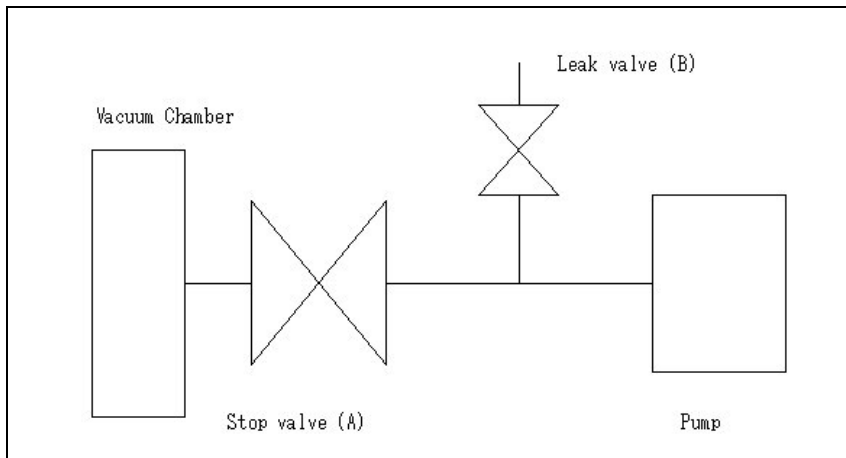
Never block the pump exhaust line. This would cause overpressure in the casing with the risk of breaking the glass window of the level indicator and/or expelling the oil seal gasket.

---

## Starting and Running the Pump

Before being put into service (refer to Figure 11), close the leak valve (B), open vacuum valve (A) to the inlet port then turn the power switch to “ON”. Then the pump starts being to exhaust.

Never insert hands, fingers, or thin objects through the motor opening.



**Figure 13** Inlet flange connection diagram

**WARNING!**



The pump is designed for operation with neutral or non-corrosive gas. It is absolutely forbidden to use potentially explosive or flammable substances.

**WARNING!**



Never insert hands, fingers or any other thin objects through the motor opening.

---

There are no special instructions for normal operation of the pump, which is delivered to you after completion of a running cycle in the factory.

**CAUTION!**

If pump operates at high pressure, oil mist is generated at the exhaust side. Install an oil mist trap or connect it to a line to discharge the oil mist outside the room.

---

**NOTE**

For repetitive work cycles, with brief time intervals in between, it is better not to stop the pump.

---

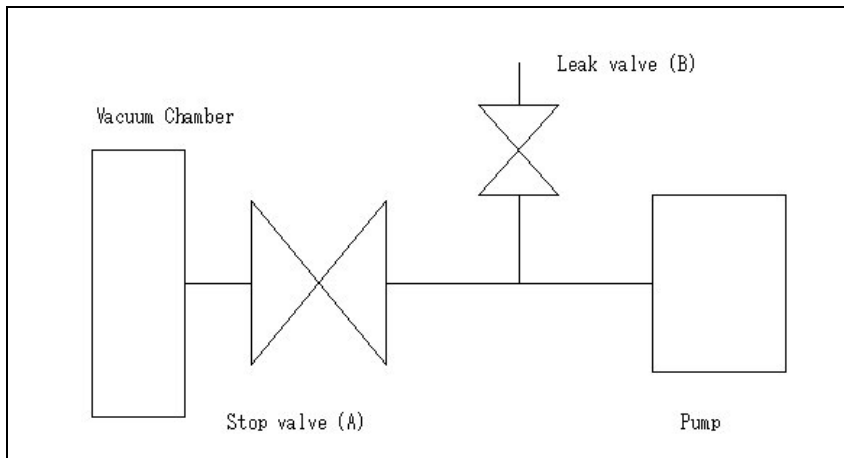
When using the pump at low temperature, should be to start the pump. This is an overload phenomenon resulting from the increase in the viscosity of the pump oil. To start the pump in such conditions, warm up the pump oil, or turn the pump on and off several times in short intervals.

When the pump stops after rotating for a few seconds, open leak valve (B) (refer to Figure 11) and continuous operation may become possible. After the pump has warmed up, close leak valve (B) and return to ordinary operation.

## Stopping the Pump

To stop operation, close vacuum valve (A), open leak valve (B) quickly, and turn the power switch to “OFF” (see Figure 12).

Then close the leak valve (B) and seal a suction side as much as possible, after having dropped off the suction side to the atmospheric pressure.



**Figure 14** Inlet flange connection diagram

When the pump is stopped, the anti-suckback device makes it possible to maintain vacuum in the vessel connected on the inlet flange of the pump.

If the pump is expected to be stopped for a long period, it is good practice to run it with the inlet line closed for a few minutes before switching off in order to limit the risk of corrosion or scaling due to pollution of the oil by condensed vapors.

## Safety Rules

Personnel responsible for pump operation and maintenance must be well-trained and must be aware of the accident prevention rules.

The accident prevention precautions contained in this section must be respected at all times during operation and maintenance of the pump to avoid damage to operators and to the pump.

These precautions are provided in the form of WARNING and CAUTION notes.

---

**WARNING!**



**Operating procedures, technical information and precautions which, if not respected and/or implemented correctly may cause body harm to operators.**

---

**CAUTION!**

Operating procedures, technical information and precautions, which, if not respected and/or implemented correctly, may cause damage to the pump.

---



## Warning Notes

- a** Death may result from contact with high voltages. Always take extreme care and observe the accident prevention regulations in force.
- b** Always disconnect the power supply to the pump before maintenance work. Place a special warning signs over the power supply breaker switch: MACHINE UNDERGOING MAINTENANCE - DO NOT POWER ON.
- c** If you are performing maintenance after the pump has been operating for a considerable time, allow sufficient time for it to cool down as the external surface temperature may be in excess of 60 °C.
- d** Failure to provide the pump with an earth connection may cause serious damage to operators. Always ensure that there is an earth connection and that it complies with the standards.
- e** When cleaning the pump and its component parts, avoid the use of flammable or toxic solvents, such as benzin, benzol, ether or alcohol. The recommendation is to use a soap and water solution, preferably in ultrasound washing machines, taking care to dry all the cleaned parts at temperatures under 100 °C in order to eliminate residual moisture.
- f** Prolonged overloads or breakdowns may cause the electrical motor to overheat, and to release noxious smoke; remove the power immediately as a precaution and do not approach the pump at least until you have provided ventilation to drive out the smoke. Take care not to breathe in the fumes remaining inside the pump in the course of repair work.
- g** In case of fire, do not throw water on the pump. Switch the power off and use CO<sub>2</sub> extinguishers.
- h** Carefully inspect the flanges to ensure that there is no dust, oil, dirt or defects of the mating surfaces, before making the required connections.
- i** Do not wear any objects that may become entangled in the mechanisms and/or act as conductors (chains, bracelets, etc.).



- j** Ensure that the tools to be used are in perfect working condition and have insulating grips, where necessary. Check that the insulating material of the cables and that the conductors of the test equipment do not show any signs of damage.
- k** Do not replace the oil immediately after stopping the machine as the oil may still be at high temperature.
- l** Perform repairs in clean and, where possible, dustfree areas. Protect all the clearances of connection points with suitable plastic caps and cover the machined surface areas of all parts stripped down until they are put back on the pump again.

## Caution Notes

- a** Before putting the pump back into operation after a breakdown, inspect it and check carefully for any other signs of damage.
- b** Use only tools that are in perfect working order and specially designed for the job; use of inappropriate or ineffective tools may cause serious damage.
- c** Perform repairs in clean and, where possible, dustfree areas. Protect all the clearances of connection points with suitable plastic caps and cover the machined surface areas of all parts stripped down until they are put back on the pump again.
- d** Always check the lubricant and that it is properly distributed through the pump; inadequate lubrication may damage the pump seriously.



## Maintenance Actions

### NOTE

The frequency with which repairs are performed depends on the process and presence of substances that shorten pump life (dust, abrasives, solvents, water, chemically aggressive substances).

---

The pump must be cleaned at regular intervals of time.

### CAUTION!

Do not clean using Alcohol or Acetone the plastic or rubber components of the pump.

---

Use only the strictly necessary amount of lubricant; an excess of lubricating oil, like when there is none, may sometimes compromise proper operation of the pump.

Only the recommended lubricants, or lubricating oils with similar characteristics and known and experimented quality, should be used. Oil changes must be made with the oil at a sufficiently high temperature, after leaving the pump to cool for a few minutes following operation.

The drain and filler plugs must not be left open any longer than is strictly necessary.

When performing maintenance, look out for all signals that may precede a breakdown, in particular:

- traces of corrosion;
- oil leaks.

Maintenance technicians must:

- be aware of all applicable national directives concerning accident prevention during work on motor-driven pumps and should know how to apply them;
- have read and understood all the sections on "Safety Rules";
- be familiar with the essential design features and operation of the pump;
- know how to use and consult the pump documentation;
- be concerned about proper operation of the pump;
- make a note of any irregularities in operation of the pump and take the necessary action, where appropriate.

For all problems arising, or to order spare parts, refer to our service department.

**Agilent S.p.A. - Vacuum Technologies**  
**Via F.lli Varian 54**  
**10040 Leini, (Torino) - Italy**  
**Tel.: +39 011 997 9111**  
**Fax: +39 011 997 9350**



## Lubricants

It will be readily understood how important adequate lubrication is to high technology pumps like the Agilent vacuum pumps. Correct use of appropriate lubricants makes a significant contribution to achieving best performance and warding off defects.

When handling lubricants, the following sanitary protection measures should be observed at all times:

- Avoid prolonged, excessive or repeated contact of the skin with products for lubrication, and also avoid directly inhaling the fumes or vapors of such products.
- Protect the skin by wearing appropriate clothes and equipment (e.g. special suits, glasses or, where permitted by the safety regulations, gloves) or by applying a special protective product.
- Clean the skin carefully after contact with the lubricants by washing freely with water and soap.
- Apply a skin cream after washing.
- Take off and change clothes or shoes on which oil has been spilled.
- Never put rags dripping with oil into the pockets of your clothes.

When disposing of waste lubricants, observe the following environment protection regulations:

- The lubricants risk contaminating the water and the ground! Therefore never pour lubricating products on to the ground, into water or in the sewage system. All violations of these rules are liable to persecution as provided for by law. When using lubricants always keep oil can nearby.
- Take care in draining off waste oils. In disposal of these products respect all regulations in force concerning waste oil disposal.

The recommended lubricating oil is the Agilent Rotary Vane Fluid AVF20S. The Rotary Vane Fluid AVF20S is a general purpose mechanical pump fluid specifically engineered to provide superior performance in high speed direct drive mechanical pumps.

This precisely distilled fluid (100% solvent refined neutral paraffinic oil) deliver lower base pressure capability, faster pump-down cycles, and reduced maintenance requirements on both the pump and the fluid.

It is absolutely necessary to continue using the lubricants initially used to fill the tank. If this is not possible for organizational or business reasons, use only products with the same characteristics as the previous oils. Only use of lubricants of suitable quality will guarantee safe operation of the pumps.

**CAUTION!**

Mineral oils and the PFPE oil are incompatible. To change from one type to another, the pump must be stripped down completely and all parts washed carefully to eliminate all oil residues.

If you expect to have to use other lubricants, first find out if the two products are compatible. In cases of doubt, the lubricant used up to that time must be flushed out by way of a pump flushing procedure.

**CAUTION!**

To avoid the risk of contaminating the oil, absolute cleanliness of the pump and surrounding area must be ensured during the lubrication procedures.

**Tab. 5** Agilent Rotary Vane Fluid AVF20S Type characteristics

Property	Unit of measure	Rotary Vane Fluid DS31 Type
Vapour pressure @ 20 °C	Torr	<1x10 <sup>-5</sup>
Boiling point @ 0,01 torr	°C (°F)	159 (318,2)
Viscosity @ 40 °C	cSt (SUS)	20 (97,3)
Viscosity @ 100 °C	cSt (SUS)	5.9 (52,7)
Pour point	°C (°F)	-15 (+5)
Flash point	°C (°F)	240 (464)
Fire point	°C (°F)	269 (516)
Density @ 25 °C	g/ml	0.867



## Oil replacement

The following procedure must be performed to oil replacement (refer to Figure 13);

- 1 Release the pump inlet pipe to the atmosphere and operate the pump for five seconds. The oil remaining in the pump is discharged efficiently.
- 2 Remove the outlet pipe and drain plug to discharge the pump oil.
- 3 Mount the drain plug and add the required amount of the new specified pump oil through the oil inlet port.

### NOTE

If the pump oil is contaminated extremely, add new pump oil and perform operation for a while (several minutes) to clean the pump. Repeat this a few times.

---

- 4 After replacing with the new pump oil, operate the pump and when the pump has become warm, check the ultimate pressure.

### CAUTION!

If the pump oil is so dirty that oil sludge accumulates at the bottom of the pump, the specified ultimate pressure couldn't be reached even after the pump oil is replaced. In such a case, overhaul the pump.

---

- 5 Remove the oil inlet plug from the oil inlet port, and add the pump oil which has been delivered together with the pump or the pump oil specified by AGILENT (AVF20S) up to the range marked on the oil level gauge.
- 6 When making the first lubrication, add oil near to the upper oil level limit shown on the oil level gauge. After lubrication, mount the oil inlet plug to the pump.

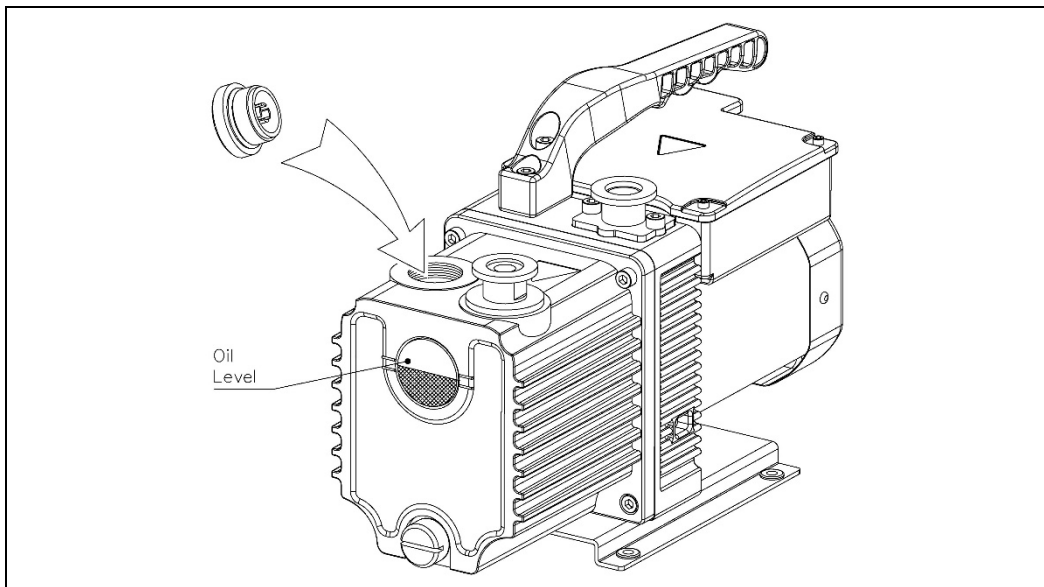
**CAUTION!** Always keep the oil level of the pump within the oil limit range shown on the oil level gauge during operation. If the amount of oil is incorrect, the performance of the pump will deteriorate resulting in the malfunctioning of the pump.

---

- 7 When the amount of oil has reduced and the oil level has reached an area below the lower line which shows the lower limit on the oil level gauge such that the level cannot be seen, the ultimate pressure increases and exhausting sound may not cease.

**CAUTION!** Do not operate the pump without adding pump oil. If it is operated in oil-less condition, the pump will be damaged.

---



**Figure 15** Oil replacement



## Scheduled Maintenance

**Tab. 6** Scheduled inspection and actions

Frequency	Item	Inspection	Action
Once/3 days	Oil	Amount.	Refill the oil.
		Color (Reddish brown, dark blown, and cloudy white are not good.)	Replace the oil.
	Sound	Abnormal sound.	Check nuts and bolts for looseness. If not clear, contact AGILENT local Service.
	Vibration	Abnormal vibration.	Check the cause of an overload. If not clear, contact AGILENT local Service.
Every week	Curent value	Difference from the rated value.	Check the cause of an overload. If not clear, contact AGILENT local Service.
	Surface temperature	Surface temperature. (The temperature higher than the room temperature by 40 °C or more is abnormal.)	Check the cause of an overload. If not clear, contact AGILENT local Service.
	Oil leakage	Oil leakage from the plugs.	Replace seals, or contact AGILENT local Service.

**NOTE**

The oil has to be replaced when it has become particularly dirty due to the presence of contaminants in the environments being evacuated;



**NOTE**

When the pump is equipped with:

- a filter for dust on the inlet side,
  - a condensation separator on the inlet side these items must also be maintained, by following the Manufacturer's instructions.
-



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## Orderable Parts

**Tab. 1**

<b>PART NUMBER</b>	<b>DESCRIPTION</b>
X3703-64003	DS40M Oil Mist Trap
X3703-64004	DS40M Oil Mist Trap cartridge
X3703-64005	DS40M Maintenance Kit
X3703-64006	Rotary Vane Fluid AVF 20 S 0.5L



***Vacuum Products Division***

*Dear Customer,*

*Thank you for purchasing an Agilent vacuum product. At Agilent Vacuum Products Division 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 products. 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,*

A handwritten signature in black ink, appearing to read "Giampaolo LEVI".

*Giampaolo LEVI*

*Vice President and General Manager  
Agilent Vacuum Products Division*

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

**CUSTOMER REQUEST FOR CORRECTIVE / PREVENTIVE / IMPROVEMENT ACTION**



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TO: AGILENT VACUUM PRODUCTS DIVISION TORINO – QUALITY ASSURANCE FAX

N°: XXXX-011-9979350

ADDRESS: AGILENT TECHNOLOGIES ITALIA S.p.A. – Vacuum Products Division –

Via F.Ili Varian, 54 – 10040 Leini (TO) – Italy

E-MAIL: [vpd-qualityassurance\\_pdl-ext@agilent.com](mailto:vpd-qualityassurance_pdl-ext@agilent.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 AGILENT VPD)		LOG N°

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

## Vacuum Products Division Instructions for returning products

Dear Customer,

Please follow these instructions whenever one of our products needs to be returned.

Complete the attached **Request for Return form** and send it to Agilent Technologies (see below), taking particular care to include the completed **Health and Safety** declaration Section. No work can be started on your unit until we receive a completed copy of this form.

After evaluating the information, Agilent Technologies will provide you with a **Return Authorization (RA) number** via email or fax, as requested. Note: Depending on the type of return, a Purchase Order may be required at the time **the Request for Return is submitted**. We will quote any necessary services (evaluation, repair, special cleaning, eg).

### Product preparation

- Remove all accessories from the core product (e.g. inlet screens, vent valves).
- Prior to shipment and if applicable for your product, drain any oils or other liquids, purge or flush all gasses, and wipe off any excess residue.
- If ordering an Advance Exchange product, please use the packaging from the Advance Exchange to return the defective product.
- Seal the product in a plastic bag, and package product carefully to avoid damage in transit. You are responsible for loss or damage in transit.
- Include a copy of the Health and Safety Declaration in the shipping documentation on the outside of the shipping box of your returning product.
- Clearly label package with RA number. Using the shipping label provided will ensure the proper address and RA number are on the package. Packages shipped to Agilent without a RA clearly written on the outside cannot be accepted and will be returned.
- Return only products for which the RA was issued.

### Shipping

- Ship to the location specified on the printable label, which will be sent, along with the RA number, as soon as we have received all of the required information. Customer is responsible for freight charges on returning product.
- Return shipments must comply with all applicable Shipping Regulations (IATA, DOT, ADR, etc.) and carrier requirements.

RETURN THE COMPLETED **REQUEST FOR RETURN** FORM TO YOUR NEAREST LOCATION:

#### EUROPE:

Fax: 00 39 011 9979 330  
Fax Free: 00 800 345 345 00  
Toll Free: 00 800 234 234 00

#### NORTH AMERICA:

Fax: 1 781 860 9252  
Toll Free: 800 882 7426, Option 3

#### PACIFIC RIM:

Please visit our website for individual office information

[vpt-customer@agilent.com](mailto:vpt-customer@agilent.com)

[vpl-ra@agilent.com](mailto:vpl-ra@agilent.com)

<http://www.agilent.com>



**Agilent Technologies**



## **Vacuum Products Division Terms and conditions**


### **TERMS AND CONDITIONS**

**Please read the terms and conditions below as they apply to all returns and are in addition to the Agilent Technologies Vacuum Product Division – Products and Services Terms of Sale.**

- Unless otherwise pre-negotiated, customer is responsible for the freight charges for the returning product. Return shipments must comply with all applicable **Shipping Regulations** (IATA, DOT, etc.) and carrier requirements.
- Agilent Technologies is not responsible for returning customer provided packaging or containers.
- Customers receiving an Advance Exchange product agree to return the defective, rebuildable part to Agilent Technologies **within 15 business days**. Failure to do so, or returning a non-rebuildable part (crashed), will result in an invoice for the non-returned/non-rebuildable part.
- Returns for credit toward the purchase of new or refurbished Products are subject to prior Agilent approval and may incur a restocking fee. Please reference the original purchase order number.
- Units returned for evaluation will be evaluated, and a quote for repair will be issued. If you choose to have the unit repaired, the cost of the evaluation will be deducted from the final repair pricing. A Purchase Order for the final repair price should be issued within 3 weeks of quotation date. Units without a Purchase Order for repair will be returned to the customer, and the evaluation fee will be invoiced.
- Products returned that have not been drained from oil will be disposed.
- A Special Cleaning fee will apply to all exposed products.
- If requesting a calibration service, units must be functionally capable of being calibrated.

Customer information		
Company :		Contact Name:
Address:		Tel: <span style="float: right;">Fax:</span>
Email:		

Equipment			
Product description	Agilent PartNo	Agilent Serial No	Original Purchasing Reference
Failure description		Type of process (for which the equipment was used)	

Type of return
<input type="checkbox"/> Non Billable <input type="checkbox"/> Billable  New PO # (hard copy must be submitted with this form): _____ <input type="checkbox"/> Exchange <input type="checkbox"/> Repair <input type="checkbox"/> Upgrade <input type="checkbox"/> Demo <input type="checkbox"/> Calibration <input type="checkbox"/> Evaluation <input type="checkbox"/> Return for Credit

Health and safety	Substances (please refer to MSDS forms)				
The product has been exposed to the following substances: (by selecting 'YES' you MUST complete the table to the right)	* Agilent will not accept delivery of any product that is exposed to radioactive, biological, explosive substances or dioxins, PCB's without written evidence of decontamination.				
		Trade name	Chemical name	Chemical Symbol	CAS Number
Toxic	<input type="checkbox"/> YES <input type="checkbox"/> NO				
Harmful	<input type="checkbox"/> YES <input type="checkbox"/> NO				
Corrosive	<input type="checkbox"/> YES <input type="checkbox"/> NO				
Reactive	<input type="checkbox"/> YES <input type="checkbox"/> NO				
Flammable	<input type="checkbox"/> YES <input type="checkbox"/> NO				
Explosive (*)	<input type="checkbox"/> YES <input type="checkbox"/> NO				
Radioactive (*)	<input type="checkbox"/> YES <input type="checkbox"/> NO				
Biological (*)	<input type="checkbox"/> YES <input type="checkbox"/> NO				
Oxidizing	<input type="checkbox"/> YES <input type="checkbox"/> NO				
Sensitizer	<input type="checkbox"/> YES <input type="checkbox"/> NO				
Other dangerous substances	<input type="checkbox"/> YES <input type="checkbox"/> NO				

Goods preparation
If you have replied YES to one of the above questions. Has the product been purged? <span style="float: right;"><input type="checkbox"/> YES   <input type="checkbox"/> NO</span> If yes, which cleaning agent/method:
Has the product been drained from oil? <span style="float: right;"><input type="checkbox"/> YES   <input type="checkbox"/> NOT APPLICABLE</span> I confirm to place this declaration on the outside of the shipping box. <span style="float: right;"><input type="checkbox"/></span>

I declare that the above information is true and complete to the best of my knowledge and belief. I understand and agree to the terms and conditions on page 2 of this document.	
Name:	Authorized Signature:
Position:	
Date:	

**NOTE:** If a product is received at Agilent 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 Agilent employees as well as to any third party occurring as a result of exposure to toxic or hazardous materials present in the product.

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